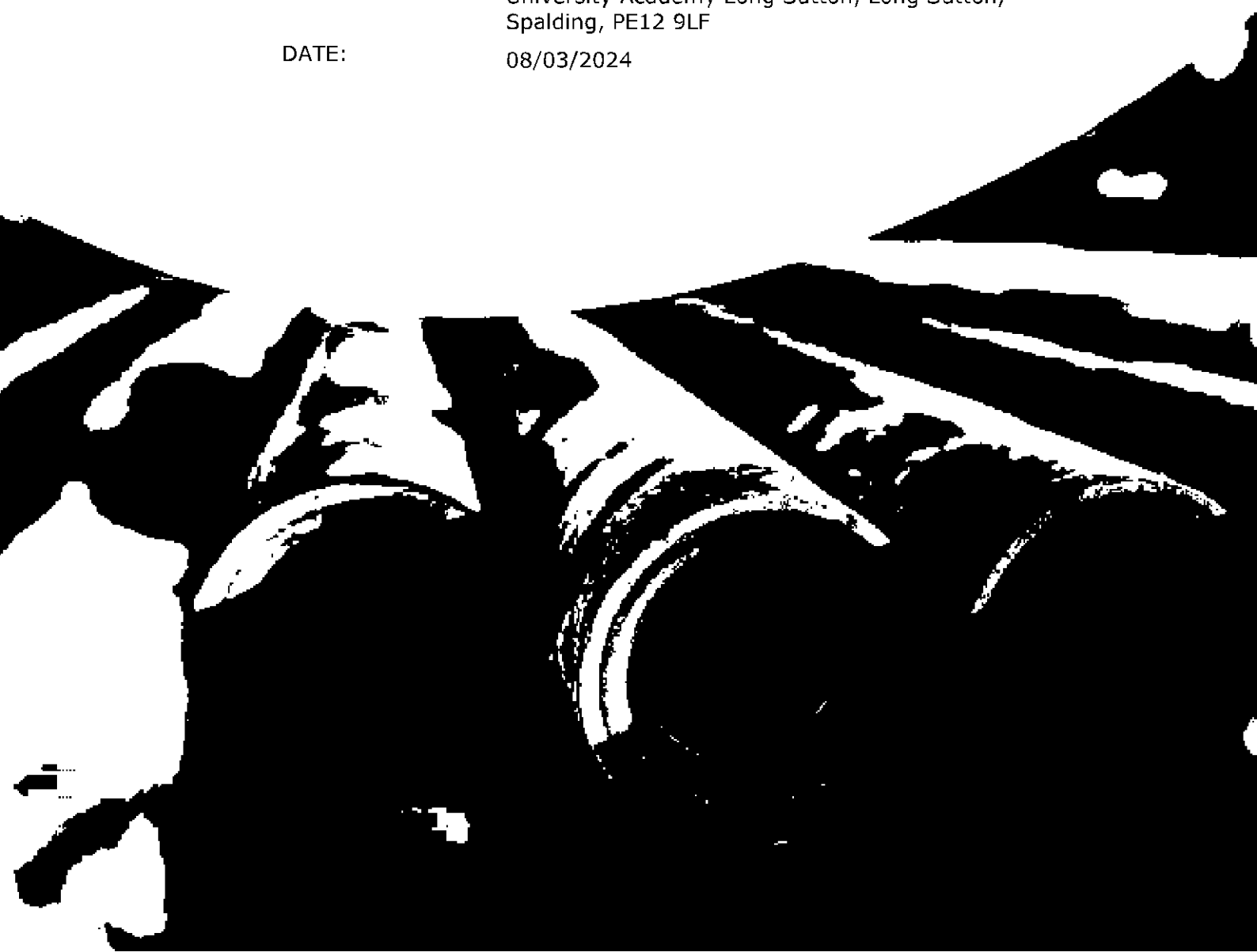


## GEOSPHERE ENVIRONMENTAL

REPORT NUMBER: 8133,GI/GROUND/RS,JD/08-03-24/V1

SITE: University Academy Long Sutton, Long Sutton,  
Spalding, PE12 9LF

DATE: 08/03/2024



## DOCUMENT CONTROL SHEET

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Project Name: University Academy Long Sutton, Long Sutton, Spalding, PE12 9LF  
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### Limit of Reliance:

This report is based upon the site findings at the time of the associated walkover/site investigation works and information provided by the client at the time of writing. Should site conditions alter or development proposals alter, a reassessment of the enclosed findings should be undertaken. Refer to Appendix 1 for full details of report limitations.

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|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Introduction</b>                      | Geosphere Environmental Ltd was commissioned by the Client, Bowmer & Kirkland Ltd to undertake a Phase 2 Ground Investigation for a proposed educational development at University Academy Long Sutton, Long Sutton, Spalding, PE12 9LF.                                                                                                                                                                                                                                                                                                                                    |
| <b>Site Works</b>                        | Site works were carried out between 12-14 <sup>th</sup> February 2024 and comprised the following:<br>Advancement of five windowless sampler boreholes to a maximum depth of 5.0 metres below ground level (mbgl);<br>Excavation of five trial pits for subsequent infiltration testing;<br>Performance of seven TRL Dynamic Cone Penetrometer tests to allow for determination of a California Bearing Ratio (CBR);<br>Installation of two monitoring wells for ground gas and groundwater monitoring; and<br>Associated soil sampling for subsequent laboratory analysis. |
| <b>Ground Conditions</b>                 | Ground conditions were recorded to comprise nominal amounts of Topsoil and/or Made Ground over cohesive Tidal Flat deposits.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Soil Quality Screening Assessment</b> | One sample of soil (WS04 at 0.5mbgl) reports elevated concentrations of hydrocarbon EC group (Aromatic >C16 – C21) and a small number of PAH congeners exceeding the adopted screening criteria. This is attributed to the presence of fragments of asphalt or bitumen-coated roadstone in this material. A low risk is posed to end users from soil quality, in general, based upon the available data with the considerations provided below and the application of the Discovery Strategy outlined below.                                                                |
| <b>Ground Gas Assessment</b>             | The site would be placed in Characteristic Situation CS1 and no special gas protection measures are required for the proposed structure(s), based upon the available data. It may be a requirement of third parties or designers that an additional three rounds of ground gas monitoring are undertaken to assess the site in line with current guidance.                                                                                                                                                                                                                  |
| <b>Conceptual Model</b>                  | A Low risk has been applied to all receptors in consideration of the Made Ground that exists onsite, based on the proposed development layout and assuming appropriate measures are employed during construction.                                                                                                                                                                                                                                                                                                                                                           |
| <b>Geotechnical Considerations</b>       | In consideration of the required bearing capacity requirements for the proposed development and the presence of soft soils at shallow depths, consideration should be given to supporting the proposed development on piled foundations. This confirms the recommendations of the previous report.                                                                                                                                                                                                                                                                          |

**This Executive Summary only provides a summary of the site data and its assessment. It does not provide a definitive engineering analysis and is for guidance only. It is recommended that the reader reviews the report in its entirety and any material referenced therein.**

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Geosphere Environmental Ltd was commissioned by the Client, Bowmer & Kirkland Ltd to undertake a Phase 2 Ground Investigation for a proposed educational development at University Academy Long Sutton, Long Sutton, Spalding, PE12 9LF.

It was understood that the site is to be developed to include a new multi-story school building, with associated parking facilities and soft landscaping. A site compound and haulage road will also be established during the construction phase of this development.

It is also understood that the area of construction is proposed to have ground elevations increased by ~1.3metres.

The primary objectives of this ground investigation were to:

- Assess the ground conditions at the site; and
- Assess the potential risk to human health and the environment based upon the findings of the investigation.

These were achieved by:

- Undertaking an intrusive investigation of the site, based upon the proposed development layout and the scope agreed with the Client;
- Logging and sampling the soils on the site and noting any visual or olfactory evidence of contamination;
- Installing monitoring wells with subsequent ground gas and groundwater level monitoring;
- Undertaking laboratory chemical analysis of selected soil samples to assess soil quality at the site;
- Undertaking laboratory geotechnical testing of selected soil samples to assess ground conditions at the site;
- Developing a Conceptual Site Model and defining suitable remedial/mitigating and verification actions.

A Proposed Development Plan, Drawing ref. *SRP1155-ONE-XX-XX-D-L-0003*, is provided within Appendix 3.

A summary of the key findings from previous reports produced by Geotechnics Limited, on behalf of Mott MacDonald Ltd. is presented below:

*PC228532 Geotechnical and Geoenvironmental Desk Study Report at University Academy Long Sutton, reference SRP1155-GEO-XX-XX-T-G-001-058DesktopGI-S2-PO2 dated December 2022; and PC228532 Preliminary Ground Investigation Report with Interpretive Chapter for University Academy Long Sutton, reference SRP1155-GEO-XX-XX-T-G-058IntrusiveGI-S5-PO2, dated July 2023.*

The Phase 1 desk study identified the presence of Made Ground from historical development on the site as posing a Low/Moderate risk to future site users, based on the potential presence of contaminants with gas generation potential. Intrusive investigation did not indicate elevated levels of ground gas but did identify the presence of elevated Naphthalene above screening criteria for human health in one soil sample, and asbestos in another shallow soil sample (below a layer of asphalt surfacing).

It should be noted that the above reports were requested by a third-party organisation (the Department for Education, understood to be the end-client). Geosphere have not had confirmation that reliance may be placed upon these reports. As such, information within the previous report data has been treated on an anecdotal basis and is not fully referenced here: the soil logs and laboratory data from previous investigation have been omitted from this report and it is recommended that the respective previous reports are reviewed, where necessary, in particular regarding the foundation design scheme.

The subject site was situated to the east of Little London in Long Sutton, Spalding, PE12 9LF and may be located by National Grid Reference (NGR) TF437239.

The site consisted of various single and multi-storey school buildings to the west and centre, associated playing fields at the east of the site with a paved parking area and a playground area to the north. The south of the site was occupied by Peele Leisure Centre and associated astro-turf pitch, with open greenspace and a small woodland area in the southwestern corner.

More widely, the site was bounded by agricultural land to the north and east, with residential properties siding Little London to the west. The town centre of Long Sutton was situated roughly 1km to the southwest. For a detailed description of the site other documents are available.

The following sections have been completed using information obtained from available online data sets and generally confirm the data within the previous reports.

The online geological map indicated the site to be underlain by superficial Tidal Flat Deposits- Clay and silt.

The bedrock Geology underlying the site comprised Ampthill Clay Formation- Mudstone.

The hydrogeological data provided within online mapping indicate both the superficial and bedrock deposits are classified as Unproductive strata.

The site was not located within a groundwater source protection zone (SPZ).

The nearest surface watercourse or feature was an unnamed stream, located approximately 430m to the east of the site.

This site investigation was carried out in accordance with the practices set out in BS 10175:2011+A2:2017, (ref. **R.5**) and BS 5930:2015+A1:2020 (ref. **R.7**). The locations of exploratory holes were supplied by the Client.

The scope of this investigation is predominantly to investigate the ground conditions in areas not investigated previously, from a soil quality aspect; the geotechnical design for the scheme is understood to be defined and is assumed to require a piled foundation solution; there is a limited geotechnical component of this report.

Site works were carried out between 12-14<sup>th</sup> February 2024 and comprised the following:

- Advancement of five windowless sampler boreholes to a maximum depth of 5.0 metres below ground level (mbgl);
- Excavation of five trial pits for subsequent infiltration testing to the standards and requirements outlined in British Research Establishment Digest 365;
- Performance of seven TRL Dynamic Cone Penetrometer tests to allow for determination of an outline California Bearing Ratio (CBR);
- Installation of two monitoring wells for ground gas and groundwater monitoring; and
- Associated soil sampling for subsequent laboratory analysis.

A selection of photographs taken during siteworks are displayed in Appendix 11 of this report.

It should be noted that sampling locations for this investigation were developed in reference to a previous proposed development scheme plan. Since the completion of works, an updated site proposal, described in Section 1.1, was provided by the Client which detailed some significant layout changes.

The sequence of the strata encountered during the investigation generally confirmed the anticipated geology as interpreted from the British Geological Survey (BGS) digital mapping, at a scale of 1:50,000.

The sequence and indicative thickness of the strata encountered are provided in Table 1 overleaf:

**Table 1 - Ground Conditions**

| Strata              | Depth Encountered (mbgl) |              | Strata Thickness (m) | Extent / Composition                                                                                                                           |
|---------------------|--------------------------|--------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | From                     | To           |                      |                                                                                                                                                |
| Topsoil             | 0.0                      | 0.25-0.50    | 0.25-0.50            | <b>SK01-SK05, WS01 and WS02:</b><br><br>Dark brown organic sandy clay/clayey sand with rootlets.                                               |
| Made Ground         | 0.0                      | 0.50 to 0.75 | 0.50 to Unproven     | <b>WS03-WS05:</b><br><br>Asphalt surfacing, underlain by reddish brown/blackish gravelly sand. Gravel of flint, brick, concrete and roadstone. |
| Tidal Flat Deposits | 0.25-0.75                | 1.0-5.0      | Unproven             | <b>All exploratory holes:</b><br><br>Soft dark brown sandy silty clay/clayey silt.                                                             |

Groundwater was encountered in the following exploratory holes during the site investigation:

**Table 2 - Level of Groundwater Encountered**

| Exploratory hole reference | Depth of Water (mbgl) |
|----------------------------|-----------------------|
| WS01                       | 1.50                  |
| WS02                       | 1.00                  |
| WS03                       | 0.80                  |
| WS04                       | 0.70                  |
| SK01                       | 0.55                  |
| SK02                       | 0.50                  |
| SK03                       | 0.60                  |
| SK04                       | 0.45                  |
| SK05                       | 0.30                  |

Within the Made Ground anthropogenic inclusions suggest variable quality and potentially contaminated soil. However, no evidence of gross contamination (olfactory or visual) was encountered during the site works.

Representative disturbed samples were taken at the depths shown on the exploratory hole records and despatched to the laboratory. The Exploratory Hole Logs are included in Appendix 5.

Samples were collected for environmental laboratory analysis purposes in amber glass jars and sealed plastic pots and kept in a cool box with cooling aid. Geotechnical samples were recovered in plastic bulk bags or sealed plastic pots. Samples were obtained from the locations distributed across the site and selected samples analysed in order to provide lateral coverage as best possible.

The environmental laboratory used (DETS) is an accredited laboratory by the United Kingdom Accreditation Service (UKAS), and at least 50% of individual parameters are from methods pending accreditation to the Environment Agency Monitoring Certification Scheme (MCERTS) for the range of analyses undertaken as part of this investigation. The MCERTS performance standard for the chemical testing of soil is an application of ISO 17025: 2005, specifically for the chemical testing of soil.

The suite of chemical analyses was based upon the observations onsite and a standard suite of analytes, in order to assess risk to human health. The chemical analyses were carried out on seven samples of soil. The nature of the analyses is detailed below:

Metals screen - arsenic, cadmium, chromium, lead, mercury, selenium, boron (water soluble), beryllium, copper, nickel and zinc;

Organic screen - total petroleum hydrocarbons (TPH) – with specific carbon banding; benzene, toluene, ethylbenzene and xylenes (BTEX); polyaromatic hydrocarbons (PAH) – USEPA 16 suite;

Inorganics screen - cyanide (total), sulphate (water soluble); and

Others - pH, organic matter, asbestos screen.

In addition, two samples were selected for a full, single stage waste acceptance criteria suite of analysis. A further three samples of asphalt surfacing were selected for a suite of analyses to indicate presence / absence of coal tar content.

A copy of the laboratory test results is included in Appendix 9.

The geotechnical testing has been chosen based on the soils encountered during the site investigation and was undertaken at a UKAS accredited laboratory.

The following tests were undertaken:

- Moisture content determination;
- Plasticity testing;
- pH and soluble sulphate testing;
- Particle size distribution testing; and
- Determination of California Bearing Ratio.

A copy of the laboratory test results is included in Appendix 10.

Two monitoring wells were installed as part of the current investigation. The wells were installed with 63mm HDPE pipework with a gravel filter pack, bentonite seal and bung/gas tap.

Ground gas monitoring was undertaken by a suitably qualified Environmental Consultant, using a GFM436 landfill gas analyser and a MultiRaeLite Photo-ionisation detector (PID). The main determinants recorded were methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>), oxygen (O<sub>2</sub>), volatile organic compounds (VOCs) and the flow rate.

Ground gas monitoring was carried out in general accordance with current guidance. Three consecutive monitoring visits were undertaken over a period of two weeks including during falling barometric pressure conditions.

The results of ground gas monitoring are included in Appendix 8 and a summary is presented in Table 3 below:

**Table 3 - Ground Gas Monitoring Results Summary**

| Location | Range of Recorded Concentrations      |       |                                              |       |                                     |       | Flow Rate<br>(l/hr) | VOC<br>(ppm) | Atmospheric Pressure<br>(mb) |
|----------|---------------------------------------|-------|----------------------------------------------|-------|-------------------------------------|-------|---------------------|--------------|------------------------------|
|          | Methane (CH <sub>4</sub> )<br>[% v/v] |       | Carbon Dioxide<br>(CO <sub>2</sub> ) [% v/v] |       | Oxygen<br>(O <sub>2</sub> ) [% v/v] |       |                     |              |                              |
|          | (Min)                                 | (Max) | (Min)                                        | (Max) | (Min)                               | (Max) |                     |              |                              |
| WS02     | <0.1                                  | <0.1  | 0.1                                          | 0.8   | 18.5                                | 19.7  | <0.1                | 0            | 1011-1108                    |
| WS05     | <0.1                                  | <0.1  | 0.3                                          | 0.6   | 18.5                                | 20.2  | <0.1                | 7            | 1010-1108                    |

The measured groundwater levels were recorded using a dipmeter and the results of monitoring are presented in Table 4 overleaf:

**Table 4 – Groundwater Monitoring Results**

| Monitoring Well | Depth of Monitoring Well<br>(mbgl) | Groundwater Encountered at (mbgl) |            |            |
|-----------------|------------------------------------|-----------------------------------|------------|------------|
|                 |                                    | Visit 1                           | Visit 2    | Visit 3    |
|                 |                                    | 14/02/2024                        | 19/02/2024 | 26/02/2024 |
| WS02            | 3.0                                | 0.28                              | 0.24       | 0.40       |
| WS05            | 2.0                                | 0.63                              | 0.65       | 0.85       |

Following the approach set out in LCRM (ref **R.1**), a Conceptual Site Model has been formulated with the results of the intrusive investigation.

The results of the soil analyses have been compared to soil quality screening values, where deemed applicable, including:

The LQM/CIEH S4ULs for Human Health Risk Assessment, (ref. **R.12**); and  
Defra/CL:AIRE Final C4SLs, (ref. **R.11**).

Based on the land-use scenario of the proposed development, the values are compared to the screening values for "Residential without Plant Uptake / Home grown produce" as an initial and conservative "check method", so that any elevated concentrations will be highlighted if poor-quality soil is indicated. Further assessment can be undertaken if potential contamination of soils is determined based upon this initial screening activity.

Where the concentrations reported by the laboratory analysis (and thus determined onsite) are at or below the respective screening concentrations, they are considered not to pose a risk and are removed from further consideration, unless otherwise stated in the following sections.

The locations, depths and other relevant information of the elevated concentrations of the specific analytes are summarised in Table 5 overleaf and assessed in more detail, where necessary:

**Table 5 - Summary of Soil Analyses and Comparison with Current Screening Values**

| Analyte                            | Analyte Concentration Range (mg/kg) |         | Screening Value (mg/kg) for Land Use Residential Without Plant Uptake (1% SOM Assumed) | Number of Elevated Concentrations |
|------------------------------------|-------------------------------------|---------|----------------------------------------------------------------------------------------|-----------------------------------|
|                                    | Minimum                             | Maximum |                                                                                        |                                   |
| Arsenic                            | 6                                   | 14      | 40                                                                                     | 0                                 |
| Beryllium                          | <0.5                                | 1.4     | 1.7                                                                                    | 0                                 |
| Boron                              | <1                                  | <1      | 11000                                                                                  | 0                                 |
| Cadmium                            | <0.2                                | 0.4     | 85                                                                                     | 0                                 |
| Chromium                           | 9                                   | 27      | 910                                                                                    | 0                                 |
| Chromium VI                        | <2                                  | <2      | 6                                                                                      | 0                                 |
| Copper                             | 6                                   | 99      | 7100                                                                                   | 0                                 |
| Lead                               | 5                                   | 31      | 310                                                                                    | 0                                 |
| Mercury                            | <1                                  | <1      | 56                                                                                     | 0                                 |
| Nickel                             | 10                                  | 22      | 180                                                                                    | 0                                 |
| Selenium                           | <2                                  | <2      | 430                                                                                    | 0                                 |
| Zinc                               | 17                                  | 195     | 40000                                                                                  | 0                                 |
| Benzo(b)fluoranthene               | <0.1                                | 54      | 3.9                                                                                    | 1-WS04 E1 0.5                     |
| Benzo(a)pyrene                     | <0.1                                | 47      | 3.2                                                                                    | 1-WS04E1 0.5                      |
| Dibenz(a,h)anthracene              | <0.1                                | 6.06    | 0.31                                                                                   | 1-WS04 E1 0.5                     |
| TPH CWG (Total)                    | <42                                 | 1560    | -                                                                                      | -                                 |
| Aliphatic >C5 - C6 : HS_1D_MS_AL   | <0.01                               | <0.01   | 42                                                                                     | 0                                 |
| Aliphatic >C6 - C8 : HS_1D_MS_AL   | <0.05                               | <0.05   | 100                                                                                    | 0                                 |
| Aliphatic >C8 - C10 : EH_CU_1D_AL  | <2                                  | <2      | 27                                                                                     | 0                                 |
| Aliphatic >C10 - C12 : EH_CU_1D_AL | <2                                  | <2      | 130                                                                                    | 0                                 |
| Aliphatic >C12 - C16 : EH_CU_1D_AL | <3                                  | 31      | 1100                                                                                   | 0                                 |
| Aliphatic >C16 - C21 : EH_CU_1D_AL | <10                                 | 118     | 65000                                                                                  | 0                                 |
| Aliphatic >C21 - C34 : EH_CU_1D_AL | <21                                 | 73      | 65000                                                                                  | 0                                 |

**Table 5 - Summary of Soil Analyses and Comparison with Current Screening Values**

| Analyte                                        | Analyte Concentration<br>Range (mg/kg) |         | Screening Value<br>(mg/kg) for Land<br>Use<br>Residential Without<br>Plant Uptake<br>(1% SOM Assumed) | Number of<br>Elevated<br>Concentrations |
|------------------------------------------------|----------------------------------------|---------|-------------------------------------------------------------------------------------------------------|-----------------------------------------|
|                                                | Minimum                                | Maximum |                                                                                                       |                                         |
| Aliphatic (C5 - C34) :<br>HS_1D_MS+EH_CU_1D_AL | <0.01                                  | <0.01   | n/a                                                                                                   | -                                       |
| Aromatic >C5 - C7 :<br>HS_1D_MS_AR             | <0.05                                  | <0.05   | 70                                                                                                    | 0                                       |
| Aromatic >C7 - C8 :<br>HS_1D_MS_AR             | <2                                     | <2      | 130                                                                                                   | 0                                       |
| Aromatic >C8 - C10 :<br>EH_CU_1D_AR            | <2                                     | <2      | 34                                                                                                    | 0                                       |
| Aromatic >C10 - C12 :<br>EH_CU_1D_AR           | <2                                     | <2      | 74                                                                                                    | 0                                       |
| Aromatic >C12 - C16 :<br>EH_CU_1D_AR           | <3                                     | 93      | 140                                                                                                   | 0                                       |
| Aromatic >C16 - C21 :<br>EH_CU_1D_AR           | <10                                    | 752     | 260                                                                                                   | 1 WS04 E1 0.5                           |
| Aromatic >C21 - C35 :<br>EH_CU_1D_AR           | <21                                    | 493     | 1100                                                                                                  | 0                                       |
| Total >C5 - C35 :<br>HS_1D_MS+EH_CU_1D_Total   | <42                                    | 1560    | n/a                                                                                                   | -                                       |

In general the soil quality indicated by the small number of soil samples is suitable for the proposed land use scenario with the exceptions below. A low risk is posed to end users from soil quality, in general, based upon the available data with the considerations provided below and the application of the Discovery Strategy outlined below.

Based on the above, one sample of soil (WS04 at 0.5mbgl) reports concentrations of some of one hydrocarbon EC group (Aromatic >C16 - C21) and a small number of PAH congeners (Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenzo(a,h)anthracene) exceeding the adopted screening criteria. In addition the total hydrocarbons (TPH) at 1560mg/kg can be considered elevated although there is no current applicable screening value for TPH.

The presence of fragments of asphalt or bitumen-coated roadstone in this sampled material may be a source of these elevated concentrations along with analysis cross-interference between these hydrocarbon types.

It can be noted that soils analysed from the nearby exploratory holes of the previous investigation phase (afore-referenced Geotechnics report, BH01, 0.3 – 0.4mbgl) reports no elevated concentrations of PAHs or TPH. However, a marginal exceedance of the applied screening value for naphthalene is reported at DS01, also in the northern section of the site; this is attributed to asphalt at that location; a low risk was applied to this.

It is assessed that a low risk is posed to end users based upon the following considerations:

the Proposed Development Plan provided by the Client indicates that this area at WS04 will be overlaid by a multi-storey school building, with soft landscaping areas present to the north; where soils are covered with permanent hardstanding (i.e. building foundations), a pathway for contaminants to reach the end-user will be severed and therefore the risk will be low/negligible; it is understood that the land elevation will be raised by ~1.3metres in the area of the structure, using, assumed, suitable quality imported granular material in order to create a suitable engineered platform; this will create a further pathway break; where any soft landscaping is proposed in this part of the scheme, Made Ground is likely to be removed and use / emplacement of suitable quality soils within these areas is likely to be required.

The above recommendation is dependent upon the most recent proposed development plan provided. The extent and source of this poor-quality soil is not identified within the scope of this scheme so, should the development plans alter, further soil analysis may be required and recommendations reviewed and updated, where appropriate.

The chemical analysis of soils included a screening for the presence of asbestos.

None of the samples screened returned positive identification of asbestos within the soil matrix. Therefore, on the basis of the testing undertaken as part of this investigation, it is envisaged that a low risk from asbestos in soils exists at the site. However it is noted that a single sample of Made Ground (at BH03) of the previous investigation reported chrysotile and amosite bundles with an overall concentration of 0.002%. As a result, see below re: discovery strategy.

A Discovery Strategy, see Appendix 13 for an example, should be incorporated into the development Construction Phase Health and Safety Plan or similar document, to address any poor-quality soils encountered during construction. It can then be implemented throughout the development of the site and any suspected contaminants (i.e. poor-quality soil, PACMs ins oils etc.) subject to assessment by a suitably qualified and experienced Geo-Environmental Engineer. This may comprise of additional soil sampling and chemical analysis to quantify its suitability onsite, and potential for remediation.

It is likely that ground preparations and foundation construction will necessitate the removal of nominal amounts of surface soils and Made Ground, providing exposure of soils to site workers and neighbours.

In general, the soil quality is indicated to provide a low risk to construction workers. In consideration of the elevated hydrocarbon and PAH concentrations in shallow Made Ground soils at WS04, potential exposure to these potential hazards would likely be short term for construction workers. However, as standard practice, when construction workers are dealing with / exposed to suspected poor quality soils, awareness of this and training is important along with applying good hygiene practices and using suitable PPE (i.e. glove) when applicable. With this and the Discovery Strategy the risk posed is low.

An initial comparison of the laboratory results has been made against the Contaminated Land Assessment Guidance, published by Water UK (ref. **R.13**), also often termed the "UKWIR Guidance". Note, the full range of thresholds given in this guidance have not specifically been tested for within the scope of this investigation; further soil sampling and analysis may be required by the water providing company or designers.

It is advised that the UK Water Industry Research Guidance (ref. **R.14**) is adopted and consultation with the local water company is sought prior to laying any services. In addition, as part of any Discovery Strategy for soil disturbance works, if suspected poor quality or contaminated soils are encountered where potable water pipes are to be laid, further assessment is likely to be required.

The Made Ground soil analysis undertaken indicates concentrations of some PAH congeners within WS04 that have the potential to affect (permeate) standard PE pipes. Two initial options exist for consultation and agreement with the local water supply company prior to further design of the scheme and before laying any services:

Removal of all Made Ground or suspected contaminated soil in the vicinity of the proposed routes of potable water pipes if this is in the vicinity of WS04, appropriate recording of this and backfilling with clean soil / granular materials; this may also require pipe "wrapping" with geotextile; or  
Use of a "barrier" pipe and fittings throughout the development.

Superficial and bedrock deposits are classified as Unproductive Strata. The site was not located within a SPZ. The closest surface water feature was an unnamed stream, located approximately 430m to the east of the site.

The risks to Controlled Waters have been assessed qualitatively using the available soil quality data only, as groundwater analysis was outside the scope of this investigation. (It can be noted that groundwater analyses were undertaken with the previous phase of investigation - this should be referred to as necessary.)

Based upon the controlled waters setting, the relative distance of the site from any surface water features and the general soil quality, the risk to controlled waters is considered to be low to negligible.

It is understood that the landscaping design of layout for the scheme is not yet finalised. However, in order to provide an initial assessment, a review of the commonly occurring phytotoxic chemicals copper, nickel and zinc, has been undertaken based the criteria set out in BS3882 standard for topsoil. These criteria are pH dependant and, based on the sampled soils all having a pH >7, are as follows:

Copper –200 mg/kg.

Nickel –110 mg/kg.

Zinc –300 mg/kg.

Concentrations of metals in the sampled soils were recorded at concentrations below the thresholds considered to have phytotoxic effects. As a result of which, the risk to plants is assessed to be low. This is notwithstanding the quality of the soil utilised within areas of planting; soil quality in terms of nutrients and suitability for the applied planting is outside of the scope of this assessment and specialist advice may need to be sought along with utilising suitable quality landscaping materials.

The results of the soil gas monitoring have been compared with current guidance (ref. **R.20**). The results show no detectable methane concentrations within soils and low concentrations of carbon dioxide. No detectable gas flow was detected within the wells across the site.

A Gas Screening Value (GSV) has equated for each of the monitoring points during each of the monitoring visits by multiplying the recorded flow rate with the recorded carbon dioxide or methane concentration. The highest calculated GSV for each monitoring locations is presented in Table 6 below:

**Table 6 – Ground Gas Screening Values (GSV)**

| Location | Recorded Values                       |                                              |                     | Gas Screening Values            |                                        |
|----------|---------------------------------------|----------------------------------------------|---------------------|---------------------------------|----------------------------------------|
|          | Methane (CH <sub>4</sub> )<br>[% v/v] | Carbon Dioxide<br>(CO <sub>2</sub> ) [% v/v] | Flow Rate<br>(l/hr) | Methane<br>ICH <sub>4</sub> /hr | Carbon Dioxide<br>ICO <sub>2</sub> /hr |
| WS02     | <0.1                                  | 0.8                                          | <0.1                | 0.0008                          | 0.0001                                 |
| WS5      | <0.1                                  | 0.6                                          | <0.1                | 0.0006                          | 0.0001                                 |

Notes:-

Where no detectable flow has been recorded, the limit of detection of the apparatus (0.1l/hr) has been used.

The proposed development is considered to be best represented by a Type B development. Type B developments are fully defined in BS8485, but in summary comprise:

**Type B building** – Private residential or commercial property with building management controls of alterations but not of management/maintenance e.g. managed apartments, some parts of offices/public buildings such as schools and hospitals.

Based upon the results, the site would be placed in Characteristic Situation CS1 and no special gas protection measures are required. However, this is based upon three rounds of ground gas monitoring undertaken to date. It may be a requirement of third parties or designers that an additional three rounds of ground gas monitoring are undertaken to assess the site in line with current guidance. Where reliance upon the previous soil gas monitoring datasets is available, it may be possible to incorporate this into the overall assessment; The previous data does indicate a similar, low risk soil gas regime setting.

Following the findings of the site investigation, a Conceptual Site Model has been developed and is presented in Table 7 overleaf:

**Table 7 – Conceptual Site Model**

| Sources     | PATHWAYS:   |                |           |             |                  | RECEPTORS: |           |                       |                    |                      |                   | Risk Rating | Comments                                                                                                                                                                                                                                                                                                                                                        |
|-------------|-------------|----------------|-----------|-------------|------------------|------------|-----------|-----------------------|--------------------|----------------------|-------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | Root Uptake | Direct Contact | Ingestion | Respiration | Gas Accumulation | Plants     | End Users | Structures (Concrete) | Services/Utilities | Construction Workers | Controlled Waters |             |                                                                                                                                                                                                                                                                                                                                                                 |
| Made Ground | N           | U              | N         | N           | N                | N          | N         | N                     | N                  | Mi                   | N                 | LR/NR       | Precautionary assessment- elevated PAH and TPH concentrations identified at WS04 only; mitigating recommendations provided above, including consideration of the proposed development and assuming appropriate safety measures employed during construction. The extent and source of this poor-quality soil is not identified within the scope of this scheme. |

**Legend:-**  
See Comparison of Consequence Against Probability within Appendix 4 for Key to Legend.

**Probability:**

Negligible (N)

Unlikely (U)

Likely (L)

Highly Likely (HL)

**Consequence (Severity):**

Negligible (N)

Mild (Mi)

Moderate (Mo)

Severe (S)

**Risk Rating:**

Very High Risk

High Risk

Moderate Risk

Low Risk

Negligible Risk

VH

MR

LR

NR

It is understood that the proposed development of the site is a new school building, together with soft landscaping areas, vehicle parking, an access road and supporting infrastructure. The number of storeys of the proposed new structure has not been detailed but it has been assumed these will range from 2-3 storeys.

Based upon the above, vertical loadings have been assumed to range from 80kN/m<sup>2</sup> to 120kN/m<sup>2</sup>.

Ground conditions were recorded to be variable across the site, although they typically comprised nominal amounts of Topsoil and/or Made Ground over cohesive Tidal Flat deposits. Bedrock mudstone of the Ampthill Clay Formation was not encountered in any of the exploratory holes.

Made Ground was identified within exploratory holes WS03, WS04 and WS05, ranging in thickness from 0.50 to 0.75m, where proven. It generally consisted of a gravelly sand with brick, asphalt rubble and concrete. Cohesive soils, considered to be Tidal Flat deposits was recorded to be present in every exploratory hole at depths ranging from 0.25m and 0.75m, and generally consisted of a soft silty clay.

Groundwater was encountered in each exploratory hole other than WS05 during the investigation, at depths ranging from 0.30-1.50mbgl.

Exploratory hole logs are included within Appendix 5 of this report.

The results of geotechnical classification testing indicate the Tidal Flat clay typically contain soils that are of low/medium plasticity and low/medium volume change potential when comparing the recorded plasticity index with their modified plasticity index ( $I'_p = I_p \times \% \text{ of material passing the } 425\mu\text{m sieve} / 100$ ).

In consideration of the required bearing capacity requirements for the proposed development and the presence of soft soils at shallow depths, consideration should be given to supporting the proposed development on piled foundations. Piling would also allow the volume of soil to be disposed of to be minimised.

In view of the presence of soils with volume change potential, a nominal amount of reinforcement should be incorporated into the pile.

Further investigation in the form of cable percussion boreholes would be required to provide soil parameters for the design of piled foundations.

The proven ground conditions would indicate that bored piles could be employed to provide a suitable foundation solution. However, the method of installation will have to accommodate the presence of groundwater at shallow depth.

It is recommended that the design of piles be undertaken by an experienced and competent professional who will reflect their own experience and expertise on the design of piles.

It appears that some tree planting is planned as part of this scheme. To achieve the minimum depth for foundations, tree planting must not be within an area smaller than 0.2 x the mature height of the tree species.

It is recommended that any future tree planting, that may form part of the proposed development, be undertaken in accordance with the guidelines laid out in the NHBC Standard Chapter 4.2 (ref. **R.28**).

All excavations within the Made Ground must be assumed to be subject to short-term instability. Excavations below the water table are likely to be problematic without positive groundwater control as discussed below.

Where personnel access is required to any excavation, its stability and any required protection / shoring should be assessed by a suitably qualified and experienced responsible person.

Particular attention must be paid to ensuring the stability of adjacent structures.

Standing water levels were recorded between 0.24 m and 0.85 m depth across the site. The potential for perched groundwater at various levels within the Made Ground should also be considered during excavations.

Excavations beneath the water table will require positive drainage to maintain adequately dry working conditions and excavation stability. Where encountered, ingress of perched water should be adequately dealt with by pumping from sumps.

In accordance with NHBC Chapter 5, 'Ground floors and substructure', (ref. **R.29**), suspended ground floors should be adopted where the following ground conditions are encountered:

Where Made Ground is proven to exceed 0.6m depth;

Where soils with volume change potential exist at shallow depths beneath the site;

Where the ground conditions warrant the extending of foundations beyond 1.2mbgl; either as a result of the influence of trees or to achieve a suitable bearing stratum.

In view of the requirement for a piled foundation, it is recommended that a suspended ground floor is adopted.

A number of laboratory CBR tests were undertaken on a number of samples of natural silty clays, with values recorded to range between 0.2% and 0.9%.

**Table 8 – Laboratory CBR Values (%)**

| Test Location | Strata              | CBR (%) |
|---------------|---------------------|---------|
| SK01          | Tidal Flat deposits | 0.2     |
| SK02          | Tidal Flat deposits | 0.9     |
| SK05          | Tidal Flat deposits | 0.3     |

A number of in-situ CBR tests, using the TRL DCP method, were undertaken in specific locations across the site, within the general location of roadways and areas of vehicular parking. The results of in-situ testing are provided within Appendix 7 and summarised within Table 9, below:

**Table 9 – Summary of TRL DCP Data (%)**

| Test Location | Layer |    |    |
|---------------|-------|----|----|
|               | 1     | 2  | 3  |
| TRL01         | 2     | 4  | 7  |
| TRL02         | 35    | 19 | 49 |
| TRL03         | 3     | 9  | 15 |
| TRL04         | 5     | 9  | 15 |
| TRL05         | 4     | 7  | 11 |
| TRL06         | 4     | 3  | 6  |
| TRL07         | 4     | 2  | 12 |

It is recommended that once the site has been graded to the appropriate pavement formation level, it is inspected and, if necessary, *in-situ* CBR testing be conducted on the subgrade to confirm the appropriate pavement design, (i.e. to determine the subbase and capping thickness). In addition to which, the formation should be proof-rolled and any soft/loose pockets encountered should be excavated and replaced with well compacted granular fill prior to pavement construction. Requirements for the design of road pavements are given in the Highways Agency, 'Design Manual for Roads and Bridges, Volume 7. Interim advice note 'Design Guidance for Road Pavement Foundations Draft HD 25', (ref. **R.26**).

Planning policy, together with the support of The Environment Agency, recommend the maximum practical use of Sustainable Urban Drainage Systems, (SuDS), within proposals for new developments. There is a requirement that SuDS be installed, where appropriate, in order to limit the amount of surface runoff entering drainage systems and to return surface water into the ground to follow its natural drainage path. Further guidance, including details of SUDS methods, is provided within CIRIA Report C753 'The SuDS Manual', 2015 (ref. **R.18**). CIRIA 687 entitled 'Planning for SUDS – Making it Happen', published in 2010 (ref. **R.19**), states that the Flood and Water Management Act 2010 aims to encourage Local Authorities to be responsible for the approval and eventual adoption of SuDS, although adoption of roadways which include permeable paving is often rejected.

Soakaway testing was undertaken in five locations at the site and was undertaken in accordance with the guidance provided within BRE Digest 365 'Soakaway Design', 2016 (ref. **R.13**). A summary of the infiltration rates is presented in Table 10 below, and provided in full within Appendix 6:

**Table 10 – Infiltration Testing Results (m/s)**

| Location    | Test 1 | Test 2 | Test 3 | Comments                                                     |
|-------------|--------|--------|--------|--------------------------------------------------------------|
| <b>SK01</b> | N/A    | N/A    | N/A    | No appreciable infiltration within 24 hours- testing failed. |
| <b>SK02</b> | N/A    | N/A    | N/A    | No appreciable infiltration within 24 hours- testing failed. |
| <b>SK03</b> | N/A    | N/A    | N/A    | No appreciable infiltration within 24 hours- testing failed. |
| <b>SK04</b> | N/A    | N/A    | N/A    | No appreciable infiltration within 24 hours- testing failed. |
| <b>SK05</b> | N/A    | N/A    | N/A    | No appreciable infiltration within 24 hours- testing failed. |

Based upon the results of testing, infiltration is not considered suitable for the site and an alternative method of surface water drainage is likely to be required. The low infiltration rate is likely due to the presence of cohesive soils and shallow groundwater.

It is recommended that liaison with the relevant regulatory bodies and third parties (i.e. the LPA, The Environment Agency, Anglian Water) is undertaken at an early stage to ensure any surface water drainage proposals are approved.

The results of chemical tests indicate a sulphate concentration in the soils to range between <10 mg/l and 160 mg/l as a 2:1 Water/soil extract and pH values in the range of 7.3 to 8.6.

In consideration of the previous usage of the site, it is recommended that 'brownfield conditions' be assumed for the purposes of assessing the aggressive chemical environment for concrete classification (ACEC class).

Due to the variable groundwater levels - the classifications relating to 'mobile groundwater' have been applied.

As per BRE Special Digest 1 (ref. **R.3**) a Design Sulphate, (DS), class of DS-1 is considered applicable, with an accompanying ACEC classification of AC-1.

The likely amount of waste soil that may be produced from a construction project and / or the options for onsite re-use (or re-use at other sites) should be assessed, ideally, at the early stages of design of a scheme. This waste / re-use optioneering is often an iterative process as the design progresses but there are often multiple opportunities to prevent soils from being considered as "waste". It is not clear from the available data whether or not there is scope for re-use or retention of excavated soils on the site.

Under the European Waste Directive and current UK legislation, any waste materials, including soils, from the scheme will require waste category classification (provided below where possible). The waste hierarchy ("reduce-re-use-recycle") applies to all construction sites and re-use of soils is a primary way of reducing waste to landfills or treatment centres.

The re-use of soils is likely to be required to be designed, monitored and verified within a CL:aire Development Industry Code of Practice (or "DoWCoP" as it is often referred-to) Materials Management Plan. If this is not undertaken it is likely that the soils will be classifiable as waste and they must be sent, treated and disposed-of as such. Wastes may require pre-treatment prior to disposal, the most basic of these options being the segregation of material types to enable effective treatment / recycling / re-use.

The proposed development is expected to require moderate to large volumes of soil disturbance and movements. Some of the soils assessed within this phase of investigation may become excess or waste soil. Further and targeted soil investigation and assessment may be needed to obtain sufficient information to define the MMP and associated activities.

If the Claire DoWCoP is applied to this scheme (via a Materials Management Plan) so that soils and site clearance / preparation / demolition materials are assessed within a mass-balance / volume assessment, then it may be possible to design the scheme as a zero-waste-soil (or low volume waste soil) scheme, by re-using as much as possible onsite. If this is required or desired as part of the scheme a Materials Management Plan must be drawn-up, approved by a QP under the DoWCoP and followed through the scheme to validation and sign-off.

There may or may not be sufficient opportunity within the scheme to re-use all soils / materials disturbed as part of the construction process. In which case the soils may be considered as waste (and will require removal from site); waste classification is provided below in this event.

Similarly, waste or excess soils should be sentenced for offsite disposal *or re-use* appropriately, in accordance with current guidance, legislation and with the assistance of reputable, suitably licenced and competent contractors. Classification of the soils is provided below, for assessment by the receivers.

Landfill tax can be avoided if / where the soils are sent to non-landfill destinations and suitable for processing, re-use, etc.

The following applies to most construction schemes:

Segregating Made Ground soils from Natural soils is likely to assist with volume reduction and adherence to the guidance provided above;

Of similar importance will be the segregation of contaminated (or potentially contaminated) soil from "clean" soils or natural soils that have the potential for re-use.

It may be possible to claim Remediation tax relief where any remedial works undertaken onsite are deemed applicable for this. Permits may be required to undertake onsite remediation.

Waste is classified as being either Hazardous or Non-Hazardous; in addition, landfills receiving waste are classified as accepting hazardous or non-hazardous wastes or the non-hazardous sub-category of inert waste, in accordance with the Waste Directive. Similarly, the facilities providing soil / materials treatment and re-use will require the material to be classified as either non-hazardous or hazardous. Waste classification is a staged process and this investigation (along with any other site data) represents the initial phases of that process. Landfilling excess soil/materials normally incurs significantly greater costs than the various options for re-use, treatment-and-re-use or others.

Once the extent and location of the excess or waste (soil / materials) that is to be removed has been defined, further sampling and testing may be necessary.

The results from this ground investigation should be used to help define the sampling plan for such further testing and, moreover, the optioneering and design for soil re-use, aggregate manufacture etc. within the scheme and for export and / or re-use.

It should be noted that "WAC" analysis (leaching test results) must not be used for waste classification purposes, other than for some landfill destinations. However, undertaking WAC testing at the time of analysis does enable all waste soil removal and disposal options to be considered.

The below assessments of the classification of the excavated soils are provided for guidance only and should be confirmed by the receiving facility (landfill/non-landfill) once the soils to be discarded have been identified and, where necessary, re-analysed.

Analysis has been undertaken to assist this assessment, utilising the available soil analysis data from this phase and has been assessed, in accordance with WM3 (ref.**R.33**) and is provided as Appendix 12 as a HazWasteOnline report.

The assessed soils (natural / Made Ground) are, largely, reported to be non-hazardous (for non-landfill destinations);

Natural soil arisings are also likely to be (chemically) suitable for re-use at other sites or onsite, in a POS or residential land- use scenario; and

EWC code 17-05-04 will apply to the non-hazardous soils.

**The above is with the exception of the soils at or in the vicinity of:**

WS04; shallow soils; to ~ 0.4mbgl, based upon the elevated hydrocarbon concentrations and PAHs; this soil is classified as Hazardous based upon the mutagenic and carcinogenic properties of the reported concentrations.

Further assessment and investigation of these may be warranted to delineate these factors.

If soils are sent for a landfill destination, it is not possible to provide a classification currently; WAC analyses will be required.

Three samples of asphalt surfacing were tested, during works, using tar detector PAK spray and sampled for further laboratory coal tar analysis. The PAK spray onsite tests did not indicate the presence of coal-tar content. This is confirmed in the analysis of three "CT01" samples from WS03 to WS05 (lab report 24-0534) that reports generally low (or <LOD) concentrations of PAHs; this indicates the absence of coal tar content. The lab report provides a "typical of bitumen" material description. A full HWOL assessment of this material can be undertaken if required.

Based upon the results of this investigation, no significant risk to receptors has been identified from the soil quality of the analysed soils. Made Ground soil at WS04 is reported to contain elevated concentrations of PAHs and TPH; the source / cause of this is interpreted to be the asphalt / coated roadstone content of this soils. It poses a low risk to end users and construction worker receptors when the development setting is considered.

There may be contamination or poor-quality soil onsite that was not encountered during these works. As a result a discovery strategy should be implemented throughout the development of the site and any suspected poor-quality soil / contamination be subject to assessment by a suitably qualified and experienced Geo-environmental engineer. See Appendix 13 for more details.

It is recommended that this report be submitted to the Local Authority as part of the planning submission for the site.

In consideration of the required bearing capacity requirements for the proposed development and the presence of soft soils at shallow depths, consideration should be given to supporting the proposed development on piled foundations. Piling would also allow the volume of soil to be disposed of to be reduced. It is recommended that the design of piles be undertaken by an experienced and competent professional who will reflect their own experience and expertise on the design of piles.

Based upon the results of testing infiltration is not considered suitable for the site and an alternative method of surface water drainage is likely to be required. The low infiltration rate is likely due to the presence of cohesive soils and shallow groundwater.

As per BRE Special Digest 1 (ref. **R.3**) a Design Sulphate, (DS), class of DS-1 is considered applicable, with an accompanying ACEC classification of AC-1.

Cohesive ground conditions and the presence of mature trees should be taken into consideration. Any excavation of foundations should be carried out in accordance with the NHBC standards or similar appropriate guidance.

Any further site investigation should be designed in general accordance with CLR 4, (ref. **R.8**) and undertaken in compliance with BS 10175:2011+A2:2017, (ref. **R.5**) and BS 5930:2015+A1:2020, (ref. **R.7**).

Should demolition of the buildings be considered it would be necessary to (a) fully update the building Asbestos Register, where present or (b) undertake a Refurbishment and Demolition (asbestos survey) of the buildings, in accordance with MDHS guidance (ref.**R.16**) and in advance of any disturbance works.



## **General Limitations and Exceptions**

This report was prepared solely for our Client for the stated purposes only and is not intended to be relied on by any other party or for any other use. No extended duty of care to any third party is implied or offered.

Geosphere Environmental Ltd does not purport to provide specialist legal advice.

The Executive Summary, Conclusions and Recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon, until considered within the context of the whole report.

Interpretations and recommendations contained within the report represent our professional opinions, which were arrived at in accordance with currently accepted industry practices at the time of reporting and based upon current legislation in force at that time.

## **Environmental and Geotechnical Reporting (including Phase 1, Phase 2 and Site Walkovers) Limitations and Exceptions**

The comments given in this report and the options expressed herein, are based upon the readily available information collated for the report and an assessment based upon the current guidance which for Phase 1 / Phase 2 reports is primarily the Environment Agency's Land Contamination Risk Management (LCRM) report, 2021.

The report has been prepared in relation to the proposed end-use and should another end-use be intended, reassessment may be required.

No warranty is given as to the possibility of future changes in the condition of the site.

The opinions expressed cannot be absolute, due to the limitation of time and resources imposed by the agreed brief.

With regards to any aspect of land contamination referred to, this is limited to those aspects specifically stated and necessarily qualified. No liability shall be accepted for other aspects which may be the result of gradual or sudden pollution incidents, past or present land uses and the potential for associated contamination migration.

Any Desk Study Report / data has been produced largely from the information purchased from The Landmark Information Group. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. The information purchased has been assumed to be correct and free from errors. However, there is the possibility that some data may be missing from the report including (but not limited to) unrecorded land uses both onsite and offsite or unrecorded pollution events. No attempt has been made to verify the information.

The accuracy of any map extracts cannot be guaranteed. It is possible that different conditions existed onsite, between and subsequent to the various map surveys provided.

Any site walkover undertaken is a snapshot of the site recording the visually evident conditions at the time of the walkover in the areas readily accessible. It is possible that after the walkover, the site was altered (for example by fly-tipping or groundworks) or before the walkover, the site conditions changed removing evidence of potentially contaminative features (such as oil tanks removed).

Any intrusive works only cover a tiny proportion of the site. Where exploratory holes are positioned by Geosphere Environmental Ltd, they are located to give as good a coverage of the site as possible and to target features / proposed land use where applicable, whilst allowing for areas that cannot be accessed, Client requested locations and other site / time / budget constraints. Whilst assumptions may have been drawn between exploratory holes on the ground conditions and / or extent or otherwise of any contamination, this is for guidance only and no liability can be accepted on its accuracy.

Foundation design is outside of the remit of Geosphere Environmental Ltd unless specifically stated and it is recommended that the services of foundation design specialists are sought as required. Any foundation appraisal contained within the report is limited to foundation optioneering.

Any conceptual model is based upon the information available at the time of conducting this assessment and is an interpretive assessment of the conditions at the site. Redevelopment and / or further investigation of the site may reveal additional information and therefore alter the conceptual model and the report conclusions.

Any infiltration testing results are considered to be representative of the ground conditions at the locations tested and at the time of testing. As well as lateral variation in ground conditions, seasonal changes in ground water level may affect the results.

Any post-fieldwork monitoring (including ground gas / groundwater) is a snapshot of the conditions at the time of monitoring.

- R.1.** Land Contamination Risk Management (LCRM), 2021.
- R.2.** The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.
- R.3.** Environment Act 1995, Section 57, DoE 1995.
- R.4.** The Environmental Protection Act, Part IIA, Section 78, 1990.
- R.5.** Nitrates Directive (91/676/EEC) 1991.
- R.6.** British Standards Institute: BS 10175:2011+A2:2017 'Investigation of Potentially Contaminated Sites', Code of Practice, 2017.
- R.7.** British Standards Institute: BS 5930:2015+A1:2020 'Code of Practice for Ground Investigations', 2020.
- R.8.** CLR 4, 'Sampling strategies for contaminated land', DoE 1994.
- R.9.** BRE Digest 465, 'Cover Systems for Land Regeneration – Thickness Cover Systems for Contaminated Land', 2004.
- R.10.** EIC/AGS/CL:AIRE. Soil Generic Assessment Criteria for Human Health Risk Assessment. Contaminated Land: Applications in Real Environments, London, UK, January 2010.
- R.11.** SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination, Final Project Report (Revision 2), Contaminated Land: Applications in Real Environments (CL:AIRE) September 2014. Appendix H – Lead.
- R.12.** Land Quality Press, The LQM/CIEH S4ULs for Human Health Risk Assessment, 2015.
- R.13.** Contaminated Land Assessment Guidance Protocols, Published by agreement between Water UK and the Home Builders Federation, Published by Water UK, January 2014.
- R.14.** UKWIR 'Guidance for the Selection of Water Supply Pipes to be Used in Brownfield Sites, August 2010.
- R.15.** Health and Safety Executive, Control of Asbestos Regulations (CAR), 2012.
- R.16.** CL:AIRE, 'Control of Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction & Demolition materials: Industry Guidance' (CAR\_SOIL™), 2016.
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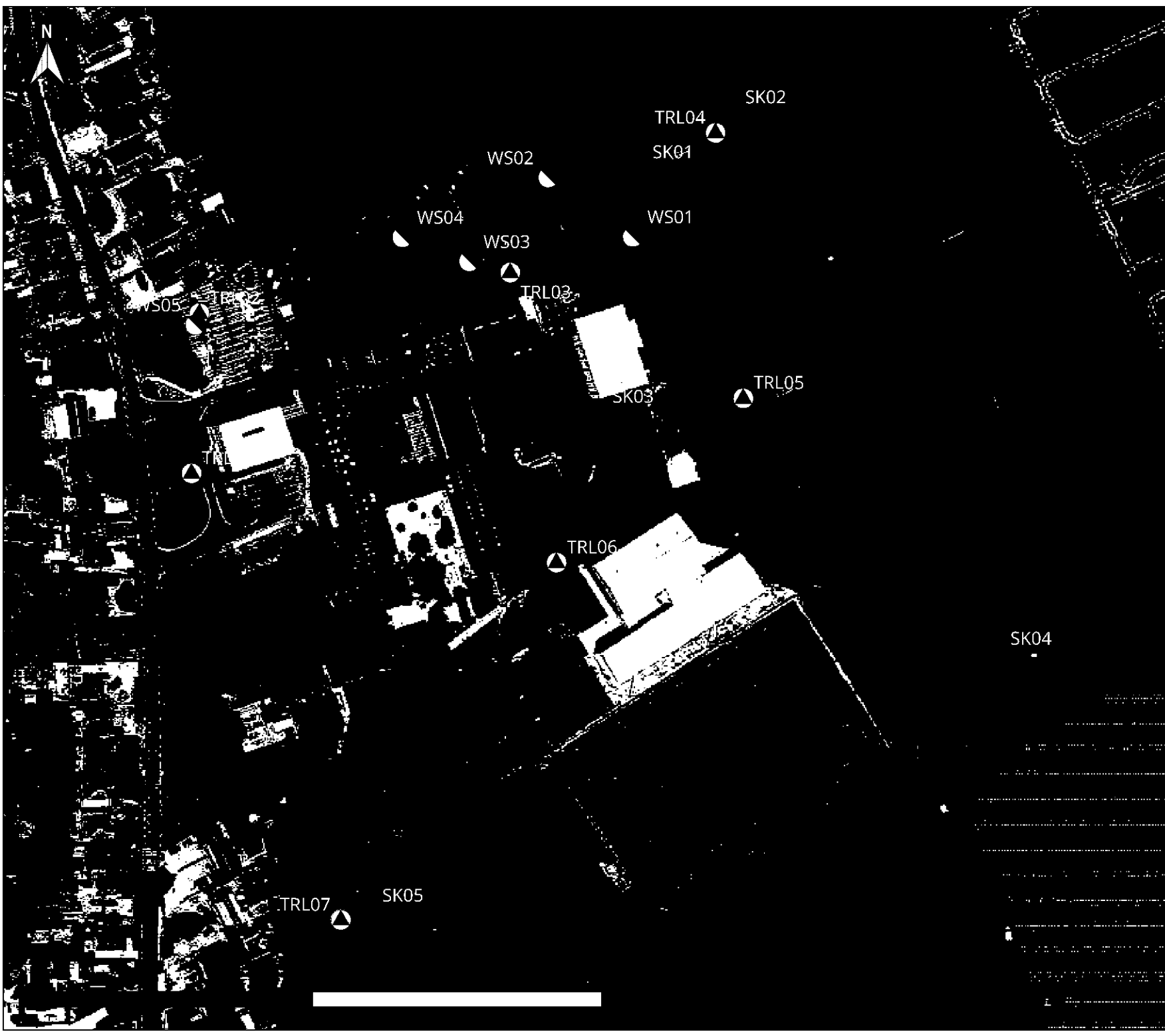
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Proposed Development Plan – Drawing ref. SRP1155-ONE-XX-XX-D-L-0003

Exploratory Hole Location Plan – Drawing ref. 8133,GI/001/Rev0



|                                                           |                                                           |                                                           |                                                           |                                                   |
|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|
| NOTES                                                     | REVISION   P04   DATE   08.01.24   BY   KP   CHECKED   JE | REVISION   P01   DATE   04.12.23   BY   YL   CHECKED   JE | CLIENT   Bowmer + Kirkland                                | <div><div></div><div>051020metres</div></div>     |
|                                                           | Updated in accordance with CEM4 feedback                  | First Issue                                               | PROJECT   University Academy Long Sutton                  |                                                   |
|                                                           | REVISION   P05   DATE   15.01.24   BY   KP   CHECKED   JE | REVISION   P02   DATE   11.12.23   BY   YL   CHECKED   JE | DRAWING TITLE   Whole Site Plan                           |                                                   |
|                                                           | Updated in accordance with CEM5 feedback                  | Updated in accordance with comments received              | DRAWING No.   SRP1155-ONE-ZZ-ZZ-D-L-0003   REVISION   P06 |                                                   |
| REVISION   P06   DATE   23.01.24   BY   KP   CHECKED   JE | Updated in accordance with comments received              | REVISION   P03   DATE   19.12.23   BY   KP   CHECKED   JE | STATUS   PRELIMINARY                                      | <div><div></div><div>ONE-ENVIRONMENTS</div></div> |
|                                                           |                                                           | Updated in accordance with CEM3 feedback                  | SCALE   1:500 @ A0   DATE   04.12.23   DRAWN BY   YL      |                                                   |



**Legend**

- Tral Pit/ Infiltration Test
- TRL Probe
- Window Borehole

GEO  
GEOGRAPHY ENVIRONMENTAL

**Project**

University Academy Long Sutton, Long Sutton, Spalding, PE12 9LF

**Drawing Title**

Exploratory Hole Plan

**Drawing Number**

8133,GI/001/Rev0

**Date**

23/02/2024

**Author / Checked By**

RS/JD

**Source**

Imagery ©2024 CNES / Airbus, Getmapping plc, Infoterra Ltd & Bluesky, Maxar Technologies, Map data ©2024

|                                                 |                    | Consequence (Severity of Linkage) |                           |                           |                           |
|-------------------------------------------------|--------------------|-----------------------------------|---------------------------|---------------------------|---------------------------|
|                                                 |                    | Severe (S)                        | Moderate (Mo)             | Mild (Mi)                 | Negligible (N)            |
| Probability (Likelihood of linkage from source) | Highly Likely (HL) | Very High Risk (VH)               |                           | Moderate Risk (MR)        | Moderate/Low Risk (MR-LR) |
|                                                 | Likely (L)         |                                   | Moderate Risk (MR)        | Moderate/Low Risk (MR-LR) | Low Risk (LR)             |
|                                                 | Unlikely (U)       | Moderate Risk (MR)                | Moderate/Low Risk (MR-LR) | Low Risk (LR)             | Negligible Risk (NR)      |
|                                                 | Negligible (N)     | Moderate/Low Risk (MR-LR)         | Low Risk (LR)             | Negligible Risk (NR)      | Negligible Risk (NR)      |

This table is to provide reference information in conjunction with the GEL Conceptual Model attached within the Hazard Risk Assessment sections of this report and Table 7 – Conceptual Site Model.

### Very High Risk (VH)

There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is happening currently.

Urgent investigation and remediation are likely to be required and advised.

### High Risk (HR)

Harm is likely to arise to a designated receptor from an identified hazard.

Urgent investigation is required and remedial works are likely necessary in both the short to long term.

### Moderate Risk (MR)

It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.

Investigation is required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.

### Low Risk (LR)

It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. Limited investigation recommended.

### Negligible Risk (NR)

There is a minimal possibility that harm could arise to a receptor. In the event of such harm being realised it is high likely to not be severe. Investigation not deemed necessary.

Windowless Sample Hole Logs  
(WS01 to WS05)

Soakage Test Pits  
(SK01 to SK05)

|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|---------------------------------------------------------------------|-----------------|-----------------|-------|-------------------------------------------------------------------|-----|---------------|-------|----------------------------------------------------------|--|--|--|--------------------------------|------|-----|-------------------|--------------------|--------|------|------|----------------------------|----------------------------------|----------------------|--|-------------------------|--|--|--|
| CLIENT: Bowmer & Kirkland Ltd                                       |                 |                 |       | PROJECT: Long Sutton, Spalding                                    |     |               |       | GROUND LEVEL m                                           |  |  |  | HOLE No. WS01                  |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
| LOGGED BY: PC<br>FIELDWORK BY: GEL<br>TEMPLATE REF: GEL AGS BH BETA |                 |                 |       | CHECKED BY: JD<br>DATE: 07/03/2024                                |     |               |       | EXCAVATION METHOD:<br>Window Sampler<br>Uncased to 5.0 m |  |  |  | Grid Reference: TF 43817 23991 |      |     |                   | SHEET 1 OF 1       |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       | DATES 12/02/2024 - 12/02/2024                            |  |  |  | PROJECT NO. 8133               |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
| Date/Time and Depth                                                 | Depth of Casing | Depth* of Water | Piez. | Description of Strata                                             | Leg | Reduced Level | Depth | Graphical Representation                                 |  |  |  | Sampling/In-Situ Testing       |      |     |                   | Laboratory Testing |        |      |      | Additional Tests and Notes |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       | SPT 'N' Value                                            |  |  |  | Depths                         | Type | No. | Blows             | SPT N              | <425 % | WC % | PL % | LL %                       | p <sub>a</sub> Mg/m <sup>3</sup> | Cu kN/m <sup>2</sup> |  |                         |  |  |  |
|                                                                     |                 |                 |       | Brown sandy ORGANIC CLAY with fine roots. [TOPSOIL]               |     |               | 0.00  | 0 10 20 30 40                                            |  |  |  | 0                              |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       | Soft to firm brown sandy silty CLAY.                              |     |               | 0.30  |                                                          |  |  |  | 0.50                           | ES   | 1   |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  | 0.80                           | D    | 1   | 2 2<br>1 2<br>2 2 | 7                  |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  | 1.80                           | D    | 2   | 1 1<br>1 2<br>1 2 | 6                  |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       | 2.00 - 2.50 Soft.                                                 |     |               |       |                                                          |  |  |  | 2.80                           | D    | 3   | 2 2<br>2 2<br>1 2 | 7                  |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       | 2.70 Becoming dark grey mottled.                                  |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       | 3.00 - 4.00 Brown sandy clay. Very poor recovery (10%).           |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       | 4.00 - 5.00 Brown/dark grey very sandy clay. Poor recovery (25%). |     |               |       |                                                          |  |  |  | 4                              |      |     | 2 1<br>1 1<br>5 6 | 13                 |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       | END OF EXPLORATORY HOLE                                           |     |               | 5.00  |                                                          |  |  |  | 5                              |      |     | 3 3<br>4 3<br>5 5 | 17                 |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  | 6                              |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  | 7                              |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  | 8                              |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  | Inflow of water at 1.5m |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
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|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |
|                                                                     |                 |                 |       |                                                                   |     |               |       |                                                          |  |  |  |                                |      |     |                   |                    |        |      |      |                            |                                  |                      |  |                         |  |  |  |

GEL AGS BH BETA 8133.GI LONG SUTTON, SPALDING.GPJ GINT STD AGS 3 1.GDT 7/3/24

| CLIENT: Bowmer & Kirkland Ltd |                 |                  |       | PROJECT: Long Sutton, Spalding                      |        |               |                          | GROUND LEVEL m                 |    |    |                          | HOLE No. WS02    |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|-------------------------------|-----------------|------------------|-------|-----------------------------------------------------|--------|---------------|--------------------------|--------------------------------|----|----|--------------------------|------------------|-----|-------|--------------------|--------|------|------|----------------------------|------|----------------------------------|----------------------|-----------------------|
| LOGGED BY: PC                 |                 | CHECKED BY: JD   |       | EXCAVATION METHOD: Window Sampler                   |        |               |                          | Grid Reference: TF 43786 24024 |    |    |                          | SHEET 1 OF 1     |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
| FIELDWORK BY: GEL             |                 | DATE: 07/03/2024 |       | Uncased to 5.0 m                                    |        |               |                          | DATES 12/02/2024 - 12/02/2024  |    |    |                          | PROJECT NO. 8133 |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
| TEMPLATE REF: GEL AGS 8H BETA |                 |                  |       |                                                     |        |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
| Date/Time and Depth           | Depth of Casing | Depth* of Water  | Piez. | Description of Strata                               | Strata |               | Graphical Representation |                                |    |    | Sampling/In-Situ Testing |                  |     |       | Laboratory Testing |        |      |      | Additional Tests and Notes |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | Leg    | Reduced Level | Depth                    | SPT 'N' Value                  |    |    | Depths                   | Type             | No. | Blows | SPT N              | <425 % | WC % | PL % |                            | LL % | p <sub>v</sub> Mg/m <sup>3</sup> | Cu kN/m <sup>2</sup> |                       |
|                               |                 |                  |       | Brown sandy ORGANIC CLAY with fine roots. [TOPSOIL] |        |               | 0.00                     | 10                             | 20 | 30 | 40                       | 0                |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       | Firm brown silty sandy CLAY.                        | X      |               | 0.25                     |                                |    |    |                          | 0.20             | ES  | 2     |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          | 0.40             | ES  | 1     |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 | 1.00             |       | 1.00 Wet and soft.                                  | X      |               |                          |                                |    |    |                          | 0.80             | D   | 1     |                    | 12     | 6    |      |                            |      |                                  |                      | Inflow of water at 1m |
|                               |                 |                  |       | 1.60 Soft to firm.                                  | X      |               |                          |                                |    |    |                          |                  |     |       |                    | 22     |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       | 1.90 Becoming dark grey and soft.                   | X      |               |                          |                                |    |    |                          |                  |     |       |                    | 11     |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          | 1.80             | D   | 2     |                    | 10     | 0    |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    | 00     |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    | 00     |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       | 3.00 - 4.00 No recovery.                            | X      |               |                          |                                |    |    |                          | 2.80             | D   | 3     |                    | 11     | 3    |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    | 01     |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    | 11     |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    | 12     | 14   |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    | 23     |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    | 45     |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       | END OF EXPLORATORY HOLE                             | X      |               | 5.00                     |                                |    |    |                          | 5                |     |       |                    | 33     | 19   |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    | 44     |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    | 56     |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          | 6                |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          | 7                |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |
|                               |                 |                  |       |                                                     | X      |               |                          |                                |    |    |                          |                  |     |       |                    |        |      |      |                            |      |                                  |                      |                       |

[illegible]

[illegible]

[illegible]



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## TRIAL PIT LOG

|                                         |                                            |                                            |                                                         |                             |
|-----------------------------------------|--------------------------------------------|--------------------------------------------|---------------------------------------------------------|-----------------------------|
| Project<br><b>Long Sutton, Spalding</b> |                                            | Client<br><b>Bowmer &amp; Kirkland Ltd</b> |                                                         | TRIAL PIT No<br><b>SK01</b> |
| Job No<br><b>8133</b>                   | Date<br><b>12-02-24</b><br><b>12-02-24</b> | Ground Level (m)                           | Coordinates/Grid Reference ( )<br><b>TF 43812 24026</b> |                             |
| Fieldwork By<br><b>GEL</b>              |                                            | Logged By<br><b>RS</b>                     |                                                         | Sheet<br><b>1 of 1</b>      |

| Depth     | DESCRIPTION                                                                              | Legend | Depth | No | Remarks/Tests            |
|-----------|------------------------------------------------------------------------------------------|--------|-------|----|--------------------------|
| 0.00-0.50 | TOPSOIL (Dark brown clayey ORGANIC SAND. Sand is fine to coarse with frequent rootlets.) |        | 0.60  | 1B | Inflow of water at 0.4 m |
| 0.50-2.00 | Soft dark brown sandy silty CLAY.                                                        |        |       |    |                          |
| 2.00      | END OF EXPLORATORY HOLE                                                                  |        |       |    |                          |

1.8



0.35

Shoring/Support: 20mm gravel  
Stability: Unstable- sidewall collapse at 1.8m

GEL AGS TP BETA 8133.GI LONG SUTTON, SPALDING.GPJ GINT STD AGS 3\_1.GDT 7/3/24

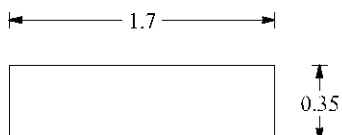
|                                                       |                         |                                        |                         |
|-------------------------------------------------------|-------------------------|----------------------------------------|-------------------------|
| All dimensions in metres<br>Scale 1:33.33333333333333 | Method Trial Pit/trench | Plant Used <b>MECHANICAL EXCAVATOR</b> | Checked By<br><b>JD</b> |
|-------------------------------------------------------|-------------------------|----------------------------------------|-------------------------|

## TRIAL PIT LOG

|                                  |                              |                  |                                                  |  |                                 |
|----------------------------------|------------------------------|------------------|--------------------------------------------------|--|---------------------------------|
| Project<br>Long Sutton, Spalding |                              |                  | Client<br>Bowmer & Kirkland Ltd                  |  | TRIAL PIT No<br><br><b>SK02</b> |
| Job No<br>8133                   | Date<br>12-02-24<br>12-02-24 | Ground Level (m) | Coordinates/Grid Reference ( )<br>TF 43854 24046 |  |                                 |
| Fieldwork By<br>GEL              |                              |                  | Logged By<br>RS                                  |  |                                 |

| Depth     | DESCRIPTION                                                                              | Legend | Depth | No | Remarks/Tests             |
|-----------|------------------------------------------------------------------------------------------|--------|-------|----|---------------------------|
| 0.00-0.40 | TOPSOIL (Dark brown clayey ORGANIC SAND. Sand is fine to coarse with frequent rootlets.) |        | 0.60  | 1B | Inflow of water at 0.55 m |
| 0.40-1.00 | Soft dark brown sandy silty CLAY.                                                        |        |       |    |                           |
| 1.00      | END OF EXPLORATORY HOLE                                                                  |        |       |    |                           |

GEL AGS TP BETA 8133,GILONG SUTTON, SPALDING.GPJ GINT STD AGS 3\_1.GDT 7/3/24



Shoring/Support: 20mm gravel  
Stability: Unstable- sidewall collapse at 1.1m

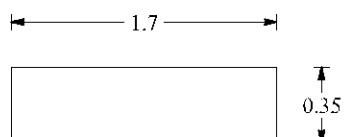
|                                                       |                         |                                            |                         |
|-------------------------------------------------------|-------------------------|--------------------------------------------|-------------------------|
| All dimensions in metres<br>Scale 1:33.33333333333333 | Method Trial Pit/trench | Plant Used <b>MECHANICAL<br/>EXCAVATOR</b> | Checked By<br><b>JD</b> |
|-------------------------------------------------------|-------------------------|--------------------------------------------|-------------------------|

## TRIAL PIT LOG

|                                  |                              |                  |                                                 |  |                                 |
|----------------------------------|------------------------------|------------------|-------------------------------------------------|--|---------------------------------|
| Project<br>Long Sutton, Spalding |                              |                  | Client<br>Bowmer & Kirkland Ltd                 |  | TRIAL PIT No<br><br><b>SK03</b> |
| Job No<br>8133                   | Date<br>13-02-24<br>13-02-24 | Ground Level (m) | Coordinates/Grid Reference ()<br>TF 43797 23940 |  |                                 |
| Fieldwork By<br>GEL              |                              |                  | Logged By<br>RS                                 |  | Sheet<br>1 of 1                 |

| Depth     | DESCRIPTION                                                                                                                                                | Legend | Depth | No | Remarks/Tests            |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------|----|--------------------------|
| 0.00-0.45 | TOPSOIL (Dark brown clayey ORGANIC SAND, Sand is fine to coarse with rare fine and medium sub-angular and sub-rounded flint gravel and frequent rootlets.) |        |       |    |                          |
| 0.45-1.80 | Soft dark brown sandy silty CLAY.                                                                                                                          |        |       |    | Inflow of water at 0.6 m |
| 1.80      | END OF EXPLORATORY HOLE                                                                                                                                    |        |       |    |                          |

GEL AGS TP BETA 8133, GILONG SUTTON, SPALDING.GPJ GINT STD AGS 3 1.GDT 7/3/24



Shoring/Support: 20mm gravel  
Stability: Unstable- sidewall collapse at 1.4m

|                                                       |                         |                                            |                         |
|-------------------------------------------------------|-------------------------|--------------------------------------------|-------------------------|
| All dimensions in metres<br>Scale 1:33.33333333333333 | Method Trial Pit/trench | Plant Used <b>MECHANICAL<br/>EXCAVATOR</b> | Checked By<br><b>JD</b> |
|-------------------------------------------------------|-------------------------|--------------------------------------------|-------------------------|



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TRIAL PIT LOG

|                                  |                              |                                 |                                                  |                             |
|----------------------------------|------------------------------|---------------------------------|--------------------------------------------------|-----------------------------|
| Project<br>Long Sutton, Spalding |                              | Client<br>Bowmer & Kirkland Ltd |                                                  | TRIAL PIT No<br><b>SK04</b> |
| Job No<br>8133                   | Date<br>13-02-24<br>13-02-24 | Ground Level (m)                | Coordinates/Grid Reference ( )<br>TF 43938 23862 |                             |
| Fieldwork By<br>GEL              |                              | Logged By<br>RS                 |                                                  | Sheet<br>1 of 1             |

| Depth     | DESCRIPTION                                                                                                                                                | Legend | Depth | No | Remarks/Tests            |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------|----|--------------------------|
| 0.00-0.40 | TOPSOIL (Dark brown clayey ORGANIC SAND. Sand is fine to coarse with rare fine and medium sub-angular and sub-rounded flint gravel and frequent rootlets.) |        |       |    |                          |
| 0.40-2.00 | Soft dark brown sandy silty CLAY.                                                                                                                          |        |       |    | Inflow of water at 0.4 m |
| 2.00      | END OF EXPLORATORY HOLE                                                                                                                                    |        |       |    |                          |

1.6



0.35

Shoring/Support: 20mm gravel  
Stability: Unstable- sidewall collapse at 1.5m

GEL AGS TP BETA 8133.GI LONG SUTTON, SPALDING.GPJ GINT STD AGS 3\_1.GDT 7/3/24

|                                                     |                         |                                       |                  |
|-----------------------------------------------------|-------------------------|---------------------------------------|------------------|
| All dimensions in metres<br>Scale 1:33.333333333333 | Method Trial Pit/trench | Plant Used<br>MECHANICAL<br>EXCAVATOR | Checked By<br>JD |
|-----------------------------------------------------|-------------------------|---------------------------------------|------------------|



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## TRIAL PIT LOG

|                                         |                                            |                                            |                                                         |                             |
|-----------------------------------------|--------------------------------------------|--------------------------------------------|---------------------------------------------------------|-----------------------------|
| Project<br><b>Long Sutton, Spalding</b> |                                            | Client<br><b>Bowmer &amp; Kirkland Ltd</b> |                                                         | TRIAL PIT No<br><b>SK05</b> |
| Job No<br><b>8133</b>                   | Date<br><b>13-02-24</b><br><b>13-02-24</b> | Ground Level (m)                           | Coordinates/Grid Reference ( )<br><b>TF 43722 23761</b> |                             |
| Fieldwork By<br><b>GEL</b>              |                                            | Logged By<br><b>RS</b>                     |                                                         | Sheet<br><b>1 of 1</b>      |

| Depth     | DESCRIPTION                                                                              | Legend | Depth | No | Remarks/Tests             |
|-----------|------------------------------------------------------------------------------------------|--------|-------|----|---------------------------|
| 0.00-0.40 | TOPSOIL (Dark brown clayey ORGANIC SAND. Sand is fine to coarse with frequent rootlets.) |        |       |    |                           |
| 0.40-2.00 | Soft dark brown sandy silty CLAY.                                                        |        |       |    | Inflow of water at 0.35 m |
| 2.00      | END OF EXPLORATORY HOLE                                                                  |        |       |    |                           |

1.8



0.35

Shoring/Support: 20mm gravel  
Stability: Stable

GEL AGS TP BETA 8133.GI LONG SUTTON, SPALDING.GPJ GINT STD AGS 3\_1.GDT 7/3/24

|                                                       |                         |                                        |                         |
|-------------------------------------------------------|-------------------------|----------------------------------------|-------------------------|
| All dimensions in metres<br>Scale 1:33.33333333333333 | Method Trial Pit/trench | Plant Used <b>MECHANICAL EXCAVATOR</b> | Checked By<br><b>JD</b> |
|-------------------------------------------------------|-------------------------|----------------------------------------|-------------------------|



**Project Number:** 8133,GI

**Date:** 23/02/2024

**Project Name:** University Academy, Long Sutton, Spalding, PE12 9LF

| Time  | Depth to Water | Pit Size [m]                           |                   |               |
|-------|----------------|----------------------------------------|-------------------|---------------|
| [min] | [mbgl]         | Length                                 | Width             | Depth         |
| 0     | 1.48           | 1.80                                   | 0.35              | 2.00          |
| 1     | 1.48           | <b>Infiltration Rate Calculations</b>  |                   |               |
| 2     | 1.48           |                                        |                   |               |
| 3     | 1.48           |                                        |                   |               |
| 4     | 1.48           |                                        |                   |               |
| 5     | 1.48           | <b>Parameter</b>                       | <b>Unit</b>       | <b>Result</b> |
| 10    | 1.48           | height                                 |                   |               |
| 15    | 1.48           | <b>h<sub>75</sub></b>                  | [m]               | 1.870         |
| 20    | 1.48           | <b>h<sub>25</sub></b>                  | [m]               | 1.610         |
| 30    | 1.47           | <b>h<sub>75</sub>-h<sub>25</sub></b>   | [m]               | 0.260         |
| 60    | 1.47           | time                                   |                   |               |
| 1200  | 1.40           | <b>t<sub>75</sub></b>                  | [s]               | N/A           |
| 1440  | 1.38           | <b>t<sub>25</sub></b>                  | [s]               | N/A           |
|       |                | <b>t<sub>75</sub> - t<sub>25</sub></b> | [s]               | N/A           |
|       |                | effective volume                       |                   |               |
|       |                | <b>v<sub>75-25</sub></b>               | [m <sup>3</sup> ] | 0.164         |
|       |                | effective area                         |                   |               |
|       |                | <b>ap<sub>50</sub></b>                 | [m <sup>2</sup> ] | 1.748         |
|       |                | soil infiltration rate                 |                   |               |
|       |                | <b>f</b>                               | [m/s]             | N/A           |

**It was not possible to undertake full-depth soakaway test.**

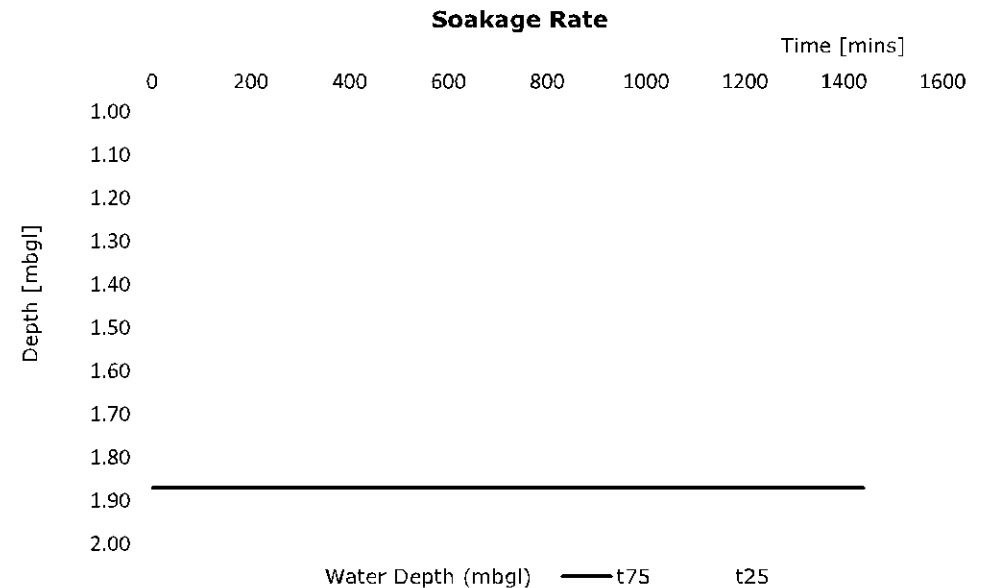
**Trial Pit** SK01

**Run** 1 of 1

**Test Date** 12/02/2024

**Groundwater Encountered:** 0.40m

**Remarks:** Pit backfilled with 20mm gravel to ensure stability.



Calculated by: RS

Checked by: JD

**Project Number:** 8133,GI

**Date:** 23/02/2024

**Project Name:** University Academy, Long Sutton, Spalding, PE12 9LF

| Time  | Depth to Water | Pit Size [m]                           |                   |        |
|-------|----------------|----------------------------------------|-------------------|--------|
| [min] | [mbgl]         | Length                                 | Width             | Depth  |
| 0     | 0.49           | 1.70                                   | 0.35              | 1.00   |
| 1     | 0.50           | <b>Infiltration Rate Calculations</b>  |                   |        |
| 2     | 0.50           |                                        |                   |        |
| 3     | 0.50           | Parameter                              | Unit              | Result |
| 4     | 0.50           |                                        | height            |        |
| 5     | 0.50           | <b>h<sub>75</sub></b>                  | [m]               | 0.873  |
| 10    | 0.50           | <b>h<sub>25</sub></b>                  | [m]               | 0.618  |
| 15    | 0.50           | <b>h<sub>75</sub>-h<sub>25</sub></b>   | [m]               | 0.255  |
| 20    | 0.50           |                                        |                   |        |
| 30    | 0.50           |                                        |                   |        |
| 45    | 0.50           | <b>t<sub>75</sub></b>                  | [s]               | N/A    |
| 60    | 0.50           | <b>t<sub>25</sub></b>                  | [s]               | N/A    |
| 1200  | 0.51           | <b>t<sub>75</sub> - t<sub>25</sub></b> | [s]               | N/A    |
| 1440  | 0.51           |                                        |                   |        |
|       |                | effective volume                       |                   |        |
|       |                | <b>v<sub>75-25</sub></b>               | [m <sup>3</sup> ] | 0.152  |
|       |                | effective area                         |                   |        |
|       |                | <b>ap<sub>50</sub></b>                 | [m <sup>2</sup> ] | 1.641  |
|       |                | soil infiltration rate                 |                   |        |
|       |                | <b>f</b>                               | [m/s]             | N/A    |

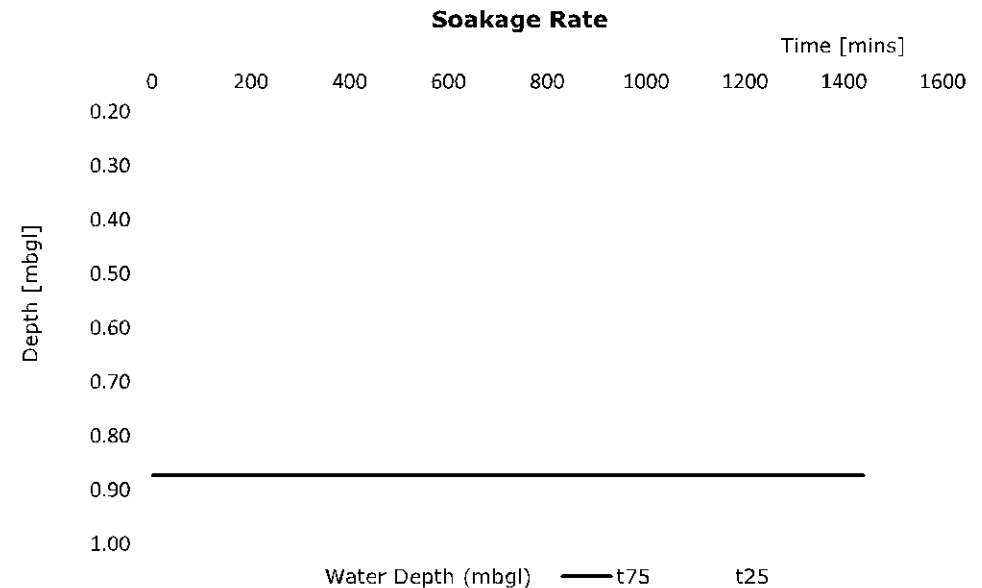
**It was not possible to undertake full-depth soakaway test.**

**Trial Pit** SK02

**Run** 1 of 1

**Test Date** 12/02/2024

**Groundwater Encountered:** 0.55m



Calculated by: RS

Checked by: JD

**Project Number:** 8133,GI

**Date:** 23/02/2024

**Project Name:** University Academy, Long Sutton, Spalding, PE12 9LF

| Time  | Depth to Water | Pit Size [m]                           |                   |        |
|-------|----------------|----------------------------------------|-------------------|--------|
| [min] | [mbgl]         | Length                                 | Width             | Depth  |
| 0     | 1.27           | 1.70                                   | 0.35              | 1.80   |
| 1     | 1.27           | <b>Infiltration Rate Calculations</b>  |                   |        |
| 2     | 1.27           |                                        |                   |        |
| 3     | 1.27           | Parameter                              | Unit              | Result |
| 4     | 1.27           |                                        | height            |        |
| 5     | 1.27           | <b>h<sub>75</sub></b>                  | [m]               | 1.668  |
| 10    | 1.27           | <b>h<sub>25</sub></b>                  | [m]               | 1.403  |
| 15    | 1.27           | <b>h<sub>75</sub>-h<sub>25</sub></b>   | [m]               | 0.265  |
| 20    | 1.27           | time                                   |                   |        |
| 30    | 1.27           |                                        |                   |        |
| 45    | 1.27           | <b>t<sub>75</sub></b>                  | [s]               | N/A    |
| 60    | 1.27           | <b>t<sub>25</sub></b>                  | [s]               | N/A    |
| 120   | 1.28           | <b>t<sub>75</sub> - t<sub>25</sub></b> | [s]               | N/A    |
| 1260  | 1.29           | effective volume                       |                   |        |
| 1440  | 1.29           |                                        |                   |        |
|       |                | <b>v<sub>75-25</sub></b>               | [m <sup>3</sup> ] | 0.158  |
|       |                | effective area                         |                   |        |
|       |                |                                        |                   |        |
|       |                | <b>ap<sub>50</sub></b>                 | [m <sup>2</sup> ] | 1.682  |
|       |                | soil infiltration rate                 |                   |        |
|       |                |                                        |                   |        |
|       |                | <b>f</b>                               | [m/s]             | N/A    |

**It was not possible to undertake full-depth soakaway test.**

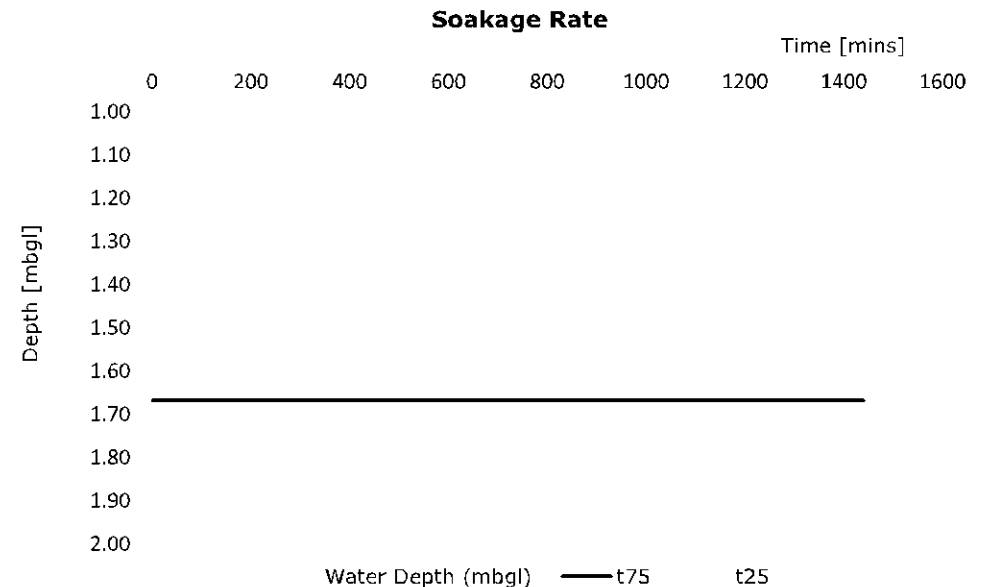
**Trial Pit** SK03

**Run** 1 of 1

**Test Date** 13/02/2024

**Groundwater Encountered:** 0.6m

**Remarks:** Pit backfilled with 20mm gravel to ensure stability.



Calculated by: RS

Checked by: JD

**Project Number:** 8133,GI

**Date:** 23/02/2024

**Project Name:** University Academy, Long Sutton, Spalding, PE12 9LF

**It was not possible to undertake full-depth soakaway test.**

| Time  | Depth to Water | Pit Size [m]                           |                   |               |
|-------|----------------|----------------------------------------|-------------------|---------------|
| [min] | [mbgl]         | Length                                 | Width             | Depth         |
| 0     | 1.50           | 1.60                                   | 0.35              | 2.00          |
| 1     | 1.50           | <b>Infiltration Rate Calculations</b>  |                   |               |
| 2     | 1.50           |                                        |                   |               |
| 3     | 1.50           |                                        |                   |               |
| 4     | 1.50           |                                        |                   |               |
| 5     | 1.50           | <b>Parameter</b>                       | <b>Unit</b>       | <b>Result</b> |
| 10    | 1.50           | height                                 |                   |               |
| 15    | 1.50           | <b>h<sub>75</sub></b>                  | [m]               | 1.875         |
| 20    | 1.50           | <b>h<sub>25</sub></b>                  | [m]               | 1.625         |
| 30    | 1.49           | <b>h<sub>75</sub>-h<sub>25</sub></b>   | [m]               | 0.250         |
| 60    | 1.49           | time                                   |                   |               |
| 1200  | 1.44           | <b>t<sub>75</sub></b>                  | [s]               | N/A           |
| 1440  | 1.44           | <b>t<sub>25</sub></b>                  | [s]               | N/A           |
|       |                | <b>t<sub>75</sub> - t<sub>25</sub></b> | [s]               | N/A           |
|       |                | effective volume                       |                   |               |
|       |                | <b>v<sub>75-25</sub></b>               | [m <sup>3</sup> ] | 0.140         |
|       |                | effective area                         |                   |               |
|       |                | <b>ap<sub>50</sub></b>                 | [m <sup>2</sup> ] | 1.535         |
|       |                | soil infiltration rate                 |                   |               |
|       |                | <b>f</b>                               | [m/s]             | N/A           |

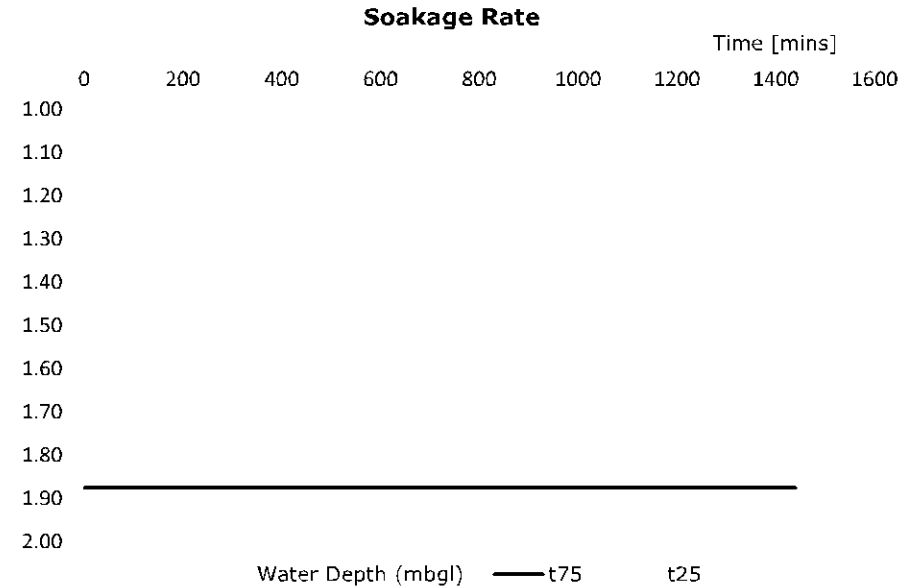
**Trial Pit** SK04

**Run** 1 of 1

**Test Date** 13/02/2024

**Groundwater Encountered:** 0.4m

**Remarks:** Pit backfilled with 20mm gravel to ensure stability.



Calculated by: RS

Checked by: JD

**Project Number:** 8133,GI

**Date:** 23/02/2024

**Project Name:** University Academy, Long Sutton, Spalding, PE12 9LF

| Time  | Depth to Water | Pit Size [m]                           |                        |        |
|-------|----------------|----------------------------------------|------------------------|--------|
| [min] | [mbgl]         | Length                                 | Width                  | Depth  |
| 0     | 1.44           | 1.80                                   | 0.35                   | 2.00   |
| 1     | 1.43           | <b>Infiltration Rate Calculations</b>  |                        |        |
| 2     | 1.43           |                                        |                        |        |
| 3     | 1.43           | Parameter                              | Unit                   | Result |
| 4     | 1.42           |                                        | height                 |        |
| 5     | 1.40           | <b>h<sub>75</sub></b>                  | [m]                    | 1.860  |
| 10    | 1.40           | <b>h<sub>25</sub></b>                  | [m]                    | 1.580  |
| 20    | 1.39           | <b>h<sub>75</sub>-h<sub>25</sub></b>   | [m]                    | 0.280  |
| 30    | 1.39           |                                        |                        |        |
| 60    | 1.39           |                                        | time                   |        |
| 1198  | 1.31           | <b>t<sub>75</sub></b>                  | [s]                    | N/A    |
| 1440  | 1.30           | <b>t<sub>25</sub></b>                  | [s]                    | N/A    |
|       |                | <b>t<sub>75</sub> - t<sub>25</sub></b> | [s]                    | N/A    |
|       |                |                                        |                        |        |
|       |                |                                        | effective volume       |        |
|       |                | <b>v<sub>75-25</sub></b>               | [m <sup>3</sup> ]      | 0.176  |
|       |                |                                        |                        |        |
|       |                |                                        | effective area         |        |
|       |                | <b>ap<sub>50</sub></b>                 | [m <sup>2</sup> ]      | 1.393  |
|       |                |                                        |                        |        |
|       |                |                                        | soil infiltration rate |        |
|       |                | <b>f</b>                               | [m/s]                  | N/A    |

**It was not possible to undertake full-depth soakaway test.**

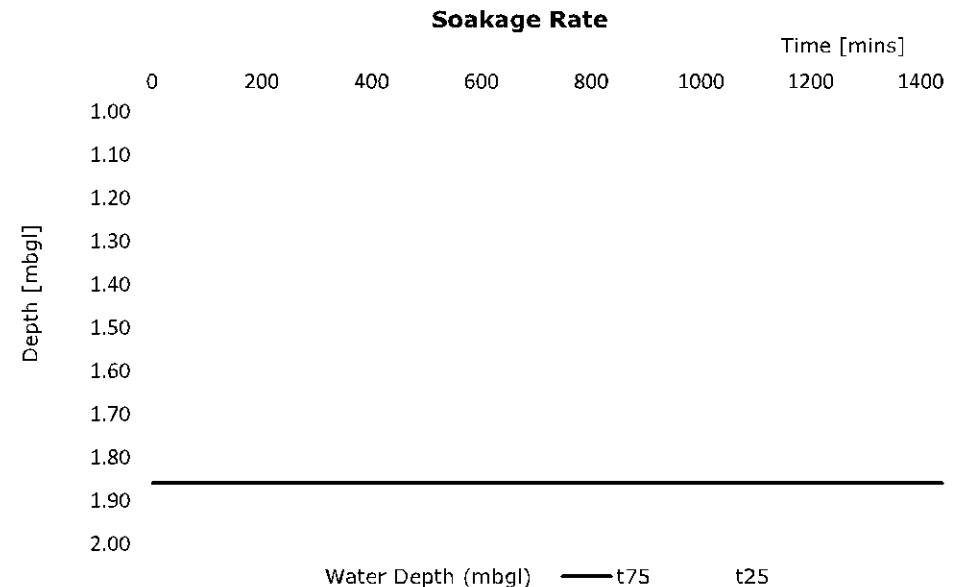
**Trial Pit** SK05

**Run** 1 of 1

**Test Date** 13/02/2024

**Groundwater Encountered:** 0.35

**Remarks:** Pit backfilled with 20mm gravel to ensure stability.



Calculated by: RS

Checked by: JD



**Project Number:** 8133,GI

**Project Name:** University Academy, Long Sutton

**Date:** 08/03/2024

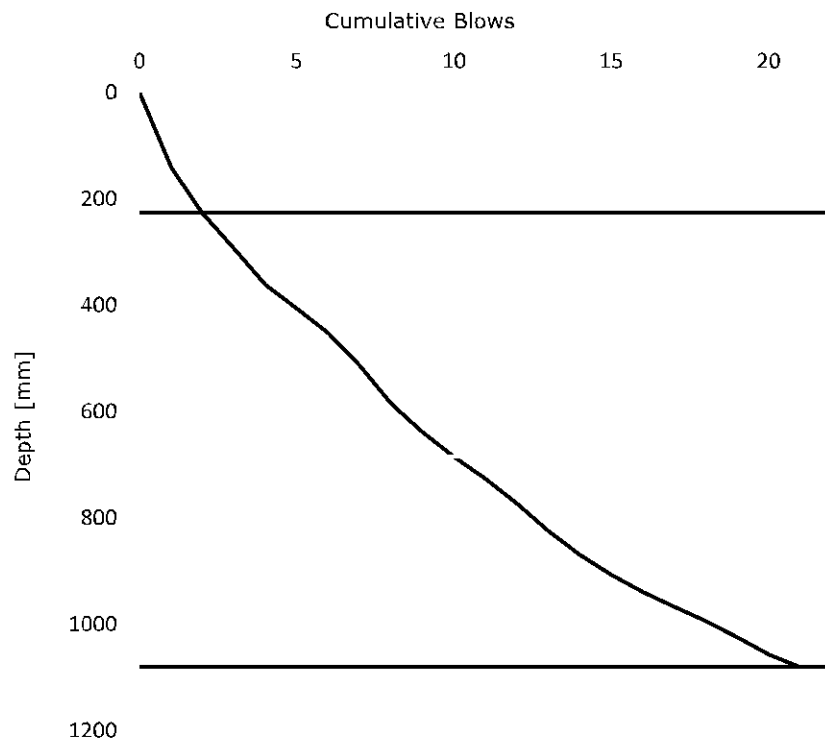
## Factual Results

|    |      |
|----|------|
| 0  | 0    |
| 1  | 142  |
| 2  | 227  |
| 3  | 293  |
| 4  | 361  |
| 5  | 407  |
| 6  | 453  |
| 7  | 513  |
| 8  | 586  |
| 9  | 639  |
| 10 | 685  |
| 11 | 726  |
| 12 | 773  |
| 13 | 825  |
| 14 | 870  |
| 15 | 908  |
| 16 | 939  |
| 17 | 966  |
| 18 | 993  |
| 19 | 1025 |
| 20 | 1057 |
| 21 | 1080 |

## Project Details

|                       |                             |
|-----------------------|-----------------------------|
| <b>Location No:</b>   | TRL01                       |
| <b>Testing Date:</b>  | 13 February 2024            |
| <b>Undertaken By:</b> | RS                          |
| <b>Approved By:</b>   | SG                          |
| <b>Comments:</b>      | Commenced from ground level |

## Interpretative Results



|    | Layer   | No of Blows | Cumulative Blows | CBR [%] | Layer Thickness [mm] | Total Depth [mm] |
|----|---------|-------------|------------------|---------|----------------------|------------------|
| 46 | Layer 1 | 2           | 2                | 2       | 227                  | 227              |
| 49 | Layer 2 | 8           | 10               | 4       | 458                  | 685              |
| 50 | Layer 3 | 11          | 21               | 7       | 395                  | 1080             |

**Project Number:**

8133,GI

**Project Name:**

University Academy, Long Sutton

**Date:**

08/03/2024

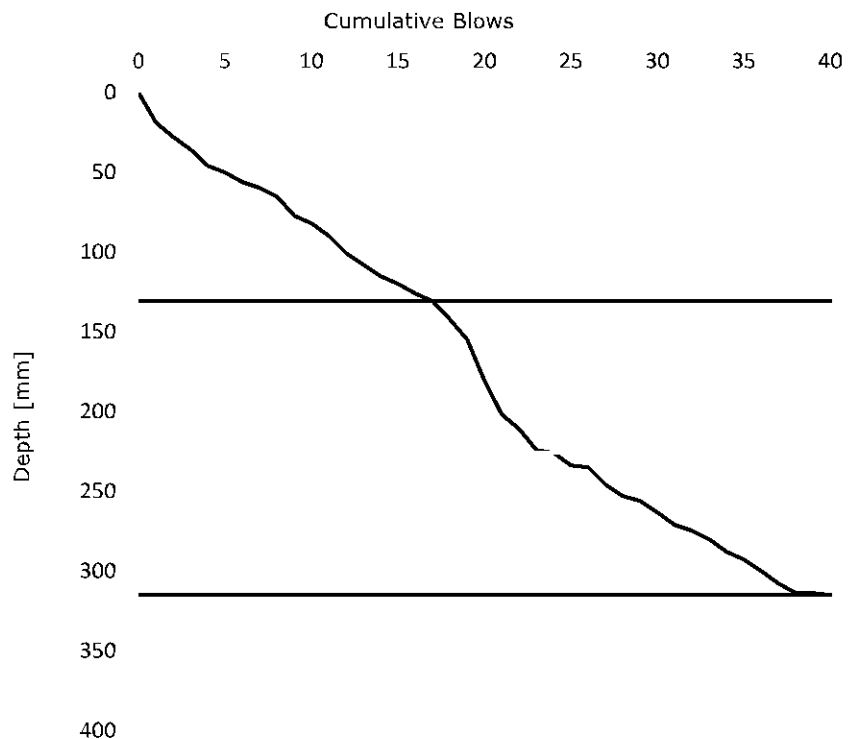
## Factual Results

|    |     |
|----|-----|
| 0  | 0   |
| 1  | 19  |
| 2  | 28  |
| 3  | 36  |
| 4  | 46  |
| 5  | 50  |
| 6  | 56  |
| 7  | 60  |
| 8  | 65  |
| 9  | 77  |
| 10 | 82  |
| 11 | 90  |
| 12 | 101 |
| 13 | 108 |
| 14 | 115 |
| 15 | 120 |
| 16 | 126 |
| 17 | 131 |
| 18 | 142 |
| 19 | 155 |
| 20 | 181 |
| 21 | 202 |
| 22 | 211 |
| 23 | 224 |
| 24 | 226 |
| 25 | 234 |
| 26 | 235 |
| 27 | 246 |
| 28 | 253 |
| 29 | 256 |
| 30 | 263 |
| 31 | 271 |
| 32 | 275 |
| 33 | 280 |
| 34 | 288 |
| 35 | 293 |
| 36 | 300 |
| 37 | 308 |
| 38 | 314 |
| 39 | 314 |
| 40 | 315 |

## Project Details

|                       |                        |
|-----------------------|------------------------|
| <b>Location No:</b>   | TRL02                  |
| <b>Testing Date:</b>  | 13/02/2024             |
| <b>Undertaken By:</b> | RS                     |
| <b>Approved By:</b>   | SG                     |
| <b>Comments:</b>      | Commenced from 0.2mbgl |

## Interpretative Results



|    | Layer   | No of Blows | Cumulative Blows | CBR [%] | Layer Thickness [mm] | Total Depth [mm] |
|----|---------|-------------|------------------|---------|----------------------|------------------|
| 46 | Layer 1 | 17          | 17               | 35      | 131                  | 131              |
| 49 | Layer 2 | 7           | 24               | 19      | 95                   | 226              |
| 50 | Layer 3 | 16          | 40               | 49      | 89                   | 315              |

**Project Number:** 8133,GI

**Project Name:** University Academy, Long Sutton

**Date:** 08/03/2024

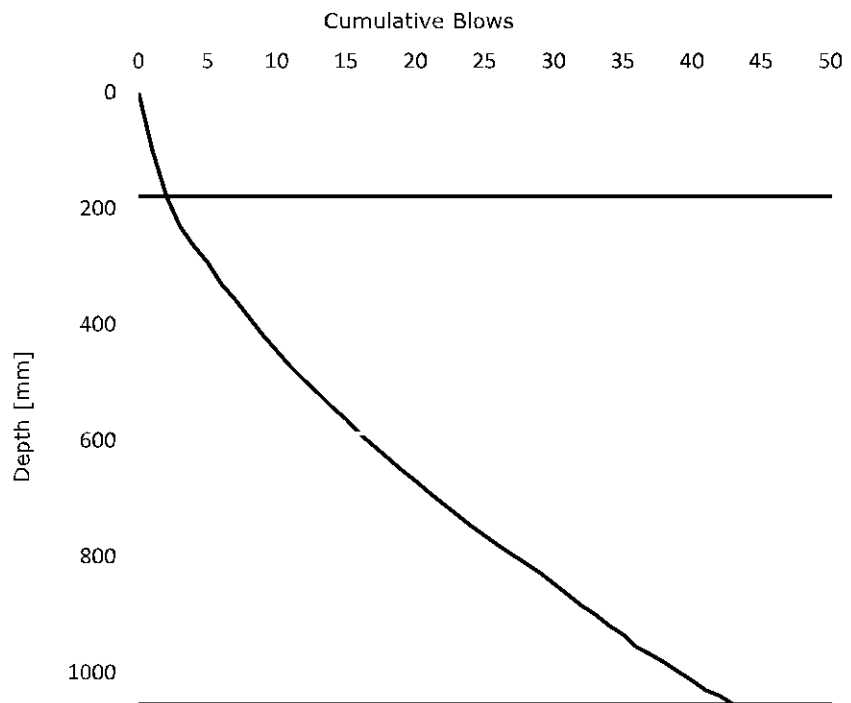
## Factual Results

|    |      |
|----|------|
| 0  | 0    |
| 1  | 98   |
| 2  | 180  |
| 3  | 230  |
| 4  | 264  |
| 5  | 294  |
| 6  | 330  |
| 7  | 358  |
| 8  | 388  |
| 9  | 417  |
| 10 | 446  |
| 11 | 473  |
| 12 | 498  |
| 13 | 518  |
| 14 | 542  |
| 15 | 564  |
| 16 | 588  |
| 17 | 610  |
| 18 | 629  |
| 19 | 651  |
| 20 | 670  |
| 21 | 690  |
| 22 | 709  |
| 23 | 727  |
| 24 | 747  |
| 25 | 763  |
| 26 | 780  |
| 27 | 797  |
| 28 | 812  |
| 29 | 829  |
| 30 | 846  |
| 31 | 865  |
| 32 | 884  |
| 33 | 900  |
| 34 | 919  |
| 35 | 935  |
| 36 | 955  |
| 37 | 969  |
| 38 | 982  |
| 39 | 999  |
| 40 | 1014 |
| 41 | 1030 |
| 42 | 1040 |
| 43 | 1055 |

## Project Details

|                       |                             |
|-----------------------|-----------------------------|
| <b>Location No:</b>   | TRL03                       |
| <b>Testing Date:</b>  | 13/02/2024                  |
| <b>Undertaken By:</b> | RS                          |
| <b>Approved By:</b>   | SG                          |
| <b>Comments:</b>      | Commenced from ground level |

## Interpretative Results



|    | Layer   | No of Blows | Cumulative Blows | CBR [%] | Layer Thickness [mm] | Total Depth [mm] |
|----|---------|-------------|------------------|---------|----------------------|------------------|
| 45 |         |             |                  |         |                      |                  |
| 46 | Layer 1 | 2           | 2                | 3       | 180                  | 180              |
| 47 | Layer 2 | 14          | 16               | 9       | 408                  | 588              |
| 48 | Layer 3 | 27          | 43               | 15      | 467                  | 1055             |
| 49 |         |             |                  |         |                      |                  |
| 50 |         |             |                  |         |                      |                  |

**Project Number:**

8133,GI

**Project Name:**

University Academy, Long Sutton

**Date:**

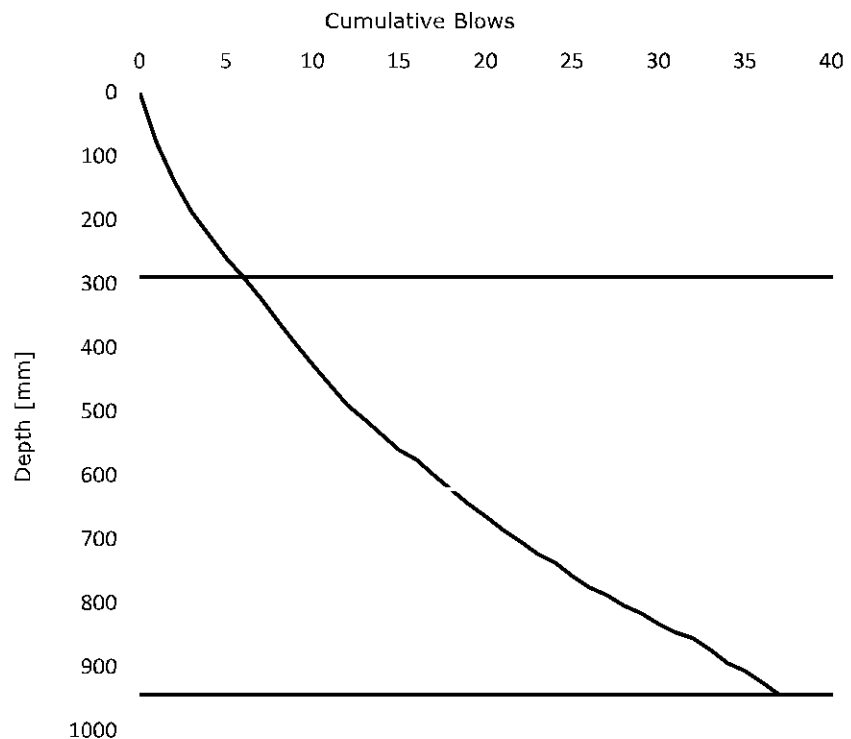
08/03/2024

**Factual Results**

|    |     |
|----|-----|
| 0  | 0   |
| 1  | 80  |
| 2  | 139 |
| 3  | 187 |
| 4  | 224 |
| 5  | 259 |
| 6  | 290 |
| 7  | 323 |
| 8  | 359 |
| 9  | 394 |
| 10 | 427 |
| 11 | 458 |
| 12 | 489 |
| 13 | 512 |
| 14 | 536 |
| 15 | 560 |
| 16 | 576 |
| 17 | 600 |
| 18 | 622 |
| 19 | 644 |
| 20 | 664 |
| 21 | 685 |
| 22 | 704 |
| 23 | 723 |
| 24 | 737 |
| 25 | 757 |
| 26 | 776 |
| 27 | 788 |
| 28 | 804 |
| 29 | 816 |
| 30 | 833 |
| 31 | 847 |
| 32 | 856 |
| 33 | 874 |
| 34 | 894 |
| 35 | 907 |
| 36 | 925 |
| 37 | 944 |

**Project Details**

|                       |                             |
|-----------------------|-----------------------------|
| <b>Location No:</b>   | TRL04                       |
| <b>Testing Date:</b>  | 13/02/2024                  |
| <b>Undertaken By:</b> | RS                          |
| <b>Approved By:</b>   | SG                          |
| <b>Comments:</b>      | Commenced from ground level |

**Interpretative Results**


|    | Layer   | No of Blows | Cumulative Blows | CBR [%] | Layer Thickness [mm] | Total Depth [mm] |
|----|---------|-------------|------------------|---------|----------------------|------------------|
| 45 |         |             |                  |         |                      |                  |
| 46 | Layer 1 | 6           | 6                | 5       | 290                  | 290              |
| 47 | Layer 2 | 12          | 18               | 9       | 332                  | 622              |
| 48 | Layer 3 | 19          | 37               | 15      | 322                  | 944              |

**Project Number:**

8133,GI

**Project Name:**

University Academy, Long Sutton

**Date:**

08/03/2024

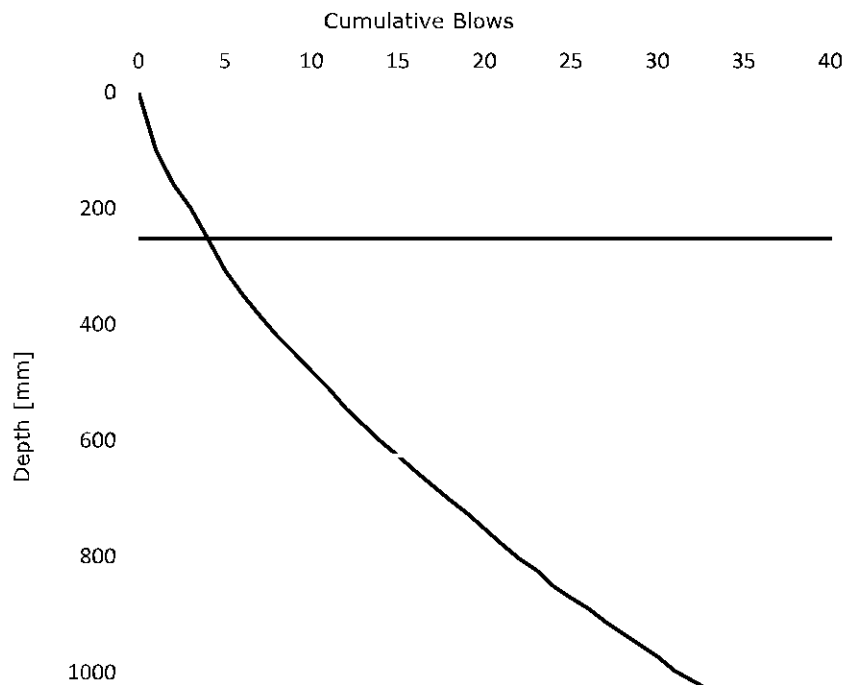
#### Factual Results

|    |      |
|----|------|
| 0  | 0    |
| 1  | 100  |
| 2  | 158  |
| 3  | 200  |
| 4  | 253  |
| 5  | 307  |
| 6  | 349  |
| 7  | 384  |
| 8  | 420  |
| 9  | 449  |
| 10 | 480  |
| 11 | 511  |
| 12 | 545  |
| 13 | 574  |
| 14 | 602  |
| 15 | 627  |
| 16 | 652  |
| 17 | 678  |
| 18 | 703  |
| 19 | 725  |
| 20 | 752  |
| 21 | 778  |
| 22 | 803  |
| 23 | 823  |
| 24 | 851  |
| 25 | 871  |
| 26 | 889  |
| 27 | 912  |
| 28 | 932  |
| 29 | 953  |
| 30 | 973  |
| 31 | 997  |
| 32 | 1013 |
| 33 | 1031 |

#### Project Details

|                       |                             |
|-----------------------|-----------------------------|
| <b>Location No:</b>   | TRL05                       |
| <b>Testing Date:</b>  | 13/02/2024                  |
| <b>Undertaken By:</b> | RS                          |
| <b>Approved By:</b>   | SG                          |
| <b>Comments:</b>      | Commenced from ground level |

#### Interpretative Results



|    | Layer   | No of Blows | Cumulative Blows | CBR [%] | Layer Thickness [mm] | Total Depth [mm] |
|----|---------|-------------|------------------|---------|----------------------|------------------|
| 46 | Layer 1 | 4           | 4                | 4       | 253                  | 253              |
| 49 | Layer 2 | 11          | 15               | 7       | 374                  | 627              |
| 50 | Layer 3 | 18          | 33               | 11      | 404                  | 1031             |

**Project Number:** 8133,GI

**Project Name:** University Academy, Long Sutton

**Date:** 08/03/2024

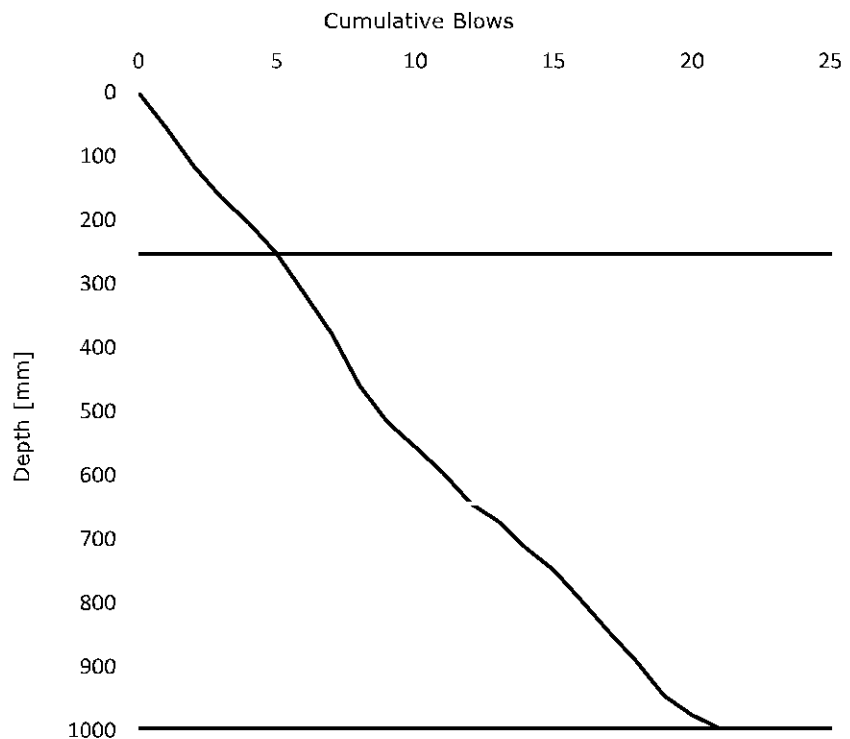
## Factual Results

|    |     |
|----|-----|
| 0  | 0   |
| 1  | 57  |
| 2  | 115 |
| 3  | 164 |
| 4  | 206 |
| 5  | 254 |
| 6  | 317 |
| 7  | 379 |
| 8  | 460 |
| 9  | 517 |
| 10 | 556 |
| 11 | 596 |
| 12 | 644 |
| 13 | 671 |
| 14 | 714 |
| 15 | 748 |
| 16 | 797 |
| 17 | 847 |
| 18 | 892 |
| 19 | 945 |
| 20 | 975 |
| 21 | 996 |

## Project Details

|                       |                             |
|-----------------------|-----------------------------|
| <b>Location No:</b>   | TRL06                       |
| <b>Testing Date:</b>  | 13/02/2024                  |
| <b>Undertaken By:</b> | RS                          |
| <b>Approved By:</b>   | SG                          |
| <b>Comments:</b>      | Commenced from ground level |

## Interpretative Results



|    | Layer   | No of Blows | Cumulative Blows | CBR [%] | Layer Thickness [mm] | Total Depth [mm] |
|----|---------|-------------|------------------|---------|----------------------|------------------|
| 45 |         |             |                  |         |                      |                  |
| 46 | Layer 1 | 5           | 5                | 5       | 254                  | 254              |
| 47 |         |             |                  |         |                      |                  |
| 48 | Layer 2 | 7           | 12               | 4       | 390                  | 644              |
| 49 |         |             |                  |         |                      |                  |
| 50 | Layer 3 | 9           | 21               | 6       | 352                  | 996              |

**Project Number:** 8133,GI

**Project Name:** University Academy, Long Sutton

**Date:** 08/03/2024

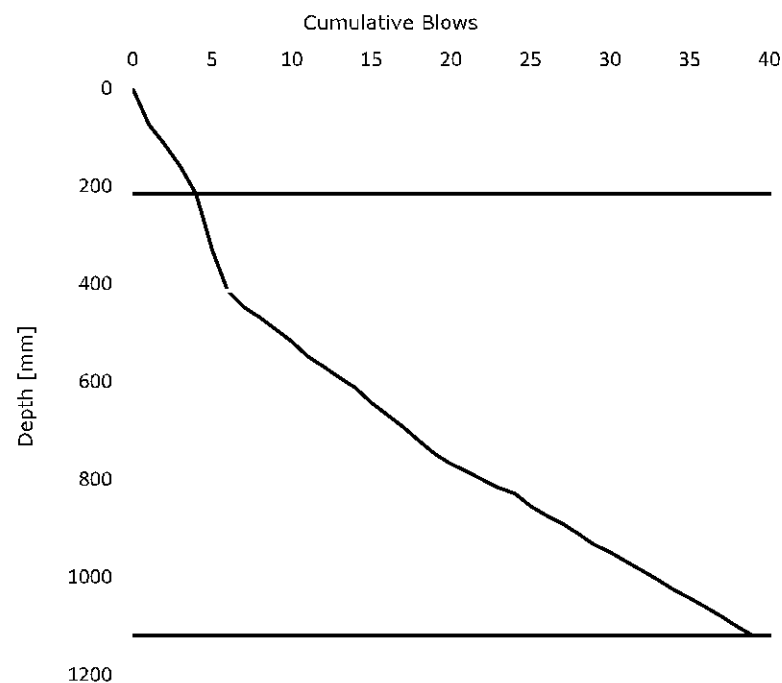
## Factual Results

|    |      |
|----|------|
| 0  | 0    |
| 1  | 75   |
| 2  | 115  |
| 3  | 162  |
| 4  | 217  |
| 5  | 332  |
| 6  | 415  |
| 7  | 448  |
| 8  | 469  |
| 9  | 493  |
| 10 | 519  |
| 11 | 548  |
| 12 | 570  |
| 13 | 591  |
| 14 | 614  |
| 15 | 643  |
| 16 | 668  |
| 17 | 694  |
| 18 | 722  |
| 19 | 749  |
| 20 | 768  |
| 21 | 785  |
| 22 | 801  |
| 23 | 818  |
| 24 | 829  |
| 25 | 854  |
| 26 | 875  |
| 27 | 891  |
| 28 | 912  |
| 29 | 933  |
| 30 | 949  |
| 31 | 969  |
| 32 | 987  |
| 33 | 1007 |
| 34 | 1026 |
| 35 | 1043 |
| 36 | 1061 |
| 37 | 1081 |
| 38 | 1102 |
| 39 | 1120 |

## Project Details

|                       |                             |
|-----------------------|-----------------------------|
| <b>Location No:</b>   | TRL07                       |
| <b>Testing Date:</b>  | 13/02/2024                  |
| <b>Undertaken By:</b> | RS                          |
| <b>Approved By:</b>   | SG                          |
| <b>Comments:</b>      | Commenced from ground level |

## Interpretative Results



|    | Layer   | No of Blows | Cumulative Blows | CBR [%] | Layer Thickness [mm] | Total Depth [mm] |
|----|---------|-------------|------------------|---------|----------------------|------------------|
| 46 | Layer 1 | 4           | 4                | 4       | 217                  | 217              |
| 49 | Layer 2 | 2           | 6                | 2       | 198                  | 415              |
| 50 | Layer 3 | 33          | 39               | 12      | 705                  | 1120             |



**Project Number:** 8133,GI

**Project Name:** University Academy, Long Sutton, Spalding PE12 9LF

**Date:** 08/03/2024

**Exploratory Hole Location**      **WS02**

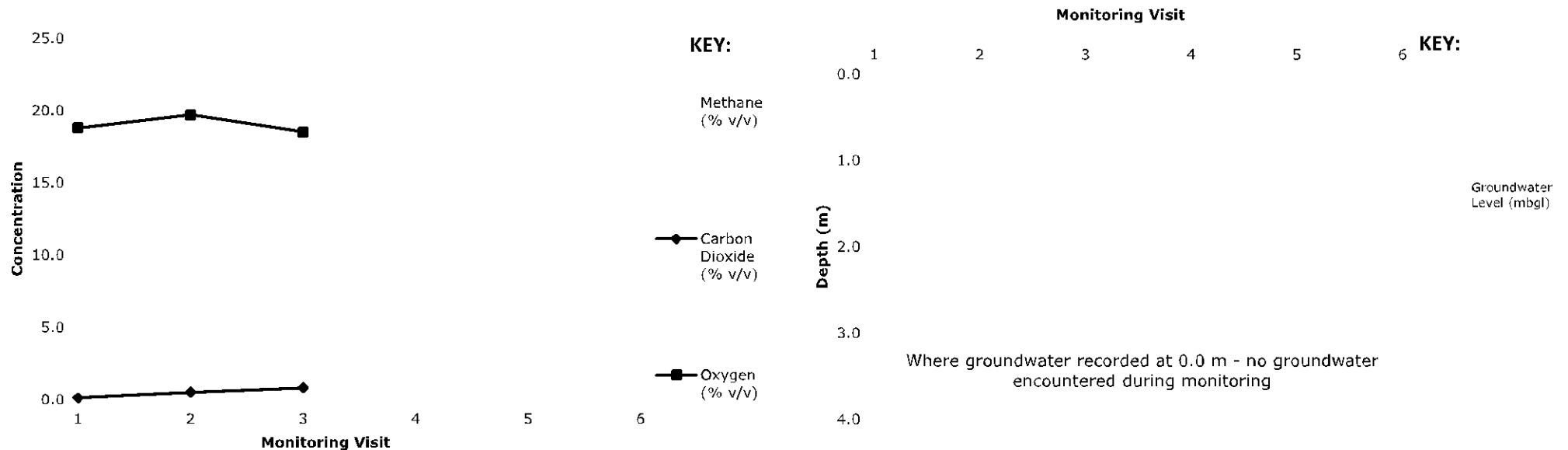
**Date of Installation**      12/02/2024

| Return Visit # | Monitoring Date | Atmospheric Pressure (mb) | Methane Content |         | Carbon Dioxide | Oxygen  | Flow Rate (l/hr) | H2S (ppm) | CO (ppm) | VOC (ppm) | Water Level (mbgl) | Base of Well (mbgl) | Weather Conditions          | Comments / Pressure Rise or Fall |
|----------------|-----------------|---------------------------|-----------------|---------|----------------|---------|------------------|-----------|----------|-----------|--------------------|---------------------|-----------------------------|----------------------------------|
|                |                 |                           | (% v/v)         | (% LEL) | (% v/v)        | (% v/v) |                  |           |          |           |                    |                     |                             |                                  |
| 1st visit      | 14/02/2024      | 1011                      | <0.1            | <2      | 0.1            | 18.8    | 0.0              | 0         | 0        | 0         | 0.28               | 2.88                | Cool, Overcast, Wet, Breezy |                                  |
| 2nd visit      | 19/02/2024      | 1023                      | <0.1            | <2      | 0.5            | 19.7    | 0.0              | 0         | 0        | 0         | 0.24               | 2.83                | Cool, Sunny, Damp, Breezy   |                                  |
| 3rd visit      | 26/02/2024      | 1108                      | <0.1            | <2      | 0.8            | 18.5    | 0                | 0         | 0        | 0         | 0.40               | 2.91                | Cool, Coudy, Dry, Windy     |                                  |

**Instruments Used:** Equipment used: [Choose from drop-down box]

**REMARKS:**

**NOTE:** n/a      Not applicable  
nm      Not measured



**Project Number:** 8133,GI

**Project Name:** University Academy, Long Sutton, Spalding PE12 9LF

**Date:** 08/03/2024

**Exploratory Hole Location** WS05

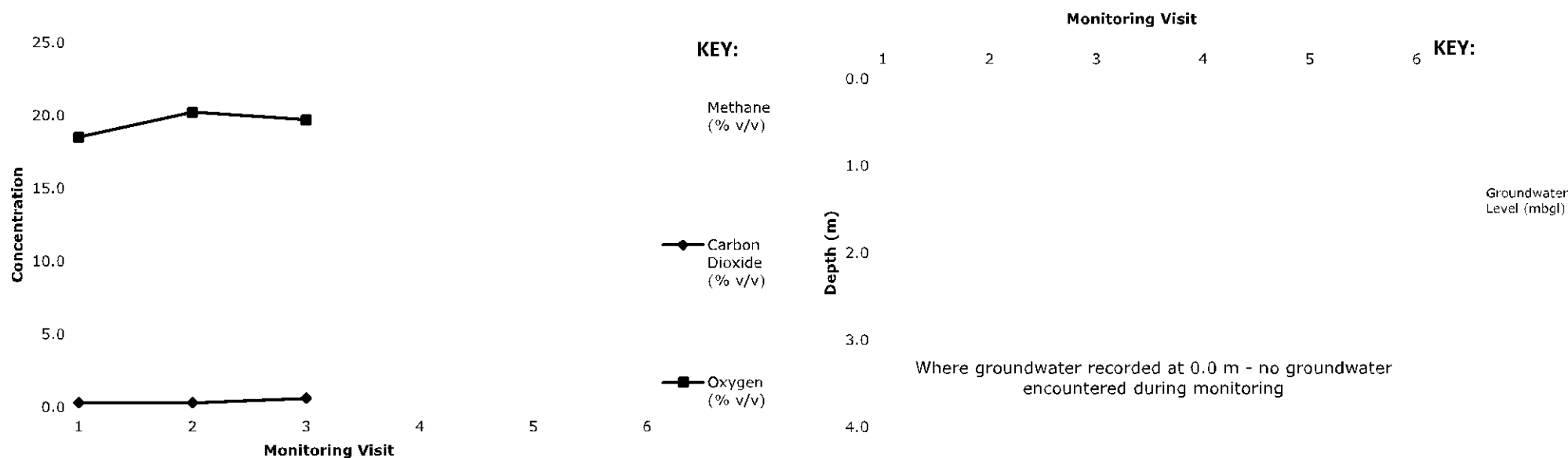
**Date of Installation** 12/02/2024

| Return Visit # | Monitoring Date | Atmospheric Pressure (mb) | Methane Content |         | Carbon Dioxide | Oxygen  | Flow Rate (l/hr) | H2S (ppm) | CO (ppm) | VOC (ppm) | Water Level (mbgl) | Base of Well (mbgl) | Weather Conditions          | Comments / Pressure Rise or Fall |
|----------------|-----------------|---------------------------|-----------------|---------|----------------|---------|------------------|-----------|----------|-----------|--------------------|---------------------|-----------------------------|----------------------------------|
|                |                 |                           | (% v/v)         | (% LEL) | (% v/v)        | (% v/v) |                  |           |          |           |                    |                     |                             |                                  |
| 1st visit      | 14/02/2024      | 1010                      | <0.1            | <2      | 0.3            | 18.5    | 0.0              | 0         | 0        | 7         | 0.63               | 2.02                | Cool, Overcast, Wet, Breezy |                                  |
| 2nd visit      | 19/02/2024      | 1024                      | <0.1            | <2      | 0.3            | 20.2    | 0.0              | 0         | 0        | 4         | 0.65               | 1.96                | Cool, Sunny, Damp, Breezy   |                                  |
| 3rd visit      | 26/02/2024      | 1108                      | <0.1            | <2      | 0.6            | 19.7    | 0.0              | 0         | 0        | 0         | 0.85               | 1.95                |                             |                                  |

**Instruments Used:** Equipment used: [Choose from drop-down box]

**REMARKS:**

**NOTE:** n/a Not applicable  
nm Not measured







Rob Slater  
Geosphere Environmental Ltd  
Brightwell Barns  
Ipswich Road  
Brightwell  
Suffolk  
IP10 0BJ



**Derwentside Environmental Testing Services Ltd**  
Unit 1  
Rose Lane Industrial Estate  
Rose Lane  
Lenham Heath  
Kent  
ME17 2JN  
t: 01622 850410

## **DETS Report No: 24-01534**

**Site Reference:** Long Sutton, Spalding

**Project / Job Ref:** 8133, GI

**Order No:** None Supplied

**Sample Receipt Date:** 14/02/2024

**Sample Scheduled Date:** 15/02/2024

**Report Issue Number:** 1

**Reporting Date:** 22/02/2024

**Authorised by:**

Steve Knight  
Customer Support Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

For Topsoil and WAC analysis the expanded uncertainty measurement should be considered while evaluating results against compliance values.

**DETS Ltd**  
**Unit 1, Rose Lane Industrial Estate**  
**Rose Lane**  
**Lenham Heath**  
**Maidstone**  
**Kent ME17 2JN**  
**Tel : 01622 850410**



| <b>Soil Analysis Certificate</b>             |                        |               |               |               |               |               |
|----------------------------------------------|------------------------|---------------|---------------|---------------|---------------|---------------|
| <b>DETS Report No: 24-01534</b>              | <b>Date Sampled</b>    | 12/02/24      | 12/02/24      | 12/02/24      | 12/02/24      | 12/02/24      |
| <b>Geosphere Environmental Ltd</b>           | <b>Time Sampled</b>    | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| <b>Site Reference: Long Sutton, Spalding</b> | <b>TP / BH No</b>      | WS01          | WS02          | WS02          | WS03          | WS04          |
| <b>Project / Job Ref: 8133, GI</b>           | <b>Additional Refs</b> | E1            | E1            | E2            | E2            | E1            |
| <b>Order No: None Supplied</b>               | <b>Depth (m)</b>       | 0.50          | 0.20          | 0.40          | 0.70          | 0.50          |
| <b>Reporting Date: 22/02/2024</b>            | <b>DETS Sample No</b>  | 699197        | 699198        | 699199        | 699200        | 699201        |

| <b>Determinand</b>                    | <b>Unit</b> | <b>RL</b> | <b>Accreditation</b> | <b>(n)</b>   |              | <b>(n)</b>   |              |
|---------------------------------------|-------------|-----------|----------------------|--------------|--------------|--------------|--------------|
| Asbestos Screen <sup>(S)</sup>        | N/a         | N/a       | <b>ISO17025</b>      | Not Detected | Not Detected | Not Detected | Not Detected |
| pH                                    | pH Units    | N/a       | <b>MCERTS</b>        | 8.3          | 8.0          | 8.1          | 8.6          |
| Total Cyanide                         | mg/kg       | < 1       | <b>NONE</b>          | < 1          | < 1          |              | < 1          |
| Complex Cyanide                       | mg/kg       | < 1       | <b>NONE</b>          | < 1          | < 1          |              | < 1          |
| Free Cyanide                          | mg/kg       | < 1       | <b>NONE</b>          | < 1          | < 1          |              | < 1          |
| W/S Sulphate as SO <sub>4</sub> (2:1) | mg/l        | < 10      | <b>MCERTS</b>        | 44           | 17           | 18           | 42           |
| W/S Sulphate as SO <sub>4</sub> (2:1) | g/l         | < 0.01    | <b>MCERTS</b>        | 0.04         | 0.02         | 0.02         | 0.04         |
| Organic Matter (SOM)                  | %           | < 0.1     | <b>MCERTS</b>        | 0.6          | 3.2          | 1.8          | 3.6          |
| Arsenic (As)                          | mg/kg       | < 2       | <b>MCERTS</b>        | 10           | 12           | 13           | 8            |
| Barium (Ba)                           | mg/kg       | < 2.5     | <b>MCERTS</b>        | 148          | 91           | 85           | 137          |
| Beryllium (Be)                        | mg/kg       | < 0.5     | <b>MCERTS</b>        | < 0.5        | 0.5          | 0.6          | 1.4          |
| W/S Boron                             | mg/kg       | < 1       | <b>NONE</b>          | < 1          | < 1          | < 1          | < 1          |
| Cadmium (Cd)                          | mg/kg       | < 0.2     | <b>MCERTS</b>        | < 0.2        | 0.2          | < 0.2        | 0.4          |
| Chromium (Cr)                         | mg/kg       | < 2       | <b>MCERTS</b>        | 17           | 22           | 26           | 27           |
| Chromium (hexavalent)                 | mg/kg       | < 2       | <b>NONE</b>          | < 2          | < 2          | < 2          | < 2          |
| Copper (Cu)                           | mg/kg       | < 4       | <b>MCERTS</b>        | 10           | 21           | 26           | 13           |
| Lead (Pb)                             | mg/kg       | < 3       | <b>MCERTS</b>        | 11           | 24           | 20           | 15           |
| Mercury (Hg)                          | mg/kg       | < 1       | <b>MCERTS</b>        | < 1          | < 1          | < 1          | < 1          |
| Molybdenum (Mo)                       | mg/kg       | < 1       | <b>MCERTS</b>        | < 1          | < 1          |              | 1.1          |
| Nickel (Ni)                           | mg/kg       | < 3       | <b>MCERTS</b>        | 15           | 16           | 17           | 22           |
| Selenium (Se)                         | mg/kg       | < 2       | <b>MCERTS</b>        | < 2          | < 2          | < 2          | < 2          |
| Vanadium (V)                          | mg/kg       | < 1       | <b>MCERTS</b>        | 29           | 31           | 32           | 29           |
| Zinc (Zn)                             | mg/kg       | < 3       | <b>MCERTS</b>        | 44           | 195          | 86           | 53           |
| Total Phenols (monohydric)            | mg/kg       | < 2       | <b>NONE</b>          |              |              |              |              |
| TPH (EPH EC10-EC40) : EH_1D_Total     | mg/kg       | < 6       | <b>MCERTS</b>        |              |              |              |              |
| Tentative Petroleum Type : EH_1D      | N/a         | N/a       | <b>NONE</b>          |              |              |              |              |
| Coal Tar Presence / Absence           | N/a         | N/a       | <b>NONE</b>          |              |              |              |              |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion  
Subcontracted analysis (S)

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**Lenham Heath**  
**Maidstone**  
**Kent ME17 2JN**  
**Tel : 01622 850410**



| Soil Analysis Certificate                    |                        |               |               |               |               |               |
|----------------------------------------------|------------------------|---------------|---------------|---------------|---------------|---------------|
| <b>DETS Report No: 24-01534</b>              | <b>Date Sampled</b>    | 12/02/24      | 12/02/24      | 12/02/24      | 12/02/24      | 12/02/24      |
| <b>Geosphere Environmental Ltd</b>           | <b>Time Sampled</b>    | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| <b>Site Reference: Long Sutton, Spalding</b> | <b>TP / BH No</b>      | WS05          | WS03          | WS04          | WS05          | SK03          |
| <b>Project / Job Ref: 8133, GI</b>           | <b>Additional Refs</b> | E1            | CT01          | CT01          | CT01          | E1            |
| <b>Order No: None Supplied</b>               | <b>Depth (m)</b>       | 0.30          | 0.00 - 0.10   | 0.00 - 0.10   | 0.00 - 0.10   | 0.50          |
| <b>Reporting Date: 22/02/2024</b>            | <b>DETS Sample No</b>  | 699202        | 699203        | 699204        | 699205        | 699206        |

| Determinand                           | Unit     | RL     | Accreditation | (n)          | (n)                | (n)                         | (n)                |
|---------------------------------------|----------|--------|---------------|--------------|--------------------|-----------------------------|--------------------|
| Asbestos Screen <sup>(S)</sup>        | N/a      | N/a    | ISO17025      | Not Detected |                    |                             | Not Detected       |
| pH                                    | pH Units | N/a    | MCERTS        | 8.5          |                    |                             | 7.3                |
| Total Cyanide                         | mg/kg    | < 1    | NONE          | < 1          |                    |                             |                    |
| Complex Cyanide                       | mg/kg    | < 1    | NONE          | < 1          |                    |                             |                    |
| Free Cyanide                          | mg/kg    | < 1    | NONE          | < 1          |                    |                             |                    |
| W/S Sulphate as SO <sub>4</sub> (2:1) | mg/l     | < 10   | MCERTS        | 12           |                    |                             | < 10               |
| W/S Sulphate as SO <sub>4</sub> (2:1) | g/l      | < 0.01 | MCERTS        | 0.01         |                    |                             | < 0.01             |
| Organic Matter (SOM)                  | %        | < 0.1  | MCERTS        | 1.3          |                    |                             | 2.3                |
| Arsenic (As)                          | mg/kg    | < 2    | MCERTS        | 6            |                    |                             | 14                 |
| Barium (Ba)                           | mg/kg    | < 2.5  | MCERTS        | 57           |                    |                             | 90                 |
| Beryllium (Be)                        | mg/kg    | < 0.5  | MCERTS        | < 0.5        |                    |                             | 0.6                |
| W/S Boron                             | mg/kg    | < 1    | NONE          | < 1          |                    |                             | < 1                |
| Cadmium (Cd)                          | mg/kg    | < 0.2  | MCERTS        | < 0.2        |                    |                             | < 0.2              |
| Chromium (Cr)                         | mg/kg    | < 2    | MCERTS        | 15           |                    |                             | 21                 |
| Chromium (hexavalent)                 | mg/kg    | < 2    | NONE          | < 2          |                    |                             | < 2                |
| Copper (Cu)                           | mg/kg    | < 4    | MCERTS        | 99           |                    |                             | 16                 |
| Lead (Pb)                             | mg/kg    | < 3    | MCERTS        | 8            |                    |                             | 31                 |
| Mercury (Hg)                          | mg/kg    | < 1    | MCERTS        | < 1          |                    |                             | < 1                |
| Molybdenum (Mo)                       | mg/kg    | < 1    | MCERTS        | < 1          |                    |                             |                    |
| Nickel (Ni)                           | mg/kg    | < 3    | MCERTS        | 11           |                    |                             | 17                 |
| Selenium (Se)                         | mg/kg    | < 2    | MCERTS        | < 2          |                    |                             | < 2                |
| Vanadium (V)                          | mg/kg    | < 1    | MCERTS        | 86           |                    |                             | 37                 |
| Zinc (Zn)                             | mg/kg    | < 3    | MCERTS        | 84           |                    |                             | 55                 |
| Total Phenols (monohydric)            | mg/kg    | < 2    | NONE          |              | < 2                | < 2                         | < 2                |
| TPH (EPH EC10-EC40) : EH_1D_Total     | mg/kg    | < 6    | MCERTS        |              | 435                | 1180                        | 1070               |
| Tentative Petroleum Type : EH_1D      | N/a      | N/a    | NONE          |              | Typical of bitumen | Typical of bitumen and PAHs | Typical of bitumen |
| Coal Tar Presence / Absence           | N/a      | N/a    | NONE          |              | Absent             | Absent                      | Absent             |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion  
Subcontracted analysis (S)

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| Soil Analysis Certificate - Speciated PAHs   |                        |               |               |               |               |               |
|----------------------------------------------|------------------------|---------------|---------------|---------------|---------------|---------------|
| <b>DETS Report No: 24-01534</b>              | <b>Date Sampled</b>    | 12/02/24      | 12/02/24      | 12/02/24      | 12/02/24      | 12/02/24      |
| <b>Geosphere Environmental Ltd</b>           | <b>Time Sampled</b>    | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| <b>Site Reference: Long Sutton, Spalding</b> | <b>TP / BH No</b>      | WS01          | WS02          | WS02          | WS03          | WS04          |
| <b>Project / Job Ref: 8133, GI</b>           | <b>Additional Refs</b> | E1            | E1            | E2            | E2            | E1            |
| <b>Order No: None Supplied</b>               | <b>Depth (m)</b>       | 0.50          | 0.20          | 0.40          | 0.70          | 0.50          |
| <b>Reporting Date: 22/02/2024</b>            | <b>DETS Sample No</b>  | 699197        | 699198        | 699199        | 699200        | 699201        |

| Determinand            | Unit  | RL    | Accreditation | (n)   |       | (n)   |       |
|------------------------|-------|-------|---------------|-------|-------|-------|-------|
| Naphthalene            | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 | 0.54  | < 0.1 |
| Acenaphthylene         | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthene           | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 | 0.21  | < 0.1 |
| Fluorene               | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 | 0.14  | 11.50 |
| Phenanthrene           | mg/kg | < 0.1 | MCERTS        | < 0.1 | 0.16  | 0.26  | 165   |
| Anthracene             | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 | < 0.1 | 41.70 |
| Fluoranthene           | mg/kg | < 0.1 | MCERTS        | < 0.1 | 0.35  | 0.21  | 179   |
| Pyrene                 | mg/kg | < 0.1 | MCERTS        | < 0.1 | 0.30  | 0.17  | 154   |
| Benzo(a)anthracene     | mg/kg | < 0.1 | MCERTS        | < 0.1 | 0.17  | < 0.1 | 55.30 |
| Chrysene               | mg/kg | < 0.1 | MCERTS        | < 0.1 | 0.21  | < 0.1 | 60.40 |
| Benzo(b)fluoranthene   | mg/kg | < 0.1 | MCERTS        | < 0.1 | 0.25  | < 0.1 | 54    |
| Benzo(k)fluoranthene   | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 | < 0.1 | 20.70 |
| Benzo(a)pyrene         | mg/kg | < 0.1 | MCERTS        | < 0.1 | 0.17  | < 0.1 | 47    |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS        | < 0.1 | 0.12  | < 0.1 | 24.50 |
| Dibenz(a,h)anthracene  | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 | < 0.1 | 6.06  |
| Benzo(ghi)perylene     | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 | < 0.1 | 19    |
| Total EPA-16 PAHs      | mg/kg | < 1.6 | MCERTS        | < 1.6 | 1.7   | < 1.6 | 857   |

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| Soil Analysis Certificate - Speciated PAHs |                 |               |               |  |  |  |
|--------------------------------------------|-----------------|---------------|---------------|--|--|--|
| DETS Report No: 24-01534                   | Date Sampled    | 12/02/24      | 12/02/24      |  |  |  |
| Geosphere Environmental Ltd                | Time Sampled    | None Supplied | None Supplied |  |  |  |
| Site Reference: Long Sutton, Spalding      | TP / BH No      | WS05          | SK03          |  |  |  |
| Project / Job Ref: 8133, GI                | Additional Refs | E1            | E1            |  |  |  |
| Order No: None Supplied                    | Depth (m)       | 0.30          | 0.50          |  |  |  |
| Reporting Date: 22/02/2024                 | DETS Sample No  | 699202        | 699206        |  |  |  |

| Determinand            | Unit  | RL    | Accreditation | (n)   |       |  |
|------------------------|-------|-------|---------------|-------|-------|--|
| Naphthalene            | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 |  |
| Acenaphthylene         | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 |  |
| Acenaphthene           | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 |  |
| Fluorene               | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 |  |
| Phenanthrene           | mg/kg | < 0.1 | MCERTS        | 1.23  | < 0.1 |  |
| Anthracene             | mg/kg | < 0.1 | MCERTS        | 0.36  | < 0.1 |  |
| Fluoranthene           | mg/kg | < 0.1 | MCERTS        | 1.82  | 0.17  |  |
| Pyrene                 | mg/kg | < 0.1 | MCERTS        | 1.98  | 0.16  |  |
| Benzo(a)anthracene     | mg/kg | < 0.1 | MCERTS        | 1.01  | < 0.1 |  |
| Chrysene               | mg/kg | < 0.1 | MCERTS        | 1.08  | < 0.1 |  |
| Benzo(b)fluoranthene   | mg/kg | < 0.1 | MCERTS        | 1.19  | < 0.1 |  |
| Benzo(k)fluoranthene   | mg/kg | < 0.1 | MCERTS        | 0.31  | < 0.1 |  |
| Benzo(a)pyrene         | mg/kg | < 0.1 | MCERTS        | 1.19  | < 0.1 |  |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 |  |
| Dibenz(a,h)anthracene  | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 |  |
| Benzo(ghi)perylene     | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 |  |
| Total EPA-16 PAHs      | mg/kg | < 1.6 | MCERTS        | 10.2  | < 1.6 |  |

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| Soil Analysis Certificate - Speciated PAHs   |                        |               |               |               |  |  |
|----------------------------------------------|------------------------|---------------|---------------|---------------|--|--|
| <b>DETS Report No: 24-01534</b>              | <b>Date Sampled</b>    | 12/02/24      | 12/02/24      | 12/02/24      |  |  |
| <b>Geosphere Environmental Ltd</b>           | <b>Time Sampled</b>    | None Supplied | None Supplied | None Supplied |  |  |
| <b>Site Reference: Long Sutton, Spalding</b> | <b>TP / BH No</b>      | WS03          | WS04          | WS05          |  |  |
| <b>Project / Job Ref: 8133, GI</b>           | <b>Additional Refs</b> | CT01          | CT01          | CT01          |  |  |
| <b>Order No: None Supplied</b>               | <b>Depth (m)</b>       | 0.00 - 0.10   | 0.00 - 0.10   | 0.00 - 0.10   |  |  |
| <b>Reporting Date: 22/02/2024</b>            | <b>DETS Sample No</b>  | 699203        | 699204        | 699205        |  |  |

| Determinand            | Unit  | RL    | Accreditation | (n)   | (n)   | (n)   |  |  |
|------------------------|-------|-------|---------------|-------|-------|-------|--|--|
| Naphthalene            | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 | < 0.1 |  |  |
| Acenaphthylene         | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 | < 0.1 |  |  |
| Acenaphthene           | mg/kg | < 0.1 | MCERTS        | < 0.1 | 1.13  | < 0.1 |  |  |
| Fluorene               | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 | < 0.1 |  |  |
| Phenanthrene           | mg/kg | < 0.1 | MCERTS        | < 0.1 | 5.49  | < 0.1 |  |  |
| Anthracene             | mg/kg | < 0.1 | MCERTS        | < 0.1 | 1.12  | < 0.1 |  |  |
| Fluoranthene           | mg/kg | < 0.1 | MCERTS        | < 0.1 | 11.60 | < 0.1 |  |  |
| Pyrene                 | mg/kg | < 0.1 | MCERTS        | < 0.1 | 11.70 | < 0.1 |  |  |
| Benzo(a)anthracene     | mg/kg | < 0.1 | MCERTS        | < 0.1 | 5.66  | < 0.1 |  |  |
| Chrysene               | mg/kg | < 0.1 | MCERTS        | < 0.1 | 6.21  | < 0.1 |  |  |
| Benzo(b)fluoranthene   | mg/kg | < 0.1 | MCERTS        | < 0.1 | 9.76  | < 0.1 |  |  |
| Benzo(k)fluoranthene   | mg/kg | < 0.1 | MCERTS        | < 0.1 | 2.95  | < 0.1 |  |  |
| Benzo(a)pyrene         | mg/kg | < 0.1 | MCERTS        | < 0.1 | 8.56  | < 0.1 |  |  |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS        | < 0.1 | 5.48  | < 0.1 |  |  |
| Dibenz(a,h)anthracene  | mg/kg | < 0.1 | MCERTS        | < 0.1 | < 0.1 | < 0.1 |  |  |
| Benzo(ghi)perylene     | mg/kg | < 0.1 | MCERTS        | < 0.1 | 5.88  | < 0.1 |  |  |
| Coronene               | mg/kg | < 0.1 | NONE          | < 0.1 | < 0.1 | < 0.1 |  |  |
| Total Oily Waste PAHs  | mg/kg | < 1   | MCERTS        | < 1   | 38.6  | < 1   |  |  |
| Total Dutch 10 PAHs    | mg/kg | < 1   | MCERTS        | < 1   | 52.9  | < 1   |  |  |
| Total EPA-16 PAHs      | mg/kg | < 1.6 | MCERTS        | < 1.6 | 75.5  | < 1.6 |  |  |
| Total WAC-17 PAHs      | mg/kg | < 1.7 | NONE          | < 1.7 | 75.5  | < 1.7 |  |  |

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**Soil Analysis Certificate - TPH CWG Banded**

|                                              |                        |               |               |               |               |               |
|----------------------------------------------|------------------------|---------------|---------------|---------------|---------------|---------------|
| <b>DETS Report No: 24-01534</b>              | <b>Date Sampled</b>    | 12/02/24      | 12/02/24      | 12/02/24      | 12/02/24      | 12/02/24      |
| <b>Geosphere Environmental Ltd</b>           | <b>Time Sampled</b>    | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| <b>Site Reference: Long Sutton, Spalding</b> | <b>TP / BH No</b>      | WS01          | WS02          | WS04          | WS05          | WS03          |
| <b>Project / Job Ref: 8133, GI</b>           | <b>Additional Refs</b> | E1            | E1            | E1            | E1            | CT01          |
| <b>Order No: None Supplied</b>               | <b>Depth (m)</b>       | 0.50          | 0.20          | 0.50          | 0.30          | 0.00 - 0.10   |
| <b>Reporting Date: 22/02/2024</b>            | <b>DETS Sample No</b>  | 699197        | 699198        | 699201        | 699202        | 699203        |

| Determinand                                      | Unit  | RL     | Accreditation | (n)    | (n)    | (n)    | (n)    |
|--------------------------------------------------|-------|--------|---------------|--------|--------|--------|--------|
| Aliphatic >C5 - C6 :<br>HS 1D MS AL              | mg/kg | < 0.01 | NONE          | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aliphatic >C6 - C8 :<br>HS 1D MS AL              | mg/kg | < 0.05 | NONE          | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aliphatic >C8 - C10 :<br>EH CU 1D AL             | mg/kg | < 2    | MCERTS        | < 2    | < 2    | < 2    | < 2    |
| Aliphatic >C10 - C12 :<br>EH CU 1D AL            | mg/kg | < 2    | MCERTS        | < 2    | < 2    | < 2    | < 2    |
| Aliphatic >C12 - C16 :<br>EH CU 1D AL            | mg/kg | < 3    | MCERTS        | < 3    | < 3    | 31     | 11     |
| Aliphatic >C16 - C21 :<br>EH CU 1D AL            | mg/kg | < 3    | MCERTS        | < 3    | < 3    | 118    | 14     |
| Aliphatic >C21 - C34 :<br>EH CU 1D AL            | mg/kg | < 10   | MCERTS        | < 10   | < 10   | 73     | < 10   |
| Aliphatic (C5 - C34) :<br>HS_1D_MS+EH_CU_1D_AL   | mg/kg | < 21   | NONE          | < 21   | < 21   | 222    | 26     |
| Aromatic >C5 - C7 :<br>HS 1D MS AR               | mg/kg | < 0.01 | NONE          | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Aromatic >C7 - C8 :<br>HS 1D MS AR               | mg/kg | < 0.05 | NONE          | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aromatic >C8 - C10 :<br>EH CU 1D AR              | mg/kg | < 2    | MCERTS        | < 2    | < 2    | < 2    | < 2    |
| Aromatic >C10 - C12 :<br>EH CU 1D AR             | mg/kg | < 2    | MCERTS        | < 2    | < 2    | < 2    | < 2    |
| Aromatic >C12 - C16 :<br>EH CU 1D AR             | mg/kg | < 2    | MCERTS        | < 2    | < 2    | 93     | < 2    |
| Aromatic >C16 - C21 :<br>EH CU 1D AR             | mg/kg | < 3    | MCERTS        | < 3    | < 3    | 752    | < 3    |
| Aromatic >C21 - C35 :<br>EH CU 1D AR             | mg/kg | < 10   | MCERTS        | < 10   | < 10   | 493    | < 10   |
| Aromatic (C5 - C35) :<br>HS_1D_MS+EH_CU_1D_AR    | mg/kg | < 21   | NONE          | < 21   | < 21   | 1338   | < 21   |
| Total >C5 - C35 :<br>HS_1D_MS+EH_CU_1D_Tot<br>al | mg/kg | < 42   | NONE          | < 42   | < 42   | 1560   | < 42   |

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**Soil Analysis Certificate - TPH CWG Banded**

|                                              |                        |               |               |  |  |  |
|----------------------------------------------|------------------------|---------------|---------------|--|--|--|
| <b>DETS Report No: 24-01534</b>              | <b>Date Sampled</b>    | 12/02/24      | 12/02/24      |  |  |  |
| <b>Geosphere Environmental Ltd</b>           | <b>Time Sampled</b>    | None Supplied | None Supplied |  |  |  |
| <b>Site Reference: Long Sutton, Spalding</b> | <b>TP / BH No</b>      | WS04          | WS05          |  |  |  |
| <b>Project / Job Ref: 8133, GI</b>           | <b>Additional Refs</b> | CT01          | CT01          |  |  |  |
| <b>Order No: None Supplied</b>               | <b>Depth (m)</b>       | 0.00 - 0.10   | 0.00 - 0.10   |  |  |  |
| <b>Reporting Date: 22/02/2024</b>            | <b>DETS Sample No</b>  | 699204        | 699205        |  |  |  |

| <b>Determinand</b>                               | <b>Unit</b> | <b>RL</b> | <b>Accreditation</b> | <b>(n)</b> | <b>(n)</b> |  |  |
|--------------------------------------------------|-------------|-----------|----------------------|------------|------------|--|--|
| Aliphatic >C5 - C6 :<br>HS 1D MS AL              | mg/kg       | < 0.01    | NONE                 |            |            |  |  |
| Aliphatic >C6 - C8 :<br>HS 1D MS AL              | mg/kg       | < 0.05    | NONE                 |            |            |  |  |
| Aliphatic >C8 - C10 :<br>EH CU 1D AL             | mg/kg       | < 2       | MCERTS               |            |            |  |  |
| Aliphatic >C10 - C12 :<br>EH CU 1D AL            | mg/kg       | < 2       | MCERTS               |            |            |  |  |
| Aliphatic >C12 - C16 :<br>EH CU 1D AL            | mg/kg       | < 3       | MCERTS               |            |            |  |  |
| Aliphatic >C16 - C21 :<br>EH CU 1D AL            | mg/kg       | < 3       | MCERTS               |            |            |  |  |
| Aliphatic >C21 - C34 :<br>EH CU 1D AL            | mg/kg       | < 10      | MCERTS               |            |            |  |  |
| Aliphatic (C5 - C34) :<br>HS_1D_MS+EH_CU_1D_AL   | mg/kg       | < 21      | NONE                 |            |            |  |  |
| Aromatic >C5 - C7 :<br>HS 1D MS AR               | mg/kg       | < 0.01    | NONE                 |            |            |  |  |
| Aromatic >C7 - C8 :<br>HS 1D MS AR               | mg/kg       | < 0.05    | NONE                 |            |            |  |  |
| Aromatic >C8 - C10 :<br>EH CU 1D AR              | mg/kg       | < 2       | MCERTS               |            |            |  |  |
| Aromatic >C10 - C12 :<br>EH CU 1D AR             | mg/kg       | < 2       | MCERTS               |            |            |  |  |
| Aromatic >C12 - C16 :<br>EH CU 1D AR             | mg/kg       | < 2       | MCERTS               |            |            |  |  |
| Aromatic >C16 - C21 :<br>EH CU 1D AR             | mg/kg       | < 3       | MCERTS               |            |            |  |  |
| Aromatic >C21 - C35 :<br>EH CU 1D AR             | mg/kg       | < 10      | MCERTS               |            |            |  |  |
| Aromatic (C5 - C35) :<br>HS_1D_MS+EH_CU_1D_AR    | mg/kg       | < 21      | NONE                 |            |            |  |  |
| Total >C5 - C35 :<br>HS_1D_MS+EH_CU_1D_Tot<br>al | mg/kg       | < 42      | NONE                 |            |            |  |  |

**DETS Ltd**  
**Unit 1, Rose Lane Industrial Estate**  
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**Tel : 01622 850410**



| Soil Analysis Certificate - BTEX / MTBE      |                        |               |               |               |               |  |
|----------------------------------------------|------------------------|---------------|---------------|---------------|---------------|--|
| <b>DETS Report No: 24-01534</b>              | <b>Date Sampled</b>    | 12/02/24      | 12/02/24      | 12/02/24      | 12/02/24      |  |
| <b>Geosphere Environmental Ltd</b>           | <b>Time Sampled</b>    | None Supplied | None Supplied | None Supplied | None Supplied |  |
| <b>Site Reference: Long Sutton, Spalding</b> | <b>TP / BH No</b>      | WS01          | WS02          | WS04          | WS05          |  |
| <b>Project / Job Ref: 8133, GI</b>           | <b>Additional Refs</b> | E1            | E1            | E1            | E1            |  |
| <b>Order No: None Supplied</b>               | <b>Depth (m)</b>       | 0.50          | 0.20          | 0.50          | 0.30          |  |
| <b>Reporting Date: 22/02/2024</b>            | <b>DETS Sample No</b>  | 699197        | 699198        | 699201        | 699202        |  |

| Determinand             | Unit  | RL  | Accreditation | (n) | (n) | (n) |
|-------------------------|-------|-----|---------------|-----|-----|-----|
| Benzene : HS_1D_MS      | ug/kg | < 2 | MCERTS        | < 2 | < 2 | < 2 |
| Toluene : HS_1D_MS      | ug/kg | < 5 | MCERTS        | < 5 | < 5 | < 5 |
| Ethylbenzene : HS_1D_MS | ug/kg | < 2 | MCERTS        | < 2 | < 2 | < 2 |
| p & m-xylene : HS_1D_MS | ug/kg | < 2 | MCERTS        | < 2 | 2   | < 2 |
| o-xylene : HS_1D_MS     | ug/kg | < 2 | MCERTS        | < 2 | < 2 | < 2 |
| MTBE : HS_1D_MS         | ug/kg | < 5 | MCERTS        | < 5 | < 5 | < 5 |

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

**Waste Acceptance Criteria Analytical Certificate - BS EN 12457/2**

|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|----------------------------------------------|--------------|------------------------|------------------|--|------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------|
| <b>DETS Report No: 24-01534</b>              |              | <b>Date Sampled</b>    | 12/02/24         |  |                              | <b>Landfill Waste Acceptance Criteria Limits</b>                                            |                                                                      |                                 |
| <b>Geosphere Environmental Ltd</b>           |              | <b>Time Sampled</b>    | None Supplied    |  |                              |                                                                                             |                                                                      |                                 |
| <b>Site Reference: Long Sutton, Spalding</b> |              | <b>TP / BH No</b>      | WS04             |  |                              |                                                                                             |                                                                      |                                 |
| <b>Project / Job Ref: 8133, GI</b>           |              | <b>Additional Refs</b> | E1               |  |                              |                                                                                             |                                                                      |                                 |
| <b>Order No: None Supplied</b>               |              | <b>Depth (m)</b>       | 0.50             |  |                              |                                                                                             |                                                                      |                                 |
| <b>Reporting Date: 22/02/2024</b>            |              | <b>DETS Sample No</b>  | 699201           |  |                              |                                                                                             |                                                                      |                                 |
| <b>Determinand</b>                           | <b>Unit</b>  | <b>MDL</b>             |                  |  |                              | <b>Inert Waste Landfill</b>                                                                 | <b>Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill</b> | <b>Hazardous Waste Landfill</b> |
| TOC <sup>MU</sup>                            | %            | < 0.1                  | 2.1              |  |                              | 3%                                                                                          | 5%                                                                   | 6%                              |
| Loss on Ignition <sup>MU</sup>               | %            | < 0.01                 | 3.60             |  |                              | --                                                                                          | --                                                                   | 10%                             |
| BTEX <sup>MU</sup>                           | mg/kg        | < 0.05                 | < 0.05           |  |                              | 6                                                                                           | --                                                                   | --                              |
| Sum of PCBs                                  | mg/kg        | < 0.1                  | < 0.1            |  |                              | 1                                                                                           | --                                                                   | --                              |
| Mineral Oil <sup>MU</sup>                    | mg/kg        | < 10                   | 223              |  |                              | 500                                                                                         | --                                                                   | --                              |
| Total PAH <sup>MU</sup>                      | mg/kg        | < 1.7                  | 860              |  |                              | <b>100</b>                                                                                  | --                                                                   | --                              |
| pH <sup>MU</sup>                             | pH Units     | N/a                    | 8.6              |  |                              | --                                                                                          | >6                                                                   | --                              |
| Acid Neutralisation Capacity                 | mol/kg (+/-) | < 1                    | 1                |  |                              | --                                                                                          | To be evaluated                                                      | To be evaluated                 |
| <b>Eluate Analysis</b>                       |              |                        | <b>10:1 mg/l</b> |  | <b>Cumulative 10:1 mg/kg</b> | <b>Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)</b> |                                                                      |                                 |
| Arsenic <sup>U</sup>                         |              | 0.0018                 |                  |  | 0.018                        | 0.5                                                                                         | 2                                                                    | 25                              |
| Barium <sup>U</sup>                          |              | 0.0110                 |                  |  | 0.110                        | 20                                                                                          | 100                                                                  | 300                             |
| Cadmium <sup>U</sup>                         |              | < 0.0002               |                  |  | < 0.002                      | 0.04                                                                                        | 1                                                                    | 5                               |
| Chromium <sup>U</sup>                        |              | 0.0004                 |                  |  | 0.004                        | 0.5                                                                                         | 10                                                                   | 70                              |
| Copper <sup>U</sup>                          |              | 0.0027                 |                  |  | 0.027                        | 2                                                                                           | 50                                                                   | 100                             |
| Mercury <sup>U</sup>                         |              | 0.00023                |                  |  | 0.0023                       | 0.01                                                                                        | 0.2                                                                  | 2                               |
| Molybdenum <sup>U</sup>                      |              | 0.0016                 |                  |  | 0.016                        | 0.5                                                                                         | 10                                                                   | 30                              |
| Nickel <sup>U</sup>                          |              | 0.0003                 |                  |  | 0.003                        | 0.4                                                                                         | 10                                                                   | 40                              |
| Lead <sup>U</sup>                            |              | 0.0003                 |                  |  | 0.003                        | 0.5                                                                                         | 10                                                                   | 50                              |
| Antimony <sup>U</sup>                        |              | < 0.0002               |                  |  | < 0.002                      | 0.06                                                                                        | 0.7                                                                  | 5                               |
| Selenium <sup>U</sup>                        |              | 0.0003                 |                  |  | 0.003                        | 0.1                                                                                         | 0.5                                                                  | 7                               |
| Zinc <sup>U</sup>                            |              | 0.003                  |                  |  | 0.03                         | 4                                                                                           | 50                                                                   | 200                             |
| Chloride <sup>U</sup>                        |              | < 1.0                  |                  |  | < 10                         | 800                                                                                         | 15000                                                                | 25000                           |
| Fluoride <sup>U</sup>                        |              | < 0.5                  |                  |  | < 5                          | 10                                                                                          | 150                                                                  | 500                             |
| Sulphate <sup>U</sup>                        |              | 1.4                    |                  |  | 14                           | 1000                                                                                        | 20000                                                                | 50000                           |
| TDS                                          |              | 40                     |                  |  | 400                          | 4000                                                                                        | 60000                                                                | 100000                          |
| Phenol Index <sup>U</sup>                    |              | < 0.01                 |                  |  | < 0.1                        | 1                                                                                           | -                                                                    | -                               |
| DOC <sup>U</sup>                             |              | 6                      |                  |  | 60.5                         | 500                                                                                         | 800                                                                  | 1000                            |
| <b>Leach Test Information</b>                |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
| <b>Sample Mass (kg)</b>                      |              |                        | 0.10             |  |                              |                                                                                             |                                                                      |                                 |
| <b>Dry Matter (%)</b>                        |              |                        | 89.1             |  |                              |                                                                                             |                                                                      |                                 |
| <b>Moisture (%)</b>                          |              |                        | 12.2             |  |                              |                                                                                             |                                                                      |                                 |
| <b>Stage 1</b>                               |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
| <b>Volume Eluate L10 (litres)</b>            |              |                        | 0.89             |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion  
Stated limits are for guidance only and DETS Ltd cannot be held responsible for any discrepancies with current legislation  
M Denotes MCERTS accredited test  
U Denotes ISO17925 accredited test

**Waste Acceptance Criteria Analytical Certificate - BS EN 12457/2**

|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|----------------------------------------------|--------------|------------------------|------------------|--|------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------|
| <b>DETS Report No: 24-01534</b>              |              | <b>Date Sampled</b>    | 12/02/24         |  |                              | <b>Landfill Waste Acceptance Criteria Limits</b>                                            |                                                                      |                                 |
| <b>Geosphere Environmental Ltd</b>           |              | <b>Time Sampled</b>    | None Supplied    |  |                              |                                                                                             |                                                                      |                                 |
| <b>Site Reference: Long Sutton, Spalding</b> |              | <b>TP / BH No</b>      | WS05             |  |                              |                                                                                             |                                                                      |                                 |
| <b>Project / Job Ref: 8133, GI</b>           |              | <b>Additional Refs</b> | E1               |  |                              |                                                                                             |                                                                      |                                 |
| <b>Order No: None Supplied</b>               |              | <b>Depth (m)</b>       | 0.30             |  |                              |                                                                                             |                                                                      |                                 |
| <b>Reporting Date: 22/02/2024</b>            |              | <b>DETS Sample No</b>  | 699202           |  |                              |                                                                                             |                                                                      |                                 |
| <b>Determinand</b>                           | <b>Unit</b>  | <b>MDL</b>             |                  |  |                              | <b>Inert Waste Landfill</b>                                                                 | <b>Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill</b> | <b>Hazardous Waste Landfill</b> |
| TOC <sup>MU</sup>                            | %            | < 0.1                  | 0.8              |  |                              | 3%                                                                                          | 5%                                                                   | 6%                              |
| Loss on Ignition <sup>MU</sup>               | %            | < 0.01                 | 1.50             |  |                              | --                                                                                          | --                                                                   | 10%                             |
| BTEX <sup>MU</sup>                           | mg/kg        | < 0.05                 | < 0.05           |  |                              | 6                                                                                           | --                                                                   | --                              |
| Sum of PCBs                                  | mg/kg        | < 0.1                  | < 0.1            |  |                              | 1                                                                                           | --                                                                   | --                              |
| Mineral Oil <sup>MU</sup>                    | mg/kg        | < 10                   | 27               |  |                              | 500                                                                                         | --                                                                   | --                              |
| Total PAH <sup>MU</sup>                      | mg/kg        | < 1.7                  | 10.2             |  |                              | 100                                                                                         | --                                                                   | --                              |
| pH <sup>MU</sup>                             | pH Units     | N/a                    | 8.5              |  |                              | --                                                                                          | >6                                                                   | --                              |
| Acid Neutralisation Capacity                 | mol/kg (+/-) | < 1                    | < 1              |  |                              | --                                                                                          | To be evaluated                                                      | To be evaluated                 |
| <b>Eluate Analysis</b>                       |              |                        | <b>10:1 mg/l</b> |  | <b>Cumulative 10:1 mg/kg</b> | <b>Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)</b> |                                                                      |                                 |
| Arsenic <sup>U</sup>                         |              | 0.0015                 |                  |  | 0.015                        | 0.5                                                                                         | 2                                                                    | 25                              |
| Barium <sup>U</sup>                          |              | 0.0083                 |                  |  | 0.083                        | 20                                                                                          | 100                                                                  | 300                             |
| Cadmium <sup>U</sup>                         |              | < 0.0002               |                  |  | < 0.002                      | 0.04                                                                                        | 1                                                                    | 5                               |
| Chromium <sup>U</sup>                        |              | < 0.0002               |                  |  | < 0.002                      | 0.5                                                                                         | 10                                                                   | 70                              |
| Copper <sup>U</sup>                          |              | 0.0022                 |                  |  | 0.022                        | 2                                                                                           | 50                                                                   | 100                             |
| Mercury <sup>U</sup>                         |              | 0.00005                |                  |  | 0.0005                       | 0.01                                                                                        | 0.2                                                                  | 2                               |
| Molybdenum <sup>U</sup>                      |              | 0.0013                 |                  |  | 0.013                        | 0.5                                                                                         | 10                                                                   | 30                              |
| Nickel <sup>U</sup>                          |              | < 0.0002               |                  |  | < 0.002                      | 0.4                                                                                         | 10                                                                   | 40                              |
| Lead <sup>U</sup>                            |              | < 0.0002               |                  |  | < 0.002                      | 0.5                                                                                         | 10                                                                   | 50                              |
| Antimony <sup>U</sup>                        |              | < 0.0002               |                  |  | < 0.002                      | 0.06                                                                                        | 0.7                                                                  | 5                               |
| Selenium <sup>U</sup>                        |              | 0.0003                 |                  |  | 0.003                        | 0.1                                                                                         | 0.5                                                                  | 7                               |
| Zinc <sup>U</sup>                            |              | 0.004                  |                  |  | 0.04                         | 4                                                                                           | 50                                                                   | 200                             |
| Chloride <sup>U</sup>                        |              | < 1.0                  |                  |  | < 10                         | 800                                                                                         | 15000                                                                | 25000                           |
| Fluoride <sup>U</sup>                        |              | < 0.5                  |                  |  | < 5                          | 10                                                                                          | 150                                                                  | 500                             |
| Sulphate <sup>U</sup>                        |              | 1.3                    |                  |  | 13                           | 1000                                                                                        | 20000                                                                | 50000                           |
| TDS                                          |              | 22                     |                  |  | 220                          | 4000                                                                                        | 60000                                                                | 100000                          |
| Phenol Index <sup>U</sup>                    |              | < 0.01                 |                  |  | < 0.1                        | 1                                                                                           | -                                                                    | -                               |
| DOC <sup>U</sup>                             |              | 3.1                    |                  |  | 30.6                         | 500                                                                                         | 800                                                                  | 1000                            |
| <b>Leach Test Information</b>                |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
| Sample Mass (kg)                             |              | 0.09                   |                  |  |                              |                                                                                             |                                                                      |                                 |
| Dry Matter (%)                               |              | 96.9                   |                  |  |                              |                                                                                             |                                                                      |                                 |
| Moisture (%)                                 |              | 3.2                    |                  |  |                              |                                                                                             |                                                                      |                                 |
| <b>Stage 1</b>                               |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
| Volume Eluate L10 (litres)                   |              | 0.90                   |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |
|                                              |              |                        |                  |  |                              |                                                                                             |                                                                      |                                 |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion  
Stated limits are for guidance only and DETS Ltd cannot be held responsible for any discrepancies with current legislation  
M Denotes MCERTS accredited test  
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# Soil Analysis Certificate - Sample Descriptions

|                                       |  |
|---------------------------------------|--|
| DETS Report No: 24-01534              |  |
| Geosphere Environmental Ltd           |  |
| Site Reference: Long Sutton, Spalding |  |
| Project / Job Ref: 8133, GI           |  |
| Order No: None Supplied               |  |
| Reporting Date: 22/02/2024            |  |

| DETS Sample No | TP / BH No | Additional Refs | Depth (m)   | Moisture Content (%) | Sample Matrix Description      |
|----------------|------------|-----------------|-------------|----------------------|--------------------------------|
| 699197         | WS01       | E1              | 0.50        | 19.7                 | Light brown clayey sand        |
| 699198         | WS02       | E1              | 0.20        | 17.5                 | Brown clay with vegetation     |
| 699199         | WS02       | E2              | 0.40        | 18.6                 | Brown sandy clay               |
| 699200         | WS03       | E2              | 0.70        | 18.4                 | Brown sandy clay               |
| 699201         | WS04       | E1              | 0.50        | 10.9                 | Brown sandy gravel with stones |
| 699202         | WS05       | E1              | 0.30        | 3.1                  | Brown sandy gravel with stones |
| 699203         | WS03       | CT01            | 0.00 - 0.10 | 0.5                  | Black tar                      |
| 699204         | WS04       | CT01            | 0.00 - 0.10 | 1.5                  | Black tar                      |
| 699205         | WS05       | CT01            | 0.00 - 0.10 | 1.2                  | Black tar                      |
| 699206         | SK03       | E1              | 0.50        | 19.1                 | Light brown sandy clay         |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample <sup>IS</sup>

Unsuitable Sample <sup>US</sup>

| <b>Soil Analysis Certificate - Methodology &amp; Miscellaneous Information</b> |  |
|--------------------------------------------------------------------------------|--|
| <b>DETS Report No: 24-01534</b>                                                |  |
| <b>Geosphere Environmental Ltd</b>                                             |  |
| <b>Site Reference: Long Sutton, Spalding</b>                                   |  |
| <b>Project / Job Ref: 8133, GI</b>                                             |  |
| <b>Order No: None Supplied</b>                                                 |  |
| <b>Reporting Date: 22/02/2024</b>                                              |  |

| Matrix | Analysed On | Determinand                                                                                                                                     | Brief Method Description                                                                                                                             | Method No |
|--------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Soil   | D           | Boron - Water Soluble                                                                                                                           | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES                                                            | E012      |
| Soil   | AR          | BTEX                                                                                                                                            | Determination of BTEX by headspace GC-MS                                                                                                             | E001      |
| Soil   | D           | Cations                                                                                                                                         | Determination of cations in soil by aqua-regia digestion followed by ICP-OES                                                                         | E002      |
| Soil   | D           | Chloride - Water Soluble (2:1)                                                                                                                  | Determination of chloride by extraction with water & analysed by ion chromatography                                                                  | E009      |
| Soil   | AR          | Chromium - Hexavalent                                                                                                                           | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphénylcarbazide followed by colorimetry | E016      |
| Soil   | AR          | Cyanide - Complex                                                                                                                               | Determination of complex cyanide by distillation followed by colorimetry                                                                             | E015      |
| Soil   | AR          | Cyanide - Free                                                                                                                                  | Determination of free cyanide by distillation followed by colorimetry                                                                                | E015      |
| Soil   | AR          | Cyanide - Total                                                                                                                                 | Determination of total cyanide by distillation followed by colorimetry                                                                               | E015      |
| Soil   | D           | Cyclohexane Extractable Matter (CEM)                                                                                                            | Gravimetrically determined through extraction with cyclohexane                                                                                       | E011      |
| Soil   | AR          | Diesel Range Organics (C10 - C24)                                                                                                               | Determination of hexane/acetone extractable hydrocarbons by GC-FID                                                                                   | E004      |
| Soil   | AR          | Electrical Conductivity                                                                                                                         | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement                             | E022      |
| Soil   | AR          | Electrical Conductivity                                                                                                                         | Determination of electrical conductivity by addition of water followed by electrometric measurement                                                  | E023      |
| Soil   | D           | Elemental Sulphur                                                                                                                               | Determination of elemental sulphur by solvent extraction followed by GC-MS                                                                           | E020      |
| Soil   | AR          | EPH (C10 - C40)                                                                                                                                 | Determination of acetone/hexane extractable hydrocarbons by GC-FID                                                                                   | E004      |
| Soil   | AR          | EPH Product ID                                                                                                                                  | Determination of acetone/hexane extractable hydrocarbons by GC-FID                                                                                   | E004      |
| Soil   | AR          | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)                                                                                   | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS                                        | E004      |
| Soil   | D           | Fluoride - Water Soluble                                                                                                                        | Determination of Fluoride by extraction with water & analysed by ion chromatography                                                                  | E009      |
| Soil   | D           | Fraction Organic Carbon (FOC)                                                                                                                   | Determination of TOC by combustion analyser.                                                                                                         | E027      |
| Soil   | D           | Organic Matter (SOM)                                                                                                                            | Determination of TOC by combustion analyser.                                                                                                         | E027      |
| Soil   | D           | TOC (Total Organic Carbon)                                                                                                                      | Determination of TOC by combustion analyser.                                                                                                         | E027      |
| Soil   | AR          | Exchangeable Ammonium                                                                                                                           | Determination of ammonium by discrete analyser.                                                                                                      | E029      |
| Soil   | D           | FOC (Fraction Organic Carbon)                                                                                                                   | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate                     | E010      |
| Soil   | D           | Loss on Ignition @ 450oC                                                                                                                        | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace                                       | E019      |
| Soil   | D           | Magnesium - Water Soluble                                                                                                                       | Determination of water soluble magnesium by extraction with water followed by ICP-OES                                                                | E025      |
| Soil   | D           | Metals                                                                                                                                          | Determination of metals by aqua-regia digestion followed by ICP-OES                                                                                  | E002      |
| Soil   | AR          | Mineral Oil (C10 - C40)                                                                                                                         | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge                                                  | E004      |
| Soil   | AR          | Moisture Content                                                                                                                                | Moisture content; determined gravimetrically                                                                                                         | E003      |
| Soil   | D           | Nitrate - Water Soluble (2:1)                                                                                                                   | Determination of nitrate by extraction with water & analysed by ion chromatography                                                                   | E009      |
| Soil   | D           | Organic Matter                                                                                                                                  | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate                                 | E010      |
| Soil   | AR          | PAH - Speciated (EPA 16)                                                                                                                        | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards                | E005      |
| Soil   | AR          | PCB - 7 Congeners                                                                                                                               | Determination of PCB by extraction with acetone and hexane followed by GC-MS                                                                         | E008      |
| Soil   | D           | Petroleum Ether Extract (PEE)                                                                                                                   | Gravimetrically determined through extraction with petroleum ether                                                                                   | E011      |
| Soil   | AR          | pH                                                                                                                                              | Determination of pH by addition of water followed by electrometric measurement                                                                       | E007      |
| Soil   | AR          | Phenols - Total (monohydric)                                                                                                                    | Determination of phenols by distillation followed by colorimetry                                                                                     | E021      |
| Soil   | D           | Phosphate - Water Soluble (2:1)                                                                                                                 | Determination of phosphate by extraction with water & analysed by ion chromatography                                                                 | E009      |
| Soil   | D           | Sulphate (as SO4) - Total                                                                                                                       | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES                                                                       | E013      |
| Soil   | D           | Sulphate (as SO4) - Water Soluble (2:1)                                                                                                         | Determination of sulphate by extraction with water & analysed by ion chromatography                                                                  | E009      |
| Soil   | D           | Sulphate (as SO4) - Water Soluble (2:1)                                                                                                         | Determination of water soluble sulphate by extraction with water followed by ICP-OES                                                                 | E014      |
| Soil   | AR          | Sulphide                                                                                                                                        | Determination of sulphide by distillation followed by colorimetry                                                                                    | E018      |
| Soil   | D           | Sulphur - Total                                                                                                                                 | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES                                                                     | E024      |
| Soil   | AR          | SVOC                                                                                                                                            | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS                                               | E006      |
| Soil   | AR          | Thiocyanate (as SCN)                                                                                                                            | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry  | E017      |
| Soil   | D           | Toluene Extractable Matter (TEM)                                                                                                                | Gravimetrically determined through extraction with toluene                                                                                           | E011      |
| Soil   | D           | Total Organic Carbon (TOC)                                                                                                                      | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate                                 | E010      |
| Soil   | AR          | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)         | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS       | E004      |
| Soil   | AR          | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS       | E004      |
| Soil   | AR          | VOCs                                                                                                                                            | Determination of volatile organic compounds by headspace GC-MS                                                                                       | E001      |
| Soil   | AR          | VPH (C6-C8 & C8-C10)                                                                                                                            | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID                                                                            | E001      |

**D Dried**  
**AR As Received**

| <b>Water Analysis Certificate - Methodology &amp; Miscellaneous Information</b> |  |
|---------------------------------------------------------------------------------|--|
| <b>DETS Report No: 24-01534</b>                                                 |  |
| <b>Geosphere Environmental Ltd</b>                                              |  |
| <b>Site Reference: Long Sutton, Spalding</b>                                    |  |
| <b>Project / Job Ref: 8133, GI</b>                                              |  |
| <b>Order No: None Supplied</b>                                                  |  |
| <b>Reporting Date: 22/02/2024</b>                                               |  |

| <b>Matrix</b> | <b>Analysed On</b> | <b>Determinand</b>                                                                                                                              | <b>Brief Method Description</b>                                                                                                             | <b>Method No</b> |
|---------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| Water         | UF                 | Alkalinity                                                                                                                                      | Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point                                 | E103             |
| Water         | F                  | Ammoniacal Nitrogen                                                                                                                             | Determination of ammoniacal nitrogen by discrete analyser.                                                                                  | E126             |
| Water         | UF                 | BTEX                                                                                                                                            | Determination of BTEX by headspace GC-MS                                                                                                    | E101             |
| Water         | F                  | Cations                                                                                                                                         | Determination of cations by filtration followed by ICP-MS                                                                                   | E102             |
| Water         | UF                 | Chemical Oxygen Demand (COD)                                                                                                                    | Determination using a COD reactor followed by colorimetry                                                                                   | E112             |
| Water         | F                  | Chloride                                                                                                                                        | Determination of chloride by filtration & analysed by ion chromatography                                                                    | E109             |
| Water         | F                  | Chromium - Hexavalent                                                                                                                           | Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by                                        | E116             |
| Water         | UF                 | Cyanide - Complex                                                                                                                               | Determination of complex cyanide by distillation followed by colorimetry                                                                    | E115             |
| Water         | UF                 | Cyanide - Free                                                                                                                                  | Determination of free cyanide by distillation followed by colorimetry                                                                       | E115             |
| Water         | UF                 | Cyanide - Total                                                                                                                                 | Determination of total cyanide by distillation followed by colorimetry                                                                      | E115             |
| Water         | UF                 | Cyclohexane Extractable Matter (CEM)                                                                                                            | Gravimetrically determined through liquid:liquid extraction with cyclohexane                                                                | E111             |
| Water         | F                  | Diesel Range Organics (C10 - C24)                                                                                                               | Determination of liquid:liquid extraction with hexane followed by GC-FID                                                                    | E104             |
| Water         | F                  | Dissolved Organic Content (DOC)                                                                                                                 | Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection                                  | E110             |
| Water         | UF                 | Electrical Conductivity                                                                                                                         | Determination of electrical conductivity by electrometric measurement                                                                       | E123             |
| Water         | F                  | EPH (C10 - C40)                                                                                                                                 | Determination of liquid:liquid extraction with hexane followed by GC-FID                                                                    | E104             |
| Water         | F                  | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)                                                                                   | Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS                         | E104             |
| Water         | F                  | Fluoride                                                                                                                                        | Determination of Fluoride by filtration & analysed by ion chromatography                                                                    | E109             |
| Water         | F                  | Hardness                                                                                                                                        | Determination of Ca and Mg by ICP-MS followed by calculation                                                                                | E102             |
| Leachate      | F                  | Leachate Preparation - NRA                                                                                                                      | Based on National Rivers Authority leaching test 1994                                                                                       | E301             |
| Leachate      | F                  | Leachate Preparation - WAC                                                                                                                      | Based on BS EN 12457 Pt1, 2, 3                                                                                                              | E302             |
| Water         | F                  | Metals                                                                                                                                          | Determination of metals by filtration followed by ICP-MS                                                                                    | E102             |
| Water         | F                  | Mineral Oil (C10 - C40)                                                                                                                         | Determination of liquid:liquid extraction with hexane followed by GC-FID                                                                    | E104             |
| Water         | F                  | Nitrate                                                                                                                                         | Determination of nitrate by filtration & analysed by ion chromatography                                                                     | E109             |
| Water         | UF                 | Monohydric Phenol                                                                                                                               | Determination of phenols by distillation followed by colorimetry                                                                            | E121             |
| Water         | F                  | PAH - Speciated (EPA 16)                                                                                                                        | Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS                      | E105             |
| Water         | F                  | PCB - 7 Congeners                                                                                                                               | Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane                                        | E108             |
| Water         | UF                 | Petroleum Ether Extract (PEE)                                                                                                                   | Gravimetrically determined through liquid:liquid extraction with petroleum ether                                                            | E111             |
| Water         | UF                 | pH                                                                                                                                              | Determination of pH by electrometric measurement                                                                                            | E107             |
| Water         | F                  | Phosphate                                                                                                                                       | Determination of phosphate by filtration & analysed by ion chromatography                                                                   | E109             |
| Water         | UF                 | Redox Potential                                                                                                                                 | Determination of redox potential by electrometric measurement                                                                               | E113             |
| Water         | F                  | Sulphate (as SO4)                                                                                                                               | Determination of sulphate by filtration & analysed by ion chromatography                                                                    | E109             |
| Water         | UF                 | Sulphide                                                                                                                                        | Determination of sulphide by distillation followed by colorimetry                                                                           | E118             |
| Water         | F                  | SVOC                                                                                                                                            | Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS    | E106             |
| Water         | UF                 | Toluene Extractable Matter (TEM)                                                                                                                | Gravimetrically determined through liquid:liquid extraction with toluene                                                                    | E111             |
| Water         | UF                 | Total Organic Carbon (TOC)                                                                                                                      | Low heat with persulphate addition followed by IR detection                                                                                 | E110             |
| Water         | F                  | TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)          | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS | E104             |
| Water         | F                  | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS | E104             |
| Water         | UF                 | VOCs                                                                                                                                            | Determination of volatile organic compounds by headspace GC-MS                                                                              | E101             |
| Water         | UF                 | VPH (C6-C8 & C8-C10)                                                                                                                            | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID                                                                   | E101             |

**Key**

**F Filtered**  
**UF Unfiltered**

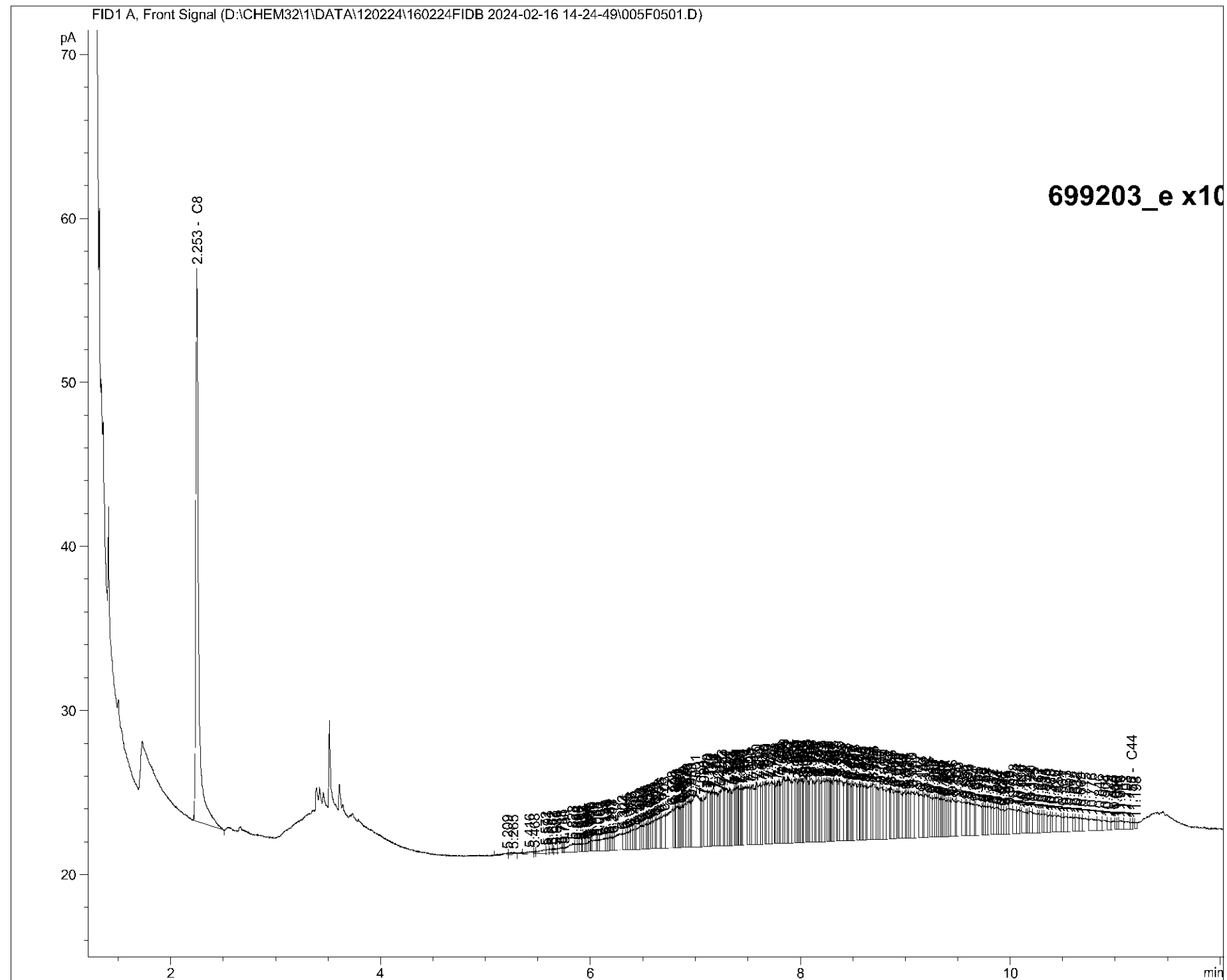
| List of HWOL Acronyms and Operators   |  |
|---------------------------------------|--|
| DETS Report No: 24-01534              |  |
| Geosphere Environmental Ltd           |  |
| Site Reference: Long Sutton, Spalding |  |
| Project / Job Ref: 8133, GI           |  |
| Order No: None Supplied               |  |
| Reporting Date: 22/02/2024            |  |

| Acronym | Description                                                         |
|---------|---------------------------------------------------------------------|
| HS      | Headspace analysis                                                  |
| EH      | Extractable Hydrocarbons - i.e. everything extracted by the solvent |
| CU      | Clean-up - e.g. by florisil, silica gel                             |
| 1D      | GC - Single coil gas chromatography                                 |
| 2D      | GC-GC - Double coil gas chromatography                              |
| Total   | Aliphatics & Aromatics                                              |
| AL      | Aliphatics only                                                     |
| AR      | Aromatics only                                                      |
| #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 eg. EH+HS_Total or EH_CU+HS_Total   |

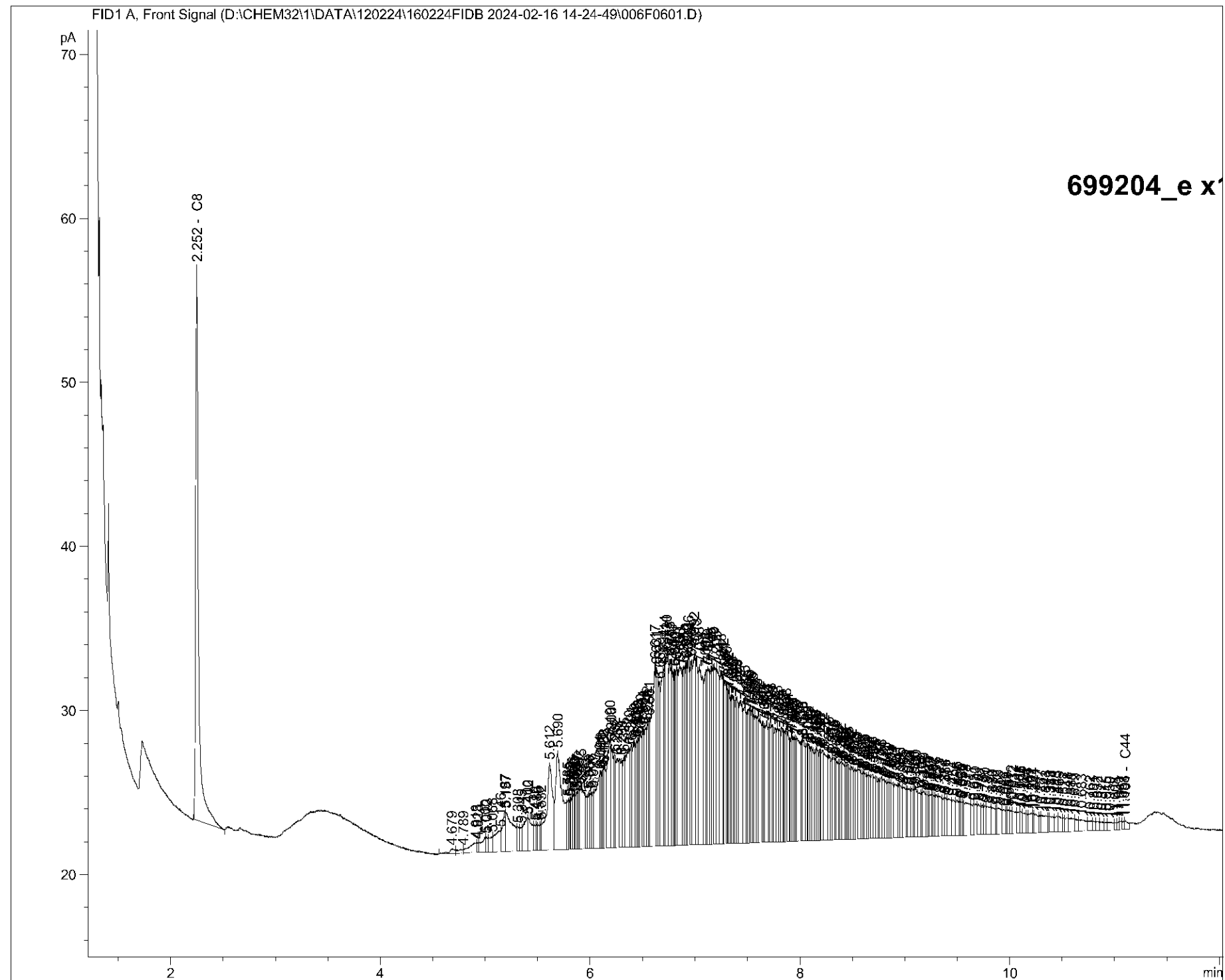
|                                                       |
|-------------------------------------------------------|
| Det - Acronym                                         |
| Benzene - HS_1D_MS                                    |
| Ethylbenzene - HS_1D_MS                               |
| MTBE - HS_1D_MS                                       |
| Mineral Oil (C10 - C40) (BS EN 12457-2) - EH_CU_1D_AL |
| TPH (EPH EC10-EC40) - EH_1D_Total                     |
| TPH CWG - Aliphatic >C10 - C12 - EH_CU_1D_AL          |
| TPH CWG - Aliphatic >C12 - C16 - EH_CU_1D_AL          |
| TPH CWG - Aliphatic >C16 - C21 - EH_CU_1D_AL          |
| TPH CWG - Aliphatic >C21 - C34 - EH_CU_1D_AL          |
| TPH CWG - Aliphatic >C5 - C6 - HS_1D_MS_AL            |
| TPH CWG - Aliphatic >C6 - C8 - HS_1D_MS_AL            |
| TPH CWG - Aliphatic >C8 - C10 - EH_CU_1D_AL           |
| TPH CWG - Aliphatic C5 - C34 - HS_1D_MS+EH_CU_1D_AL   |
| TPH CWG - Aromatic >C10 - C12 - EH_CU_1D_AR           |
| TPH CWG - Aromatic >C12 - C16 - EH_CU_1D_AR           |
| TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR           |
| TPH CWG - Aromatic >C21 - C35 - EH_CU_1D_AR           |
| TPH CWG - Aromatic >C5 - C35 - HS_1D_MS+EH_CU_1D_AR   |
| TPH CWG - Aromatic >C5 - C7 - HS_1D_MS_AR             |
| TPH CWG - Aromatic >C7 - C8 - HS_1D_MS_AR             |
| TPH CWG - Aromatic >C8 - C10 - EH_CU_1D_AR            |
| TPH CWG - Total >C5 - C35 - HS_1D_MS+EH_CU_1D_Total   |
| Tentative Petroleum Type - EH_1D                      |
| Toluene - HS_1D_MS                                    |
| Total BTEX (BS EN 12457-2) - HS_1D_MS_Total           |
| m & p-xylene - HS_1D_MS                               |
| o-Xylene - HS_1D_MS                                   |

| Parameter                    | Matrix Type | Suite Reference | Expanded Uncertainty Measurement | Unit  |
|------------------------------|-------------|-----------------|----------------------------------|-------|
| TOC                          | Soil        | BS EN 12457     | 12.2                             | %     |
| Loss on Ignition             | Soil        | BS EN 12457     | 22.9                             | %     |
| BTEX                         | Soil        | BS EN 12457     | 11.2                             | %     |
| Sum of PCBs                  | Soil        | BS EN 12457     | 43.4                             | %     |
| Mineral Oil                  | Soil        | BS EN 12457     | 9.0                              | %     |
| Total PAH                    | Soil        | BS EN 12457     | 18.5                             | %     |
| pH                           | Soil        | BS EN 12457     | 0.335                            | Units |
| Acid Neutralisation Capacity | Soil        | BS EN 12457     | 18.0                             | %     |
| Clay Content                 | Soil        | BS 3882: 2015   | 15.0                             | %     |
| Silt Content                 | Soil        | BS 3882: 2015   | 14.0                             | %     |
| Sand Content                 | Soil        | BS 3882: 2015   | 13.0                             | %     |
| Loss on Ignition             | Soil        | BS 3882: 2015   | 22.9                             | %     |
| pH                           | Soil        | BS 3882: 2015   | 0.335                            | Units |
| Carbonate                    | Soil        | BS 3882: 2015   | 12.0                             | %     |
| Total Nitrogen               | Soil        | BS 3882: 2015   | 12.0                             | %     |
| Phosphorus (Extractable)     | Soil        | BS 3882: 2015   | 24.0                             | %     |
| Potassium (Extractable)      | Soil        | BS 3882: 2015   | 20.0                             | %     |
| Magnesium (Extractable)      | Soil        | BS 3882: 2015   | 26.0                             | %     |
| Zinc                         | Soil        | BS 3882: 2015   | 21.6                             | %     |
| Copper                       | Soil        | BS 3882: 2015   | 18.2                             | %     |
| Nickel                       | Soil        | BS 3882: 2015   | 24.3                             | %     |
| Available Sodium             | Soil        | BS 3882: 2015   | 23.0                             | %     |
| Available Calcium            | Soil        | BS 3882: 2015   | 23.0                             | %     |
| Electrical Conductivity      | Soil        | BS 3882: 2015   | 10.0                             | %     |

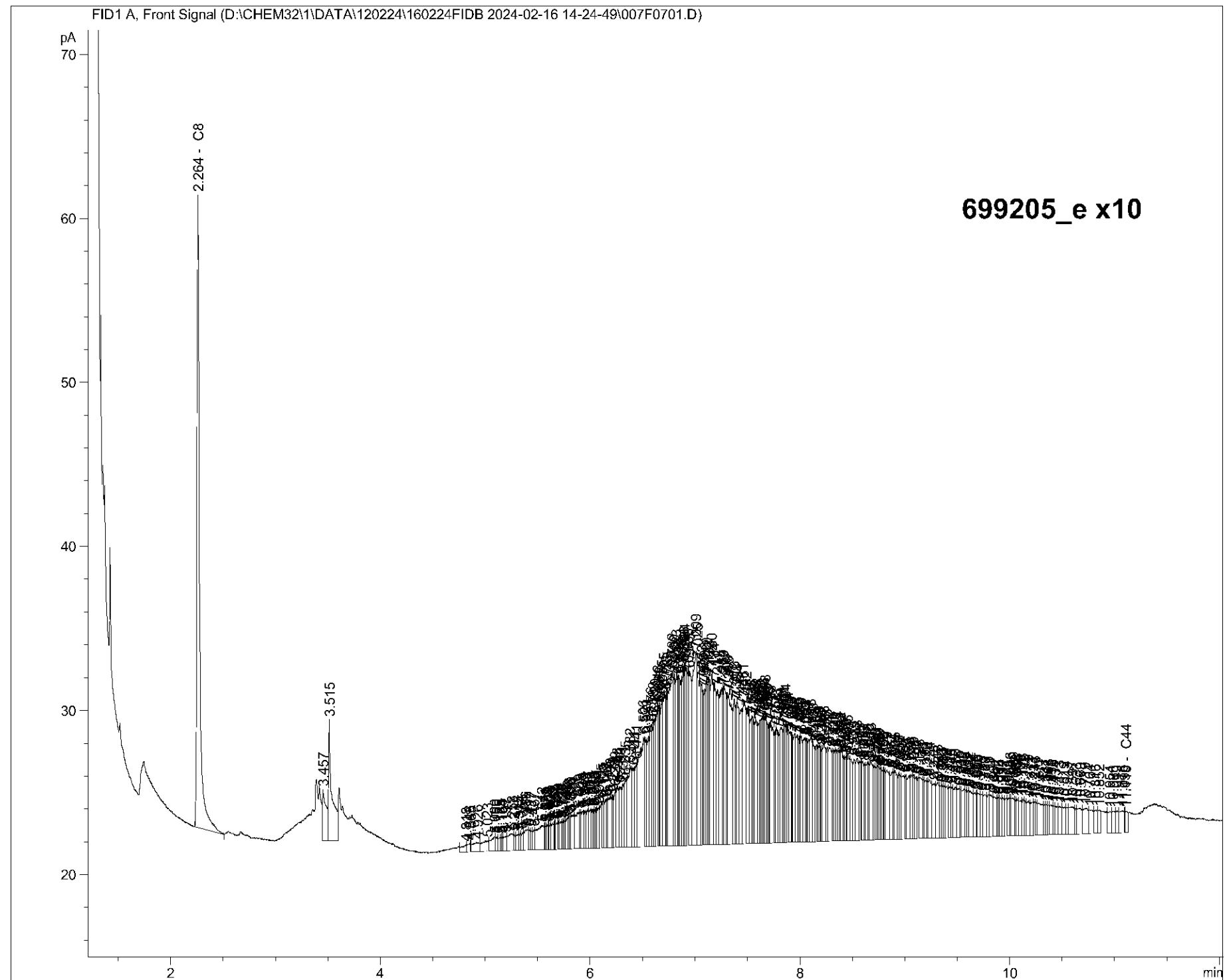
Current Chromatogram(s)



Current Chromatogram(s)



Current Chromatogram(s)





## PAH Source Signature Double Ratio Plot

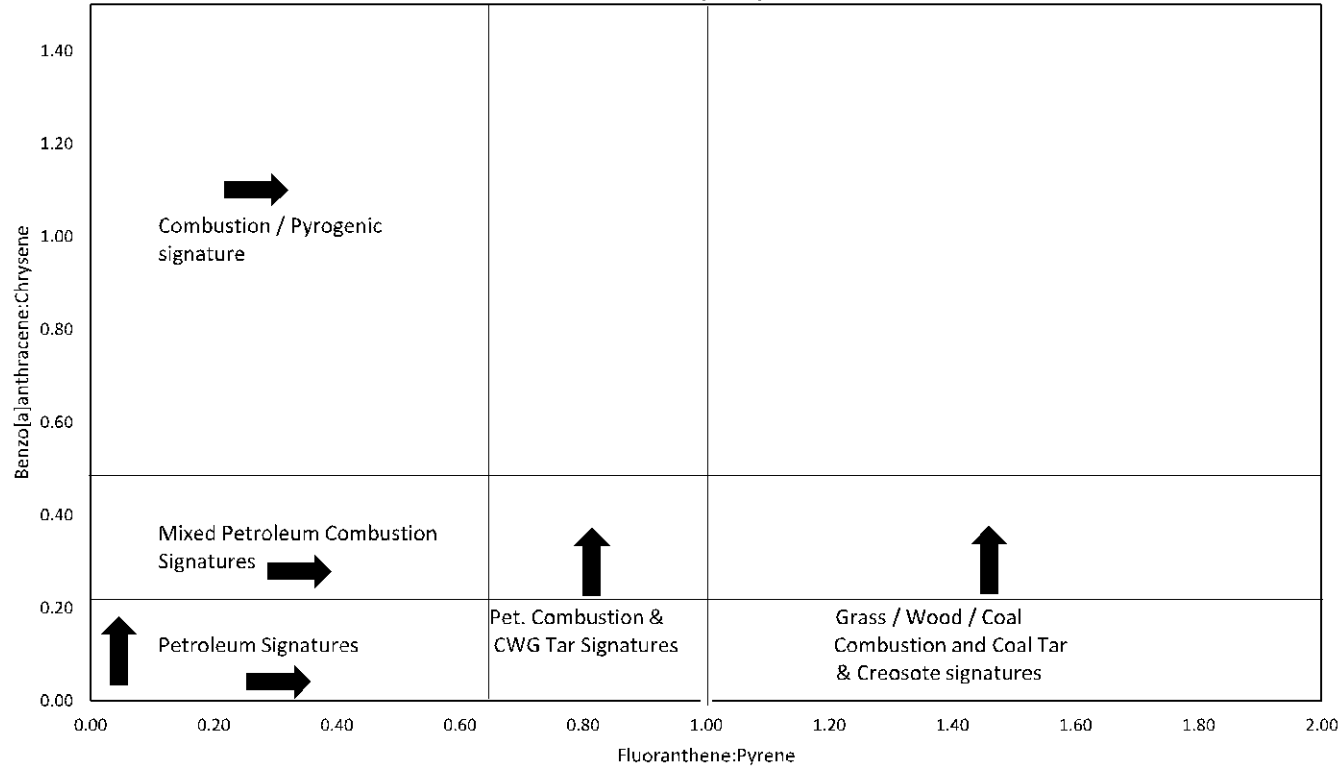
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# Double Ratio Plot Fluoranthene : Pyrene v Benzo[a]anthracene : Chrysene

Yunker et al. (2002)



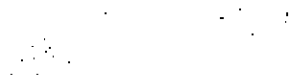
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**Derwentside Environmental Testing Services Ltd**  
Unit 1  
Rose Lane Industrial Estate  
Rose Lane  
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Kent  
ME17 2JN  
t: 01622 850410

## **DETS Report No: 24-01575**

**Site Reference:** Long Sutton, Spalding

**Project / Job Ref:** 8133, GI

**Order No:** None Supplied

**Sample Receipt Date:** 14/02/2024

**Sample Scheduled Date:** 16/02/2024

**Report Issue Number:** 1

**Reporting Date:** 22/02/2024

**Authorised by:**

Steve Knight  
Customer Support Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

**DETS Ltd**  
**Unit 1, Rose Lane Industrial Estate**  
**Rose Lane**  
**Lenham Heath**  
**Maidstone**  
**Kent ME17 2JN**  
**Tel : 01622 850410**



| Soil Analysis Certificate             |                 |               |  |  |  |  |
|---------------------------------------|-----------------|---------------|--|--|--|--|
| DETS Report No: 24-01575              | Date Sampled    | 12/02/24      |  |  |  |  |
| Geosphere Environmental Ltd           | Time Sampled    | None Supplied |  |  |  |  |
| Site Reference: Long Sutton, Spalding | TP / BH No      | WS05          |  |  |  |  |
| Project / Job Ref: 8133, GI           | Additional Refs | E2            |  |  |  |  |
| Order No: None Supplied               | Depth (m)       | 0.70          |  |  |  |  |
| Reporting Date: 22/02/2024            | DETS Sample No  | 699389        |  |  |  |  |

| Determinand                           | Unit     | RL     | Accreditation |              |  |  |  |
|---------------------------------------|----------|--------|---------------|--------------|--|--|--|
| Asbestos Screen <sup>(S)</sup>        | N/a      | N/a    | ISO17025      | Not Detected |  |  |  |
| pH                                    | pH Units | N/a    | MCERTS        | 9.5          |  |  |  |
| W/S Sulphate as SO <sub>4</sub> (2:1) | mg/l     | < 10   | MCERTS        | 309          |  |  |  |
| W/S Sulphate as SO <sub>4</sub> (2:1) | g/l      | < 0.01 | MCERTS        | 0.31         |  |  |  |
| Organic Matter (SOM)                  | %        | < 0.1  | MCERTS        | 0.7          |  |  |  |
| Arsenic (As)                          | mg/kg    | < 2    | MCERTS        | 7            |  |  |  |
| Barium (Ba)                           | mg/kg    | < 2.5  | MCERTS        | 36           |  |  |  |
| Beryllium (Be)                        | mg/kg    | < 0.5  | MCERTS        | < 0.5        |  |  |  |
| W/S Boron                             | mg/kg    | < 1    | NONE          | < 1          |  |  |  |
| Cadmium (Cd)                          | mg/kg    | < 0.2  | MCERTS        | < 0.2        |  |  |  |
| Chromium (Cr)                         | mg/kg    | < 2    | MCERTS        | 9            |  |  |  |
| Chromium (hexavalent)                 | mg/kg    | < 2    | NONE          | < 2          |  |  |  |
| Copper (Cu)                           | mg/kg    | < 4    | MCERTS        | 6            |  |  |  |
| Lead (Pb)                             | mg/kg    | < 3    | MCERTS        | 5            |  |  |  |
| Mercury (Hg)                          | mg/kg    | < 1    | MCERTS        | < 1          |  |  |  |
| Nickel (Ni)                           | mg/kg    | < 3    | MCERTS        | 10           |  |  |  |
| Selenium (Se)                         | mg/kg    | < 2    | MCERTS        | < 2          |  |  |  |
| Vanadium (V)                          | mg/kg    | < 1    | MCERTS        | 22           |  |  |  |
| Zinc (Zn)                             | mg/kg    | < 3    | MCERTS        | 17           |  |  |  |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion.  
Subcontracted analysis (S)

**DETS Ltd**  
**Unit 1, Rose Lane Industrial Estate**  
**Rose Lane**  
**Lenham Heath**  
**Maidstone**  
**Kent ME17 2JN**  
**Tel : 01622 850410**



| Soil Analysis Certificate - Speciated PAHs |                 |               |  |  |  |  |
|--------------------------------------------|-----------------|---------------|--|--|--|--|
| DETS Report No: 24-01575                   | Date Sampled    | 12/02/24      |  |  |  |  |
| Geosphere Environmental Ltd                | Time Sampled    | None Supplied |  |  |  |  |
| Site Reference: Long Sutton, Spalding      | TP / BH No      | WS05          |  |  |  |  |
| Project / Job Ref: 8133, GI                | Additional Refs | E2            |  |  |  |  |
| Order No: None Supplied                    | Depth (m)       | 0.70          |  |  |  |  |
| Reporting Date: 22/02/2024                 | DETS Sample No  | 699389        |  |  |  |  |

| Determinand            | Unit  | RL    | Accreditation |       |  |  |  |
|------------------------|-------|-------|---------------|-------|--|--|--|
| Naphthalene            | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Acenaphthylene         | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Acenaphthene           | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Fluorene               | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Phenanthrene           | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Anthracene             | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Fluoranthene           | mg/kg | < 0.1 | MCERTS        | 0.19  |  |  |  |
| Pyrene                 | mg/kg | < 0.1 | MCERTS        | 0.19  |  |  |  |
| Benzo(a)anthracene     | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Chrysene               | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Benzo(b)fluoranthene   | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Benzo(k)fluoranthene   | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Benzo(a)pyrene         | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Dibenz(a,h)anthracene  | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Benzo(ghi)perylene     | mg/kg | < 0.1 | MCERTS        | < 0.1 |  |  |  |
| Total EPA-16 PAHs      | mg/kg | < 1.6 | MCERTS        | < 1.6 |  |  |  |

DETS Ltd  
Unit 1, Rose Lane Industrial Estate  
Rose Lane  
Lenham Heath  
Maidstone  
Kent ME17 2JN  
Tel : 01622 850410



| Soil Analysis Certificate - Sample Descriptions |  |
|-------------------------------------------------|--|
| DETS Report No: 24-01575                        |  |
| Geosphere Environmental Ltd                     |  |
| Site Reference: Long Sutton, Spalding           |  |
| Project / Job Ref: 8133, GI                     |  |
| Order No: None Supplied                         |  |
| Reporting Date: 22/02/2024                      |  |

| DETS Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description       |
|----------------|------------|-----------------|-----------|----------------------|---------------------------------|
| & 699389       | WS05       | E2              | 0.70      | 11.7                 | Brown gravelly sand with stones |

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample <sup>1s</sup>

& samples received in inappropriate containers for hydrocarbon analysis

### Soil Analysis Certificate - Methodology & Miscellaneous Information

**DETS Report No: 24-01575**

**Geosphere Environmental Ltd**

**Site Reference: Long Sutton, Spalding**

**Project / Job Ref: 8133, GI**

**Order No: None Supplied**

**Reporting Date: 22/02/2024**

| Matrix | Analysed On | Determinand                                                                                                                                     | Brief Method Description                                                                                                                             | Method No |
|--------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Soil   | D           | Boron - Water Soluble                                                                                                                           | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES                                                            | E012      |
| Soil   | AR          | BTEX                                                                                                                                            | Determination of BTEX by headspace GC-MS                                                                                                             | E001      |
| Soil   | D           | Cations                                                                                                                                         | Determination of cations in soil by aqua-regia digestion followed by ICP-OES                                                                         | E002      |
| Soil   | D           | Chloride - Water Soluble (2:1)                                                                                                                  | Determination of chloride by extraction with water & analysed by ion chromatography                                                                  | E009      |
| Soil   | AR          | Chromium - Hexavalent                                                                                                                           | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphénylcarbazide followed by colorimetry | E016      |
| Soil   | AR          | Cyanide - Complex                                                                                                                               | Determination of complex cyanide by distillation followed by colorimetry                                                                             | E015      |
| Soil   | AR          | Cyanide - Free                                                                                                                                  | Determination of free cyanide by distillation followed by colorimetry                                                                                | E015      |
| Soil   | AR          | Cyanide - Total                                                                                                                                 | Determination of total cyanide by distillation followed by colorimetry                                                                               | E015      |
| Soil   | D           | Cyclohexane Extractable Matter (CEM)                                                                                                            | Gravimetrically determined through extraction with cyclohexane                                                                                       | E011      |
| Soil   | AR          | Diesel Range Organics (C10 - C24)                                                                                                               | Determination of hexane/acetone extractable hydrocarbons by GC-FID                                                                                   | E004      |
| Soil   | AR          | Electrical Conductivity                                                                                                                         | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement                             | E022      |
| Soil   | AR          | Electrical Conductivity                                                                                                                         | Determination of electrical conductivity by addition of water followed by electrometric measurement                                                  | E023      |
| Soil   | D           | Elemental Sulphur                                                                                                                               | Determination of elemental sulphur by solvent extraction followed by GC-MS                                                                           | E020      |
| Soil   | AR          | EPH (C10 - C40)                                                                                                                                 | Determination of acetone/hexane extractable hydrocarbons by GC-FID                                                                                   | E004      |
| Soil   | AR          | EPH Product ID                                                                                                                                  | Determination of acetone/hexane extractable hydrocarbons by GC-FID                                                                                   | E004      |
| Soil   | AR          | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)                                                                                   | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS                                        | E004      |
| Soil   | D           | Fluoride - Water Soluble                                                                                                                        | Determination of Fluoride by extraction with water & analysed by ion chromatography                                                                  | E009      |
| Soil   | D           | Fraction Organic Carbon (FOC)                                                                                                                   | Determination of TOC by combustion analyser.                                                                                                         | E027      |
| Soil   | D           | Organic Matter (SOM)                                                                                                                            | Determination of TOC by combustion analyser.                                                                                                         | E027      |
| Soil   | D           | TOC (Total Organic Carbon)                                                                                                                      | Determination of TOC by combustion analyser.                                                                                                         | E027      |
| Soil   | AR          | Exchangeable Ammonium                                                                                                                           | Determination of ammonium by discrete analyser.                                                                                                      | E029      |
| Soil   | D           | FOC (Fraction Organic Carbon)                                                                                                                   | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate                     | E010      |
| Soil   | D           | Loss on Ignition @ 450oC                                                                                                                        | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace                                       | E019      |
| Soil   | D           | Magnesium - Water Soluble                                                                                                                       | Determination of water soluble magnesium by extraction with water followed by ICP-OES                                                                | E025      |
| Soil   | D           | Metals                                                                                                                                          | Determination of metals by aqua-regia digestion followed by ICP-OES                                                                                  | E002      |
| Soil   | AR          | Mineral Oil (C10 - C40)                                                                                                                         | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge                                                  | E004      |
| Soil   | AR          | Moisture Content                                                                                                                                | Moisture content; determined gravimetrically                                                                                                         | E003      |
| Soil   | D           | Nitrate - Water Soluble (2:1)                                                                                                                   | Determination of nitrate by extraction with water & analysed by ion chromatography                                                                   | E009      |
| Soil   | D           | Organic Matter                                                                                                                                  | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate                                 | E010      |
| Soil   | AR          | PAH - Speciated (EPA 16)                                                                                                                        | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards                | E005      |
| Soil   | AR          | PCB - 7 Congeners                                                                                                                               | Determination of PCB by extraction with acetone and hexane followed by GC-MS                                                                         | E008      |
| Soil   | D           | Petroleum Ether Extract (PEE)                                                                                                                   | Gravimetrically determined through extraction with petroleum ether                                                                                   | E011      |
| Soil   | AR          | pH                                                                                                                                              | Determination of pH by addition of water followed by electrometric measurement                                                                       | E007      |
| Soil   | AR          | Phenols - Total (monohydric)                                                                                                                    | Determination of phenols by distillation followed by colorimetry                                                                                     | E021      |
| Soil   | D           | Phosphate - Water Soluble (2:1)                                                                                                                 | Determination of phosphate by extraction with water & analysed by ion chromatography                                                                 | E009      |
| Soil   | D           | Sulphate (as SO4) - Total                                                                                                                       | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES                                                                       | E013      |
| Soil   | D           | Sulphate (as SO4) - Water Soluble (2:1)                                                                                                         | Determination of sulphate by extraction with water & analysed by ion chromatography                                                                  | E009      |
| Soil   | D           | Sulphate (as SO4) - Water Soluble (2:1)                                                                                                         | Determination of water soluble sulphate by extraction with water followed by ICP-OES                                                                 | E014      |
| Soil   | AR          | Sulphide                                                                                                                                        | Determination of sulphide by distillation followed by colorimetry                                                                                    | E018      |
| Soil   | D           | Sulphur - Total                                                                                                                                 | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES                                                                     | E024      |
| Soil   | AR          | SVOC                                                                                                                                            | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS                                               | E006      |
| Soil   | AR          | Thiocyanate (as SCN)                                                                                                                            | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry  | E017      |
| Soil   | D           | Toluene Extractable Matter (TEM)                                                                                                                | Gravimetrically determined through extraction with toluene                                                                                           | E011      |
| Soil   | D           | Total Organic Carbon (TOC)                                                                                                                      | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate                                 | E010      |
| Soil   | AR          | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)         | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS       | E004      |
| Soil   | AR          | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS       | E004      |
| Soil   | AR          | VOCs                                                                                                                                            | Determination of volatile organic compounds by headspace GC-MS                                                                                       | E001      |
| Soil   | AR          | VPH (C6-C8 & C8-C10)                                                                                                                            | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID                                                                            | E001      |

**D Dried**  
**AR As Received**

**DETS Ltd**  
**Unit 1, Rose Lane Industrial Estate**  
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**Lenham Heath**  
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**Tel : 01622 850410**



| List of HWOL Acronyms and Operators   |  |
|---------------------------------------|--|
| DETS Report No: 24-01575              |  |
| Geosphere Environmental Ltd           |  |
| Site Reference: Long Sutton, Spalding |  |
| Project / Job Ref: 8133, GI           |  |
| Order No: None Supplied               |  |
| Reporting Date: 22/02/2024            |  |

| Acronym | Description                                                         |
|---------|---------------------------------------------------------------------|
| HS      | Headspace analysis                                                  |
| EH      | Extractable Hydrocarbons - i.e. everything extracted by the solvent |
| CU      | Clean-up - e.g. by florisil, silica gel                             |
| 1D      | GC - Single coil gas chromatography                                 |
| 2D      | GC-GC - Double coil gas chromatography                              |
| Total   | Aliphatics & Aromatics                                              |
| AL      | Aliphatics only                                                     |
| AR      | Aromatics only                                                      |
| #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 eg. EH+HS_Total or EH_CU+HS_Total   |

|               |
|---------------|
| Det - Acronym |
|               |
|               |





# TEST REPORT

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                           |                                                                                                                                                                                                                                                                                                                                                                        |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Contract</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | University Academy, Long Sutton, Spalding |                                                                                                                                                                                                                                                                                                                                                                        |  |
| <b>Serial No.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 44184_1                                   |                                                                                                                                                                                                                                                                                                                                                                        |  |
| <b>Client:</b><br>Geosphere Environmental Ltd<br><br>Head Office<br>Brightwell Barns<br>Ipswich Road<br>Brightwell<br>Suffolk<br>IP10 0BJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                           | <b>Soil Property Testing Ltd</b><br><br>15, 16, 18 Halcyon Court, St Margaret's Way,<br>Stukeley Meadows, Huntingdon,<br>Cambridgeshire, PE29 6DG<br><br>Tel: 01480 455579<br>Email: <a href="mailto:enquiries@soilpropertytesting.com">enquiries@soilpropertytesting.com</a><br>Website: <a href="http://www.soilpropertytesting.com">www.soilpropertytesting.com</a> |  |
| <b>Samples Submitted By:</b><br>Geosphere Environmental Ltd<br><br><b>Samples Labelled:</b><br>University Academy, Long Sutton,<br>Spalding                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                           | <b>Approved Signatories:</b><br><br><input checked="" type="checkbox"/> <b>J.C. Garner B.Eng (Hons) FGS</b><br>Technical Director & Quality Manager<br><br><input type="checkbox"/> <b>W. Johnstone</b><br>Materials Lab Manager<br><br>                                          |  |
| <b>Date Received:</b> 15/02/2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                           | <b>Samples Tested Between:</b> 15/02/2024 and 28/02/2024                                                                                                                                                                                                                                                                                                               |  |
| <b>Remarks:</b><br>For the attention of Rob Slater<br>Your Reference No: 8133, GI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                           |                                                                                                                                                                                                                                                                                                                                                                        |  |
| <b>Notes:</b><br><ol style="list-style-type: none"><li>1 All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary.</li><li>2 Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.</li><li>3 Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory.</li><li>4 This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.</li><li>5 The results within this report only relate to the items tested or sampled.</li></ol> |                                           |                                                                                                                                                                                                                                                                                                                                                                        |  |



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|                  |      |                                           |           |                                                                                                                                                                             |    |   |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
|------------------|------|-------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---|---|---|---|--|--|-------------|--|------------|--|--|--|--|-----------------|--|--|----------------|
| Contract         |      | University Academy, Long Sutton, Spalding |           |                                                                                                                                                                             |    |   |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| Serial No.       |      | 44184_1                                   |           |                                                                                                                                                                             |    |   |   |   |   |  |  | Target Date |  | 29/02/2024 |  |  |  |  |                 |  |  |                |
| Scheduled By     |      | Geosphere Environmental Ltd               |           |                                                                                                                                                                             |    |   |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| Schedule Remarks |      |                                           |           |                                                                                                                                                                             |    |   |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| Bore Hole No.    | Type | Sample Ref.                               | Top Depth | California Bearing Ratio Test<br>Water Content (BSEN)<br>Sulphate Content/pH Value<br>Liquid/Plastic Limits<br>Wet Sieve Preparation<br>Particle Size Distribution (BS1377) |    |   |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  | Sample Remarks |
| SK01             | B    | 1                                         | 0.60      | 1                                                                                                                                                                           |    |   |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| SK02             | B    | 1                                         | 0.60      | 1                                                                                                                                                                           |    |   |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| SK05             | B    | 1                                         | 0.60      | 1                                                                                                                                                                           |    |   |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS01             | D    | 1                                         | 0.80      |                                                                                                                                                                             | 1  |   |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS01             | D    | 2                                         | 1.80      |                                                                                                                                                                             | 1  |   |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS01             | D    | 3                                         | 2.80      |                                                                                                                                                                             | 1  |   |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS02             | D    | 1                                         | 0.80      |                                                                                                                                                                             | 1  | 1 |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS02             | D    | 2                                         | 1.80      |                                                                                                                                                                             | 1  |   | 1 |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS02             | D    | 3                                         | 2.80      |                                                                                                                                                                             | 1  |   | 1 |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS03             | D    | 1                                         | 0.80      |                                                                                                                                                                             | 1  |   |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS03             | D    | 2                                         | 1.80      |                                                                                                                                                                             | 1  | 1 |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS03             | D    | 3                                         | 2.80      |                                                                                                                                                                             | 1  | 1 |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS03             | D    | 4                                         | 3.80      |                                                                                                                                                                             | 1  | 1 | 1 | 1 |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS03             | D    | 5                                         | 4.80      |                                                                                                                                                                             |    |   |   |   | 1 |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS04             | D    | 1                                         | 0.80      |                                                                                                                                                                             | 1  |   |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS04             | D    | 2                                         | 1.80      |                                                                                                                                                                             | 1  |   | 1 |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| WS05             | D    | 1                                         | 0.90      |                                                                                                                                                                             |    | 1 |   |   |   |  |  |             |  |            |  |  |  |  |                 |  |  |                |
| Totals           |      |                                           |           | 3                                                                                                                                                                           | 12 | 5 | 4 | 1 | 1 |  |  |             |  |            |  |  |  |  | End of Schedule |  |  |                |



# TEST REPORT

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|                          |           |                                                                                                                                                                           |      |                   |                                                                                                                         |                                            |
|--------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Contract                 |           | University Academy, Long Sutton, Spalding                                                                                                                                 |      |                   |                                                                                                                         |                                            |
| Serial No.               |           | 44184_1                                                                                                                                                                   |      |                   |                                                                                                                         |                                            |
|                          |           |                                                                                                                                                                           |      |                   |                                                                                                                         |                                            |
| SUMMARY OF WATER CONTENT |           |                                                                                                                                                                           |      |                   |                                                                                                                         |                                            |
| Borehole /Pit No.        | Depth (m) | Type                                                                                                                                                                      | Ref. | Water Content (%) | Description                                                                                                             | Remarks                                    |
| WS01                     | 0.80      | D                                                                                                                                                                         | 1    | 30.0              | Yellowish brown slightly clayey SILT with rare recently active roots.                                                   |                                            |
| WS01                     | 1.80      | D                                                                                                                                                                         | 2    | 28.4              | Very soft yellowish brown silty CLAY with rare orange staining and recently active roots.                               |                                            |
| WS01                     | 2.80      | D                                                                                                                                                                         | 3    | 37.0              | Very soft yellowish brown silty CLAY with locally dark grey organic pockets and rare recently active and decayed roots. |                                            |
| WS02                     | 0.80      | D                                                                                                                                                                         | 1    | 26.9              | Yellowish brown SILT with rare recently active roots.                                                                   |                                            |
| WS02                     | 1.80      | D                                                                                                                                                                         | 2    | 29.8              | Yellowish brown slightly sandy silty CLAY.                                                                              |                                            |
| WS02                     | 2.80      | D                                                                                                                                                                         | 3    | 51.6              | Very dark grey and brown organic clayey SILT.                                                                           | Dried at 50°C due to high organic content. |
| WS03                     | 0.80      | D                                                                                                                                                                         | 1    | 27.0              | Yellowish brown SILT with rare recently active roots.                                                                   |                                            |
| WS03                     | 1.80      | D                                                                                                                                                                         | 2    | 27.2              | Yellowish brown slightly clayey SILT with rare orange staining and recently active roots.                               |                                            |
| WS03                     | 2.80      | D                                                                                                                                                                         | 3    | 35.1              | Yellowish brown CLAY/SILT with rare fine chert gravel.                                                                  |                                            |
| WS03                     | 3.80      | D                                                                                                                                                                         | 4    | 38.9              | Very soft greyish brown slightly sandy silty CLAY with occasional shell debris.                                         | Wet sieved due to shell debris.            |
| WS04                     | 0.80      | D                                                                                                                                                                         | 1    | 25.8              | Very soft yellowish brown silty CLAY with rare recently active roots.                                                   |                                            |
| WS04                     | 1.80      | D                                                                                                                                                                         | 2    | 25.4              | Soft mottled light grey and yellowish brown silty CLAY with rare orange staining.                                       |                                            |
|                          |           |                                                                                                                                                                           |      |                   |                                                                                                                         |                                            |
|                          |           |                                                                                                                                                                           |      |                   |                                                                                                                         |                                            |
| Method Of Preparation:   |           | BS EN ISO: 17892-1: 2014                                                                                                                                                  |      |                   |                                                                                                                         |                                            |
| Method of Test:          |           | BS EN ISO: 17892-1: 2014                                                                                                                                                  |      |                   |                                                                                                                         |                                            |
| Type of Sample Key:      |           | U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter                                                                   |      |                   |                                                                                                                         |                                            |
| Comments:                |           |                                                                                                                                                                           |      |                   |                                                                                                                         |                                            |
| Remarks to Include:      |           | Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample, oven drying temperature if not 105-110C |      |                   |                                                                                                                         |                                            |



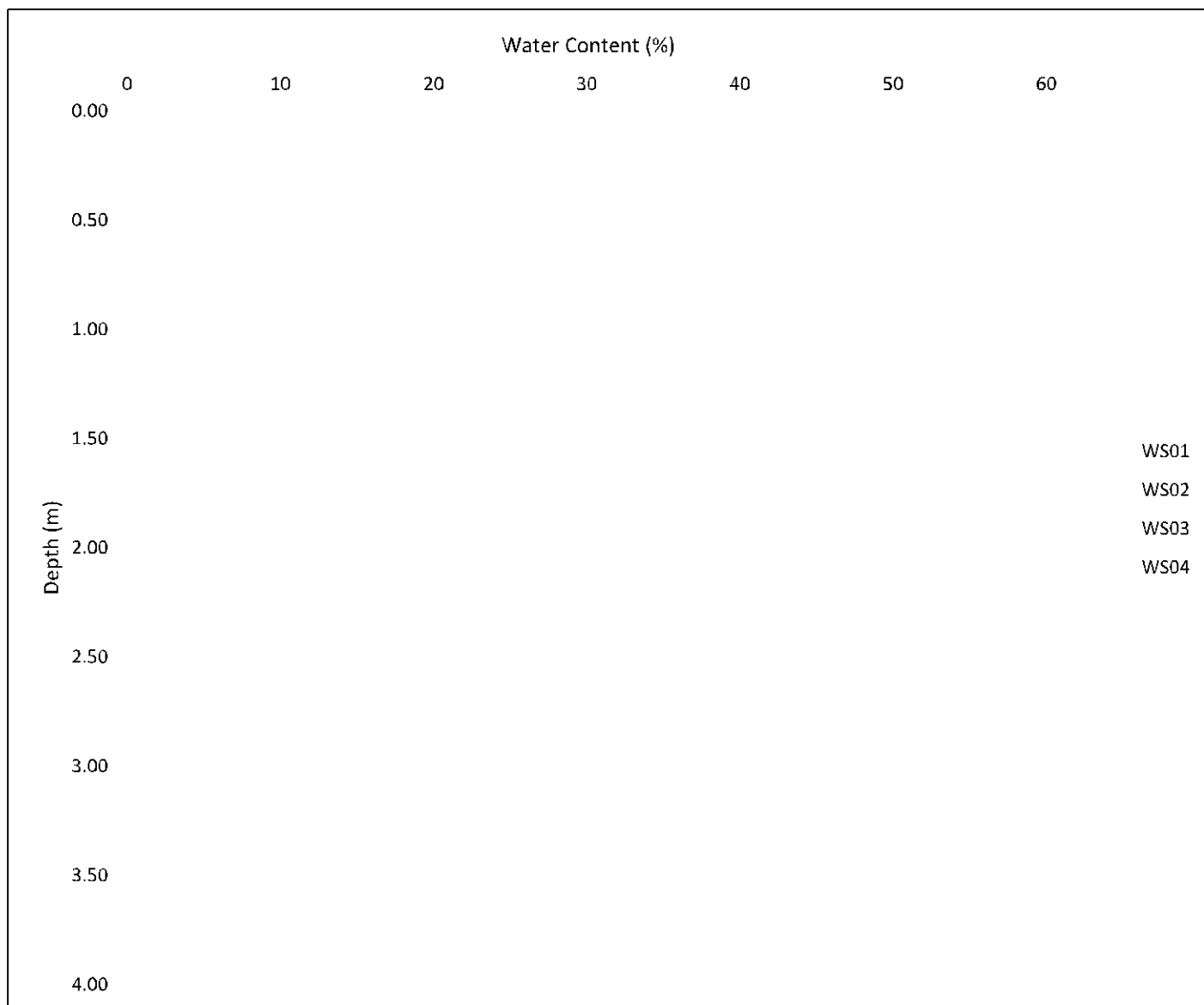
# TEST REPORT

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|            |                                           |
|------------|-------------------------------------------|
| Contract   | University Academy, Long Sutton, Spalding |
| Serial No. | 44184_1                                   |

## WATER CONTENT VS DEPTH BELOW GROUND LEVEL



|                        |                                                                                                                                                                            |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Method of Preparation: | BSEN ISO 17892-1: 2014                                                                                                                                                     |
| Method of Test:        | BSEN ISO 17892-1: 2014                                                                                                                                                     |
| Type of Sample Key:    | U - Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter                                                                    |
| Comments:              |                                                                                                                                                                            |
| Remarks to Include:    | Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample, oven drying temperature if not 105-110°C |



# TEST REPORT

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|            |                                           |
|------------|-------------------------------------------|
| Contract   | University Academy, Long Sutton, Spalding |
| Serial No. | 44184_1                                   |

## SUMMARY OF WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

| Borehole /Pit No. | Depth (m) | Type | Ref. | Water Content (%) | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index (%) | Liquidity Index | Sample Preparation |                   |                     |                   | Description                                                                       | Class |
|-------------------|-----------|------|------|-------------------|------------------|-------------------|----------------------|-----------------|--------------------|-------------------|---------------------|-------------------|-----------------------------------------------------------------------------------|-------|
|                   |           |      |      |                   |                  |                   |                      |                 | Method             | Ret'd 0.425mm (%) | Corr'd W/C <0.425mm | Curing Time (hrs) |                                                                                   |       |
| WS02              | 1.80      | D    | 2    | 29.8              | 33               | 20                | 13                   | 0.76            | From Natural       | 0 (A)             |                     | 25                | Yellowish brown slightly sandy silty CLAY.                                        | CL    |
| WS02              | 2.80      | D    | 3    | 51.6              | 66               | 38                | 28                   | 0.49            | From Natural       | 0 (A)             |                     | 25                | Very dark grey and brown organic clayey SILT.                                     | MHO   |
| WS03              | 3.80      | D    | 4    | 38.9              | 33               | 16                | 17                   | 1.34            | Wet Sieved         | 4 (M)             | 40.5*               | 97                | Very soft greyish brown slightly sandy silty CLAY with occasional shell debris.   | CL    |
| WS04              | 1.80      | D    | 2    | 25.4              | 40               | 22                | 18                   | 0.19            | From Natural       | 0 (A)             |                     | 25                | Soft mottled light grey and yellowish brown silty CLAY with rare orange staining. | CI    |
|                   |           |      |      |                   |                  |                   |                      |                 |                    |                   |                     |                   |                                                                                   |       |
|                   |           |      |      |                   |                  |                   |                      |                 |                    |                   |                     |                   |                                                                                   |       |
|                   |           |      |      |                   |                  |                   |                      |                 |                    |                   |                     |                   |                                                                                   |       |
|                   |           |      |      |                   |                  |                   |                      |                 |                    |                   |                     |                   |                                                                                   |       |
|                   |           |      |      |                   |                  |                   |                      |                 |                    |                   |                     |                   |                                                                                   |       |
|                   |           |      |      |                   |                  |                   |                      |                 |                    |                   |                     |                   |                                                                                   |       |

|                        |                                                                                                                        |
|------------------------|------------------------------------------------------------------------------------------------------------------------|
| Method Of Preparation: | BS EN ISO: 17892-1: 2014 & BS 1377: Part 2:1990:4.2                                                                    |
| Method of Test:        | BS EN ISO: 17892-1: 2014 & BS 1377: Part 2:1990:3.2, 4.4, 5.3, 5.4                                                     |
| Type of Sample Key:    | U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter                |
| Comments:              | *Corrected water content assume material greater than 0.425mm is non-porous. See BS1377: Part 2: 1990 Clause 3 Note 1. |
| Table Notation:        | Ret'd 0.425mm: (A) = Assumed, (M) = Measured                                                                           |



# TEST REPORT

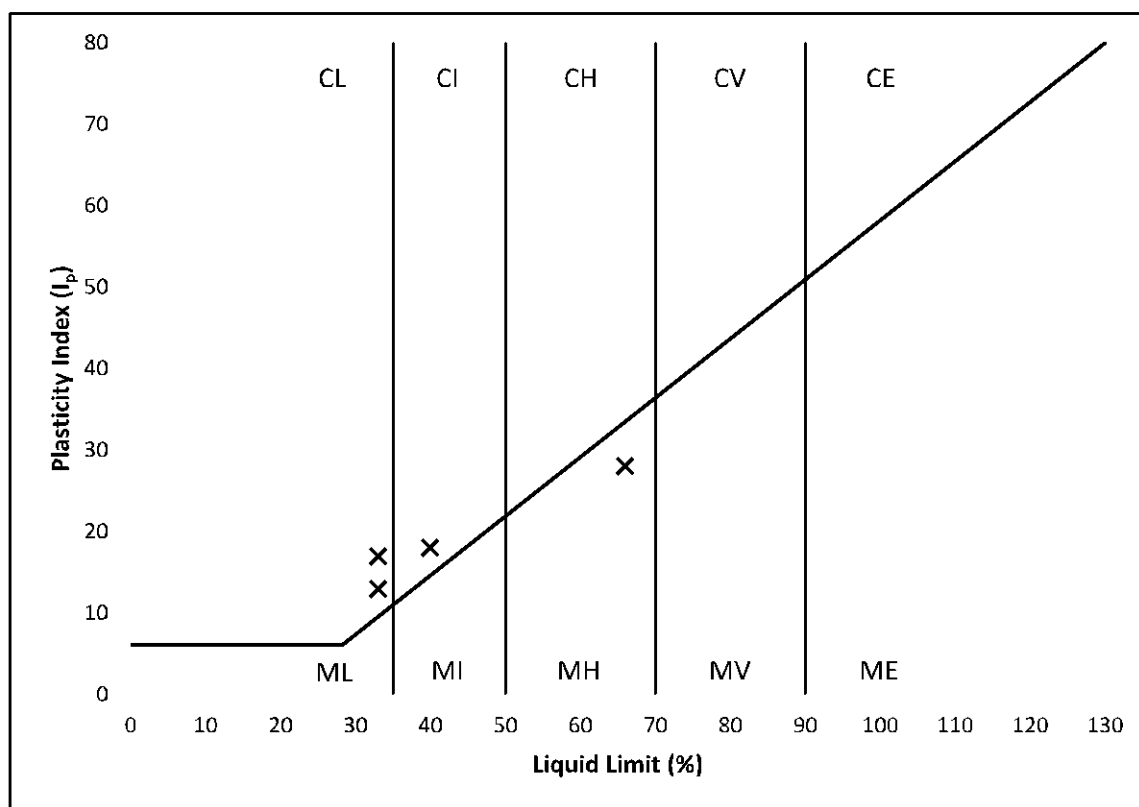
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|            |                                           |
|------------|-------------------------------------------|
| Contract   | University Academy, Long Sutton, Spalding |
| Serial No. | 44184_1                                   |

## PLOT OF PLASTICITY INDEX AGAINST LIQUID LIMIT USING CASAGRANDE CLASSIFICATION CHART

| Plasticity |        |      |           |                |
|------------|--------|------|-----------|----------------|
| Low        | Medium | High | Very High | Extremely High |



Plasticity Chart BS5930: 2015: Figure 8

|                        |                                                                                                         |
|------------------------|---------------------------------------------------------------------------------------------------------|
| Method of Preparation: | BS 1377: Part 2: 1990: 4.2                                                                              |
| Method of Test:        | BS1377: Part 2: 3.2, 4.4, 5.3, 5.4                                                                      |
| Type of Sample Key:    | U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter |
| Comments:              | Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index                         |



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|                                                                                                                              |                                           |                          |        |                        |                                            |                     |              |
|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------|--------|------------------------|--------------------------------------------|---------------------|--------------|
| Contract                                                                                                                     | University Academy, Long Sutton, Spalding |                          |        |                        |                                            |                     |              |
| Serial No.                                                                                                                   | 44184_1                                   |                          |        |                        |                                            |                     |              |
| <b>DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX</b> |                                           |                          |        |                        |                                            |                     |              |
| Borehole / Pit No.                                                                                                           | Depth<br>m                                | Sample<br>Type Reference |        | Water Content<br>(W) % | Description                                | Remarks             |              |
| WS02                                                                                                                         | 1.80                                      | D                        | 2      | 29.8                   | Yellowish brown slightly sandy silty CLAY. |                     |              |
| <b>PREPARATION</b>                                                                                                           |                                           |                          |        |                        | Liquid Limit                               | 33 %                |              |
| Method of preparation                                                                                                        |                                           |                          |        |                        | From natural                               | Plastic Limit       | 20 %         |
| Sample retained 0.425mm sieve (Assumed)                                                                                      |                                           |                          |        |                        | 0 %                                        | Plasticity Index    | 13 %         |
| Corrected water content for material passing 0.425mm                                                                         |                                           |                          |        |                        |                                            | Liquidity Index     | 0.76         |
| Sample retained 2mm sieve (Assumed)                                                                                          |                                           |                          |        |                        | 0 %                                        | NHBC Modified (I'p) | n/a          |
| Curing time                                                                                                                  |                                           |                          | 25 hrs | Clay Content           | Not analysed                               | Derived Activity    | Not analysed |
| <div><div><div>C=CLAY</div><div>M=SILT</div></div><div></div><div>Plasticity Chart BS5930: 2015: Figure 8</div></div>        |                                           |                          |        |                        |                                            |                     |              |
| Method of Preparation: BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 4.2                                                 |                                           |                          |        |                        |                                            |                     |              |
| Method of Test: BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 3.2, 4.4, 5.3, 5.4                                         |                                           |                          |        |                        |                                            |                     |              |
| Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter                |                                           |                          |        |                        |                                            |                     |              |
| Comments:                                                                                                                    |                                           |                          |        |                        |                                            |                     |              |



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|                                                                                                                          |                                           |                         |   |                        |                                               |                                                          |              |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------|---|------------------------|-----------------------------------------------|----------------------------------------------------------|--------------|
| Contract                                                                                                                 | University Academy, Long Sutton, Spalding |                         |   |                        |                                               |                                                          |              |
| Serial No.                                                                                                               | 44184_1                                   |                         |   |                        |                                               |                                                          |              |
| DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND<br>DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX |                                           |                         |   |                        |                                               |                                                          |              |
| Borehole / Pit No.                                                                                                       | Depth<br>m                                | Sample<br>TypeReference |   | Water Content<br>(W) % | Description                                   | Remarks                                                  |              |
| WS02                                                                                                                     | 2.80                                      | D                       | 3 | 51.6                   | Very dark grey and brown organic clayey SILT. | Specimen oven dried at 50°C due to high organic content. |              |
| PREPARATION                                                                                                              |                                           |                         |   |                        | Liquid Limit                                  | 66 %                                                     |              |
| Method of preparation                                                                                                    |                                           |                         |   |                        | From natural                                  | Plastic Limit                                            | 38 %         |
| Sample retained 0.425mm sieve (Assumed)                                                                                  |                                           |                         |   |                        | 0 %                                           | Plasticity Index                                         | 28 %         |
| Corrected water content for material passing 0.425mm                                                                     |                                           |                         |   |                        |                                               | Liquidity Index                                          | 0.49         |
| Sample retained 2mm sieve (Assumed)                                                                                      |                                           |                         |   |                        | 0 %                                           | NHBC Modified (I'p)                                      | n/a          |
| Curing time                                                                                                              |                                           | 25 hrs                  |   | Clay Content           | Not analysed                                  | Derived Activity                                         | Not analysed |
| <div><div><div>C=CLAY</div><div>M=SILT</div></div><div></div><div>Plasticity Chart BS5930: 2015: Figure 8</div></div>    |                                           |                         |   |                        |                                               |                                                          |              |
| Method of Preparation: BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 4.2                                             |                                           |                         |   |                        |                                               |                                                          |              |
| Method of Test: BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 3.2, 4.4, 5.3, 5.4                                     |                                           |                         |   |                        |                                               |                                                          |              |
| Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter            |                                           |                         |   |                        |                                               |                                                          |              |
| Comments:                                                                                                                |                                           |                         |   |                        |                                               |                                                          |              |



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|                                                                                                                                                                                                                                                                                          |                                           |                         |        |                        |                                                                                 |                                 |              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------|--------|------------------------|---------------------------------------------------------------------------------|---------------------------------|--------------|
| Contract                                                                                                                                                                                                                                                                                 | University Academy, Long Sutton, Spalding |                         |        |                        |                                                                                 |                                 |              |
| Serial No.                                                                                                                                                                                                                                                                               | 44184_1                                   |                         |        |                        |                                                                                 |                                 |              |
| DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND<br>DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX                                                                                                                                                                 |                                           |                         |        |                        |                                                                                 |                                 |              |
| Borehole / Pit No.                                                                                                                                                                                                                                                                       | Depth<br>m                                | Sample<br>TypeReference |        | Water Content<br>(W) % | Description                                                                     | Remarks                         |              |
| WS03                                                                                                                                                                                                                                                                                     | 3.80                                      | D                       | 4      | 38.9                   | Very soft greyish brown slightly sandy silty CLAY with occasional shell debris. | Wet sieved due to shell debris. |              |
| PREPARATION                                                                                                                                                                                                                                                                              |                                           |                         |        |                        | Liquid Limit                                                                    | 33 %                            |              |
| Method of preparation                                                                                                                                                                                                                                                                    |                                           |                         |        |                        | Wet sieved over 0.425mm sieve                                                   | Plastic Limit                   | 16 %         |
| Sample retained 0.425mm sieve (Measured)                                                                                                                                                                                                                                                 |                                           |                         |        |                        | 4 %                                                                             | Plasticity Index                | 17 %         |
| Corrected water content for material passing 0.425mm                                                                                                                                                                                                                                     |                                           |                         |        |                        | Not reported                                                                    | Liquidity Index                 | 1.34         |
| Sample retained 2mm sieve (Measured)                                                                                                                                                                                                                                                     |                                           |                         |        |                        | 3 %                                                                             | NHBC Modified (I'p)             | 16 %         |
| Curing time                                                                                                                                                                                                                                                                              |                                           |                         | 97 hrs | Clay Content           | Not analysed                                                                    | Derived Activity                | Not analysed |
| <div><div><div>C=CLAY</div><div>M=SILT</div></div><div></div></div> <p>Plasticity Chart BS5930: 2015: Figure 8</p>                                                                                                                                                                       |                                           |                         |        |                        |                                                                                 |                                 |              |
| Method of Preparation: BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 4.2                                                                                                                                                                                                             |                                           |                         |        |                        |                                                                                 |                                 |              |
| Method of Test: BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 3.2, 4.4, 5.3, 5.4                                                                                                                                                                                                     |                                           |                         |        |                        |                                                                                 |                                 |              |
| Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter                                                                                                                                                                            |                                           |                         |        |                        |                                                                                 |                                 |              |
| Comments: Corrected water content assume material greater than 0.425mm non-porous. See BS1377: Part2: 1990 Clause 3 Note 1<br>Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index<br>Note: Modified Plasticity Index I'p = Ip x (% less than 425microns/100) |                                           |                         |        |                        |                                                                                 |                                 |              |



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|                                                                                                                          |                                           |                         |   |                        |                                                                                   |                                 |              |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------|---|------------------------|-----------------------------------------------------------------------------------|---------------------------------|--------------|
| Contract                                                                                                                 | University Academy, Long Sutton, Spalding |                         |   |                        |                                                                                   |                                 |              |
| Serial No.                                                                                                               | 44184_1                                   |                         |   |                        |                                                                                   |                                 |              |
| DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND<br>DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX |                                           |                         |   |                        |                                                                                   |                                 |              |
| Borehole / Pit No.                                                                                                       | Depth<br>m                                | Sample<br>TypeReference |   | Water Content<br>(W) % | Description                                                                       | Remarks                         |              |
| WS04                                                                                                                     | 1.80                                      | D                       | 2 | 25.4                   | Soft mottled light grey and yellowish brown silty CLAY with rare orange staining. |                                 |              |
| PREPARATION                                                                                                              |                                           |                         |   |                        | Liquid Limit                                                                      | 40 %                            |              |
| Method of preparation                                                                                                    |                                           |                         |   |                        | From natural                                                                      | Plastic Limit                   | 22 %         |
| Sample retained 0.425mm sieve (Assumed)                                                                                  |                                           |                         |   |                        | 0 %                                                                               | Plasticity Index                | 18 %         |
| Corrected water content for material passing 0.425mm                                                                     |                                           |                         |   |                        |                                                                                   | Liquidity Index                 | 0.19         |
| Sample retained 2mm sieve (Assumed)                                                                                      |                                           |                         |   |                        | 0 %                                                                               | NHBC Modified (I <sub>p</sub> ) | n/a          |
| Curing time                                                                                                              |                                           | 25 hrs                  |   | Clay Content           | Not analysed                                                                      | Derived Activity                | Not analysed |
| <div><div><div>C=CLAY</div><div>M=SILT</div></div><div></div></div> <p>Plasticity Chart BS5930: 2015: Figure 8</p>       |                                           |                         |   |                        |                                                                                   |                                 |              |



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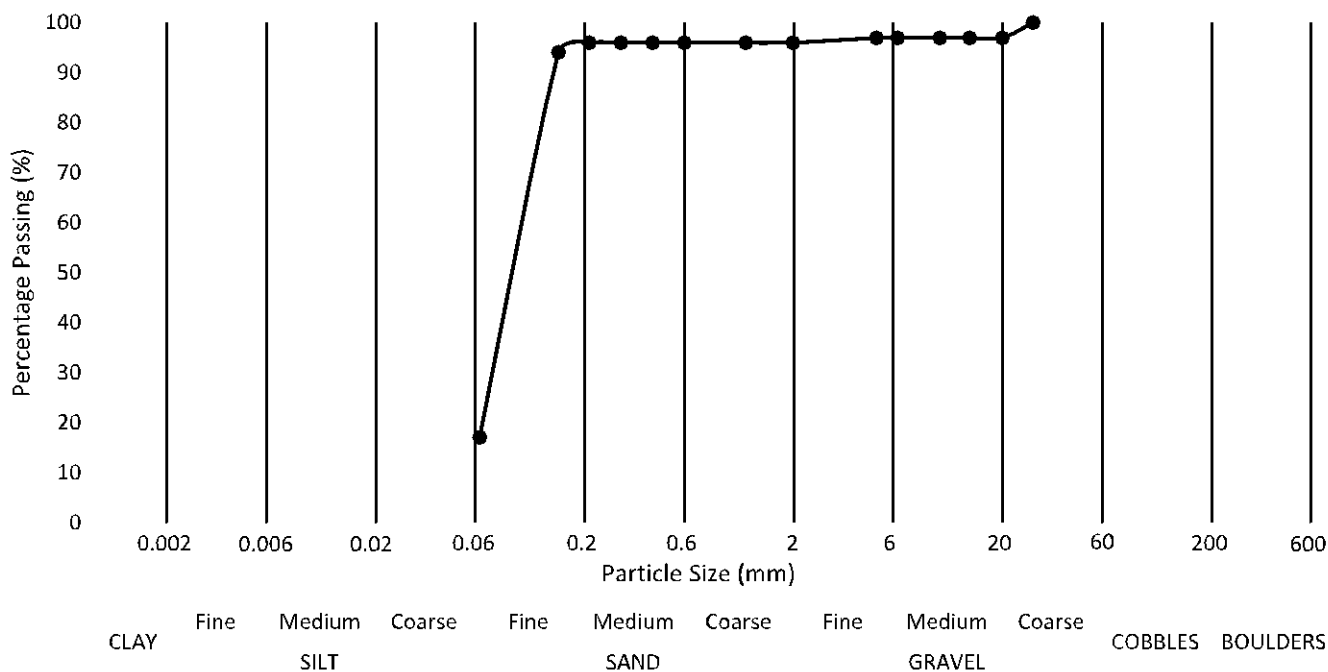


|            |                                           |
|------------|-------------------------------------------|
| Contract   | University Academy, Long Sutton, Spalding |
| Serial No. | 44184_1                                   |

## DETERMINATION OF PARTICLE SIZE DISTRIBUTION

| Borehole / Pit No. | Depth (m) | Sample |           | Description                                                                                                     | Remarks |
|--------------------|-----------|--------|-----------|-----------------------------------------------------------------------------------------------------------------|---------|
|                    |           | Type   | Reference |                                                                                                                 |         |
| WS03               | 4.80      | D      | 5         | Dark greyish brown slightly gravelly silty SAND. Gravel is brown, black and white angular to sub angular chert. |         |

Method of Test: Wet Sieve      Method of Pretreatment: Not required



| Hydrometer | Particle Size (mm) | Passing (%) | Silt by Dry Mass (%) |
|------------|--------------------|-------------|----------------------|
|            | 0.075              |             |                      |
|            | 0.15               |             |                      |
|            | 0.3                |             |                      |
|            | 0.6                |             |                      |
|            | 1.0                |             |                      |
|            | 2.0                |             |                      |
|            | 4.0                |             |                      |
|            |                    |             | Clay by Dry Mass (%) |
|            |                    |             |                      |

| Sieve Size (mm) | Passing (%) | Sand By Dry Mass (%) |
|-----------------|-------------|----------------------|
| 2.00            | 96          | 79                   |
| 1.18            | 96          |                      |
| 0.600           | 96          |                      |
| 0.425           | 96          |                      |
| 0.300           | 96          |                      |
| 0.212           | 96          |                      |
| 0.150           | 94          |                      |
| 0.063           | 17          |                      |

| Fines By Dry Mass (%) |    |
|-----------------------|----|
| <0.063mm              | 17 |

| Sieve Size (mm) | Passing (%) | 2mm+ By Dry Mass (%) |
|-----------------|-------------|----------------------|
| 300             |             | 4                    |
| 125             |             |                      |
| 90              |             |                      |
| 63              |             |                      |
| 50              |             |                      |
| 37.5            |             |                      |
| 28              | 100         |                      |
| 20              | 97          |                      |
| 14              | 97          |                      |
| 10              | 97          |                      |
| 6.3             | 97          |                      |
| 5               | 97          |                      |

Method of Preparation: BS1377: Part 1: 2016: 8.3 & 8.4.5  
Method of test: BS1377: Part 2: 1990: 9.2  
Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter  
Comments:



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|            |                                           |
|------------|-------------------------------------------|
| Contract   | University Academy, Long Sutton, Spalding |
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## CALIFORNIA BEARING RATIO TEST

| Borehole /Pit No. | Depth (m) | Sample |           | Description                                           | Remarks |
|-------------------|-----------|--------|-----------|-------------------------------------------------------|---------|
|                   |           | Type   | Reference |                                                       |         |
| SK01              | 0.60      | B      | 1         | Yellowish brown SILT with rare recently active roots. |         |

### Specimen Preparation

|           |                                                               |
|-----------|---------------------------------------------------------------|
| Condition | Remoulded                                                     |
| Details   | Recompacted with specified standard effort using 2.5kg rammer |

| Soaking Details          | Not Soaked |      |
|--------------------------|------------|------|
| Period of Soaking        |            | days |
| Time to Surface          |            | days |
| Amount of Swell Recorded |            | mm   |
| Initial Water Content    |            | %    |

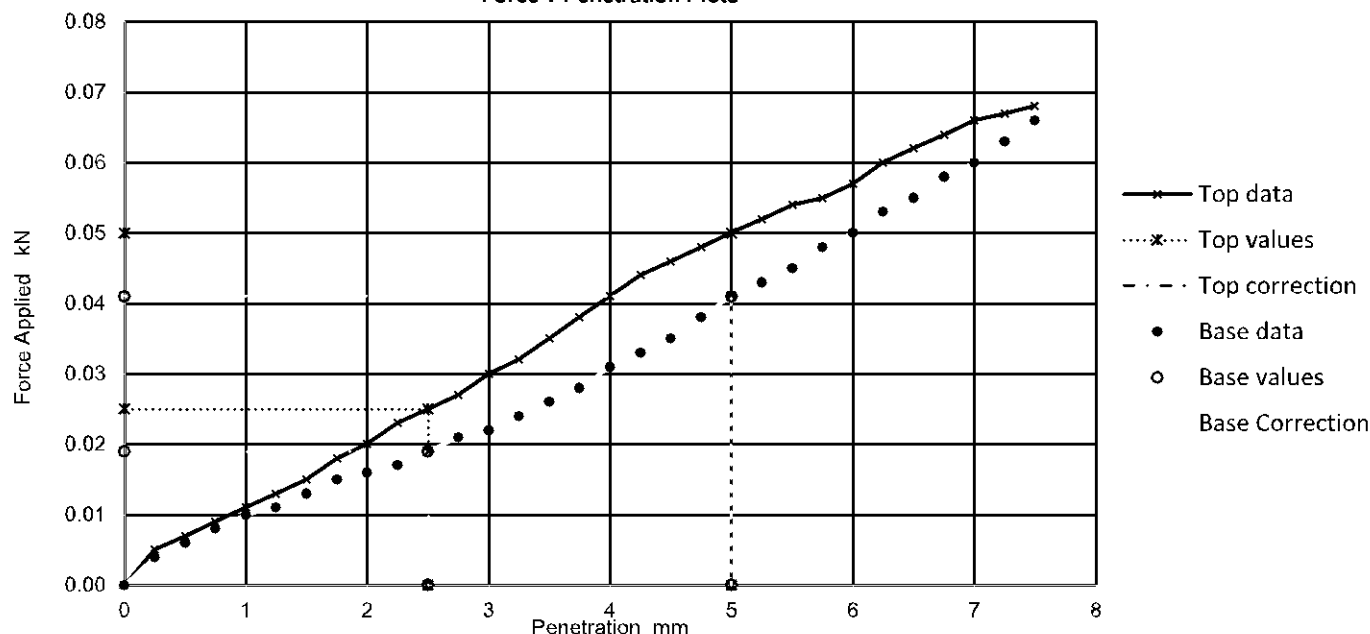
|                                         |              |                        |
|-----------------------------------------|--------------|------------------------|
| Material Retained on 20mm Sieve Removed | 0.0          | %                      |
| Initial Specimen Details:               | Bulk Density | 1.89 Mg/m <sup>3</sup> |
|                                         | Dry Density  | 1.48 Mg/m <sup>3</sup> |

|                   |    |    |
|-------------------|----|----|
| Surcharge Applied | 15 | kg |
|-------------------|----|----|

### Test Results

|      | Curve Correction | CBR Values (%) |       |         |       | Water Content (%) |
|------|------------------|----------------|-------|---------|-------|-------------------|
|      |                  | 2.5mm          | 5.0mm | Highest | Mean* |                   |
| TOP  | No               | 0.2            | 0.3   | 0.3     | 0.2   | 28.0              |
| BASE | No               | 0.1            | 0.2   |         |       | 27.4              |

Force v Penetration Plots



|                        |                                                                                                                                                                                                                             |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Method of Preparation: | BS1377: Part1: 2016 & BS1377: Part 4: 1990: 7.2.4.4                                                                                                                                                                         |
| Method of Test:        | BS 1377: Part 4: 1990: 7                                                                                                                                                                                                    |
| Type of Sample Key     | U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT= Split Spoon Sample, C = Core Cutter                                                                                                                      |
| Comments:              | *Only reported if the results from each end of the sample are within $\pm 10\%$ of the mean value.<br>Note:- CBR Results are water content dependent - an increase in water content will result in a decrease of CBR value. |



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## CALIFORNIA BEARING RATIO TEST

| Borehole /Pit No. | Depth (m) | Sample |           | Description                                                  | Remarks |
|-------------------|-----------|--------|-----------|--------------------------------------------------------------|---------|
|                   |           | Type   | Reference |                                                              |         |
| SK02              | 0.60      | B      | 1         | Yellowish brown clayey SILT with rare recently active roots. |         |

### Specimen Preparation

|           |                                                               |
|-----------|---------------------------------------------------------------|
| Condition | Remoulded                                                     |
| Details   | Recompacted with specified standard effort using 2.5kg rammer |

| Soaking Details          | Not Soaked |      |
|--------------------------|------------|------|
| Period of Soaking        |            | days |
| Time to Surface          |            | days |
| Amount of Swell Recorded |            | mm   |
| Initial Water Content    |            | %    |

|                                         |              |                        |
|-----------------------------------------|--------------|------------------------|
| Material Retained on 20mm Sieve Removed | 0.0          | %                      |
| Initial Specimen Details:               | Bulk Density | 1.92 Mg/m <sup>3</sup> |
|                                         | Dry Density  | 1.51 Mg/m <sup>3</sup> |

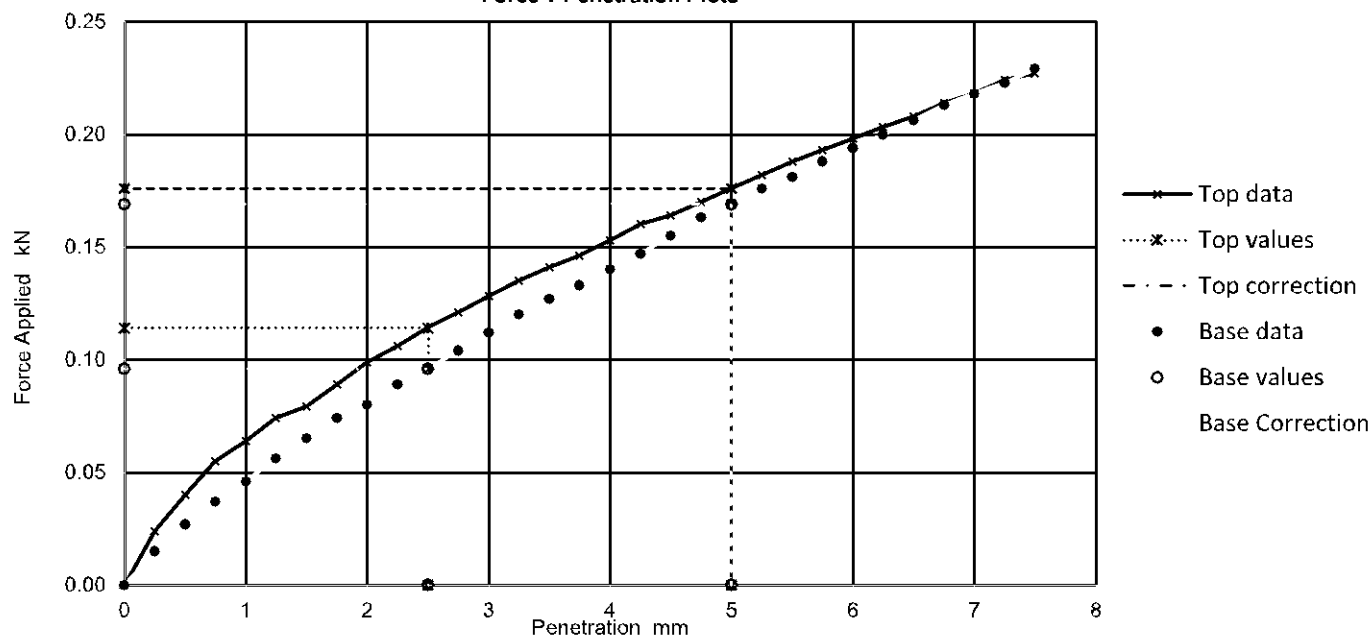
|                   |    |    |
|-------------------|----|----|
| Surcharge Applied | 15 | kg |
|-------------------|----|----|

### Test Results

|      | Curve Correction | CBR Values (%) |       |         |       |
|------|------------------|----------------|-------|---------|-------|
|      |                  | 2.5mm          | 5.0mm | Highest | Mean* |
| TOP  | No               | 0.9            | 0.9   | 0.9     | 0.9   |
| BASE | No               | 0.7            | 0.9   |         |       |

| Water Content (%) |
|-------------------|
| 27.4              |
| 27.3              |

Force v Penetration Plots



|                        |                                                                                                                                                                                                                             |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Method of Preparation: | BS1377: Part1: 2016 & BS1377: Part 4: 1990: 7.2.4.4                                                                                                                                                                         |
| Method of Test:        | BS 1377: Part 4: 1990: 7                                                                                                                                                                                                    |
| Type of Sample Key     | U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT= Split Spoon Sample, C = Core Cutter                                                                                                                      |
| Comments:              | *Only reported if the results from each end of the sample are within $\pm 10\%$ of the mean value.<br>Note:- CBR Results are water content dependent - an increase in water content will result in a decrease of CBR value. |



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|            |                                           |
|------------|-------------------------------------------|
| Contract   | University Academy, Long Sutton, Spalding |
| Serial No. | 44184_1                                   |

## CALIFORNIA BEARING RATIO TEST

| Borehole /Pit No. | Depth (m) | Sample |           | Description                                           | Remarks |
|-------------------|-----------|--------|-----------|-------------------------------------------------------|---------|
|                   |           | Type   | Reference |                                                       |         |
| SK05              | 0.60      | B      | 1         | Yellowish brown SILT with rare recently active roots. |         |

### Specimen Preparation

|           |                                                               |
|-----------|---------------------------------------------------------------|
| Condition | Remoulded                                                     |
| Details   | Recompacted with specified standard effort using 2.5kg rammer |

| Soaking Details          | Not Soaked |      |
|--------------------------|------------|------|
| Period of Soaking        |            | days |
| Time to Surface          |            | days |
| Amount of Swell Recorded |            | mm   |
| Initial Water Content    |            | %    |

|                                         |              |                        |
|-----------------------------------------|--------------|------------------------|
| Material Retained on 20mm Sieve Removed | 0.0          | %                      |
| Initial Specimen Details:               | Bulk Density | 1.88 Mg/m <sup>3</sup> |
|                                         | Dry Density  | 1.46 Mg/m <sup>3</sup> |

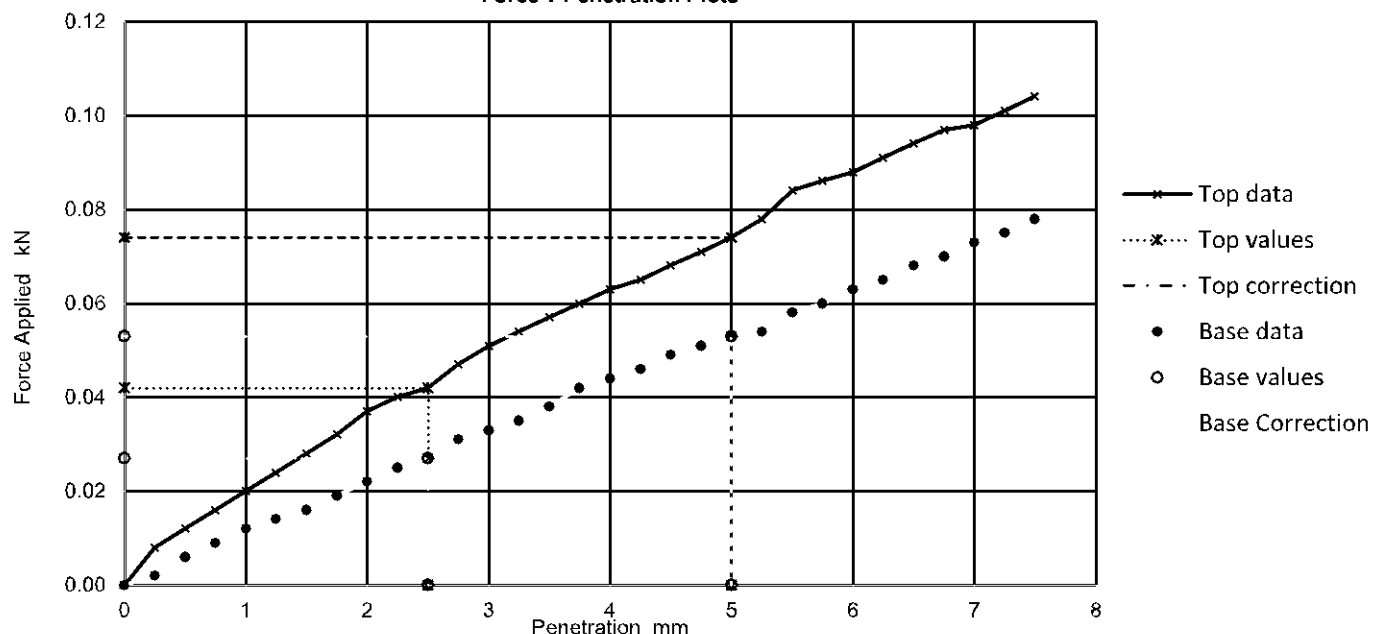
|                   |    |    |
|-------------------|----|----|
| Surcharge Applied | 15 | kg |
|-------------------|----|----|

### Test Results

|      | Curve Correction | CBR Values (%) |       |         |       |
|------|------------------|----------------|-------|---------|-------|
|      |                  | 2.5mm          | 5.0mm | Highest | Mean* |
| TOP  | No               | 0.3            | 0.4   | 0.4     |       |
| BASE | No               | 0.2            | 0.3   |         |       |

| Water Content (%) |
|-------------------|
| 28.6              |
| 28.5              |

Force v Penetration Plots



|                        |                                                                                                                                                                                                                             |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Method of Preparation: | BS1377: Part1: 2016 & BS1377: Part 4: 1990: 7.2.4.4                                                                                                                                                                         |
| Method of Test:        | BS 1377: Part 4: 1990: 7                                                                                                                                                                                                    |
| Type of Sample Key     | U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT= Split Spoon Sample, C = Core Cutter                                                                                                                      |
| Comments:              | *Only reported if the results from each end of the sample are within $\pm 10\%$ of the mean value.<br>Note:- CBR Results are water content dependent - an increase in water content will result in a decrease of CBR value. |



# TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD  
DATE ISSUED: 28/02/2024

|            |                                           |
|------------|-------------------------------------------|
| Contract:  | University Academy, Long Sutton, Spalding |
| Serial No: | 44184_1                                   |

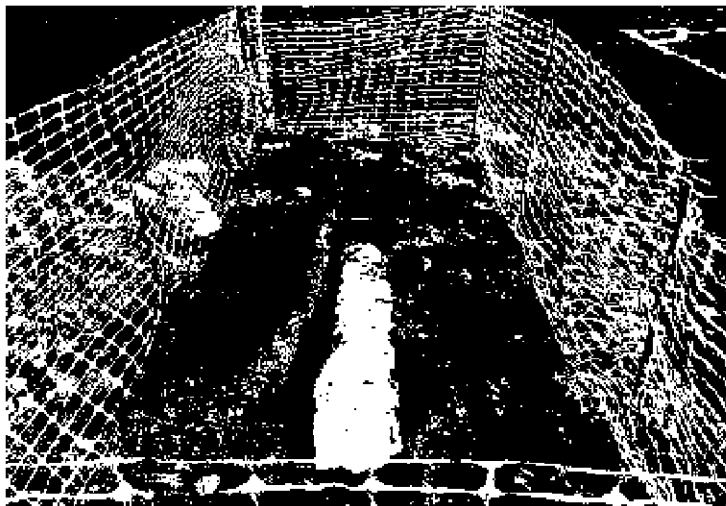
## DETERMINATION OF THE SULPHATE CONTENT AND pH OF SOIL AND GROUNDWATER

| Borehole / Pit No. | Depth (m) | Sample |      | Conc. of Soluble SO <sub>3</sub> |                    | Calc'd                         | pH Value | % Sample Passing 2mm Sieve | Description                                                                               | Remarks |
|--------------------|-----------|--------|------|----------------------------------|--------------------|--------------------------------|----------|----------------------------|-------------------------------------------------------------------------------------------|---------|
|                    |           | Type   | Ref. | Water Soluble 2:1 (g/L)          | Ground Water (g/L) | Conc. Of SO <sub>4</sub> (g/L) |          |                            |                                                                                           |         |
| WS02               | 0.80      | D      | 1    | 0.03                             |                    | 0.04                           | 7.7      | 100                        | Yellowish brown SILT with rare recently active roots.                                     |         |
| WS03               | 1.80      | D      | 2    | <0.01                            |                    | <0.01                          | 7.7      | 100                        | Yellowish brown slightly clayey SILT with rare orange staining and recently active roots. |         |
| WS03               | 2.80      | D      | 3    | 0.04                             |                    | 0.04                           | 7.6      | 100                        | Yellowish brown CLAY/SILT with rare fine chert gravel.                                    |         |
| WS03               | 3.80      | D      | 4    | 0.16                             |                    | 0.19                           | 7.6      | 97                         | Very soft greyish brown slightly sandy silty CLAY with occasional shell debris.           |         |
| WS05               | 0.90      | D      | 1    | 0.04                             |                    | 0.05                           | 7.8      | 100                        | Soft yellowish brown silty CLAY.                                                          |         |
|                    |           |        |      |                                  |                    |                                |          |                            |                                                                                           |         |
|                    |           |        |      |                                  |                    |                                |          |                            |                                                                                           |         |
|                    |           |        |      |                                  |                    |                                |          |                            |                                                                                           |         |

|                        |                                                                                                                                                                             |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Method of Preparation: | BS1377: Part 1: 2016: 8.5, BS1377: Part 3: 1990: 5.3 Soil/Water Extract, 5.4 Groundwater                                                                                    |
| Method of Test:        | BS1377: Part 3: 1990: 5.5                                                                                                                                                   |
| Type of Sample Key:    | U= Undisturbed, B= Bulk, D= Disturbed, J= Jar, W= Water, SPT= Split Spoon Sample, C= Core Cutter                                                                            |
| Comments:              | <b>Test not UKAS accredited</b>                                                                                                                                             |
| Remarks to Include:    | Sample disturbance, loss of moisture, variation from test procedure, location, and origin of test specimen within original sample. Oven drying temperature if not 105-110C. |



Photograph 1



Photograph 3



Photograph 2



Photograph 4



Photograph 1  
Infiltration testing at SK02.

Photograph 2  
Recovered material at WS01.

Photograph 3  
Recovered material at SK04, typical of natural soils underlying site.

Photograph 4  
Example PAK spray test at WS04.

University Academy Long Sutton,  
Spalding, PE12 9LF

8133,GI

Site Photographs

08/03/2024



## Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



5A69Y-9XRL2-SD83B

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

### Job name

8133,GI, University Academy, Long Sutton, Spalding

### Description/Comments

Ground investigation soils lab analysis data

### Project

8133,GI, University Academy, Long Sutton, Spalding

### Site

8133,GI, University Academy, Long Sutton, Spalding

### Classified by

Name:

**Jim Dawson**

Date:

**08 Mar 2024 10:58 GMT**

Telephone:

**01603 298076**

Company:

**Geosphere Environmental Ltd  
Brightwell Barns, Ipswich Road  
Brightwell  
IP10 0BJ**

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

**HazWasteOnline™ Certification:**

**CERTIFIED**

**Course**

**Hazardous Waste Classification  
Most recent 3 year Refresher**

**Date**

**11 Mar 2020  
07 Feb 2023**

Next 3 year Refresher due by Feb 2026

### Purpose of classification

2 - Material Characterisation

### Address of the waste

University Academy, Little London, Long Sutton, Spalding

**Post Code** PE12 9LF

### SIC for the process giving rise to the waste

41201 Construction of commercial buildings

### Description of industry/producer giving rise to the waste

Construction of new commercial buildings including school/ educational facilities

### Description of the specific process, sub-process and/or activity that created the waste

Excavation of building foundations and / or buried utilities trenches, drainage systems

### Description of the waste

Made Ground soils and natural soils - see logs logs of GI report.



CLASSIFIER FOR DETERMINANDS

## Job summary

| # | Sample name          | Depth [m] | Classification Result | Hazard properties | Page |
|---|----------------------|-----------|-----------------------|-------------------|------|
| 1 | WS01 - 0.50          | 0.50      | Non Hazardous         |                   | 3    |
| 2 | WS02-0.20            | 0.20      | Non Hazardous         |                   | 6    |
| 3 | WS02-0.40            | 0.40      | Non Hazardous         |                   | 9    |
| 4 | WS03-0.70            | 0.70      | Non Hazardous         |                   | 11   |
| 5 | WS04-0.50-12/02/2024 | 0.50      | Hazardous             | HP 7, HP 11       | 13   |
| 6 | WS05-0.30            | 0.30      | Non Hazardous         |                   | 16   |
| 7 | SK03-0.50            | 0.50      | Non Hazardous         |                   | 19   |

## Related documents

| # | Name                                   | Description                                           |
|---|----------------------------------------|-------------------------------------------------------|
| 1 | 24-01575.1.xlsx                        | Ground investigation soils lab analysis data; 2 *rpt  |
| 2 | 24-01534.1.xlsx                        | Ground investigation soils lab analysis data; 2 *rpt  |
| 3 | 24-01534.1.pdf                         | Ground investigation soils lab analysis data; 2 * rpt |
| 4 | 24-01575.1.pdf                         | Ground investigation soils lab analysis data; 2 * rpt |
| 5 | 24-01534.1.hwol                        | DETS South .hwol file used to populate the Job        |
| 6 | GEL HWOL waste stream standard Nov2022 | waste stream template used to create this Job         |

## Report

Created by: Jim Dawson

Created date: 08 Mar 2024 10:58 GMT

| Appendices                                                 | Page |
|------------------------------------------------------------|------|
| Appendix A: Classifier defined and non GB MCL determinands | 21   |
| Appendix B: Rationale for selection of metal species       | 22   |
| Appendix C: Version                                        | 23   |

## Classification of sample: WS01 - 0.50

○ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

### Sample details

Sample name:

**WS01 - 0.50**

Sample Depth:

**0.50 m**

Moisture content:

**19.7%**

(wet weight correction)

LoW Code:

Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)

Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

### Hazard properties

None identified

### Determinands

Moisture content: 19.7% Wet Weight Moisture Correction applied (MC)

| #  | Determinand                                                                                                                                             | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|------------|----------|-------------------|--------------|----------------|----------------------|------------|----------------|
| 1  | arsenic { arsenic trioxide }                                                                                                                            | 033-003-00-0        | 215-481-4 | 1327-53-3  |          | 10 mg/kg          | 1.32         | 10.602 mg/kg   | 0.00106 %            | ✓          |                |
| 2  | beryllium { beryllium oxide }                                                                                                                           | 004-003-00-8        | 215-133-1 | 1304-56-9  |          | <0.5 mg/kg        | 2.775        | <1.388 mg/kg   | <0.000139 %          |            | <LOD           |
| 3  | boron { diboron trioxide }                                                                                                                              | 005-008-00-8        | 215-125-8 | 1303-86-2  |          | <1 mg/kg          | 3.22         | <3.22 mg/kg    | <0.000322 %          |            | <LOD           |
| 4  | cadmium { cadmium oxide }                                                                                                                               | 048-002-00-0        | 215-146-2 | 1306-19-0  |          | <0.2 mg/kg        | 1.142        | <0.228 mg/kg   | <0.0000228 %         |            | <LOD           |
| 5  | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }                                                                                |                     | 215-160-9 | 1308-38-9  |          | 17 mg/kg          | 1.462        | 19.952 mg/kg   | 0.002 %              | ✓          |                |
| 6  | chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex } | 024-017-00-8        |           |            |          | <2 mg/kg          | 2.27         | <4.54 mg/kg    | <0.000454 %          |            | <LOD           |
| 7  | copper { dicopper oxide; copper (I) oxide }                                                                                                             | 029-002-00-X        | 215-270-7 | 1317-39-1  |          | 10 mg/kg          | 1.126        | 9.041 mg/kg    | 0.000904 %           | ✓          |                |
| 8  | lead { lead chromate }                                                                                                                                  | 082-004-00-2        | 231-846-0 | 7758-97-6  | 1        | 11 mg/kg          | 1.56         | 13.778 mg/kg   | 0.000883 %           | ✓          |                |
| 9  | mercury { mercury dichloride }                                                                                                                          | 080-010-00-X        | 231-299-8 | 7487-94-7  |          | <1 mg/kg          | 1.353        | <1.353 mg/kg   | <0.000135 %          |            | <LOD           |
| 10 | molybdenum { molybdenum(VI) oxide }                                                                                                                     | 042-001-00-9        | 215-204-7 | 1313-27-5  |          | <1 mg/kg          | 1.5          | <1.5 mg/kg     | <0.00015 %           |            | <LOD           |
| 11 | nickel { nickel chromate }                                                                                                                              | 028-035-00-7        | 238-766-5 | 14721-18-7 |          | 15 mg/kg          | 2.976        | 35.849 mg/kg   | 0.00358 %            | ✓          |                |
| 12 | selenium { nickel selenate }                                                                                                                            | 028-031-00-5        | 239-125-2 | 15060-62-5 |          | <2 mg/kg          | 2.554        | <5.108 mg/kg   | <0.000511 %          |            | <LOD           |
| 13 | zinc { zinc chromate }                                                                                                                                  | 024-007-00-3        | 236-878-9 | 13530-65-9 |          | 44 mg/kg          | 2.774        | 98.016 mg/kg   | 0.0098 %             | ✓          |                |
| 14 | TPH (C6 to C40) petroleum group                                                                                                                         |                     |           | TPH        |          | <42 mg/kg         |              | <42 mg/kg      | <0.0042 %            |            | <LOD           |
| 15 | tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane                                                                                                | 603-181-00-X        | 216-653-1 | 1634-04-4  |          | <0.005 mg/kg      |              | <0.005 mg/kg   | <0.0000005 %         |            | <LOD           |

| #  |   | Determinand                                                                                                                                                                                              |                                                                  |                                                                                                 | CLP Note | User entered data   | Conv. Factor | Compound conc.    | Classification value | M/C Applied | Conc. Not Used |
|----|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------|---------------------|--------------|-------------------|----------------------|-------------|----------------|
|    |   | EU CLP index number                                                                                                                                                                                      | EC Number                                                        | CAS Number                                                                                      |          |                     |              |                   |                      |             |                |
| 16 |   | benzene<br>601-020-00-8                                                                                                                                                                                  | 200-753-7                                                        | 71-43-2                                                                                         |          | <0.002    mg/kg     |              | <0.002    mg/kg   | <0.0000002 %         |             | <LOD           |
| 17 |   | toluene<br>601-021-00-3                                                                                                                                                                                  | 203-625-9                                                        | 108-88-3                                                                                        |          | <0.005    mg/kg     |              | <0.005    mg/kg   | <0.0000005 %         |             | <LOD           |
| 18 | ☐ | ethylbenzene<br>601-023-00-4                                                                                                                                                                             | 202-849-4                                                        | 100-41-4                                                                                        |          | <0.002    mg/kg     |              | <0.002    mg/kg   | <0.0000002 %         |             | <LOD           |
| 19 |   | xylene<br>601-022-00-9                                                                                                                                                                                   | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4]                                    |          | <0.004    mg/kg     |              | <0.004    mg/kg   | <0.0000004 %         |             | <LOD           |
| 20 | ☒ | cyanides { ☐ salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }<br>006-007-00-5 |                                                                  |                                                                                                 |          | <1            mg/kg | 1.884        | <1.884    mg/kg   | <0.000188 %          |             | <LOD           |
| 21 | ☐ | pH<br><br>PH                                                                                                                                                                                             |                                                                  |                                                                                                 |          | 8.3          pH     |              | 8.3          pH   | 8.3 pH               |             |                |
| 22 |   | naphthalene<br>601-052-00-2                                                                                                                                                                              | 202-049-5                                                        | 91-20-3                                                                                         |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 23 | ☐ | acenaphthylene<br>205-917-1                                                                                                                                                                              |                                                                  | 208-96-8                                                                                        |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 24 | ☐ | acenaphthene<br>201-469-6                                                                                                                                                                                |                                                                  | 83-32-9                                                                                         |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 25 | ☐ | fluorene<br>201-695-5                                                                                                                                                                                    |                                                                  | 86-73-7                                                                                         |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 26 | ☐ | phenanthrene<br>201-581-5                                                                                                                                                                                |                                                                  | 85-01-8                                                                                         |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 27 | ☐ | anthracene<br>204-371-1                                                                                                                                                                                  |                                                                  | 120-12-7                                                                                        |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 28 | ☐ | fluoranthene<br>205-912-4                                                                                                                                                                                |                                                                  | 206-44-0                                                                                        |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 29 | ☐ | pyrene<br>204-927-3                                                                                                                                                                                      |                                                                  | 129-00-0                                                                                        |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 30 |   | benzo[a]anthracene<br>601-033-00-9                                                                                                                                                                       | 200-280-6                                                        | 56-55-3                                                                                         |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 31 |   | chrysene<br>601-048-00-0                                                                                                                                                                                 | 205-923-4                                                        | 218-01-9                                                                                        |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 32 |   | benzo[b]fluoranthene<br>601-034-00-4                                                                                                                                                                     | 205-911-9                                                        | 205-99-2                                                                                        |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 33 |   | benzo[k]fluoranthene<br>601-036-00-5                                                                                                                                                                     | 205-916-6                                                        | 207-08-9                                                                                        |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 34 |   | benzo[a]pyrene; benzo[def]chrysene<br>601-032-00-3                                                                                                                                                       | 200-028-5                                                        | 50-32-8                                                                                         |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 35 | ☐ | indeno[123-cd]pyrene<br>205-893-2                                                                                                                                                                        |                                                                  | 193-39-5                                                                                        |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 36 |   | dibenz[a,h]anthracene<br>601-041-00-2                                                                                                                                                                    | 200-181-8                                                        | 53-70-3                                                                                         |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 37 | ☐ | benzo[ghi]perylene<br>205-883-8                                                                                                                                                                          |                                                                  | 191-24-2                                                                                        |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 38 |   | asbestos<br>650-013-00-6                                                                                                                                                                                 | -----                                                            | 12001-28-4<br>132207-32-0<br>12172-73-5<br>77536-66-4<br>77536-68-6<br>77536-67-5<br>12001-29-5 |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |
| 39 | ☐ | asbestos in identifiable pieces of suspected ACM<br>ACM_FRAG                                                                                                                                             |                                                                  |                                                                                                 |          | <0.1        mg/kg   |              | <0.1        mg/kg | <0.00001 %           |             | <LOD           |

| #      |                                                                                   | Determinand                                                                                                  |           |            | CLP Note | User entered data |       | Conv. Factor | Compound conc. |       | Classification value | MC Applied                                                                        | Conc. Not Used |
|--------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------|------------|----------|-------------------|-------|--------------|----------------|-------|----------------------|-----------------------------------------------------------------------------------|----------------|
|        |                                                                                   | EU CLP index number                                                                                          | EC Number | CAS Number |          |                   |       |              |                |       |                      |                                                                                   |                |
| 40     |  | barium {  barium sulphide } |           |            |          | 148               | mg/kg | 1.233        | 146.593        | mg/kg | 0.0147 %             |  |                |
|        |                                                                                   | 016-002-00-X                                                                                                 | 244-214-4 | 21109-95-5 |          |                   |       |              |                |       |                      |                                                                                   |                |
| 41     |  | vanadium { divanadium pentaoxide; vanadium pentoxide }                                                       |           |            |          | 29                | mg/kg | 1.785        | 41.572         | mg/kg | 0.00416 %            |  |                |
|        |                                                                                   | 023-001-00-8                                                                                                 | 215-239-8 | 1314-62-1  |          |                   |       |              |                |       |                      |                                                                                   |                |
| Total: |                                                                                   |                                                                                                              |           |            |          |                   |       |              |                |       | 0.0433 %             |                                                                                   |                |

## Key

|                                                                                   |                                                                                                                                 |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
|                                                                                   | User supplied data                                                                                                              |
|  | Determinand values ignored for classification, see column 'Conc. Not Used' for reason                                           |
|  | Determinand defined or amended by HazWasteOnline (see Appendix A)                                                               |
|  | Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| <LOD                                                                              | Below limit of detection                                                                                                        |
| CLP: Note 1                                                                       | Only the metal concentration has been used for classification                                                                   |
| ACM                                                                               | Asbestos Containing Materials                                                                                                   |

## Classification of sample: WS02-0.20

Non Hazardous Waste  
Classified as 17 05 04  
in the List of Waste

### Sample details

Sample name:

**WS02-0.20**

Sample Depth:

**0.20 m**

Moisture content:

**17.5%**

(wet weight correction)

LoW Code:

Chapter:

17: Construction and Demolition Wastes (including excavated soil from contaminated sites)

Entry:

17 05 04 (Soil and stones other than those mentioned in 17 05 03)

### Hazard properties

None identified

### Determinands

Moisture content: 17.5% Wet Weight Moisture Correction applied (MC)

| #  | Determinand                                                                                                                                             | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|------------|----------|-------------------|--------------|----------------|----------------------|------------|----------------|
| 1  | arsenic { arsenic trioxide }                                                                                                                            | 033-003-00-0        | 215-481-4 | 1327-53-3  |          | 12 mg/kg          | 1.32         | 13.071 mg/kg   | 0.00131 %            | ✓          |                |
| 2  | beryllium { beryllium oxide }                                                                                                                           | 004-003-00-8        | 215-133-1 | 1304-56-9  |          | 0.5 mg/kg         | 2.775        | 1.145 mg/kg    | 0.000114 %           | ✓          |                |
| 3  | boron { diboron trioxide }                                                                                                                              | 005-008-00-8        | 215-125-8 | 1303-86-2  |          | <1 mg/kg          | 3.22         | <3.22 mg/kg    | <0.000322 %          |            | <LOD           |
| 4  | cadmium { cadmium oxide }                                                                                                                               | 048-002-00-0        | 215-146-2 | 1306-19-0  |          | 0.2 mg/kg         | 1.142        | 0.188 mg/kg    | 0.0000188 %          | ✓          |                |
| 5  | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }                                                                                |                     | 215-160-9 | 1308-38-9  |          | 22 mg/kg          | 1.462        | 26.527 mg/kg   | 0.00265 %            | ✓          |                |
| 6  | chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex } | 024-017-00-8        |           |            |          | <2 mg/kg          | 2.27         | <4.54 mg/kg    | <0.000454 %          |            | <LOD           |
| 7  | copper { dicopper oxide; copper (I) oxide }                                                                                                             | 029-002-00-X        | 215-270-7 | 1317-39-1  |          | 21 mg/kg          | 1.126        | 19.506 mg/kg   | 0.00195 %            | ✓          |                |
| 8  | lead { lead chromate }                                                                                                                                  | 082-004-00-2        | 231-846-0 | 7758-97-6  | 1        | 24 mg/kg          | 1.56         | 30.884 mg/kg   | 0.00198 %            | ✓          |                |
| 9  | mercury { mercury dichloride }                                                                                                                          | 080-010-00-X        | 231-299-8 | 7487-94-7  |          | <1 mg/kg          | 1.353        | <1.353 mg/kg   | <0.000135 %          |            | <LOD           |
| 10 | molybdenum { molybdenum(VI) oxide }                                                                                                                     | 042-001-00-9        | 215-204-7 | 1313-27-5  |          | <1 mg/kg          | 1.5          | <1.5 mg/kg     | <0.00015 %           |            | <LOD           |
| 11 | nickel { nickel chromate }                                                                                                                              | 028-035-00-7        | 238-766-5 | 14721-18-7 |          | 16 mg/kg          | 2.976        | 39.287 mg/kg   | 0.00393 %            | ✓          |                |
| 12 | selenium { nickel selenate }                                                                                                                            | 028-031-00-5        | 239-125-2 | 15060-62-5 |          | <2 mg/kg          | 2.554        | <5.108 mg/kg   | <0.000511 %          |            | <LOD           |
| 13 | zinc { zinc chromate }                                                                                                                                  | 024-007-00-3        | 236-878-9 | 13530-65-9 |          | 195 mg/kg         | 2.774        | 446.291 mg/kg  | 0.0446 %             | ✓          |                |
| 14 | TPH (C6 to C40) petroleum group                                                                                                                         |                     |           | TPH        |          | <42 mg/kg         |              | <42 mg/kg      | <0.0042 %            |            | <LOD           |
| 15 | tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane                                                                                                | 603-181-00-X        | 216-653-1 | 1634-04-4  |          | <0.005 mg/kg      |              | <0.005 mg/kg   | <0.0000005 %         |            | <LOD           |



HAZARDOUS WASTE ANALYTICAL

| #  | Determinand                                                                                                                                                                                            | CLP Note                                                         | User entered data                                                                               | Conv. Factor | Compound conc. | Classification value | MC Applied   | Conc. Not Used |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------------|----------------|----------------------|--------------|----------------|
|    | EU CLP index number                                                                                                                                                                                    | EC Number                                                        | CAS Number                                                                                      |              |                |                      |              |                |
| 16 | benzene<br>601-020-00-8                                                                                                                                                                                | 200-753-7                                                        | 71-43-2                                                                                         |              | <0.002 mg/kg   | <0.002 mg/kg         | <0.0000002 % | <LOD           |
| 17 | toluene<br>601-021-00-3                                                                                                                                                                                | 203-625-9                                                        | 108-88-3                                                                                        |              | <0.005 mg/kg   | <0.005 mg/kg         | <0.0000005 % | <LOD           |
| 18 | ethylbenzene<br>601-023-00-4                                                                                                                                                                           | 202-849-4                                                        | 100-41-4                                                                                        |              | <0.002 mg/kg   | <0.002 mg/kg         | <0.0000002 % | <LOD           |
| 19 | xylene<br>601-022-00-9                                                                                                                                                                                 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4]                                    |              | <0.004 mg/kg   | <0.004 mg/kg         | <0.0000004 % | <LOD           |
| 20 | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }<br>006-007-00-5 |                                                                  |                                                                                                 |              | <1 mg/kg       | 1.884 <1.884 mg/kg   | <0.000188 %  | <LOD           |
| 21 | pH                                                                                                                                                                                                     |                                                                  | PH                                                                                              |              | 8 pH           | 8 pH                 | 8pH          |                |
| 22 | naphthalene<br>601-052-00-2                                                                                                                                                                            | 202-049-5                                                        | 91-20-3                                                                                         |              | <0.1 mg/kg     | <0.1 mg/kg           | <0.00001 %   | <LOD           |
| 23 | acenaphthylene<br>205-917-1                                                                                                                                                                            | 208-96-8                                                         |                                                                                                 |              | <0.1 mg/kg     | <0.1 mg/kg           | <0.00001 %   | <LOD           |
| 24 | acenaphthene<br>201-469-6                                                                                                                                                                              | 83-32-9                                                          |                                                                                                 |              | <0.1 mg/kg     | <0.1 mg/kg           | <0.00001 %   | <LOD           |
| 25 | fluorene<br>201-695-5                                                                                                                                                                                  | 86-73-7                                                          |                                                                                                 |              | <0.1 mg/kg     | <0.1 mg/kg           | <0.00001 %   | <LOD           |
| 26 | phenanthrene<br>201-581-5                                                                                                                                                                              | 85-01-8                                                          |                                                                                                 |              | 0.16 mg/kg     | 0.132 mg/kg          | 0.0000132 %  | ✓              |
| 27 | anthracene<br>204-371-1                                                                                                                                                                                | 120-12-7                                                         |                                                                                                 |              | <0.1 mg/kg     | <0.1 mg/kg           | <0.00001 %   | <LOD           |
| 28 | fluoranthene<br>205-912-4                                                                                                                                                                              | 206-44-0                                                         |                                                                                                 |              | 0.35 mg/kg     | 0.289 mg/kg          | 0.0000289 %  | ✓              |
| 29 | pyrene<br>204-927-3                                                                                                                                                                                    | 129-00-0                                                         |                                                                                                 |              | 0.3 mg/kg      | 0.248 mg/kg          | 0.0000247 %  | ✓              |
| 30 | benzo[a]anthracene<br>601-033-00-9                                                                                                                                                                     | 200-280-6                                                        | 56-55-3                                                                                         |              | 0.17 mg/kg     | 0.14 mg/kg           | 0.000014 %   | ✓              |
| 31 | chrysene<br>601-048-00-0                                                                                                                                                                               | 205-923-4                                                        | 218-01-9                                                                                        |              | 0.21 mg/kg     | 0.173 mg/kg          | 0.0000173 %  | ✓              |
| 32 | benzo[b]fluoranthene<br>601-034-00-4                                                                                                                                                                   | 205-911-9                                                        | 205-99-2                                                                                        |              | 0.25 mg/kg     | 0.206 mg/kg          | 0.0000206 %  | ✓              |
| 33 | benzo[k]fluoranthene<br>601-036-00-5                                                                                                                                                                   | 205-916-6                                                        | 207-08-9                                                                                        |              | <0.1 mg/kg     | <0.1 mg/kg           | <0.00001 %   | <LOD           |
| 34 | benzo[a]pyrene; benzo[def]chrysene<br>601-032-00-3                                                                                                                                                     | 200-028-5                                                        | 50-32-8                                                                                         |              | 0.17 mg/kg     | 0.14 mg/kg           | 0.000014 %   | ✓              |
| 35 | indeno[123-cd]pyrene<br>205-893-2                                                                                                                                                                      | 193-39-5                                                         |                                                                                                 |              | 0.12 mg/kg     | 0.099 mg/kg          | 0.0000099 %  | ✓              |
| 36 | dibenz[a,h]anthracene<br>601-041-00-2                                                                                                                                                                  | 200-181-8                                                        | 53-70-3                                                                                         |              | <0.1 mg/kg     | <0.1 mg/kg           | <0.00001 %   | <LOD           |
| 37 | benzo[ghi]perylene<br>205-883-8                                                                                                                                                                        | 191-24-2                                                         |                                                                                                 |              | <0.1 mg/kg     | <0.1 mg/kg           | <0.00001 %   | <LOD           |
| 38 | asbestos<br>650-013-00-6                                                                                                                                                                               | -----                                                            | 12001-28-4<br>132207-32-0<br>12172-73-5<br>77536-66-4<br>77536-68-6<br>77536-67-5<br>12001-29-5 |              | <0.1 mg/kg     | <0.1 mg/kg           | <0.00001 %   | <LOD           |
| 39 | asbestos in identifiable pieces of suspected ACM<br>ACM_FRAG                                                                                                                                           |                                                                  |                                                                                                 |              | <0.1 mg/kg     | <0.1 mg/kg           | <0.00001 %   | <LOD           |



APPENDIX B - DETERMINANDS

| #      |                                                                                   | Determinand                                                                                                  |           |            | CLP Note | User entered data |       | Conv. Factor | Compound conc. |       | Classification value | MC Applied                          | Conc. Not Used |
|--------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------|------------|----------|-------------------|-------|--------------|----------------|-------|----------------------|-------------------------------------|----------------|
|        |                                                                                   | EU CLP index number                                                                                          | EC Number | CAS Number |          |                   |       |              |                |       |                      |                                     |                |
| 40     |  | barium {  barium sulphide } |           |            |          | 91                | mg/kg | 1.233        | 92.605         | mg/kg | 0.00926 %            | <input checked="" type="checkbox"/> |                |
|        |                                                                                   | 016-002-00-X                                                                                                 | 244-214-4 | 21109-95-5 |          |                   |       |              |                |       |                      |                                     |                |
| 41     |  | vanadium { divanadium pentaoxide; vanadium pentoxide }                                                       |           |            |          | 31                | mg/kg | 1.785        | 45.656         | mg/kg | 0.00457 %            | <input checked="" type="checkbox"/> |                |
|        |                                                                                   | 023-001-00-8                                                                                                 | 215-239-8 | 1314-62-1  |          |                   |       |              |                |       |                      |                                     |                |
| Total: |                                                                                   |                                                                                                              |           |            |          |                   |       |              |                |       | 0.0766 %             |                                     |                |

Key

|                                                                                   |                                                                                                                                 |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
|                                                                                   | User supplied data                                                                                                              |
|  | Determinand values ignored for classification, see column 'Conc. Not Used' for reason                                           |
|  | Determinand defined or amended by HazWasteOnline (see Appendix A)                                                               |
|  | Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| <LOD                                                                              | Below limit of detection                                                                                                        |
| CLP: Note 1                                                                       | Only the metal concentration has been used for classification                                                                   |
| ACM                                                                               | Asbestos Containing Materials                                                                                                   |

## Classification of sample: WS02-0.40

○ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

### Sample details

Sample name:

**WS02-0.40**

Sample Depth:

**0.40 m**

Moisture content:

**18.6%**

(wet weight correction)

LoW Code:

Chapter:

17: Construction and Demolition Wastes (including excavated soil from contaminated sites)

Entry:

17 05 04 (Soil and stones other than those mentioned in 17 05 03)

### Hazard properties

None identified

### Determinands

Moisture content: 18.6% Wet Weight Moisture Correction applied (MC)

| #  | Determinand                                                                                                                                              | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|------------|----------|-------------------|--------------|----------------|----------------------|------------|----------------|
| 1  | arsenic { arsenic trioxide }                                                                                                                             | 033-003-00-0        | 215-481-4 | 1327-53-3  |          | 13 mg/kg          | 1.32         | 13.972 mg/kg   | 0.0014 %             | ✓          |                |
| 2  | beryllium { beryllium oxide }                                                                                                                            | 004-003-00-8        | 215-133-1 | 1304-56-9  |          | 0.6 mg/kg         | 2.775        | 1.355 mg/kg    | 0.000136 %           | ✓          |                |
| 3  | boron { diboron trioxide }                                                                                                                               | 005-008-00-8        | 215-125-8 | 1303-86-2  |          | <1 mg/kg          | 3.22         | <3.22 mg/kg    | <0.000322 %          |            | <LOD           |
| 4  | cadmium { cadmium oxide }                                                                                                                                | 048-002-00-0        | 215-146-2 | 1306-19-0  |          | <0.2 mg/kg        | 1.142        | <0.228 mg/kg   | <0.0000228 %         |            | <LOD           |
| 5  | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }                                                                                 | 215-160-9           |           | 1308-38-9  |          | 26 mg/kg          | 1.462        | 30.932 mg/kg   | 0.00309 %            | ✓          |                |
| 6  | chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex } | 024-017-00-8        |           |            |          | <2 mg/kg          | 2.27         | <4.54 mg/kg    | <0.000454 %          |            | <LOD           |
| 7  | copper { dicopper oxide; copper (I) oxide }                                                                                                              | 029-002-00-X        | 215-270-7 | 1317-39-1  |          | 26 mg/kg          | 1.126        | 23.828 mg/kg   | 0.00238 %            | ✓          |                |
| 8  | lead { lead chromate }                                                                                                                                   | 082-004-00-2        | 231-846-0 | 7758-97-6  | 1        | 20 mg/kg          | 1.56         | 25.394 mg/kg   | 0.00163 %            | ✓          |                |
| 9  | mercury { mercury dichloride }                                                                                                                           | 080-010-00-X        | 231-299-8 | 7487-94-7  |          | <1 mg/kg          | 1.353        | <1.353 mg/kg   | <0.000135 %          |            | <LOD           |
| 10 | nickel { nickel chromate }                                                                                                                               | 028-035-00-7        | 238-766-5 | 14721-18-7 |          | 17 mg/kg          | 2.976        | 41.186 mg/kg   | 0.00412 %            | ✓          |                |
| 11 | selenium { nickel selenate }                                                                                                                             | 028-031-00-5        | 239-125-2 | 15060-62-5 |          | <2 mg/kg          | 2.554        | <5.108 mg/kg   | <0.000511 %          |            | <LOD           |
| 12 | zinc { zinc chromate }                                                                                                                                   | 024-007-00-3        | 236-878-9 | 13530-65-9 |          | 86 mg/kg          | 2.774        | 194.201 mg/kg  | 0.0194 %             | ✓          |                |
| 13 | pH                                                                                                                                                       |                     |           | PH         |          | 8.1 pH            |              | 8.1 pH         | 8.1 pH               |            |                |
| 14 | naphthalene                                                                                                                                              | 601-052-00-2        | 202-049-5 | 91-20-3    |          | 0.54 mg/kg        |              | 0.44 mg/kg     | 0.000044 %           | ✓          |                |
| 15 | acenaphthylene                                                                                                                                           |                     | 205-917-1 | 208-96-8   |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |

| #      | Determinand                                            | EU CLP index number | EC Number | CAS Number                                                                                      | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | M/C Applied | Conc. Not Used |
|--------|--------------------------------------------------------|---------------------|-----------|-------------------------------------------------------------------------------------------------|----------|-------------------|--------------|----------------|----------------------|-------------|----------------|
| 16     | acenaphthene                                           |                     | 201-469-6 | 83-32-9                                                                                         |          | 0.21 mg/kg        |              | 0.171 mg/kg    | 0.0000171 %          | ✓           |                |
| 17     | fluorene                                               |                     | 201-695-5 | 86-73-7                                                                                         |          | 0.14 mg/kg        |              | 0.114 mg/kg    | 0.0000114 %          | ✓           |                |
| 18     | phenanthrene                                           |                     | 201-581-5 | 85-01-8                                                                                         |          | 0.26 mg/kg        |              | 0.212 mg/kg    | 0.0000212 %          | ✓           |                |
| 19     | anthracene                                             |                     | 204-371-1 | 120-12-7                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 20     | fluoranthene                                           |                     | 205-912-4 | 206-44-0                                                                                        |          | 0.21 mg/kg        |              | 0.171 mg/kg    | 0.0000171 %          | ✓           |                |
| 21     | pyrene                                                 |                     | 204-927-3 | 129-00-0                                                                                        |          | 0.17 mg/kg        |              | 0.138 mg/kg    | 0.0000138 %          | ✓           |                |
| 22     | benzo[a]anthracene                                     | 601-033-00-9        | 200-280-6 | 56-55-3                                                                                         |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 23     | chrysene                                               | 601-048-00-0        | 205-823-4 | 218-01-9                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 24     | benzo[b]fluoranthene                                   | 601-034-00-4        | 205-911-9 | 205-99-2                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 25     | benzo[k]fluoranthene                                   | 601-036-00-5        | 205-916-6 | 207-08-9                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 26     | benzo[a]pyrene; benzo[def]chrysene                     | 601-032-00-3        | 200-028-5 | 50-32-8                                                                                         |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 27     | indeno[123-cd]pyrene                                   |                     | 205-893-2 | 193-39-5                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 28     | dibenz[a,h]anthracene                                  | 601-041-00-2        | 200-181-8 | 53-70-3                                                                                         |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 29     | benzo[ghi]perylene                                     |                     | 205-883-8 | 191-24-2                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 30     | asbestos                                               | 650-013-00-6        | -----     | 12001-28-4<br>132207-32-0<br>12172-73-5<br>77536-66-4<br>77536-68-6<br>77536-67-5<br>12001-29-5 |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 31     | asbestos in identifiable pieces of suspected ACM       |                     |           | ACM_FRAG                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 32     | barium { barium sulphide }                             | 016-002-00-X        | 244-214-4 | 21109-95-5                                                                                      |          | 85 mg/kg          | 1.233        | 85.345 mg/kg   | 0.00853 %            | ✓           |                |
| 33     | vanadium { divanadium pentaoxide; vanadium pentoxide } | 023-001-00-8        | 215-239-8 | 1314-62-1                                                                                       |          | 32 mg/kg          | 1.785        | 46.5 mg/kg     | 0.00465 %            | ✓           |                |
| Total: |                                                        |                     |           |                                                                                                 |          |                   |              |                | 0.047 %              |             |                |

## Key

|             |                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------|
|             | User supplied data                                                                                                              |
|             | Determinand values ignored for classification, see column 'Conc. Not Used' for reason                                           |
| ⊖           | Determinand defined or amended by HazWasteOnline (see Appendix A)                                                               |
| ⚠           | Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| <LOD        | Below limit of detection                                                                                                        |
| CLP: Note 1 | Only the metal concentration has been used for classification                                                                   |
| ACM         | Asbestos Containing Materials                                                                                                   |

## Classification of sample: WS03-0.70

○ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

### Sample details

Sample name:

**WS03-0.70**

Sample Depth:

**0.70 m**

Moisture content:

**18.4%**

(wet weight correction)

LoW Code:

Chapter:

17: Construction and Demolition Wastes (including excavated soil from contaminated sites)

Entry:

17 05 04 (Soil and stones other than those mentioned in 17 05 03)

### Hazard properties

None identified

### Determinands

Moisture content: 18.4% Wet Weight Moisture Correction applied (MC)

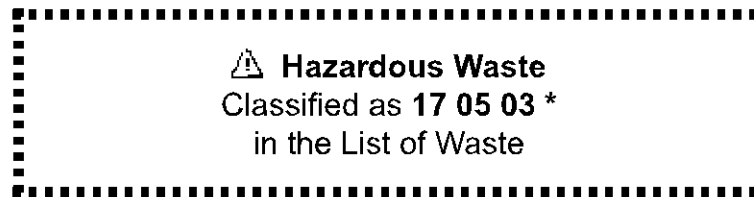
| #  | Determinand                                                                                                                                              | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|------------|----------|-------------------|--------------|----------------|----------------------|------------|----------------|
| 1  | arsenic { arsenic trioxide }                                                                                                                             | 033-003-00-0        | 215-481-4 | 1327-53-3  |          | 9 mg/kg           | 1.32         | 9.696 mg/kg    | 0.00097 %            | ✓          |                |
| 2  | beryllium { beryllium oxide }                                                                                                                            | 004-003-00-8        | 215-133-1 | 1304-56-9  |          | <0.5 mg/kg        | 2.775        | <1.388 mg/kg   | <0.000139 %          |            | <LOD           |
| 3  | boron { diboron trioxide }                                                                                                                               | 005-008-00-8        | 215-125-8 | 1303-86-2  |          | <1 mg/kg          | 3.22         | <3.22 mg/kg    | <0.000322 %          |            | <LOD           |
| 4  | cadmium { cadmium oxide }                                                                                                                                | 048-002-00-0        | 215-146-2 | 1306-19-0  |          | <0.2 mg/kg        | 1.142        | <0.228 mg/kg   | <0.0000228 %         |            | <LOD           |
| 5  | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }                                                                                 | 215-160-9           |           | 1308-38-9  |          | 17 mg/kg          | 1.462        | 20.275 mg/kg   | 0.00203 %            | ✓          |                |
| 6  | chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex } | 024-017-00-8        |           |            |          | <2 mg/kg          | 2.27         | <4.54 mg/kg    | <0.000454 %          |            | <LOD           |
| 7  | copper { dicopper oxide; copper (I) oxide }                                                                                                              | 029-002-00-X        | 215-270-7 | 1317-39-1  |          | 7 mg/kg           | 1.126        | 6.431 mg/kg    | 0.000643 %           | ✓          |                |
| 8  | lead { lead chromate }                                                                                                                                   | 082-004-00-2        | 231-846-0 | 7758-97-6  | 1        | 10 mg/kg          | 1.56         | 12.728 mg/kg   | 0.000816 %           | ✓          |                |
| 9  | mercury { mercury dichloride }                                                                                                                           | 080-010-00-X        | 231-299-8 | 7487-94-7  |          | <1 mg/kg          | 1.353        | <1.353 mg/kg   | <0.000135 %          |            | <LOD           |
| 10 | nickel { nickel chromate }                                                                                                                               | 028-035-00-7        | 238-766-5 | 14721-18-7 |          | 15 mg/kg          | 2.976        | 36.429 mg/kg   | 0.00364 %            | ✓          |                |
| 11 | selenium { nickel selenate }                                                                                                                             | 028-031-00-5        | 239-125-2 | 15060-62-5 |          | <2 mg/kg          | 2.554        | <5.108 mg/kg   | <0.000511 %          |            | <LOD           |
| 12 | zinc { zinc chromate }                                                                                                                                   | 024-007-00-3        | 236-878-9 | 13530-65-9 |          | 42 mg/kg          | 2.774        | 95.076 mg/kg   | 0.00951 %            | ✓          |                |
| 13 | pH                                                                                                                                                       |                     |           | PH         |          | 8.3 pH            |              | 8.3 pH         | 8.3 pH               |            |                |
| 14 | naphthalene                                                                                                                                              | 601-052-00-2        | 202-049-5 | 91-20-3    |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
| 15 | acenaphthylene                                                                                                                                           |                     | 205-917-1 | 208-96-8   |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |

| #      | Determinand                                            | EU CLP index number | EC Number | CAS Number                                                                                      | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | M/C Applied | Conc. Not Used |
|--------|--------------------------------------------------------|---------------------|-----------|-------------------------------------------------------------------------------------------------|----------|-------------------|--------------|----------------|----------------------|-------------|----------------|
| 16     | acenaphthene                                           |                     | 201-469-6 | 83-32-9                                                                                         |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 17     | fluorene                                               |                     | 201-695-5 | 86-73-7                                                                                         |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 18     | phenanthrene                                           |                     | 201-581-5 | 85-01-8                                                                                         |          | 0.7 mg/kg         |              | 0.571 mg/kg    | 0.0000571 %          | ✓           |                |
| 19     | anthracene                                             |                     | 204-371-1 | 120-12-7                                                                                        |          | 0.13 mg/kg        |              | 0.106 mg/kg    | 0.0000106 %          | ✓           |                |
| 20     | fluoranthene                                           |                     | 205-912-4 | 206-44-0                                                                                        |          | 0.48 mg/kg        |              | 0.392 mg/kg    | 0.0000392 %          | ✓           |                |
| 21     | pyrene                                                 |                     | 204-927-3 | 129-00-0                                                                                        |          | 0.39 mg/kg        |              | 0.318 mg/kg    | 0.0000318 %          | ✓           |                |
| 22     | benzo[a]anthracene                                     | 601-033-00-9        | 200-280-6 | 56-55-3                                                                                         |          | 0.16 mg/kg        |              | 0.131 mg/kg    | 0.0000131 %          | ✓           |                |
| 23     | chrysene                                               | 601-048-00-0        | 205-823-4 | 218-01-9                                                                                        |          | 0.15 mg/kg        |              | 0.122 mg/kg    | 0.0000122 %          | ✓           |                |
| 24     | benzo[b]fluoranthene                                   | 601-034-00-4        | 205-911-9 | 205-99-2                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 25     | benzo[k]fluoranthene                                   | 601-036-00-5        | 205-916-6 | 207-08-9                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 26     | benzo[a]pyrene; benzo[def]chrysene                     | 601-032-00-3        | 200-028-5 | 50-32-8                                                                                         |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 27     | indeno[123-cd]pyrene                                   |                     | 205-893-2 | 193-39-5                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 28     | dibenz[a,h]anthracene                                  | 601-041-00-2        | 200-181-8 | 53-70-3                                                                                         |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 29     | benzo[ghi]perylene                                     |                     | 205-883-8 | 191-24-2                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 30     | asbestos                                               | 650-013-00-6        | -----     | 12001-28-4<br>132207-32-0<br>12172-73-5<br>77536-66-4<br>77536-68-6<br>77536-67-5<br>12001-29-5 |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 31     | asbestos in identifiable pieces of suspected ACM       |                     |           | ACM_FRAG                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 32     | barium { barium sulphide }                             | 016-002-00-X        | 244-214-4 | 21109-95-5                                                                                      |          | 72 mg/kg          | 1.233        | 72.47 mg/kg    | 0.00725 %            | ✓           |                |
| 33     | vanadium { divanadium pentaoxide; vanadium pentoxide } | 023-001-00-8        | 215-239-8 | 1314-62-1                                                                                       |          | 29 mg/kg          | 1.785        | 42.245 mg/kg   | 0.00422 %            | ✓           |                |
| Total: |                                                        |                     |           |                                                                                                 |          |                   |              |                | 0.0309 %             |             |                |

## Key

|             |                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------|
|             | User supplied data                                                                                                              |
|             | Determinand values ignored for classification, see column 'Conc. Not Used' for reason                                           |
| ⊖           | Determinand defined or amended by HazWasteOnline (see Appendix A)                                                               |
| ⚠           | Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| <LOD        | Below limit of detection                                                                                                        |
| CLP: Note 1 | Only the metal concentration has been used for classification                                                                   |
| ACM         | Asbestos Containing Materials                                                                                                   |

Classification of sample: WS04-0.50-12/02/2024



## Sample details

Sample name:  
**WS04-0.50-12/02/2024**  
Sample Depth:  
**0.50 m**  
Moisture content:  
**10.9%**  
(wet weight correction)

LoW Code:  
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)  
Entry: 17 05 03 \* (Soil and stones containing hazardous substances)

## Hazard properties

**HP 7: Carcinogenic** "waste which induces cancer or increases its incidence"

Hazard Statements hit:

**Carc. 1B; H350** "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.139%)

**HP 11: Mutagenic** "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

**Muta. 1B; H340** "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.139%)

## Determinands

Moisture content: 10.9% Wet Weight Moisture Correction applied (MC)

| # | Determinand                                                                                                                                             | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|------------|----------|-------------------|--------------|----------------|----------------------|------------|----------------|
| 1 | arsenic { arsenic trioxide }                                                                                                                            | 033-003-00-0        | 215-481-4 | 1327-53-3  |          | 8 mg/kg           | 1.32         | 9.411 mg/kg    | 0.000941 %           | ✓          |                |
| 2 | beryllium { beryllium oxide }                                                                                                                           | 004-003-00-8        | 215-133-1 | 1304-56-9  |          | 1.4 mg/kg         | 2.775        | 3.462 mg/kg    | 0.000346 %           | ✓          |                |
| 3 | boron { diboron trioxide }                                                                                                                              | 005-008-00-8        | 215-125-8 | 1303-86-2  |          | <1 mg/kg          | 3.22         | <3.22 mg/kg    | <0.000322 %          |            | <LOD           |
| 4 | cadmium { cadmium oxide }                                                                                                                               | 048-002-00-0        | 215-146-2 | 1306-19-0  |          | 0.4 mg/kg         | 1.142        | 0.407 mg/kg    | 0.0000407 %          | ✓          |                |
| 5 | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }                                                                                |                     | 215-160-9 | 1308-38-9  |          | 27 mg/kg          | 1.462        | 35.161 mg/kg   | 0.00352 %            | ✓          |                |
| 6 | chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex } | 024-017-00-8        |           |            |          | <2 mg/kg          | 2.27         | <4.54 mg/kg    | <0.000454 %          |            | <LOD           |
| 7 | copper { dicopper oxide; copper (I) oxide }                                                                                                             | 029-002-00-X        | 215-270-7 | 1317-39-1  |          | 13 mg/kg          | 1.126        | 13.041 mg/kg   | 0.0013 %             | ✓          |                |

| #  | Determinand                                                                                                                                                                            | EU CLP index number | EC Number                                                        | CAS Number                                                   | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | M/C Applied | Conc. Not Used |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------|--------------------------------------------------------------|----------|-------------------|--------------|----------------|----------------------|-------------|----------------|
| 8  | lead { lead chromate }                                                                                                                                                                 | 082-004-00-2        | 231-846-0                                                        | 7758-97-6                                                    | 1        | 15 mg/kg          | 1.56         | 20.847 mg/kg   | 0.00134 %            | ✓           |                |
| 9  | mercury { mercury dichloride }                                                                                                                                                         | 080-010-00-X        | 231-299-8                                                        | 7487-94-7                                                    |          | <1 mg/kg          | 1.353        | <1.353 mg/kg   | <0.000135 %          |             | <LOD           |
| 10 | molybdenum { molybdenum(VI) oxide }                                                                                                                                                    | 042-001-00-9        | 215-204-7                                                        | 1313-27-5                                                    |          | 1.1 mg/kg         | 1.5          | 1.47 mg/kg     | 0.000147 %           | ✓           |                |
| 11 | nickel { nickel chromate }                                                                                                                                                             | 028-035-00-7        | 238-766-5                                                        | 14721-18-7                                                   |          | 22 mg/kg          | 2.976        | 58.341 mg/kg   | 0.00583 %            | ✓           |                |
| 12 | selenium { nickel selenate }                                                                                                                                                           | 028-031-00-5        | 239-125-2                                                        | 15060-62-5                                                   |          | <2 mg/kg          | 2.554        | <5.108 mg/kg   | <0.000511 %          |             | <LOD           |
| 13 | zinc { zinc chromate }                                                                                                                                                                 | 024-007-00-3        | 236-878-9                                                        | 13530-65-9                                                   |          | 53 mg/kg          | 2.774        | 131.004 mg/kg  | 0.0131 %             | ✓           |                |
| 14 | TPH (C6 to C40) petroleum group                                                                                                                                                        |                     |                                                                  | TPH                                                          |          | 1560 mg/kg        |              | 1389.96 mg/kg  | 0.139 %              | ✓           |                |
| 15 | tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane                                                                                                                               | 603-181-00-X        | 216-653-1                                                        | 1634-04-4                                                    |          | <0.005 mg/kg      |              | <0.005 mg/kg   | <0.0000005 %         |             | <LOD           |
| 16 | benzene                                                                                                                                                                                | 601-020-00-8        | 200-753-7                                                        | 71-43-2                                                      |          | <0.002 mg/kg      |              | <0.002 mg/kg   | <0.0000002 %         |             | <LOD           |
| 17 | toluene                                                                                                                                                                                | 601-021-00-3        | 203-625-9                                                        | 108-88-3                                                     |          | <0.005 mg/kg      |              | <0.005 mg/kg   | <0.0000005 %         |             | <LOD           |
| 18 | ethylbenzene                                                                                                                                                                           | 601-023-00-4        | 202-849-4                                                        | 100-41-4                                                     |          | <0.002 mg/kg      |              | <0.002 mg/kg   | <0.0000002 %         |             | <LOD           |
| 19 | xylene                                                                                                                                                                                 | 601-022-00-9        | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] |          | <0.004 mg/kg      |              | <0.004 mg/kg   | <0.0000004 %         |             | <LOD           |
| 20 | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5        |                                                                  |                                                              |          | <1 mg/kg          | 1.884        | <1.884 mg/kg   | <0.000188 %          |             | <LOD           |
| 21 | pH                                                                                                                                                                                     |                     |                                                                  | PH                                                           |          | 8.6 pH            |              | 8.6 pH         | 8.5 pH               |             |                |
| 22 | naphthalene                                                                                                                                                                            | 601-052-00-2        | 202-049-5                                                        | 91-20-3                                                      |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 23 | acenaphthylene                                                                                                                                                                         |                     | 205-917-1                                                        | 208-96-8                                                     |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 24 | acenaphthene                                                                                                                                                                           |                     | 201-469-6                                                        | 83-32-9                                                      |          | 18 mg/kg          |              | 16.038 mg/kg   | 0.0016 %             | ✓           |                |
| 25 | fluorene                                                                                                                                                                               |                     | 201-695-5                                                        | 86-73-7                                                      |          | 11.5 mg/kg        |              | 10.247 mg/kg   | 0.00102 %            | ✓           |                |
| 26 | phenanthrene                                                                                                                                                                           |                     | 201-581-5                                                        | 85-01-8                                                      |          | 165 mg/kg         |              | 147.015 mg/kg  | 0.0147 %             | ✓           |                |
| 27 | anthracene                                                                                                                                                                             |                     | 204-371-1                                                        | 120-12-7                                                     |          | 41.7 mg/kg        |              | 37.155 mg/kg   | 0.00372 %            | ✓           |                |
| 28 | fluoranthene                                                                                                                                                                           |                     | 205-912-4                                                        | 206-44-0                                                     |          | 179 mg/kg         |              | 159.489 mg/kg  | 0.0159 %             | ✓           |                |
| 29 | pyrene                                                                                                                                                                                 |                     | 204-927-3                                                        | 129-00-0                                                     |          | 154 mg/kg         |              | 137.214 mg/kg  | 0.0137 %             | ✓           |                |
| 30 | benzo[a]anthracene                                                                                                                                                                     | 601-033-00-9        | 200-280-6                                                        | 56-55-3                                                      |          | 55.3 mg/kg        |              | 49.272 mg/kg   | 0.00493 %            | ✓           |                |
| 31 | chrysene                                                                                                                                                                               | 601-048-00-0        | 205-923-4                                                        | 218-01-9                                                     |          | 60.4 mg/kg        |              | 53.816 mg/kg   | 0.00538 %            | ✓           |                |
| 32 | benzo[b]fluoranthene                                                                                                                                                                   | 601-034-00-4        | 205-911-9                                                        | 205-99-2                                                     |          | 54 mg/kg          |              | 48.114 mg/kg   | 0.00481 %            | ✓           |                |
| 33 | benzo[k]fluoranthene                                                                                                                                                                   | 601-036-00-5        | 205-916-6                                                        | 207-08-9                                                     |          | 20.7 mg/kg        |              | 18.444 mg/kg   | 0.00184 %            | ✓           |                |

| #      | Determinand                                                            |           |                                                                                                 | CLP Note | User entered data |       | Conv. Factor | Compound conc. |       | Classification value | MC Applied | Conc. Not Used |
|--------|------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------------------|----------|-------------------|-------|--------------|----------------|-------|----------------------|------------|----------------|
|        | EU CLP index number                                                    | EC Number | CAS Number                                                                                      |          |                   |       |              |                |       |                      |            |                |
| 34     | benzo[a]pyrene; benzo[def]chrysene<br>601-032-00-3                     | 200-028-5 | 50-32-8                                                                                         |          | 47                | mg/kg |              | 41.877         | mg/kg | 0.00419 %            | ✓          |                |
| 35     | indeno[123-cd]pyrene<br>205-893-2                                      | 193-39-5  |                                                                                                 |          | 24.5              | mg/kg |              | 21.83          | mg/kg | 0.00218 %            | ✓          |                |
| 36     | dibenz[a,h]anthracene<br>601-041-00-2                                  | 200-181-8 | 53-70-3                                                                                         |          | 6.06              | mg/kg |              | 5.399          | mg/kg | 0.00054 %            | ✓          |                |
| 37     | benzo[ghi]perylene<br>205-883-8                                        | 191-24-2  |                                                                                                 |          | 19                | mg/kg |              | 16.929         | mg/kg | 0.00169 %            | ✓          |                |
| 38     | polychlorobiphenyls; PCB<br>602-039-00-4                               | 215-648-1 | 1336-36-3                                                                                       |          | <0.1              | mg/kg |              | <0.1           | mg/kg | <0.00001 %           |            | <LOD           |
| 39     | asbestos<br>650-013-00-6                                               | -----     | 12001-28-4<br>132207-32-0<br>12172-73-5<br>77536-66-4<br>77536-68-6<br>77536-67-5<br>12001-29-5 |          | <0.1              | mg/kg |              | <0.1           | mg/kg | <0.00001 %           |            | <LOD           |
| 40     | asbestos in identifiable pieces of suspected ACM<br>ACM_FRAG           |           |                                                                                                 |          | <0.1              | mg/kg |              | <0.1           | mg/kg | <0.00001 %           |            | <LOD           |
| 41     | barium { barium sulphide }<br>016-002-00-X                             | 244-214-4 | 21109-95-5                                                                                      |          | 137               | mg/kg | 1.233        | 150.569        | mg/kg | 0.0151 %             | ✓          |                |
| 42     | vanadium { divanadium pentaoxide; vanadium pentoxide }<br>023-001-00-8 | 215-239-8 | 1314-62-1                                                                                       |          | 29                | mg/kg | 1.785        | 46.127         | mg/kg | 0.00461 %            | ✓          |                |
| Total: |                                                                        |           |                                                                                                 |          |                   |       |              |                |       | 0.263 %              |            |                |

## Key

|             |                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------|
|             | User supplied data                                                                                                              |
|             | Determinand values ignored for classification, see column 'Conc. Not Used' for reason                                           |
|             | Hazardous result                                                                                                                |
| ○           | Determinand defined or amended by HazWasteOnline (see Appendix A)                                                               |
| ⚠           | Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| <LOD        | Below limit of detection                                                                                                        |
| CLP: Note 1 | Only the metal concentration has been used for classification                                                                   |
| ACM         | Asbestos Containing Materials                                                                                                   |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Soils with hydrocarbon content of less than 5000mg/kg will not be flammable; Concentrations of greater than 5000mg/kg have the limited potential to be flammable, if, as free product hydrocarbon; further assessment should be undertaken where this is the case, however flammability still remains a low likelihood due to the soil matrix being inflammable.

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.139%)

## Classification of sample: WS05-0.30

Non Hazardous Waste  
Classified as 17 05 04  
in the List of Waste

### Sample details

Sample name:

**WS05-0.30**

Sample Depth:

**0.30 m**

Moisture content:

**3.1%**

(wet weight correction)

LoW Code:

Chapter:

17: Construction and Demolition Wastes (including excavated soil from contaminated sites)

Entry:

17 05 04 (Soil and stones other than those mentioned in 17 05 03)

### Hazard properties

None identified

### Determinands

Moisture content: 3.1% Wet Weight Moisture Correction applied (MC)

| #  | Determinand                                                                                                                                             | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|------------|----------|-------------------|--------------|----------------|----------------------|------------|----------------|
| 1  | arsenic { arsenic trioxide }                                                                                                                            | 033-003-00-0        | 215-481-4 | 1327-53-3  |          | 6 mg/kg           | 1.32         | 7.676 mg/kg    | 0.000768 %           | ✓          |                |
| 2  | beryllium { beryllium oxide }                                                                                                                           | 004-003-00-8        | 215-133-1 | 1304-56-9  |          | <0.5 mg/kg        | 2.775        | <1.388 mg/kg   | <0.000139 %          |            | <LOD           |
| 3  | boron { diboron trioxide }                                                                                                                              | 005-008-00-8        | 215-125-8 | 1303-86-2  |          | <1 mg/kg          | 3.22         | <3.22 mg/kg    | <0.000322 %          |            | <LOD           |
| 4  | cadmium { cadmium oxide }                                                                                                                               | 048-002-00-0        | 215-146-2 | 1306-19-0  |          | <0.2 mg/kg        | 1.142        | <0.228 mg/kg   | <0.0000228 %         |            | <LOD           |
| 5  | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }                                                                                |                     | 215-160-9 | 1308-38-9  |          | 15 mg/kg          | 1.462        | 21.244 mg/kg   | 0.00212 %            | ✓          |                |
| 6  | chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex } | 024-017-00-8        |           |            |          | <2 mg/kg          | 2.27         | <4.54 mg/kg    | <0.000454 %          |            | <LOD           |
| 7  | copper { dicopper oxide; copper (I) oxide }                                                                                                             | 029-002-00-X        | 215-270-7 | 1317-39-1  |          | 99 mg/kg          | 1.126        | 108.008 mg/kg  | 0.0108 %             | ✓          |                |
| 8  | lead { lead chromate }                                                                                                                                  | 082-004-00-2        | 231-846-0 | 7758-97-6  | 1        | 8 mg/kg           | 1.56         | 12.092 mg/kg   | 0.000775 %           | ✓          |                |
| 9  | mercury { mercury dichloride }                                                                                                                          | 080-010-00-X        | 231-299-8 | 7487-94-7  |          | <1 mg/kg          | 1.353        | <1.353 mg/kg   | <0.000135 %          |            | <LOD           |
| 10 | molybdenum { molybdenum(VI) oxide }                                                                                                                     | 042-001-00-9        | 215-204-7 | 1313-27-5  |          | <1 mg/kg          | 1.5          | <1.5 mg/kg     | <0.00015 %           |            | <LOD           |
| 11 | nickel { nickel chromate }                                                                                                                              | 028-035-00-7        | 238-766-5 | 14721-18-7 |          | 11 mg/kg          | 2.976        | 31.724 mg/kg   | 0.00317 %            | ✓          |                |
| 12 | selenium { nickel selenate }                                                                                                                            | 028-031-00-5        | 239-125-2 | 15060-62-5 |          | <2 mg/kg          | 2.554        | <5.108 mg/kg   | <0.000511 %          |            | <LOD           |
| 13 | zinc { zinc chromate }                                                                                                                                  | 024-007-00-3        | 236-878-9 | 13530-65-9 |          | 84 mg/kg          | 2.774        | 225.804 mg/kg  | 0.0226 %             | ✓          |                |
| 14 | TPH (C6 to C40) petroleum group                                                                                                                         |                     |           | TPH        |          | <42 mg/kg         |              | <42 mg/kg      | <0.0042 %            |            | <LOD           |
| 15 | tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane                                                                                                | 603-181-00-X        | 216-653-1 | 1634-04-4  |          | <0.005 mg/kg      |              | <0.005 mg/kg   | <0.0000005 %         |            | <LOD           |

| #  |   | Determinand                                                                                                                                                                                              |                                                                  |                                                                                                 | CLP Note | User entered data   | Conv. Factor | Compound conc.     | Classification value | M/C Applied | Conc. Not Used |
|----|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------|---------------------|--------------|--------------------|----------------------|-------------|----------------|
|    |   | EU CLP index number                                                                                                                                                                                      | EC Number                                                        | CAS Number                                                                                      |          |                     |              |                    |                      |             |                |
| 16 |   | benzene<br>601-020-00-8                                                                                                                                                                                  | 200-753-7                                                        | 71-43-2                                                                                         |          | <0.002    mg/kg     |              | <0.002    mg/kg    | <0.0000002 %         |             | <LOD           |
| 17 |   | toluene<br>601-021-00-3                                                                                                                                                                                  | 203-625-9                                                        | 108-88-3                                                                                        |          | <0.005    mg/kg     |              | <0.005    mg/kg    | <0.0000005 %         |             | <LOD           |
| 18 | ☐ | ethylbenzene<br>601-023-00-4                                                                                                                                                                             | 202-849-4                                                        | 100-41-4                                                                                        |          | <0.002    mg/kg     |              | <0.002    mg/kg    | <0.0000002 %         |             | <LOD           |
| 19 |   | xylene<br>601-022-00-9                                                                                                                                                                                   | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4]                                    |          | <0.004    mg/kg     |              | <0.004    mg/kg    | <0.0000004 %         |             | <LOD           |
| 20 | ☑ | cyanides { ☐ salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }<br>006-007-00-5 |                                                                  |                                                                                                 |          | <1            mg/kg | 1.884        | <1.884    mg/kg    | <0.000188 %          |             | <LOD           |
| 21 | ☐ | pH                                                                                                                                                                                                       |                                                                  | PH                                                                                              |          | 8.5          pH     |              | 8.5          pH    | 8.5 pH               |             |                |
| 22 |   | naphthalene<br>601-052-00-2                                                                                                                                                                              | 202-049-5                                                        | 91-20-3                                                                                         |          | <0.1        mg/kg   |              | <0.1        mg/kg  | <0.00001 %           |             | <LOD           |
| 23 | ☐ | acenaphthylene                                                                                                                                                                                           | 205-917-1                                                        | 208-96-8                                                                                        |          | <0.1        mg/kg   |              | <0.1        mg/kg  | <0.00001 %           |             | <LOD           |
| 24 | ☐ | acenaphthene                                                                                                                                                                                             | 201-469-6                                                        | 83-32-9                                                                                         |          | <0.1        mg/kg   |              | <0.1        mg/kg  | <0.00001 %           |             | <LOD           |
| 25 | ☐ | fluorene                                                                                                                                                                                                 | 201-695-5                                                        | 86-73-7                                                                                         |          | <0.1        mg/kg   |              | <0.1        mg/kg  | <0.00001 %           |             | <LOD           |
| 26 | ☐ | phenanthrene                                                                                                                                                                                             | 201-581-5                                                        | 85-01-8                                                                                         |          | 1.23        mg/kg   |              | 1.192       mg/kg  | 0.000119 %           | ✓           |                |
| 27 | ☐ | anthracene                                                                                                                                                                                               | 204-371-1                                                        | 120-12-7                                                                                        |          | 0.36        mg/kg   |              | 0.349       mg/kg  | 0.0000349 %          | ✓           |                |
| 28 | ☐ | fluoranthene                                                                                                                                                                                             | 205-912-4                                                        | 206-44-0                                                                                        |          | 1.82        mg/kg   |              | 1.764       mg/kg  | 0.000176 %           | ✓           |                |
| 29 | ☐ | pyrene                                                                                                                                                                                                   | 204-927-3                                                        | 129-00-0                                                                                        |          | 1.98        mg/kg   |              | 1.919       mg/kg  | 0.000192 %           | ✓           |                |
| 30 |   | benzo[a]anthracene<br>601-033-00-9                                                                                                                                                                       | 200-280-6                                                        | 56-55-3                                                                                         |          | 1.01        mg/kg   |              | 0.979       mg/kg  | 0.0000979 %          | ✓           |                |
| 31 |   | chrysene<br>601-048-00-0                                                                                                                                                                                 | 205-923-4                                                        | 218-01-9                                                                                        |          | 1.08        mg/kg   |              | 1.047       mg/kg  | 0.000105 %           | ✓           |                |
| 32 |   | benzo[b]fluoranthene<br>601-034-00-4                                                                                                                                                                     | 205-911-9                                                        | 205-99-2                                                                                        |          | 1.19        mg/kg   |              | 1.153       mg/kg  | 0.000115 %           | ✓           |                |
| 33 |   | benzo[k]fluoranthene<br>601-036-00-5                                                                                                                                                                     | 205-916-6                                                        | 207-08-9                                                                                        |          | 0.31        mg/kg   |              | 0.3          mg/kg | 0.00003 %            | ✓           |                |
| 34 |   | benzo[a]pyrene; benzo[def]chrysene<br>601-032-00-3                                                                                                                                                       | 200-028-5                                                        | 50-32-8                                                                                         |          | 1.19        mg/kg   |              | 1.153       mg/kg  | 0.000115 %           | ✓           |                |
| 35 | ☐ | indeno[123-cd]pyrene<br>205-893-2                                                                                                                                                                        |                                                                  | 193-39-5                                                                                        |          | <0.1        mg/kg   |              | <0.1        mg/kg  | <0.00001 %           |             | <LOD           |
| 36 |   | dibenz[a,h]anthracene<br>601-041-00-2                                                                                                                                                                    | 200-181-8                                                        | 53-70-3                                                                                         |          | <0.1        mg/kg   |              | <0.1        mg/kg  | <0.00001 %           |             | <LOD           |
| 37 | ☐ | benzo[ghi]perylene<br>205-883-8                                                                                                                                                                          |                                                                  | 191-24-2                                                                                        |          | <0.1        mg/kg   |              | <0.1        mg/kg  | <0.00001 %           |             | <LOD           |
| 38 | ☐ | polychlorobiphenyls; PCB<br>602-039-00-4                                                                                                                                                                 |                                                                  |                                                                                                 |          | <0.1        mg/kg   |              | <0.1        mg/kg  | <0.00001 %           |             | <LOD           |
| 39 |   | asbestos<br>650-013-00-6                                                                                                                                                                                 | -----                                                            | 12001-28-4<br>132207-32-0<br>12172-73-5<br>77536-66-4<br>77536-68-6<br>77536-67-5<br>12001-29-5 |          | <0.1        mg/kg   |              | <0.1        mg/kg  | <0.00001 %           |             | <LOD           |
| 40 | ☐ | asbestos in identifiable pieces of suspected ACM<br>ACM_FRAG                                                                                                                                             |                                                                  |                                                                                                 |          | <0.1        mg/kg   |              | <0.1        mg/kg  | <0.00001 %           |             | <LOD           |



APPENDIX B - DETERMINANDS

| #      |                                                                                   | Determinand                                                                                                  |           |            | CLP Note | User entered data |       | Conv. Factor | Compound conc. |       | Classification value | MC Applied                          | Conc. Not Used |
|--------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------|------------|----------|-------------------|-------|--------------|----------------|-------|----------------------|-------------------------------------|----------------|
|        |                                                                                   | EU CLP index number                                                                                          | EC Number | CAS Number |          |                   |       |              |                |       |                      |                                     |                |
| 41     |  | barium {  barium sulphide } |           |            |          | 57                | mg/kg | 1.233        | 68.13          | mg/kg | 0.00681 %            | <input checked="" type="checkbox"/> |                |
|        |                                                                                   | 016-002-00-X                                                                                                 | 244-214-4 | 21109-95-5 |          |                   |       |              |                |       |                      |                                     |                |
| 42     |  | vanadium { divanadium pentaoxide; vanadium pentoxide }                                                       |           |            |          | 86                | mg/kg | 1.785        | 148.767        | mg/kg | 0.0149 %             | <input checked="" type="checkbox"/> |                |
|        |                                                                                   | 023-001-00-8                                                                                                 | 215-239-8 | 1314-62-1  |          |                   |       |              |                |       |                      |                                     |                |
| Total: |                                                                                   |                                                                                                              |           |            |          |                   |       |              |                |       | 0.0691 %             |                                     |                |

#### Key

|                                                                                   |                                                                                                                                 |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
|                                                                                   | User supplied data                                                                                                              |
|                                                                                   | Determinand values ignored for classification, see column 'Conc. Not Used' for reason                                           |
|  | Determinand defined or amended by HazWasteOnline (see Appendix A)                                                               |
|  | Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| <LOD                                                                              | Below limit of detection                                                                                                        |
| CLP: Note 1                                                                       | Only the metal concentration has been used for classification                                                                   |
| ACM                                                                               | Asbestos Containing Materials                                                                                                   |

## Classification of sample: SK03-0.50

○ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

### Sample details

Sample name:

**SK03-0.50**

Sample Depth:

**0.50 m**

Moisture content:

**19.1%**

(wet weight correction)

LoW Code:

Chapter:

17: Construction and Demolition Wastes (including excavated soil from contaminated sites)

Entry:

17 05 04 (Soil and stones other than those mentioned in 17 05 03)

### Hazard properties

None identified

### Determinands

Moisture content: 19.1% Wet Weight Moisture Correction applied (MC)

| #  | Determinand                                                                                                                                              | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|------------|----------|-------------------|--------------|----------------|----------------------|------------|----------------|
| 1  | arsenic { arsenic trioxide }                                                                                                                             | 033-003-00-0        | 215-481-4 | 1327-53-3  |          | 14 mg/kg          | 1.32         | 14.954 mg/kg   | 0.0015 %             | ✓          |                |
| 2  | beryllium { beryllium oxide }                                                                                                                            | 004-003-00-8        | 215-133-1 | 1304-56-9  |          | 0.6 mg/kg         | 2.775        | 1.347 mg/kg    | 0.000135 %           | ✓          |                |
| 3  | boron { diboron trioxide }                                                                                                                               | 005-008-00-8        | 215-125-8 | 1303-86-2  |          | <1 mg/kg          | 3.22         | <3.22 mg/kg    | <0.000322 %          |            | <LOD           |
| 4  | cadmium { cadmium oxide }                                                                                                                                | 048-002-00-0        | 215-146-2 | 1306-19-0  |          | <0.2 mg/kg        | 1.142        | <0.228 mg/kg   | <0.0000228 %         |            | <LOD           |
| 5  | chromium in chromium(III) compounds { chromium(III) oxide (worst case) }                                                                                 | 215-160-9           |           | 1308-38-9  |          | 21 mg/kg          | 1.462        | 24.83 mg/kg    | 0.00248 %            | ✓          |                |
| 6  | chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex } | 024-017-00-8        |           |            |          | <2 mg/kg          | 2.27         | <4.54 mg/kg    | <0.000454 %          |            | <LOD           |
| 7  | copper { dicopper oxide; copper (I) oxide }                                                                                                              | 029-002-00-X        | 215-270-7 | 1317-39-1  |          | 16 mg/kg          | 1.126        | 14.573 mg/kg   | 0.00146 %            | ✓          |                |
| 8  | lead { lead chromate }                                                                                                                                   | 082-004-00-2        | 231-846-0 | 7758-97-6  | 1        | 31 mg/kg          | 1.56         | 39.119 mg/kg   | 0.00251 %            | ✓          |                |
| 9  | mercury { mercury dichloride }                                                                                                                           | 080-010-00-X        | 231-299-8 | 7487-94-7  |          | <1 mg/kg          | 1.353        | <1.353 mg/kg   | <0.000135 %          |            | <LOD           |
| 10 | nickel { nickel chromate }                                                                                                                               | 028-035-00-7        | 238-766-5 | 14721-18-7 |          | 17 mg/kg          | 2.976        | 40.933 mg/kg   | 0.00409 %            | ✓          |                |
| 11 | selenium { nickel selenate }                                                                                                                             | 028-031-00-5        | 239-125-2 | 15060-62-5 |          | <2 mg/kg          | 2.554        | <5.108 mg/kg   | <0.000511 %          |            | <LOD           |
| 12 | zinc { zinc chromate }                                                                                                                                   | 024-007-00-3        | 236-878-9 | 13530-65-9 |          | 55 mg/kg          | 2.774        | 123.436 mg/kg  | 0.0123 %             | ✓          |                |
| 13 | pH                                                                                                                                                       |                     |           | PH         |          | 7.3 pH            |              | 7.3 pH         | 7.3 pH               |            |                |
| 14 | naphthalene                                                                                                                                              | 601-052-00-2        | 202-049-5 | 91-20-3    |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |
| 15 | acenaphthylene                                                                                                                                           |                     | 205-917-1 | 208-96-8   |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |            | <LOD           |

| #      | Determinand                                            | EU CLP index number | EC Number | CAS Number                                                                                      | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | M/C Applied | Conc. Not Used |
|--------|--------------------------------------------------------|---------------------|-----------|-------------------------------------------------------------------------------------------------|----------|-------------------|--------------|----------------|----------------------|-------------|----------------|
| 16     | acenaphthene                                           |                     | 201-469-6 | 83-32-9                                                                                         |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 17     | fluorene                                               |                     | 201-695-5 | 86-73-7                                                                                         |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 18     | phenanthrene                                           |                     | 201-581-5 | 85-01-8                                                                                         |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 19     | anthracene                                             |                     | 204-371-1 | 120-12-7                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 20     | fluoranthene                                           |                     | 205-912-4 | 206-44-0                                                                                        |          | 0.17 mg/kg        |              | 0.138 mg/kg    | 0.0000138 %          | ✓           |                |
| 21     | pyrene                                                 |                     | 204-927-3 | 129-00-0                                                                                        |          | 0.16 mg/kg        |              | 0.129 mg/kg    | 0.0000129 %          | ✓           |                |
| 22     | benzo[a]anthracene                                     | 601-033-00-9        | 200-280-6 | 56-55-3                                                                                         |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 23     | chrysene                                               | 601-048-00-0        | 205-823-4 | 218-01-9                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 24     | benzo[b]fluoranthene                                   | 601-034-00-4        | 205-911-9 | 205-99-2                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 25     | benzo[k]fluoranthene                                   | 601-036-00-5        | 205-916-6 | 207-08-9                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 26     | benzo[a]pyrene; benzo[def]chrysene                     | 601-032-00-3        | 200-028-5 | 50-32-8                                                                                         |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 27     | indeno[123-cd]pyrene                                   |                     | 205-893-2 | 193-39-5                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 28     | dibenz[a,h]anthracene                                  | 601-041-00-2        | 200-181-8 | 53-70-3                                                                                         |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 29     | benzo[ghi]perylene                                     |                     | 205-883-8 | 191-24-2                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 30     | asbestos                                               | 650-013-00-6        | -----     | 12001-28-4<br>132207-32-0<br>12172-73-5<br>77536-66-4<br>77536-68-6<br>77536-67-5<br>12001-29-5 |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 31     | asbestos in identifiable pieces of suspected ACM       |                     |           | ACM_FRAG                                                                                        |          | <0.1 mg/kg        |              | <0.1 mg/kg     | <0.00001 %           |             | <LOD           |
| 32     | barium { barium sulphide }                             | 016-002-00-X        | 244-214-4 | 21109-95-5                                                                                      |          | 90 mg/kg          | 1.233        | 89.811 mg/kg   | 0.00898 %            | ✓           |                |
| 33     | vanadium { divanadium pentaoxide; vanadium pentoxide } | 023-001-00-8        | 215-239-8 | 1314-62-1                                                                                       |          | 37 mg/kg          | 1.785        | 53.436 mg/kg   | 0.00534 %            | ✓           |                |
| Total: |                                                        |                     |           |                                                                                                 |          |                   |              |                | 0.0405 %             |             |                |

## Key

|             |                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------|
|             | User supplied data                                                                                                              |
|             | Determinand values ignored for classification, see column 'Conc. Not Used' for reason                                           |
| ⊖           | Determinand defined or amended by HazWasteOnline (see Appendix A)                                                               |
| ⚠           | Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| <LOD        | Below limit of detection                                                                                                        |
| CLP: Note 1 | Only the metal concentration has been used for classification                                                                   |
| ACM         | Asbestos Containing Materials                                                                                                   |

## Appendix A: Classifier defined and non GB MCL determinands

### ✧ **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332, Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Resp. Sens. 1; H334, Skin Sens. 1; H317, Repr. 1B; H360FD, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

### ✧ **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3; H226, Asp. Tox. 1; H304, STOT RE 2; H373, Muta. 1B; H340, Carc. 1B; H350, Repr. 2; H361d, Aquatic Chronic 2; H411

### ✧ **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4

Description/Comments:

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

### ✧ **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

GB MCL index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

### ✧ **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

### ✧ **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302, Acute Tox. 1; H330, Acute Tox. 1; H310, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315

### ✧ **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Aquatic Chronic 2; H411

### ✧ **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

### ✧ **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Carc. 2; H351, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Skin Irrit. 2; H315

### ✧ **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

✧ **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database  
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>  
Data source date: 21 Aug 2015  
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

✧ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014  
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>  
Data source date: 21 Aug 2015  
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

✧ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database  
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>  
Data source date: 06 Aug 2015  
Hazard Statements: Carc. 2; H351

✧ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015  
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>  
Data source date: 23 Jul 2015  
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

✧ **asbestos in identifiable pieces of suspected ACM** (CAS Number: ACM\_FRAG)

Description/Comments: Enter the concentration of asbestos relative to the suspected ACM not the whole waste  
Data source: WM3 v1, Chapter 3.1  
Data source date: 31 May 2015  
Hazard Statements: Carc. 1A; H350 , STOT RE 1; H372

✧ **barium sulphide** (EC Number: 244-214-4, CAS Number: 21109-95-5)

GB MCL index number: 016-002-00-X  
Description/Comments:  
Additional Hazard Statement(s): EUH031 >= 0.8 %  
Reason for additional Hazards Statement(s):  
20 Nov 2021 - EUH031 >= 0.8 % hazard statement sourced from: WM3, Table C12.2

✧ **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

GB MCL index number: 602-039-00-4  
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans;

POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.

Additional Hazard Statement(s): Carc. 1A; H350  
Reason for additional Hazards Statement(s):  
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

## Appendix B: Rationale for selection of metal species

### arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

### beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required)

### boron {diboron trioxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

### cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

## **chromium in chromium(III) compounds {chromium(III) oxide {worst case}}**

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

## **chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}**

Worst case species based on hazard statements/molecular weight (edit as required)

### **copper {dicopper oxide; copper (I) oxide}**

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

### **lead {lead chromate}**

Worst case CLP species based on hazard statements/molecular weight (edit as required)

### **mercury {mercury dichloride}**

Worst case CLP species based on hazard statements/molecular weight (edit as required)

### **molybdenum {molybdenum(VI) oxide}**

Worst case CLP species based on hazard statements/molecular weight (edit as required)

### **nickel {nickel chromate}**

Worst case CLP species based on hazard statements/molecular weight (edit as required)

### **selenium {nickel selenate}**

Worst case CLP species based on hazard statements/molecular weight (edit as required)

### **zinc {zinc chromate}**

Worst case CLP species based on hazard statements/molecular weight (edit as required)

## **cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}**

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

### **barium {barium sulphide}**

In the absence of significant chromium in samples, chromate species (barium chromate) not possible or very unlikely; barium sulphide selected as applicable

### **vanadium {divanadium pentaoxide; vanadium pentoxide}**

worst case / most likely species

## **Appendix C: Version**

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021

HazWasteOnline Classification Engine Version: 2024.30.5942.10989 (30 Jan 2024)

HazWasteOnline Database: 2024.26.5938.10982 (26 Jan 2024)

This classification utilises the following guidance and legislation:

**WM3 v1.2.GB - Waste Classification** - 1st Edition v1.2.GB - Oct 2021

**CLP Regulation** - Regulation 1272/2008/EC of 16 December 2008

**1st ATP** - Regulation 790/2009/EC of 10 August 2009

**2nd ATP** - Regulation 286/2011/EC of 10 March 2011

**3rd ATP** - Regulation 618/2012/EU of 10 July 2012

**4th ATP** - Regulation 487/2013/EU of 8 May 2013

**Correction to 1st ATP** - Regulation 758/2013/EU of 7 August 2013

**5th ATP** - Regulation 944/2013/EU of 2 October 2013

**6th ATP** - Regulation 605/2014/EU of 5 June 2014

**WFD Annex III replacement** - Regulation 1357/2014/EU of 18 December 2014

**Revised List of Waste 2014** - Decision 2014/955/EU of 18 December 2014

**7th ATP** - Regulation 2015/1221/EU of 24 July 2015

**8th ATP** - Regulation (EU) 2016/918 of 19 May 2016

**9th ATP** - Regulation (EU) 2016/1179 of 19 July 2016

**10th ATP** - Regulation (EU) 2017/776 of 4 May 2017

**HP14 amendment** - Regulation (EU) 2017/997 of 8 June 2017

**13th ATP** - Regulation (EU) 2018/1480 of 4 October 2018

**14th ATP** - Regulation (EU) 2020/217 of 4 October 2019

**15th ATP** - Regulation (EU) 2020/1182 of 19 May 2020

**The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)**

**Regulations 2020** - UK: 2020 No. 1567 of 16th December 2020

**The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020** - UK:

2020 No. 1540 of 16th December 2020

**GB MCL List** - version 1.1 of 09 June 2021

**GB MCL List v2.0** - version 2.0 of 20th October 2023

There is the possibility that sources of contamination may be present on the site which were not identified during this investigation. Should contamination be identified or suspected during any phase of the development (most likely groundworks) this should be assessed accordingly by implementing the following:

#### Immediate action

All works in the vicinity of the suspected contaminated material to cease; and  
Attendance by a suitably experienced Environmental Engineer to assess the suspected contaminated material and if necessary, sample for characterisation.

#### Likely steps (to be confirmed following initial assessment)

If it is **not** feasible to keep the suspected material in situ, then these should be removed and temporarily stored in a fenced area, whilst characterisation is undertaken. The storage area should be secured and contained to ensure that potential contamination does not get moved and affect other areas of the site. Depending upon the amounts of material under consideration, this could be either a skip or a lined area;

If the suspected contaminated material is dry or is suspected to contain asbestos, the material should be covered to prevent airborne contamination in the form of dust or fibres;

Upon characterisation of the suspected contamination, if assessed to be impacted, the material may be either treated or removed from site following suitable waste management licensing or obtaining appropriate consents or agreements with relevant Regulatory Authorities;

All contaminated material to be removed from site, should be disposed of at a suitably licensed facility / removed by a suitably licensed waste handler;

Following excavation and removal, any open excavations or service trenches should be backfilled with soil that is suitable and certified as 'clean', (this may be either site-won or imported); and

Validation of backfilling and remedial works will likely be required.

The Discovery Strategy is applicable during all phases of the development.



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**Knotweed.**

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