

Dŵr Cymru Welsh Water AMP7 Alliance

Trebanos WwTW

Ground Investigation Interpretive Report

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Introduction

This Ground Investigation Interpretive Report has been prepared as a summary interpretation of the ground investigation at Trebanos Wastewater Treatment Works (WwTW) for the purpose of upgrades to the WwTW. This ground investigation was preceded by an initial intrusive investigation for the purpose of a new stormwater outfall to the River Tawe (see B16421-102503-ZZ-ZZ-RP-GB-GC6704).

The site is at National Grid Reference 271088, 202180 to the south-east of the village of Trebanos. The location is shown in Drawing 1.

The site is bounded by the Swansea Canal to the north and the River Tawe to the south.

The site is relatively flat and located within the flood plain of the River Tawe, bounded by the Swansea Valley hills to the northwest and southeast. Online topographical mapping shows the site's elevation to be at around 24mAOD. The site is currently used as a wastewater treatment works. Proposals include upgrading the current WwTW infrastructure, and extending the Works to the west. This area of the site is currently used as farmland for livestock. A summary of the key proposals is listed below and are shown on Drawing 1 and can be found in Appendix F.1.

- Modifying existing aeration tanks.
- New stone/grasscrete track for crane access to aeration track.
- Two new FST tanks.
- New concrete access road.
- Two new sludge holding tanks.
- New sludge thickener.
- New MCC kiosk.
- New first flush storm tank (likely to change into twin conical tanks, similar in form to FST tanks).
- New PFET lift.
- New package plant for FE booster filter and pumps.
- Final effluent chamber.

Executive Summary

Heading	Findings	Construction considerations
Geotechnical Engineering	The site was found to predominantly comprise ~1.4m of Made Ground (re-worked granular natural material), overlying ~20m of granular Alluvium and Glaciofluvial Deposits. Geotechnical testing was scheduled on selected samples to allow for characteristic parameters to be determined. These are shown in Appendix B. Groundwater was encountered within the top ~2.5m of material in all exploratory holes. The ACEC concrete classification is DS-1 AC-1 for both Made Ground and Alluvium / Glaciofluvial Deposits across the site.	Key buildability risks are driven by the high groundwater across the site and water ingress to excavations; the granular nature of both Made Ground and Alluvium / Glaciofluvial Deposits requiring support to excavations to prevent collapse; and the variable nature of both the Made Ground and Alluvium / Glaciofluvial Deposits and the potential for obstructions (i.e., cobbles and boulders), and localised soft spots from cohesive horizons. Consolidation is not considered to be a significant risk due to the granular nature of the material underlying the site. Uplift due to the depth of some of the larger structures (i.e., FST tanks) and high groundwater levels both encountered during the ground investigation and in a 1-in-100-year flood event is a significant risk. Preliminary foundation advice is presented in B.3.5.2 and will need to be considered in detailed design.
Human Health Risk Assessment	There were no exceedances of the commercial guideline values and therefore no significant risks have been identified with respect to end use, and therefore if material re-use is considered as part of the design, materials are suitable for re-use with respect to human health. For both Averaging Areas, there is a potential risk to construction workers/future maintenance workers due to elevated metals. The recommendations for the site are that general health and safety measures which are standard to a brownfield site development project are to be applied by the Contractor to mitigate the identified risks, as presented in Appendix C.2.4.	Recommended control measures to be implemented are presented in Appendix C.2.4. Contractor is to undertake their own risk assessment to inform control measures.
Controlled Waters Risk Assessment	Chemical analyses results of soil leachate, groundwater, and surface water, reflective of the existing site conditions, indicates that there is limited evidence to suggest that leachable contaminants from the site are impacting groundwater and surface water. In the permanent case (post completion of the proposed development), removal of the source material (e.g. Made Ground) because of construction, and building/hardstanding cover reducing infiltration/leaching potential, will reduce risks to controlled waters post completion of the development.	During construction, the Contractor should ensure that the works do not negatively impact the quality of adjacent watercourses. This should be done by following best practice guidelines as shown in the Guidance for Pollution Prevention (GPPs). Should there be any Made Ground identified during the works that has not previously been encountered, the risk of leachable contaminants should be reassessed through appropriate testing.
Waste Assessment	A waste assessment was undertaken on selected samples to inform disposal options for the anticipated arisings. The following was identified from the assessment: <u>Averaging Zone 1, field:</u>	Recommendations for best practice relating to materials/waste management during construction are provided in Appendix D.1.3.

Heading	Findings	Construction considerations
	Waste Stream 1: HAZARDOUS waste with pre-treatment required to be suitable for disposal at a HAZARDOUS waste landfill. Waste Stream 2: NON-HAZARDOUS waste and suitable for disposal at a NON-HAZARDOUS waste landfill. Waste Stream 3: NON-HAZARDOUS waste and suitable for disposal at an INERT waste landfill (should the waste receiver/regulator accept the approach of using WAC Sulphate and Chloride values instead of Total Dissolved Solids, in line with the Landfill Regulations). <u>Averaging Zone 2, existing WwTW development area:</u> Waste Stream 1: NON-HAZARDOUS waste and suitable for disposal at an INERT waste landfill. Waste Stream 2: NON-HAZARDOUS waste and suitable for disposal at a NON-HAZARDOUS waste landfill. Waste Stream 3: NON-HAZARDOUS waste and suitable for disposal at an INERT waste landfill (should the waste receiver/regulator accept the approach of using WAC Sulphate and Chloride values instead of Total Dissolved Solids, in line with the Landfill Regulations). Full waste assessment and recommendations are presented in Appendix D.	
Dewatering Assessment	The assessment has concluded that the proposed below ground works at the Trebanos WwTW will require excavation below the water table and as such will require appropriate groundwater control measures or construction in the wet. Due to the high permeability, groundwater ingress rates are anticipated to be high should excavation be undertaken in the dry. Screening of the groundwater quality measurements has identified environmental quality standard exceedances for several determinands.	Groundwater control or wet construction methodologies will be required to construct structures below the water table (which is close to surface). To construct in the dry could necessitate permeation grouting into the granular soils, together with lateral cutoff by sheet pile excavation support. These would be temporary works elements designed directly by the contractor. Groundwater control requirements should be reviewed as works progress, to ensure the most appropriate methodology is utilised for the encountered ground conditions (for instance sump pumping may not be appropriate where running sand conditions are encountered or where the permeability is very high such as at this site). Due to the high permeability, groundwater ingress rates into excavations are anticipated to be high and an abstraction license is likely to be required from Natural Resources Wales. Where dewatering is considered without additional cut-off measures, a pumping test should be undertaken to establish aquifer parameters and inform any license applications.

Heading	Findings	Construction considerations
		Appropriate arrangements will need to be made to dispose of any abstracted water. Discharges to ground or surface water may require an environmental permit. Exceedances of environmental quality standards may impact the ability of discharging the groundwater to ground or the river without prior treatment. Many risks (e.g. contamination) to the water environment can be mitigated through the implementation of good site practice and pollution prevention measures which should be followed during construction. Surface water runoff can be significant if not appropriately managed. Code of Construction Practice (CoCP) measures should be incorporated to ensure that surface water is diverted away from any subsurface works.

Appendix A

Ground Investigation

The ground investigation was carried out by Quantum Geotechnical Limited on behalf of Morgan Sindall Construction and Infrastructure Ltd under technical direction of Ove Arup and Partners Ltd. The factual report of this ground investigation can be found in Appendix F.6. Ten exploratory holes were carried out between 30th October – 8th November 2023 comprising:

- Five dynamic sampled/rotary cored boreholes; and
- Five machine excavated trial pits.

The location of these exploratory holes is shown on Drawing 1.

In-situ testing comprised Standard Penetration Tests (SPTs), and two Dynamic Cone Penetrometer tests (DCPs). Upon completion, combined gas and groundwater standpipes were installed within each of the boreholes. Five variable head permeability tests were attempted, however, due to the speed of re-charge rate, these tests were unsuccessful. This is a testament to the difficulties to be expected in controlling groundwater during excavations.

Geotechnical and geo-environmental laboratory testing was carried by Geo Site and Testing Services. Geotechnical testing comprised:

- Three moisture content tests.
- Three Atterberg limit tests.
- 26 Particle Size Distribution (PSD) tests.
- Six sedimentation tests.
- Seven shear box tests.
- 18 BRE Suite C concrete classification tests.

Geo-environmental testing comprised:

- 17 samples tested for general suite (metals and general inorganic contaminants).
- 10 samples screened for asbestos (no subsequent quantification analysis was undertaken as asbestos was not identified).
- 17 samples tested for total petroleum hydrocarbon (TPH).
- 12 samples tested for polycyclic aromatic hydrocarbons (PAH) and benzene, toluene, ethylbenzene, and xylenes (BTEX compounds).
- Five samples tested for semi-volatile organic and volatile organic compounds (SVOC and VOC).
- Five samples tested for polychlorinated biphenyls (PCB).
- Nine samples tested for hexavalent chromium.
- 12 samples tested for Waste Acceptance Criteria (WAC) testing.
- Six samples of soil tested for leachable contaminants.

Post ground investigation, Arup were made aware that the GI Contractor had not tested soil samples in BH101 (1m and 2.8m bgl) and BH106 (0.2m and 0.5m bgl), despite these being included on the populated laboratory testing schedules. Arup communicated the missing testing information to Morgan Sindall prior to the written interpretation of this report, to which Morgan Sindall confirmed that Arup can proceed with the interpretative reporting without this information.

Appendix B

Ground Conditions

B.1 Encountered Ground Conditions

Details pertaining to the published geology of the site can be found within the desk study (B16421-102503-XX-ZZ-RP-GB-GC6701). The published geology comprises superficial deposits of Alluvium over Glaciofluvial Deposits, with Sandstone at depth as bedrock.

Intrusive investigation confirmed the presence of Made Ground overlying granular soils which could be either alluvium or glaciofluvial deposits (referred hereafter generally as Alluvium, for clarity). Sandstone was not encountered within the scheduled depth of any of the exploratory holes.

A summary of the encountered ground conditions is presented in Table 1.

Table 1: Encountered ground conditions.

Stratum	Thickness (m)	Approximate Depth to Top of Stratum (mBGL)	Typical Description
Made Ground	1.4	0	Sandy silty fine to coarse subrounded Gravel with anthropogenic inclusions including slag, brick, concrete.
Alluvium (or Glaciofluvial Deposits)	~ 10.0 – 18.0 encountered (total thickness not confirmed).	1.4	Medium dense to dense sandy sub-rounded to sub-angular gravel. Occasional localised pockets of medium dense medium Sand and very soft to soft slightly gravelly sandy Clay.
Sandstone	Not encountered.		

B.2 Groundwater

Piezometers were installed in all five boreholes. These boreholes were dipped on three return visits to site by the Ground Investigation contractor (28/11/2023, 13/12/2023, and 01/01/2024) and on a fourth return visit by Morgan Sindall (24/01/2024). Groundwater levels from these return visits are presented in **Error! Reference source not found..** Further information pertaining to groundwater can be found in Appendix E.

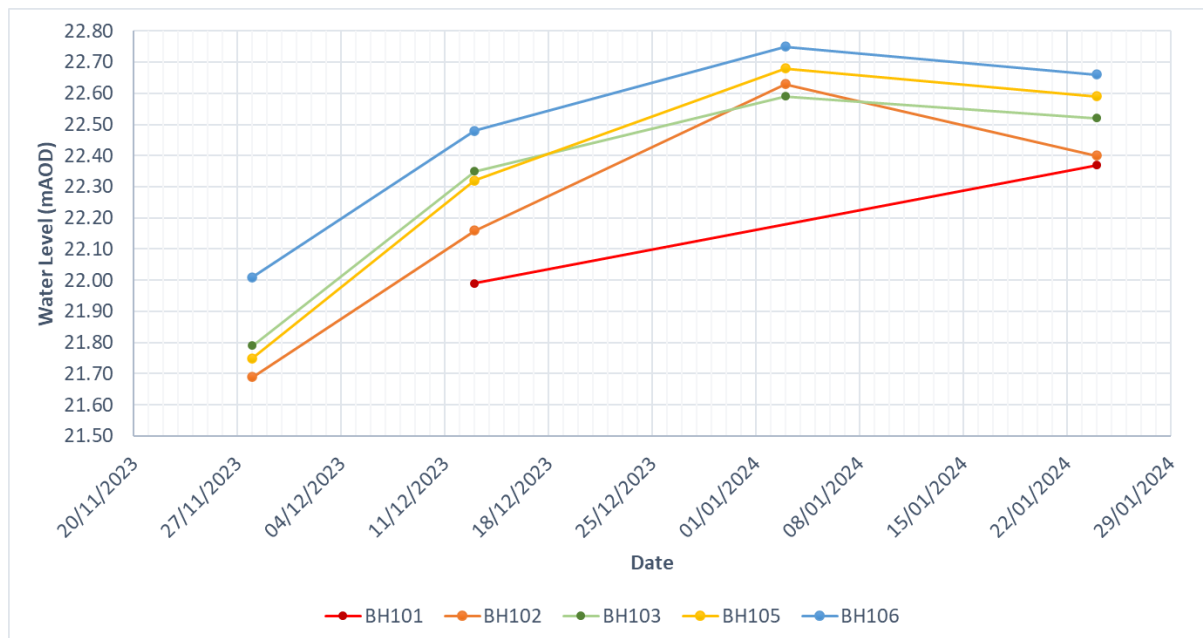


Figure 1: Groundwater levels.

B.3 Geotechnical Analysis

This section provides a summary of the site ground model, which has been interpreted from the findings of the ground investigation.

B.3.1 Made Ground

Made Ground was encountered in BH101, BH102, BH105, TP101, TP103, and TP104. PSD testing was conducted on three samples of Made Ground and the corresponding grading curves can be found in Appendix F.2 Figure 1. These grading curves are closely correlated to the grading curves produced by testing on samples of Alluvium/Glaciofluvial Deposits. This suggests that the majority of the Made Ground comprises re-worked natural material. One SPT test was conducted within the Made Ground 1.4mBGL and yielded an SPT N value of 167. This is not considered to be representative of the strata (see Appendix F.2 Figure 4) due to scale effects from the gravelly nature of these soils.

Two DCP tests were conducted within the Made Ground at the locations of TP101 and TP103, starting at 0.645mBGL and 0.636mBGL respectively. The DCP test conducted in TP101 was terminated due to refusal. A CBR percentage of 6% was determined between 0.636-0.800mBGL in TP103. Between 0.480-1.484m BGL, a CBR percentage of 10% was determined, however, the test was terminated due to refusal.

B.3.2 Alluvium / Glaciofluvial Deposits

Alluvium/Glaciofluvial Deposits was encountered in all exploratory holes and immediately underlying Made Ground where encountered. PSD testing was conducted on 22 examples of Alluvium/Glaciofluvial Deposits and confirmed its predominantly granular descriptions from within the logs. Percentage fines content was generally found to be <10%. Three samples were found to have percentage fines content within 10-20% and were subject to Atterberg limit testing. The cohesive fractions of these samples, though not representative of the overall mass of this unit, were shown to have plasticity indexes ranging between 27-47% and can be defined as intermediate to very high plasticity clays (see Appendix F.2 Figure 2 and 3).

SPT N values within the top 12m of Alluvium/Glaciofluvial Deposits ranged between 6 and 48. From 12-18mBGL, SPT values increased linearly from 16 to 41 (see Appendix F.2 Figure 4). Seven small shear box tests were conducted on samples of Alluvium/Glaciofluvial Deposits between 2.20-7.20mBGL and yielded shearing resistance angles between 31.0-40.0°.

B.3.3 Geotechnical Parameters

Values of geotechnical properties are presented in Table 2 below. Soil parameters have been derived from in-situ SPTs, correlations with ground investigation data and published values as well as engineering judgement.

Table 2: Geotechnical parameters.

Strata	Unit Weight, γ'_k (kN/m ³)	Angle of Friction, $\phi'_{pk,k}$ (°)	Young's Modulus, E'_k (MPa)
Made Ground	20 ^[1]	32 ^[2]	32 ^[4]
Alluvium / Glaciofluvial Deposits	20 ^[1]	31 ^[3]	0-12m BGL: 32 ^[4] 12-z-18m BGL: $\frac{z-3.13}{0.12}$ ^[4]
¹: Based on BS8004:2015+A1:2020. Figure 2. ²: Based on BS8004:2015+A1:2020: Equation 4 using $\phi'_{ang}=2^\circ$ and $\phi_{PSD}=0^\circ$ from Table 1. ³: Based on shear box testing: See B3.2 and Appendix A Figure 5. ⁴: Based on Stroud (1989): $SPTN_{60} \times 2.0$ for granular material. z = depth (mBGL) between 12-18m BGL			

B.3.4 Buried Concrete Classification

BRE Suite C (Brownfield site – pyrite absent) tests were undertaken on samples of Made Ground and Alluvium/Glaciofluvial Deposits in the locations of proposed concrete to be used in construction. Table 3 summarises the tests and determines the ACEC class following guidance from BRE Special Digest 1.

Table 3: Buried concrete classification.

Strata	No. of Samples	Sulphate as SO ₄ (mg/l)	Design Sulphate Class	pH	ACEC Class
Made Ground	9	94.0	DS-1	6.7	AC-1
Alluvium / Glaciofluvial Deposits	9	89.5		6.8	

B.3.5 Geotechnical Considerations

B.3.5.1 Buildability

Shallow groundwater was encountered across the site and is expected to be a key buildability risk. Variable head tests had to be terminated early due to high recharge rates, and trial pits terminated due to water ingress. A combination of high groundwater levels and the granular (thus highly permeable) nature of both the Made Ground and Alluvium/Glaciofluvial Deposits means that water ingress into excavations is to be expected and appropriate temporary works (i.e., cofferdams, grouting, etc) and de-watering measures are expected to be essential during construction.

Excavations are expected to require support to stay open due to the granular and water-bearing nature of both Made Ground and Alluvium/Glaciofluvial Deposits. There is also potential to encounter buried obstructions in the form of cobbles and boulders during excavations.

Localised soft spots are anticipated from cohesive horizons within the Alluvium/Glaciofluvial Deposits. If these are encountered at the formation level of any foundations or structures across the site, they will require removal and replacement with an appropriate compacted granular material to avoid excessive settlements.

B.3.5.2 Foundations

Consolidation is not considered a significant risk at the site, as the site is predominantly underlain by granular material. Localised pockets of cohesive material will require excavation and replacement with suitable compacted granular material if encountered. The main risk associated with the larger structures (i.e., the two new FST tanks), is that of uplift. By inspection, the two large FST tanks are likely to be subject to large uplift pressures from ~10m head of water considering the 1-in-100-year flood event water level of 24.7mAOD. Preliminary options to manage this risk could include:

- Increasing the self-weight of the structures by increasing the amount of concrete (i.e., via increasing the thickness of the walls, or mass concrete pour at the base of the structure) used in construction.
- Increasing the diameter of the founding slab of the structure and creating closed cells which could potentially be filled with site-won materials, thus increasing the self-weight of the structure.
- Use of tension piles to counteract the uplift pressures.

Appendix C

Geo-Environmental Risk Assessment

C.1 Conceptual Site Model

C.1.1 Overview

An overview of relevant sources, pathways, and receptors of contamination with respect to the development, and interactions, is provided in Table 4. This forms the Conceptual Site Model (CSM).

Table 4: Overview of the Conceptual Site Model (CSM)

Sources	Pathways	Receptors	Commentary
Made Ground: All exploratory holes except BH103, BH106, TP102, and TP105. Anthropogenic materials encountered within the Made Ground included concrete, brick, coal (TP103) and slag.	Direct soil and dust ingestion.	Construction and maintenance workers	Construction workers will be directly exposed to Made Ground via these pathways during earthworks.
	Dermal exposure to soils during excavations.		Maintenance works required to below ground assets (e.g. pipework) will result in exposure to Made Ground via these pathways to maintenance workers.
	Inhalation of particulates/fibres should they be disturbed.		Assessment undertaken in Section C.2 to confirm risks and inform the appropriate health and safety measures.
	Inhalation of particulate matter/fibres and soil vapours.		
Made Ground: See above.	Direct dermal and ingestion pathways.	Site workers post-development	Limited potential for material re-use. The source (Made Ground) is likely to be removed because of construction, or covered with buildings/hardstanding, removing the pathway.
	Inhalation of soil vapours and ground gases		Assessment undertaken in Section C.2 to confirm risks and confirm if control measures are required.
Made Ground: See above.	Infiltration, leaching, and vertical migration.	Groundwater	Leachate generation may potentially increase during the construction phase during excavation of Made Ground.
			Assessment undertaken in Section C.3 to confirm risks and confirm if control measures are required.
Made Ground: See above.	Lateral migration through intergranular groundwater flow.	River Tawe (surface water).	Continuity between groundwater and surface water is anticipated.
			Assessment required to validate potential pathways.
			Assessment undertaken in Section C.3 to confirm risks and confirm if control measures are required.

C.2 Tier 2 Human Health Risk Assessment

C.2.1 Methodology

To assess the risks posed by contaminated land to human health, a Tier 2 human health risk assessment has been undertaken. The Tier 1 risk assessment, which is the presentation of the CSM, is presented in Section C.1.

To give an indication of potential risks posed to the identified short-term receptors, the chemical analyses results will be screened against conservative guideline values (S4UL¹) and Arup Generic Assessment Criteria (GAC) where relevant, including residential without plant uptake and commercial land use scenarios. The following assessment criteria/scenarios have been considered for the assessment, along with the justification for their use:

- Residential without plant uptake: To assess the risks posed to site operatives and future maintenance workers (in the absence of acute-term exposure GAC) – ‘construction phase’.
- Commercial: To assess the risks posed to workers of the WwTW post completion of the works – ‘operational phase’.

This risk assessment considers two separate Averaging Zones, on account of the different historical development and therefore anticipated differences in soil chemistry across the site. These Averaging Zones are shown on **Error! Reference source not found.** and include soils associated with the field and soils associated with the existing WwTW development. Within the given Averaging Zones, soils have also been distinguished into Made Ground and natural soils and have been assessed separately, due to anticipated differences in chemistry and composition.

The number of samples per category is provided below:

- **Averaging Zone 1, Field:**
 - Reworked topsoil: Two samples.
 - Made Ground: Two samples.
 - Alluvial soil: Six samples.
- **Averaging Zone 2, existing WwTW:**
 - Reworked topsoil: One sample.
 - Made Ground: Five samples.
 - Alluvial soil: One sample.

There has been no evidence of building/infrastructure development associated with Averaging Zone 1. On historical maps, Averaging Zone 1 has only been recorded as an undeveloped field. Aerial imagery available on Google Earth from 1999 indicates that there is some evidence of agricultural activities in Averaging Zone 1. Since 2015, there has also been evidence of some surface working of the ground, prominent in the southeast/east, which can be seen on **Error! Reference source not found.**

C.2.2 Results

No soils (both Averaging Zones), including reworked topsoil, Made Ground or alluvial soil, were associated with exceedances of the commercial GAC. Additionally, no asbestos was identified from the laboratory screening in any of the anthropogenic soils across both Averaging Zones.

¹ The LQM/CIEH S4ULs for Human Health Risk Assessment, (2014) Version 1.0, Paul Nathanail et al. February 2014.

Exceedances of the residential without plant uptake GAC were identified in both Averaging Zones associated with both anthropogenic and natural soils, see Table 5.

Table 5: Residential without plant uptake GAC exceedances

Hole ID (depth): sample description	Determinand	Recorded Concentration (mg/kg)	GAC (mg/kg)
Averaging Zone 1 – reworked topsoil			
TP105 (0.2): Dark brownish grey sandy gravelly CLAY. Gravel of mudstone, sandstone, and brick fragments.	Arsenic	<u>73</u>	40
	Lead	<u>840</u>	310
Averaging Zone 1 – Made Ground			
BH105 (0.5): Dark grey, brown sandy very gravelly CLAY. Sand is fine to medium. Gravel is angular to subrounded of limestone and mudstone.	Arsenic	<u>48</u>	40
Averaging Zone 1 – Alluvial soils			
TP105 (0.5): Greyish brown with orange mottles sandy SILT.	Arsenic	<u>59</u>	40
BH103 (1.7): Medium dense brown very gravelly coarse SAND. Gravel is subrounded to rounded of mudstone, limestone, and quartz.	Arsenic	<u>52</u>	40
	Chromium	<u>2000</u>	910
Averaging Zone 2 – Made Ground			
TP101 (0.2): Greyish brown sandy silty fine to coarse subrounded to angular GRAVEL of concrete, limestone, and brick.	Arsenic	<u>40</u>	40
	Chromium	<u>1100</u>	910
TP101 (0.5): Dark greyish brown sandy silty medium to coarse subrounded to angular GRAVEL of concrete, brick, and slag.	Arsenic	<u>51</u>	40
	Lead	<u>420</u>	310

C.2.3 Discussion

Table 5 indicates that reworked topsoil, Made Ground and alluvial soils contain elevated arsenic, above the applied residential without plant uptake GAC. Lead was also recorded above the GAC in reworked topsoil, and chromium in alluvial soils. There is no visual evidence of metal contamination associated with the exploratory hole descriptions and based on the site history⁸, the field has no historical building/infrastructure development and has only been used for agriculture. Recorded elevated metals may be associated with agricultural practices (e.g. fertiliser or chemical applications).

The Made Ground in the existing WwTW was associated with similarly elevated metals. The source of elevated metals may be associated with the historical development of the site as a WwTW.

Further review has been undertaken as both Averaging Areas were associated with similarly elevated contaminants, despite being the subject of different historical development. The British Geological Survey (BGS) UK Soil Observatory Viewer² contains geochemical data associated with the *Advanced Soil Geochemical Atlas of England and Wales*. The Atlas contains geochemical maps for 50 major and trace elements, based on the data findings of 5700 surface soil samples (0-15cm) collected across England and Wales. Based on the maps, the anticipated concentrations of arsenic in shallow soils in the Trebanos area is 103mg/kg. The recorded concentrations of arsenic from the ground investigation testing were generally below the anticipated geochemical concentration, although review of recorded concentrations and anticipated

² UK Soil Observatory Viewer. [Accessed January 2024: [UK Soil Observatory \(bgs.ac.uk\)](https://bgs.ac.uk/)]

geochemistries² indicates that elevated concentrations of arsenic (and other metals) may be associated with the wider regional area of Swansea and the Neath Valley. This is likely to be associated with historical industrial development of the Swansea and Neath Valleys areas, which were the world-centre of copper and other non-ferrous smelting processing arsenic, lead, zinc, silver and tin in the 18th and 19th centuries³. It is possible that the elevated metals recorded at the site relate to the regional geochemistry and its associated industrial legacy.

C.2.4 Conclusions and recommendations

There were no exceedances of the commercial guideline values and therefore no significant risks have been identified with respect to end use, and therefore if material re-use is considered as part of the design, materials are suitable for re-use with respect to human health.

For both Averaging Areas, there is a potential risk to construction workers/future maintenance workers due to elevated metals.

General recommendations based on the assessment undertaken are provided in Table 6.

Table 6: Human health risk assessment recommendations

Recommendation	Commentary
General health and safety measures	The Contractor should undertake their own health and safety risk assessments based on available information to ensure these risks are controlled and mitigated. As a minimum, these are to include provision of appropriate welfare facilities allowing for hands and face washing and application of appropriate PPE.
Risk of exposure to asbestos in soils	While no asbestos was detected from any of the samples, exposure to asbestos must still be considered as a potential risk when undertaking works in un-investigated areas consisting of Made Ground (particularly in areas of existing assets which may contain asbestos). Dust suppression measures should be implemented where necessary.
Materials management during construction works	Should materials different in nature to those encountered in the ground investigation or unforeseen contamination be encountered during the scheme construction the following is recommended: - Works are halted. - The encountered contamination is assessed by a suitably qualified and experienced person. - Suitable risk assessments are undertaken to confirm the level of health and safety measures (e.g. PPE) required for site operatives. - Materials exhibiting evidence of contamination are separated from other arisings and placed on plastic sheeting (for further sampling and analysis). - In the case of suspected asbestos, a specialist asbestos contractor should be consulted to confirm the appropriate management and associated mitigation measures of any asbestos impacted materials or ACM should these be encountered.
Re-use of materials	Based on completed testing during the GI, the site won materials are likely to be suitable for re-use from a human health perspective. All excavations should be backfilled with material that is known to be geotechnically and chemically appropriate; free from contaminants and asbestos.

³ Marchant et al. The assessment of point-source and diffuse soil metal pollution using robust geostatistical methods: a case study in Swansea (Wales, UK).

C.3 Tier 2 Controlled Waters Risk Assessment

C.3.1 Methodology

A total of 17 samples of soil were obtained and subject to leachate testing. Three rounds of groundwater monitoring were undertaken in boreholes, and surface water sampling from three surface water locations located upstream, midstream, and downstream of the WwTW in the River Tawe.

The site does not lie within a Source Protection Zone (SPZ) and the underlying groundwater body is classified as a Secondary A aquifer. A surface watercourse, the River Tawe, runs adjacent to the site to the east and south. Therefore, the river is considered the primary receptor to potential site contamination. Consequently, freshwater Environmental Quality Standards (EQS) values have been applied as the appropriate screening criteria.

The applied freshwater EQS for copper, nickel, manganese, lead, and zinc pertain to bioavailable concentrations of the substances. The calculation of the bioavailable concentrations was undertaken using the BA Assessment Tool (M-BAT) produced by UKTAG⁴. This requires the analysis of pH (average), Dissolved Organic Carbon (DOC) (median), and calcium (average) in the receiving water receptor. The criteria for zinc have been derived using the Average Background Concentration (ABC) of 10.9µg/l plus 1.4µg/l (all other freshwaters not listed); 12.3µg/l.

The EQS for cadmium is based on hardness, an average of which has been taken from surface water, therefore a value of 0.09µg/l has been used based on a hardness value of between 50mg/l and 100mg/l in line with the WFD guidance.

C.3.2 Soil Leachate Assessment

Samples of soil leachate exceeding the assessment criteria are presented in Table 7.

Table 7: Soil leachate exceedances

Hole ID (depth): sample description	Determinand	Recorded Concentration (µg/l)	Criteria (µg/l)
Averaging Zone 1 – reworked topsoil			
TP105 (0.2): Dark brownish grey sandy gravelly CLAY. Gravel of mudstone, sandstone, and brick fragments.	Cadmium	<u>0.28</u>	0.09
	Bioavailable copper	<u>2.96</u>	1
	Bioavailable lead	<u>27.2</u>	1.2
	Bioavailable zinc	<u>48.3</u>	12.3
Averaging Zone 1 – Made Ground			
BH105 (0.5): Dark greyish brown sandy very gravelly CLAY. Gravel of limestone and mudstone.	Bioavailable copper	<u>1.8</u>	1
BH105 (1): Dark greyish brown slightly gravelly very sandy SILT. Gravel of mudstone.	Ammoniacal nitrogen	<u>420</u>	300
	Bioavailable copper	<u>1.6</u>	1
	Bioavailable manganese	<u>170</u>	123
	Bioavailable lead	<u>1.67</u>	1.2
Averaging Zone 1 – Alluvial soils			
BH103 (0.5): Soft greyish brown slightly gravelly sandy CLAY.	Bioavailable copper	<u>1.3</u>	1

⁴ Water Framework Directive, (2014) – United Kingdom Technical Advisory (WFD-UKTAG), “Metal Bioavailability Assessment Tool (M-BAT)”.

Hole ID (depth): sample description	Determinand	Recorded Concentration (µg/l)	Criteria (µg/l)
	Bioavailable lead	<u>2.5</u>	1.2
BH103 (1.7): Medium dense brown very gravelly coarse SAND. Gravel is subrounded to rounded of mudstone, limestone, and quartz.	pH	<u>10.9</u>	6 to 9
	Chromium	<u>57</u>	4.7
	Mercury	<u>2.4</u>	0.07
BH106 (2.5): Dense brown to brownish grey very gravelly medium SAND.	Cyanide	<u>200</u>	1
	Anthracene	<u>0.32</u>	0.1
	Fluoranthene	<u>1.5</u>	0.0063
Averaging Zone 2 – Made Ground			
TP101 (0.2): Greyish brown sandy silty fine to coarse subrounded to angular GRAVEL of concrete, limestone, and brick.	pH	<u>11</u>	6 to 9
	Chromium	<u>24</u>	4.7
	Bioavailable copper	<u>1.02</u>	1
	Mercury	<u>0.17</u>	0.07
BH102 (0.5): Grass over grey slightly silty sandy fine to coarse mudstone, siltstone, sandstone, brick, and slag GRAVEL.	Mercury	<u>0.37</u>	0.07
TP101 (0.5): Dark greyish brown sandy silty medium to coarse subrounded to angular GRAVEL of concrete, brick, and slag.	pH	<u>10.8</u>	6 to 9
	Chromium	<u>39</u>	4.7
	Mercury	<u>1.6</u>	0.07

The following has been noted from the soil quality assessment:

- Bioavailable metals were recorded as elevated in Made Ground and natural ground across both Averaging Zones. Concentrations were highest in the Made Ground/reworked material in Averaging Zone 1 (the field).
- Other metals (chromium, mercury, and cadmium) were recorded above the freshwater EQS. Mercury was only recorded above the EQS in Made Ground associated with the WwTW (potential source), whilst chromium was recorded above the EQS in Made Ground (Averaging Zone 2) and natural ground. Cadmium was recorded above the EQS in one case in a sample of reworked topsoil in Averaging Zone 1.
- pH was recorded as elevated (above the EQS range of 6 to 9) in samples of Made Ground associated with the existing WwTW and alluvial soils. Both samples of Made Ground pertained to concrete gravel inclusions, which may be the source of elevated pH.
- BH106 (2.5m bgl), a sample of natural alluvial soil, was associated with elevated cyanide (200 times EQS), anthracene (three times EQS), and fluoranthene (238 times EQS). There is no visual or olfactory evidence of contamination in the sample location, and the borehole log only recorded natural soils from surface. No samples of the shallower surface soils were tested for soil leachate to make a comparison.
- Ammoniacal nitrogen recorded above EQS in one sample of Made Ground in Averaging Zone 1.

Discussion of the results in the context of the hydrogeological Conceptual Site Model is provided in Section C.3.4.

C.3.3 Groundwater and Surface Water Quality Assessment

Three rounds of groundwater monitoring and surface water monitoring were undertaken at the site between 28th November 2023 and 3rd January 2024. This included boreholes installed in Made Ground (BH101, one round) and Alluvium (BH102, BH103, BH105, and BH106), and samples of surface water located upstream (SW1) midstream (SW2) and downstream (SW3) of the Trebanos WwTW in the River Tawe.

Groundwater and surface water exceedances of the EQS are shown in Table 8.

Table 8: Groundwater and surface water exceedances

Location ID	Determinand (rounds exceeding)	Recorded Concentration (µg/l)	Criteria (µg/l)
Groundwater - MG			
BH101	Cadmium (R2)	<u>0.12</u>	0.09
	Bioavailable copper (R2)	<u>1.1</u>	1
	Bioavailable zinc (R2)	<u>13.5</u>	12.3
Groundwater - Alluvium			
BH102	Ammoniacal nitrogen (R1)	<u>310</u>	300
	Bioavailable manganese (R1)	<u>260</u>	123
	Bioavailable zinc (R3)	<u>23.7</u>	12.3
BH103	Bioavailable manganese (R1, R2)	<u>820, 240</u>	123
	Bioavailable nickel (R1, R2)	<u>5.4, 4.3</u>	4
BH105	Bioavailable manganese (R1, R2)	<u>260, 190</u>	123
	Bioavailable zinc (R1)	<u>33.4</u>	12.3
BH106	Bioavailable manganese (R1, R2, R3)	<u>450, 360, 180</u>	123
	Bioavailable zinc (R1, R2, R3)	<u>28, 14, 20.3</u>	12.3
Surface water			
SW1 – Upstream	Bioavailable manganese (R3)	<u>250</u>	123
	Bioavailable zinc (R3)	<u>16.9</u>	12.3
SW2 – Midstream	Ammoniacal nitrogen (R2, R3)	<u>0.32, 2.2</u>	0.3
SW3 - Downstream	Ammoniacal nitrogen (R1, R2)	<u>1.3, 8.6</u>	0.3
	Bioavailable zinc (R2, R3)	<u>15, 12.6</u>	12.3

The following has been noted from the groundwater and surface water quality testing:

- Groundwater within the Alluvium was consistently associated with elevated bioavailable manganese and bioavailable zinc, and lesser frequent bioavailable nickel and ammoniacal nitrogen. These determinands were prevalent across the monitoring rounds.
- Only one round of sampling was undertaken in BH101 as the standpipe was repeatedly recorded as dry. In this round, cadmium, bioavailable copper, and bioavailable zinc were recorded as elevated.
- Bioavailable zinc was recorded in surface water upstream and downstream, but not midstream; and was not typically repeated across rounds. Ammoniacal nitrogen was recorded midstream and downstream in two rounds of sampling. Bioavailable manganese was only recorded in one round in the upstream sampling location, and not elsewhere.
- Determinands recorded as elevated in soil leachate, for example chromium, mercury, cyanide, and PAHs, were not recorded above the freshwater EQS in groundwater or surface water.

C.3.4 Discussion

In soil leachate, the prevalence of elevated leachable bioavailable metals across all Averaging Zones (including natural strata) may be reflective of natural background concentrations, like dry weight. There was some evidence of cross variation of chemical species in the Averaging Zones, for example, leachable mercury was only recorded above the EQS in Made Ground associated with the WwTW, which may be reflective of the source of leachable mercury being from the current development of this area as a WwTW. More elevated

leachable chromium was also identified in Made Ground associated with the WwTW, which may be reflective of this area being a source of contamination. Although, elevated leachable mercury and leachable chromium was also recorded in one sample of alluvial soil. In alluvial soil, leachable cyanide and leachable PAHs were also recorded as elevated, which were not recorded elsewhere.

In groundwater and surface water, there was no evidence of elevated leachable mercury, cyanide, PAHs, or chromium (above the EQS), which were identified in soil leachate. Contaminants recorded frequently above the EQS in groundwater and surface water included bioavailable manganese and bioavailable zinc (which are likely to be reflective of natural background concentrations), with the remaining exceedances generally isolated to singular monitoring rounds.

Based on the chemical analyses results, there is limited evidence to suggest that leachable contaminants from the site are impacting groundwater and surface water. Relative to the Conceptual Site Model (CSM), the scheme will result in the removal of soils from the site to facilitate the construction of new WwTW assets, resulting in the removal of the source material from the site, reducing potential contaminant loading relative to the existing site conditions. Additionally, during the operational phase, there will be an increase in building/hardstanding cover which will result in reduced rates of infiltration and therefore leaching of site soils. Leachability potential may increase during construction due to exposed soils in excavations, although this is only considered to be short-term and is unlikely to pose a significant risk to controlled waters.

Based on the above, the risks posed by leachable contaminants is low.

C.3.5 Conclusions and recommendations

Chemical analyses results of soil leachate, groundwater, and surface water, reflective of the existing site conditions, indicates that there is limited evidence to suggest that leachable contaminants from the site are impacting groundwater and surface water.

In the permanent case (post completion of the proposed development), removal of the source material (e.g. Made Ground) because of construction, and building/hardstanding cover reducing infiltration/leaching potential, will reduce risks to controlled waters post completion of the development. During construction, the Contractor should ensure that the works do not negatively impact the quality of adjacent watercourses. This should be done by following best practice guidelines as shown in the Guidance for Pollution Prevention (GPPs).

Should there be any Made Ground identified during the works that has not previously been encountered, the risk of leachable contaminants should be reassessed through appropriate testing.

C.4 Ground gas

Three fortnightly rounds of ground gas monitoring were undertaken on the site. Boreholes were installed for gas monitoring which included BH101 (Made Ground) and BH102, BH103, BH105 and BH106 (Alluvium). Reference has been made in this section to relevant ground gas risk assessment guidance, namely assumptions relating to ground gas source generation potential in accordance with relevant CIRIA⁵ and NHBC Foundation⁶ guidance and comparisons with the site monitoring data.

The response zone in BH101 was consistently dry, and the response zones in BH102 and BH103 (Alluvium) recorded one round of monitoring where there was at least some partially unsaturated installation. The remaining installations, and most monitoring rounds within the Alluvium took place in an entirely flooded installation, limiting the reliance of the recorded gas readings.

Flow rates in partially unsaturated wells were recorded at a maximum of 0.1 l/hr. Even in flooded wells, recorded flow rates did not peak higher than 0.1 l/hr. Given this, the monitoring has not identified significant flow readings, therefore reducing the potential risk from ground gas. Additionally, the monitoring indicated limited source potential, with maximum methane and carbon dioxide concentrations recorded as 0.4% and 4.1% respectively. The data from the monitoring is congruent with the CIRIA and NHBC Foundation assumptions relating to source potential, which indicate that degradable materials within a soil matrix of Made Ground and alluvial deposits are typically low risk sources of bulk gases.

There is a negligible risk to construction and maintenance workers from ground gas due to low flow rates and lack of generative sources. The site will predominantly be hardstanding and soft landscaping, with limited enclosed spaces for entry for maintenance workers post development therefore the risk to ground gas on-site is low.

⁵ CIRIA C665, 2007. Assessing risks posed by hazardous ground gases to buildings.

⁶ NHBC Foundation, 2023. Hazardous ground gas – an essential guide for housebuilders.

Appendix D

Waste Assessment

D.1 Waste Assessment

D.1.1 Introduction

This waste assessment is for the proposed works as part of the Trebanos WwTW scheme, to confirm the waste classification for soils that may be disposed off-site. A waste assessment is required as it is anticipated that the proposed works will result in the generation of surplus materials from across the scheme (through construction upgrades required and expansion of the existing facility), which will require off-site disposal. In accordance with the Waste Hierarchy, prior to any decision making on the disposal of materials, consideration will be given to alternatives such as the potential re-use of arisings, to minimise the environmental impact associated with the design.

The waste classification report is presented at the end of this waste assessment.

D.1.2 Dry Weight Classification

D.1.2.1 European Waste Catalogue (EWC) Code Classification

To confirm the potential off-site disposal options for material arisings, the chemical analyses results obtained during the ground investigation have been assessed in accordance with current waste management guidance, the European Waste Catalogue (EWC) and guidance from WM3⁷.

This waste assessment will consider two Averaging Zones (a total area of soil encompassing a similar chemical species). This is because there have been two distinct areas of historical development identified associated with the site and therefore different soil chemistries are anticipated, these areas include:

- Averaging Zone 1: Field.
- Averaging Zone 2: Existing WwTW development area.

Error! Reference source not found. shows the Averaging Zones considered.

There has been no evidence of building/infrastructure development associated with Averaging Zone 1. On historical maps, Averaging Zone 1 has only been recorded as an undeveloped field. Aerial imagery available on Google Earth from 1999 indicates that there is some evidence of agricultural activities in Averaging Zone 1. Since 2015, there has also been evidence of some surface working of the ground, prominent in the southeast/east, which can be seen on **Error! Reference source not found.** TP102, TP105, BH103, BH105, and BH106 from the ground investigation have been excavated in this area of surface working.

It is evident from the review of the site history⁸ that the area comprising Averaging Zone 2 (see **Error! Reference source not found.**) has been occupied by sewerage work buildings since 1937 and development since then has been associated with growth of the Trebanos WwTW. Prior to 1937, Averaging Zone 2 had been undeveloped.

⁷ Waste Classification, Guidance on the classification and assessment of Waste (Technical Guidance WM3), Version 1.2GB (Appendix B update), SEPA, NRW, EA, NIEA, 2021.

⁸ Arup, 2022. Trebanos WwTW Part 1: Preliminary Review of Features/Constraints, B16421-102503-XX-ZZ-RP-GB-GC6701.

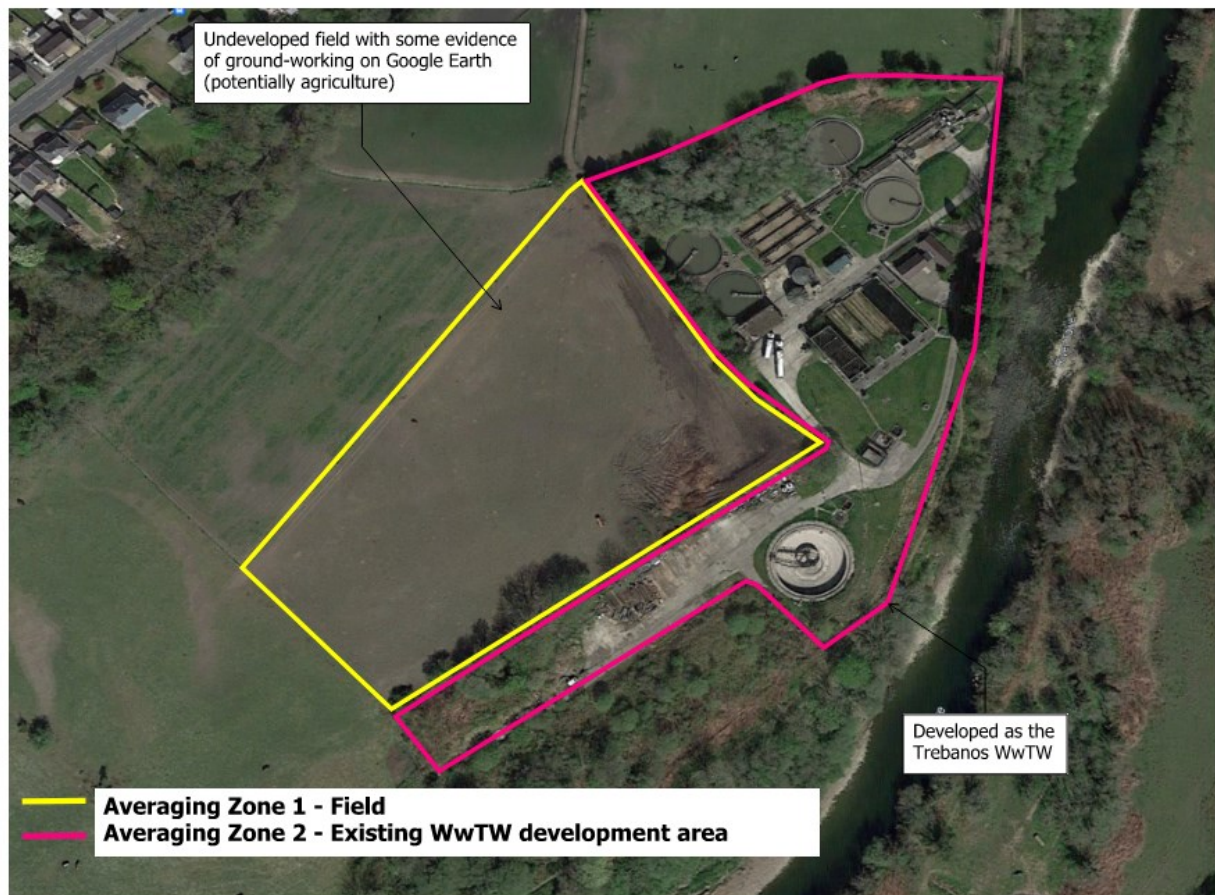


Figure 2: Averaging Zones for waste classification.

Within both Averaging Zones, reworked topsoil, Made Ground, and alluvial soils are present from surface (as identified from the ground model in Appendix B). These materials are anticipated to be excavated during construction, and therefore have been considered as waste streams for the assessment of arisings:

- Waste Stream 1: Reworked topsoil.
- Waste Stream 2: Made Ground.
- Waste Stream 3: Alluvial soils.

The waste streams have been designated the following EWC codes: **17 05 03*: Soil and stones containing dangerous substances (mirror hazardous entry)**, and **17 05 04: Soils and stones other than those mentioned in 17 05 03 (mirror non-hazardous entry)**. This is because these materials are either naturally occurring and in-situ, or have previously been placed with a defined, and intended use, and because of this project, will be excavated as part of construction (then defined as a waste).

D.1.2.1.1 Asbestos

Asbestos screening was undertaken on three samples of Waste Stream 1 and seven samples of Waste Stream 2 during the ground investigation (includes both Averaging Zones). Asbestos was not detected in any of the 10 samples screened as part of the ground investigation. No visual evidence of asbestos was identified during the ground investigation on exploratory hole records.

D.1.2.2 Soil Dry Weight Assessment

This assessment has been undertaken using the HazWasteOnline™ computer package.

D.1.2.2.1 Model Inputs

The following detail is provided relating to the model inputs:

- **Moisture Correction:** The HazWasteOnline – Wiki page⁹ for moisture content provides a review of each laboratory's procedures for types of moisture correction. This indicates that Chemtest (which is the laboratory used during this ground investigation) calculate moisture content based on a wet weight correction, and therefore the wet weight moisture correction has been applied to the assessment.
- **Hexavalent Chromium:** Nine samples were tested for hexavalent chromium across the different waste streams. In all instances the model flagged the use of chromate compounds as inappropriate for metal species, as the recorded concentrations of hexavalent chromium (not detected) were too low. Appropriate species were selected based on the information presented in the HazWasteOnline – Wiki help pages and review of chemical concentrations from geoenvironmental testing.
- **Hydrocarbon Analyses:** Samples tested from the site were analysed for Total Petroleum Hydrocarbons (TPH) and the total of the relevant fractions (C6-C40) have been assessed using HazWasteOnline™.

D.1.2.3 Haz-Waste Online (HWOL) Soil Classification and Landfill Classification (WAC Analyses)

HWOL classification and WAC analysis results are presented per Averaging Zone and waste stream in this section.

⁹ HazWasteOnline™ – Wiki, Moisture Content [Accessed January 2024: [Moisture Content \[HazWasteOnline™ - Wiki\]](#)]

D.1.2.3.1 Averaging Zone 1

Table 9 presents the waste classification and landfill disposal classification (WAC) for the encountered soils within the field during the ground investigation.

Table 9: Waste classification, WAC analysis and landfill disposal options (Averaging Zone 1)

Hole ID (depth)	Strata	HWOL classification – justification	WAC – justification	Landfill disposal																													
Waste Stream 1 – Reworked topsoil																																	
TP105 (0.2)	Dark brownish grey sandy gravelly CLAY. Gravel is mudstone, sandstone, and brick.	TP105 (0.2) was classified as Hazardous due to zinc concentrations above the HP 14 Ecotoxic threshold; Aquatic Chronic 1; H410. TP102 (0.2) was Non-Hazardous. Overall Hazardous classification for the waste stream.	No WAC testing was undertaken for TP105 (0.2). WAC testing for TP102 (0.2) indicated that Total Organic Carbon (TOC) was above the Hazardous WAC: TOC: 11% > 6%. <u>Pre-treatment required prior to Hazardous disposal.</u>	HAZARDOUS waste, with pre-treatment required prior to hazardous waste disposal.																													
TP102 (0.2)	Grass over dark grey sandy gravelly SILT.				Waste Stream 2 – Made Ground					BH105 (0.5)	Dark greyish brown sandy very gravelly CLAY. Gravel is limestone and mudstone.	Both samples of Made Ground were classified as Non-Hazardous. Overall Non-Hazardous classification for the waste stream.	No WAC testing was undertaken for BH105 (1). WAC testing for BH105 (0.5) indicated that TOC was above the Inert WAC: TOC: 8.4% > 3%. <u>Disposal at a Non-Hazardous waste facility.</u>	NON-HAZARDOUS waste, suitable for non-hazardous waste disposal.	BH105 (1)	Dark greyish brown slightly gravelly very sandy SILT. Gravel is mudstone.	Waste Stream 3 – Alluvial soils					TP105 (0.5)	Greyish brown with orange mottles sandy SILT.	All samples within this waste stream were classified as Non-Hazardous. Overall Non-Hazardous classification for the waste stream.	All determinands recorded within Inert WAC limits, except Total Dissolved Solids (TDS) in BH103 (1.7): TDS: 6300mg/kg > 4000mg/kg. Landfill regulations ¹⁰ state “ <i>The value for TDS can be used alternatively to the values for Sulphate and Chloride</i> ”. All Sulphate and Chloride values were recorded within the Inert WAC limits. The waste receiver/regulator may accept the approach of using Sulphate and Chloride as a substitute for TDS, which may allow the material to be disposed off-site at an inert waste disposal facility. If this approach is not feasible, then disposal at a Non-Hazardous waste facility may be required.	NON-HAZARDOUS waste and suitable for inert waste disposal *subject to acceptance of using Sulphate and Chloride as a substitute for TDS.	TP102 (1)	Brown very sandy fine to coarse GRAVEL.	BH103 (1.7)	Medium dense brown very gravelly coarse SAND.	BH103 (0.5)	Soft greyish brown slightly gravelly sandy CLAY.	BH106 (2.5)
Waste Stream 2 – Made Ground																																	
BH105 (0.5)	Dark greyish brown sandy very gravelly CLAY. Gravel is limestone and mudstone.	Both samples of Made Ground were classified as Non-Hazardous. Overall Non-Hazardous classification for the waste stream.	No WAC testing was undertaken for BH105 (1). WAC testing for BH105 (0.5) indicated that TOC was above the Inert WAC: TOC: 8.4% > 3%. <u>Disposal at a Non-Hazardous waste facility.</u>	NON-HAZARDOUS waste, suitable for non-hazardous waste disposal.																													
BH105 (1)	Dark greyish brown slightly gravelly very sandy SILT. Gravel is mudstone.				Waste Stream 3 – Alluvial soils					TP105 (0.5)	Greyish brown with orange mottles sandy SILT.	All samples within this waste stream were classified as Non-Hazardous. Overall Non-Hazardous classification for the waste stream.	All determinands recorded within Inert WAC limits, except Total Dissolved Solids (TDS) in BH103 (1.7): TDS: 6300mg/kg > 4000mg/kg. Landfill regulations ¹⁰ state “ <i>The value for TDS can be used alternatively to the values for Sulphate and Chloride</i> ”. All Sulphate and Chloride values were recorded within the Inert WAC limits. The waste receiver/regulator may accept the approach of using Sulphate and Chloride as a substitute for TDS, which may allow the material to be disposed off-site at an inert waste disposal facility. If this approach is not feasible, then disposal at a Non-Hazardous waste facility may be required.	NON-HAZARDOUS waste and suitable for inert waste disposal *subject to acceptance of using Sulphate and Chloride as a substitute for TDS.	TP102 (1)	Brown very sandy fine to coarse GRAVEL.	BH103 (1.7)	Medium dense brown very gravelly coarse SAND.	BH103 (0.5)	Soft greyish brown slightly gravelly sandy CLAY.	BH106 (2.5)	Dense brown, grey very gravelly medium SAND.	BH106 (5.8)				Soft greyish brown sandy SILT with high black organic content.						
Waste Stream 3 – Alluvial soils																																	
TP105 (0.5)	Greyish brown with orange mottles sandy SILT.	All samples within this waste stream were classified as Non-Hazardous. Overall Non-Hazardous classification for the waste stream.	All determinands recorded within Inert WAC limits, except Total Dissolved Solids (TDS) in BH103 (1.7): TDS: 6300mg/kg > 4000mg/kg. Landfill regulations ¹⁰ state “ <i>The value for TDS can be used alternatively to the values for Sulphate and Chloride</i> ”. All Sulphate and Chloride values were recorded within the Inert WAC limits. The waste receiver/regulator may accept the approach of using Sulphate and Chloride as a substitute for TDS, which may allow the material to be disposed off-site at an inert waste disposal facility. If this approach is not feasible, then disposal at a Non-Hazardous waste facility may be required.	NON-HAZARDOUS waste and suitable for inert waste disposal *subject to acceptance of using Sulphate and Chloride as a substitute for TDS.																													
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BH103 (0.5)	Soft greyish brown slightly gravelly sandy CLAY.																																
BH106 (2.5)	Dense brown, grey very gravelly medium SAND.																																
BH106 (5.8)	Soft greyish brown sandy SILT with high black organic content.																																

¹⁰ The Landfill (England and Wales) (Amendment) Regulations 2004.

D.1.2.3.2 Averaging Zone 2

Table 10 presents the waste classification and landfill disposal classification (WAC) for the encountered soils associated with the existing WwTW during the ground investigation.

Table 10: Waste classification, WAC analysis and landfill disposal options (Averaging Zone 2)

Hole ID (depth)	Strata	HWOL classification	WAC	Landfill disposal
Waste Stream 1 – Reworked topsoil				
TP104 (0.2)	Grass over dark brown/black sandy gravelly CLAY.	<u>Non-hazardous.</u>	All recorded within Inert WAC limits.	NON-HAZARDOUS waste and suitable for inert waste disposal.
Waste Stream 2 – Made Ground				
BH102 (0.5)	Grass over grey slightly silty sandy fine to coarse sub-angular to well-rounded mudstone siltstone sandstone brick slag GRAVEL (slag cobble content).	All samples within this waste stream were classified as Non-Hazardous. Overall <u>Non-Hazardous</u> classification for the waste stream.	The following determinands were recorded above the Inert WAC limits: TOC: <u>13%</u> > 3% (TP103, 1). TOC: <u>3.2%</u> > 3% (TP101, 0.5). TDS: <u>10000mg/kg</u> > 4000mg/kg (TP101, 0.5). <u>Disposal at a Non-Hazardous waste facility.</u>	NON-HAZARDOUS waste and suitable for non-hazardous waste disposal.
TP103 (1)	Dark brownish grey mottled orange gravelly SILT. Gravel of mudstone, coal, and brick fragments.			
TP101 (0.5)	Dark greyish brown sandy silty medium to coarse subrounded to angular GRAVEL of concrete, brick, and slag.			
TP101 (0.2)	Greyish brown sandy silty fine to coarse subrounded to angular GRAVEL of concrete, brick, and slag.			
TP104 (0.5)	Dark brownish grey mottled orange sandy gravelly SILT. Gravel of mudstone and brick.			
Waste Stream 3 – Alluvial soils				
TP103 (1.3)	Brown very gravelly medium to coarse SAND.	<u>Non-hazardous.</u>	See discussion on Waste Stream 3 in Table 9.	NON-HAZARDOUS waste and suitable for inert waste disposal *subject to acceptance of using Sulphate and Chloride as a substitute for TDS.

D.1.2.4 Summary of Off-site Disposal Options for Soils

A summary of each waste stream classification per Averaging Zone is given below:

Averaging Zone 1, field:

- Waste Stream 1: HAZARDOUS waste with pre-treatment required to be suitable for disposal at a HAZARDOUS waste landfill.
- Waste Stream 2: NON-HAZARDOUS waste and suitable for disposal at a NON-HAZARDOUS waste landfill.
- Waste Stream 3: NON-HAZARDOUS waste and suitable for disposal at an INERT waste landfill (should the waste receiver/regulator accept the approach of using WAC Sulphate and Chloride values instead of Total Dissolved Solids, in line with the Landfill Regulations¹⁰).

Averaging Zone 2, existing WwTW development area:

- Waste Stream 1: NON-HAZARDOUS waste and suitable for disposal at an INERT waste landfill.
- Waste Stream 2: NON-HAZARDOUS waste and suitable for disposal at a NON-HAZARDOUS waste landfill.
- Waste Stream 3: NON-HAZARDOUS waste and suitable for disposal at an INERT waste landfill (should the waste receiver/regulator accept the approach of using WAC Sulphate and Chloride values instead of Total Dissolved Solids, in line with the Landfill Regulations¹⁰).

D.1.3 Disposal Options and Recommendations

It is understood that there is no scope for material re-use and therefore off-site disposal of materials is required. Off-site disposal to treatment, recycling or transfer facilities may be considered, prior to landfill. Landfill disposal is the last resort, in accordance with the hierarchy of waste. The operators of such facilities should be consulted and supplied with a copy of the chemical analyses results prior to the removal of the materials from the site, to confirm acceptance.

It should be noted that this waste assessment is preliminary. The frequency of testing undertaken during the ground investigation is suitable to inform the basis of this assessment. More testing (initial classification and WAC testing) may be required by the waste receiver based on the volumes generated during construction. This may change the overall classification of the individual waste streams and Averaging Zones considered as part of this assessment.

The waste producer should consult relevant landfill operators and the environmental regulator to ascertain whether the different waste streams will be accepted at the relevant landfills without the requirement for pre-treatment of waste. If pre-treatment is considered as a pre-requisite to waste disposal, the Contractor should consider relevant guidance documentation when considering waste pre-treatment options prior to landfill, including the Environment Agency's review of waste pre-treatment options¹¹.

During construction, it is imperative that there is no mixing of different waste streams, and these materials should always be kept separate and segregated (e.g. Made Ground kept separate from natural materials).

Any materials encountered during the construction works that differ in nature, consistency and/or colour to those sampled and tested as part of the recent ground investigation or exhibiting visual and/or olfactory evidence of contamination (e.g. asbestos or hydrocarbons) will require separate management and additional sampling and analyses to confirm potential off-site disposal options.

This waste assessment has been undertaken and reviewed by competent and trained staff in accordance with current regulatory guidance and using available approved software. Additionally, this waste assessment has used available ground investigation information provided by Morgan Sindall/QGL. The assessments and advice given are specific to the waste streams to be generated during the site works as currently understood at

¹¹ Environment Agency, 2002. Waste Pre-Treatment: A Review, R&D Technical Report, P1-344.

the time of writing, however appropriate disposal of the soils to landfill is reliant on appropriate management of the waste streams generated during the site works. It is assumed that the management of wastes, and compliance with the findings of the assessments, to ensure that materials are disposed of to the appropriate landfill, lies with the Contractor and their site operatives.

Appendix E

Dewatering Assessment

E.1 Assessment of Dewatering Requirements

E.1.1 Introduction

This assessment of dewatering requirements has been produced for the proposed Trebanos Wastewater Treatment Works (WwTW) upgrade scheme, east of the village of Trebanos in the Swansea Valley, Wales. This ground investigation was preceded by a previous investigation for the purpose of a new stormwater outfall from the WwTW to the River Tawe (see report B16421-102503-ZZ-ZZ-RP-GB-GC6704).

The site is relatively flat and located within a flood plain, which has flooded within the past year. The scheme proposals include upgrading of the existing WwTW at the site and extending the works to the west, into an area currently used as pastoral farmland. The site is bounded by the River Tawe to the south.

Further details on the proposed scheme are summarised in the Ground Investigation Report. The deepest structures are understood to be two 25m diameter (27.5m external diameter) Final Settlement Tanks (FSTs) which have a base at 15.805m AOD (approximately 7.7m bgl).

Excavation below ground has the potential to intercept groundwater which, without appropriate consideration and mitigation, can lead to geotechnical and environmental challenges.

This Appendix summarises the anticipated hydrogeological conditions at the site, requirements for groundwater control, the potential requirement for licences/permits and potential hydrogeological impacts.

E.1.2 Baseline Hydrogeological Conditions

E.1.2.1 Geology

A site investigation was undertaken in October and November 2023 at the site, comprising five boreholes drilled up to 19.5 metres below ground level (m bgl), five trial pits and one trial trench. The ground investigation and geology of the site is discussed in detail in Appendix A and Appendix B of the Ground Investigation Report.

In summary, the ground conditions of the site comprise:

- Made Ground – Sandy silty fine to coarse gravel with anthropogenic inclusions (e.g. slag, brick and concrete);
- Alluvium / Glaciofluvial Deposits – Sandy gravel. Occasional localised pockets of medium sand and slightly gravelly, sand clay (total thickness not proven);
- Bedrock – Not encountered during Ground Investigation but shown as the Hughes Member of the Pennant Sandstone Formation in 1:50,000 scale geological maps. The Hughes Member generally comprises Sandstone with thin mudstone/siltstone and seatearth interbeds and thin coals.

E.1.2.2 Hydraulic Conductivity

Several variable head tests were attempted in the boreholes, but all tests were unsuccessful due to the speed at which the water recharged. The stabilising of the water levels at the ambient water table faster than water could be added indicates that the strata tested (predominantly Alluvium) has a high hydraulic conductivity.

The geological descriptions and Particle Size Distribution (PSD) curves from the site investigation can also provide an indication of the likely hydraulic conductivity of the soils (see Table 11 below reproduced from CIRIA C750, Groundwater control: design and practice, second edition).

Table 11: Hydraulic Conductivity of Typical Soils (reproduced from CIRIA C750)

Indicative Soil Type	Degree of hydraulic conductivity	Typical Hydraulic Conductivity (m/s)
Clean gravels	High	$>1 \times 10^{-3}$

Indicative Soil Type	Degree of hydraulic conductivity	Typical Hydraulic Conductivity (m/s)
Sand and gravel mixtures	Medium	1×10^{-3} to 1×10^{-5}
Very fine sands, silty sands	Low	1×10^{-4} to 1×10^{-7}
Silt and interlaminated silt/sand/clay	Very low	1×10^{-6} to 1×10^{-9}
Intact clays	Practically impermeable	$< 1 \times 10^{-9}$

The soil descriptions for the strata encountered can be summarised as:

- Made Ground: Heterogenous mixture of sands and clays with anthropogenic inclusions (e.g. glass and plastic)
- Alluvium / Glaciofluvial Deposits : Sandy Gravels. Occasional pockets of Clay

The soil descriptions, PSD curves and variable head testing all indicate that the natural alluvial soils will be highly permeable, potentially in excess of 1×10^{-3} m/s.

E.1.2.3 Groundwater Levels

Groundwater strikes and rises were recorded during drilling and excavation of a number of boreholes and trial pits as summarise in Table 12.

Table 12: Groundwater Strikes and Rises

Borehole/Trial Pit	Groundwater Strike		Groundwater Rise	
	m bgl	m AOD	m bgl	M AOD
BH101	1.30	22.65	No rise recorded	
BH102	2.20	21.69	1.10	22.79
BH103	0.50	22.35	No rise recorded	
BH105	2.20	21.52	1.20	22.52
BH106	0.90	22.28	No rise recorded	
TP101	1.20	16.99	1.00	17.19
TP102	1.40	21.71	No rise recorded	
TP103	1.90	22.38	No rise recorded	
TP104	1.60	22.37	1.50	22.47
TP105	1.20	21.78	1.00	21.98

Groundwater monitoring standpipes were installed in all five boreholes (BH101, BH102, BH103, BH105 and BH106), with the response zones as follows:

- BH101: 0.60 – 2.00m bgl within Made Ground and Alluvium
- BH102: 1.50 – 3.00m bgl within Alluvium
- BH103: 0.50 – 2.00m bgl within Alluvium
- BH105: 5.00 – 7.50m bgl within Alluvium
- BH106: 3.00 – 5.00m bgl within Alluvium

Four post-installation site visits were undertaken on 28th November 2023, 13th December 2023, 3rd January 2024 and 24th January 2024 to measure groundwater levels within the standpipes. The first three were undertaken by the Ground Investigation contractor with the fourth undertaken by Morgan Sindall.

The groundwater levels are summarised in Table 13 and **Error! Reference source not found.** below.

Table 13: Groundwater Monitoring Results

Monitoring Visit	Monitored Groundwater Level									
	BH101		BH102		BH103		BH105		BH106	
	mbgl	m OD	mbgl	m OD	mbgl	m OD	mbgl	m OD	mbgl	m OD
28/11/2023	-	-	2.20	21.69	1.06	21.79	1.97	21.75	1.17	22.01
13/12/2023	1.96	21.99	1.73	22.16	0.50	22.35	1.40	22.32	0.70	22.48
03/01/2024	-	-	1.26	22.63	0.26	22.59	1.04	22.68	0.43	22.75
24/01/2024	1.58	22.37	1.49	22.40	0.33	22.52	1.13	22.59	0.52	22.66

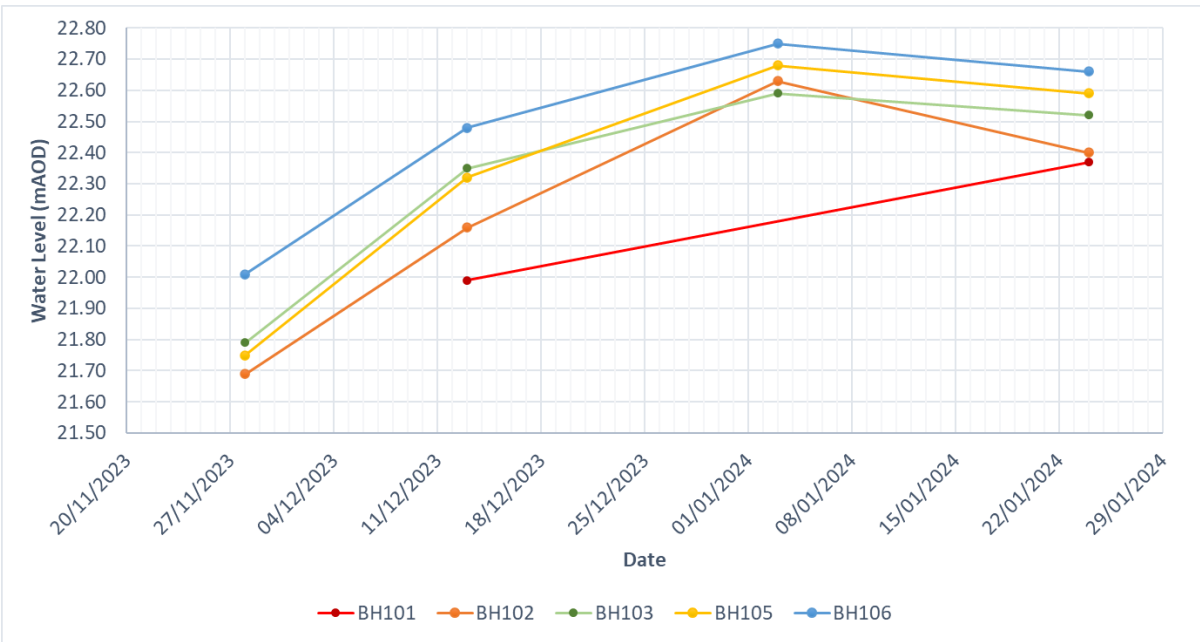


Figure 3: Post-installation groundwater monitoring.

The post-installation groundwater monitoring indicates a groundwater level range between 21.69m OD and 22.75m OD.

Groundwater levels generally fluctuate seasonally in response to changes in precipitation and recharge, and the level of the nearby River Tawe. Lowest groundwater levels typically occur in late summer and will rise through the autumn and winter, reaching peak levels typically between January and mid-March. As such, the groundwater level may be higher during wetter periods. The groundwater levels are likely to be influenced by the River Tawe adjacent to the site and as such, when the river level is higher, the groundwater levels will also likely be higher.

The depth of the bedrock was not proven by the ground investigation, and the presence of confined artesian conditions at depth is not known. For this assessment, it is assumed that the bedrock is at sufficient depth for any potential confined artesian groundwater conditions to not be a risk to the relatively shallow subterranean structures.

Perched water may be also encountered during construction in more granular beds within the Made Ground.

E.1.2.4 Groundwater Quality

Three rounds of groundwater sampling were undertaken following the main fieldwork period on the 28th November 2023, 13th December 2023 and 3rd January 2024. Groundwater samples were obtained from

BH102, BH105 and BH106 in all rounds, whilst BH103 was only sampled in rounds 1 and 2, and BH101 was only samples in round 2 (12 samples in total). Surface water samples were also collected on all visits from the River Tawe upstream, midstream and downstream of the site.

The samples were screened against Freshwater Environmental Quality Standards (EQS) as part of the Tier 2 Controlled Waters Risk Assessment (see Appendix C).

The screening of the groundwater samples identified several EQS exceedances as summarised in Table 14 below.

Table 14: Groundwater EQS Exceedances

Determinand	Screening Criteria (Freshwater EQS)	Recorded Exceedances				
		BH101	BH102	BH103	BH105	BH106
Cadmium	0.09 µg/l	0.12 µg/l (Round 2)	-	-	-	-
Ammoniacal Nitrogen	0.3 mg/l	-	0.31 mg/l (Round 1)	-	-	-
Bioavailable Copper	1 µg/l	1.11 µg/l (Round 2)	-	-	-	-
Bioavailable Manganese	123 µg/l	-	260 µg/l (Round 1)	820 µg/l (Round 1) 240 µg/l (Round 2)	260 µg/l (Round 1) 190 µg/l (Round 2)	450 µg/l (Round 1) 360 µg/l (Round 2) 180 µg/l (Round 3)
Bioavailable Nickel	4 µg/l	-	-	5.43 µg/l (Round 1) 4.26 µg/l (Round 2)	-	-
Bioavailable Zinc	12.3 µg/l	13.54 µg/l (Round 2)	23.69 µg/l (Round 3)	-	33.36 µg/l (Round 1)	28.04 µg/l (Round 1) 14.02 µg/l (Round 2) 20.3 µg/l (Round 3)

The groundwater quality will need to be considered when selecting a discharge location for any groundwater abstracted during construction, together with obtaining the relevant permissions/consents/permits. Based on the initial water quality screening and Environmental Quality Standards, any discharges to ground or surface water are likely to require a bespoke environmental permit and may require treatment before discharge.

E.1.3 Groundwater Control Requirements

E.1.3.1 Assessment of Dewatering Requirements

Since January 2018, construction dewatering has been a licensable activity, unless the abstraction rate is less than 20m³/day or the works are undertaken in accordance with an exemption. Abstraction licence exemptions include construction dewatering of less than 100m³/d, if undertaken in accordance with the relevant requirements (see <https://www.legislation.gov.uk/ukxi/2017/1044/regulation/5/made>). There are no designated conservation sites within 500m of the site.

With a groundwater level observed at 22.75m OD at its shallowest, the groundwater table will be encountered during excavation of the FSTs, together with other shallower structure and pipe runs within the proposed development. As such, some form of groundwater control will be required if the excavations are to be undertaken in the dry.

An assessment has been undertaken of the potential dewatering rate for one of the deepest FST structures, to ascertain if an abstraction licence is likely to be required for the works from Natural Resources Wales, as detailed below.

A conservative assessment of steady state dewatering rates for the excavation has been undertaken using the Dupuit-Forcheimer analytical solution for steady state flow in an unconfined aquifer, as follows¹²:

$$Q = \frac{\pi k (H^2 - h_w^2)}{\ln [R_0 / r_e]}$$

Where

k	= soil hydraulic conductivity
H	= initial piezometric level
h _w	= piezometric level in the equivalent well (target level)
R ₀	= radius of influence
r _e	= radius of equivalent well

The following assumptions apply to the Dupuit-Forcheimer equation:

- The aquifer has infinite areal extent.
- The aquifer is homogenous, isotropic and of uniform thickness.
- The initial water table is flat.
- The aquifer is pumped at a constant discharge rate.
- The pumping well is fully penetrating, therefore receiving water from the entire saturated thickness of the aquifer.
- The flow to the well is in a steady state.

Utilising the Dupuit-Forcheimer equation, the potential dewatering rates for a 7.5m drawdown at the deepest excavation is calculated in Table 15.

Table 15: Potential Steady State Dewatering Rates

Parameter	Approximately 7.7m deep FST
Ground Level	23.5m AOD
Base of FST Slab	15.805m AOD
Initial water table above base of aquifer	14.25m ¹³ (Highest measured groundwater level at 22.75m AOD)

¹² Preene, M, Roberts, T O L and Powrie, W (2016). Groundwater Control – Design and Practice, 2nd edition. Construction Industry Research and Information Association, CIRIA Report C750, London.

¹³ For the purpose of this assessment base of aquifer taken as 15m bgl (8.5m AOD). Alluvium deposits proven to 19.5m bgl in BH101, but some evidence from logs and PSDs that soils are anisotropic with lower permeability bands. Assumed that dewatering wells will not extend deeper than 15.0m bgl.

Parameter	Approximately 7.7m deep FST
Target water level above base of aquifer	6.805m (Target 0.5m below FST base, 15.305m AOD)
Hydraulic conductivity (m/s)	1×10^{-3}
Radius of influence (m) ¹⁴	80
Radius of equivalent well (m) ¹⁵	14.75
Calculated Flow Rate (m ³ /d)	22,901

Based on the site investigation data, it is assumed that the overall hydraulic conductivity of the soils is likely to be high in areas; potentially exceeding 1×10^{-3} m/s. On this basis, the assessment indicates that the abstraction rate is likely to significantly exceed the exemption allowance of 100m³/d and an abstraction licence may be required for dewatering operations on the site, supported by a pumping test. If the hydraulic conductivity is one to two orders of magnitude lower and the radius of influence is higher, the flow rates are still likely to exceed exemption allowances requiring an abstraction licence. A pumping test will confirm the hydraulic conductivity and radius of influence.

Proximity to the river, high permeability soils and a shallow groundwater table may make construction in the wet a more appropriate option, if practically feasible.

Alternatively some form of groundwater cut-off (such as sheet piling or use of permeation grouting, deep soil mixing, etc) may be appropriate to minimise groundwater inflows. These measures would limit or minimise the potential hydrogeological impacts of the works, whilst potentially negating the requirement for an abstraction licence of discharge permit. Timing the works in drier conditions will assist with the water management requirements (although flows are still likely to be sufficient to require a licence).

Appropriate arrangements will need to be made to manage and dispose of any abstracted water. Any discharges to surface water or ground will likely require an environmental permit.

E.1.3.2 Additional Considerations

The assessment has calculated the potential dewatering rate from the deepest structure only. Other structures (including the second FST) and pipelines will require excavation below the water table, and it is assumed that several structures will be constructed consecutively. As such, the cumulative abstraction rates from all excavations may be greater than calculated above.

Any groundwater abstracted during the early stages of dewatering will potentially be greater than the steady state rate calculated above. During the initial dewatering stages, groundwater is drained out of storage and the cone of drawdown expands until a balance is reached between groundwater recharge and abstraction (steady state). During these initial stages, the dewatering rate can be an order of magnitude greater than the steady-state rate however this is typically of short duration. Staged dewatering can limit the maximum abstraction rate during the early stages.

The site is near to a surface watercourse (and a canal) of which the depth and substrate are not currently known. The degree of continuity between the soils and water course will influence the dewatering rate and could lead to higher abstraction rates and larger hydrogeological impacts.

¹⁴ The radius of influence has been based on the approximate distance to the River Tame. A lower radius of influence results in higher calculated flow rates.

¹⁵ Radius of equivalent well calculated for 27.5m external diameter FST + 1.0m working room to potential wells/wellpoints (i.e. 29.5m diameter).

Anthropogenic (i.e. man-made) ground conditions can significantly impact the required dewatering rates. Higher permeability pathways such as pipe bedding or historical drainage can lead to higher inflows into the excavation. Where these conditions are encountered, additional mitigation may need to be implemented.

Surface water runoff can be significant if not appropriately managed. Code of Construction Practice (CoCP) measures should be incorporated to ensure that surface water is diverted away from any subsurface works. Clear surface water run-off should be segregated from any groundwater control from the excavation.

E.1.4 Hydrogeological Impacts

If dewatering is implemented to enable construction in the dry, the hydrogeological impact of the works needs to be taken into consideration.

The construction of the proposed works are assumed to not be of sufficient duration to result in long term impacts to the water balance. As such, the impacts of any temporary net abstraction from the aquifers overall water resource are anticipated to be low.

The Alluvium, Glacial Sands and Gravels and Bedrock (Hughes Member of the Pennant Sandstone Formation) are all designated as Secondary A aquifers which are aquifers that comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers.

The drawdown impacts on the surrounding receptors (such as surface water features and any existing licensed or private abstractions) need to be taken into consideration and assessed as part of any abstraction license application. A water features survey has been undertaken by Morgan Sindall of accessible water features within 500m of the site (see Report TBWFS01 Version 2).

The site is not located within a Source Protection Zone, with the nearest licensed abstractions (groundwater or surface water) more than 1km away. Unlicensed private water abstraction may be present within the area, which should be identified (through consultation with the local authority) should any dewatering operations be undertaken.

The site is adjacent to the River Tawe (a NRW defined Main River), and within its flood plain. Swansea Canal and a small tributary of the River Tawe are to the northwest of the proposed site.

The high hydraulic conductivity of the strata at the site and proximity to receptors means that any hydrogeological impacts (e.g. reduction in baseflow) on local receptors needs to be assessed in further detail should dewatering be undertaken (such as in a hydrogeological impact assessment that will be required as part of any abstraction license application).

Many risks to the water environment (such as contamination) can be mitigated through the implementation of good site practice and pollution prevention measures (see the Environment Agency groundwater collection for further information, which has been adopted by NRW).

As noted above, appropriate arrangements will need to be made to dispose of any abstracted water. Discharges to surface water or ground will likely require an environmental permit and will need to consider the potential impacts on the receiving water body.

E.1.5 Conclusions and Recommendations

This assessment has concluded that the proposed below ground works at the Trebanos WwTW will require excavation below the water table and as such will require appropriate groundwater control measures or construction in the wet.

Groundwater control measures for deep excavations could include dewatering or cut-off techniques using sheet piles / grouting, with minor excavations potentially able to be dealt with by sump pumping or perimeter drains.

Once a preferred option or options is adopted for different scenarios of groundwater control, the methods should be reviewed as works progress, to ensure the most appropriate methodology is utilised for the

encountered ground conditions (for instance sump pumping for shallow dewatering may not be appropriate where running sand conditions are encountered).

Due to the high permeability, groundwater ingress rates when dewatering are anticipated to be high and an abstraction licence is likely to be required from Natural Resources Wales to undertake the works. A pumping test should be undertaken to establish the aquifer parameters and zone of influence.

Proximity to the river, high permeability soils and a shallow groundwater table may make construction in the wet a more appropriate option, if practically feasible. Alternatively some form of groundwater cut-off (such as sheet piling, permeation grouting, or deep soil mixing) may be appropriate to minimise groundwater inflows (further assessment of any proposed cut-off would need to be undertaken).

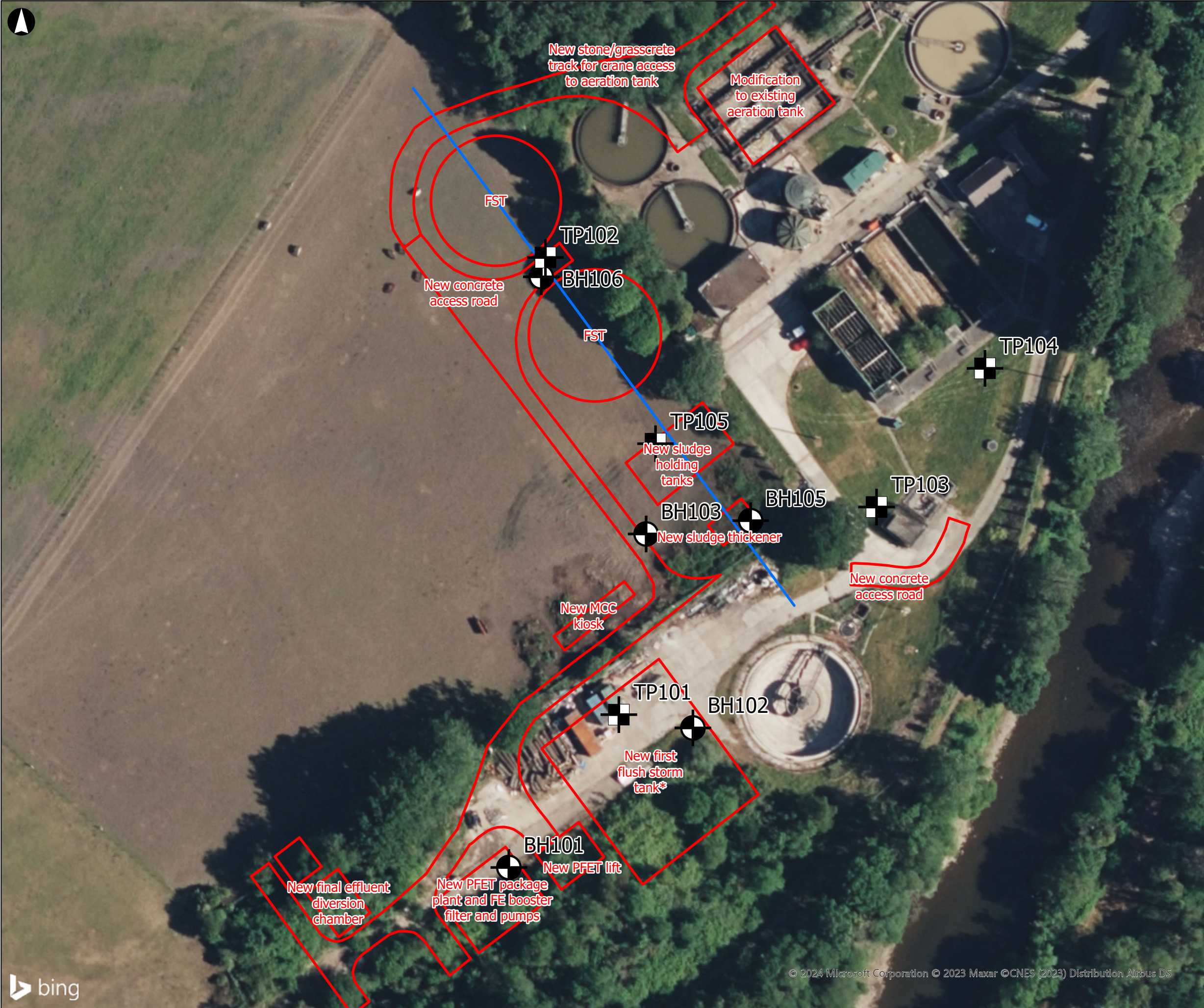
Appropriate arrangements will need to be made to dispose of any abstracted water (discharges to ground or surface water may require an environmental permit). Screening of the groundwater quality measurements has identified environmental quality standard exceedances for several determinands. Exceedances of environmental quality standards may impact the ability of discharging the groundwater to ground or the river without prior treatment.

Due to the high permeability of the deposits and proximity to potential receptors, hydrogeological impacts will need to be considered in further detail should dewatering be undertaken, and to inform any license application. This assessment will need to consider both quantity impacts (e.g. reduction in baseflow to the river) and quality impacts (e.g. contaminant mobilisation).

Many risks (e.g. contamination) to the water environment can be mitigated through the implementation of good site practice and pollution prevention measures (see the [Environment Agency groundwater collection](#) for further information) which should be followed during construction.

Surface water runoff can be significant if not appropriately managed. Code of Construction Practice (CoCP) measures should be incorporated to ensure that surface water is diverted away from any subsurface works.

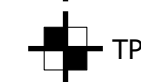
Drawings



Exploratory Holes



RC

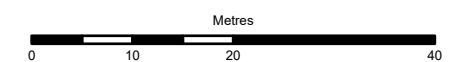


TP

— Cross Section

— Proposed Structures

Coordinate System: British National Grid



1	24/01/2024	RC	SR	SR	
Rev	Date	By	Chkd	Appd	Authd

ARUP

Client
Dŵr Cymru Welsh Water

Project Name
Trebanos WwTW

Drawing Title
Exploratory Hole Locations

Scale at A3

1:750

Role

GIR

Suitability

Issue

Project Number
275281

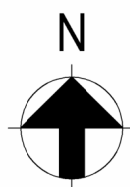
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Drawing Number
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Appendix F

Supporting Documents

F.1 Scheme Proposals

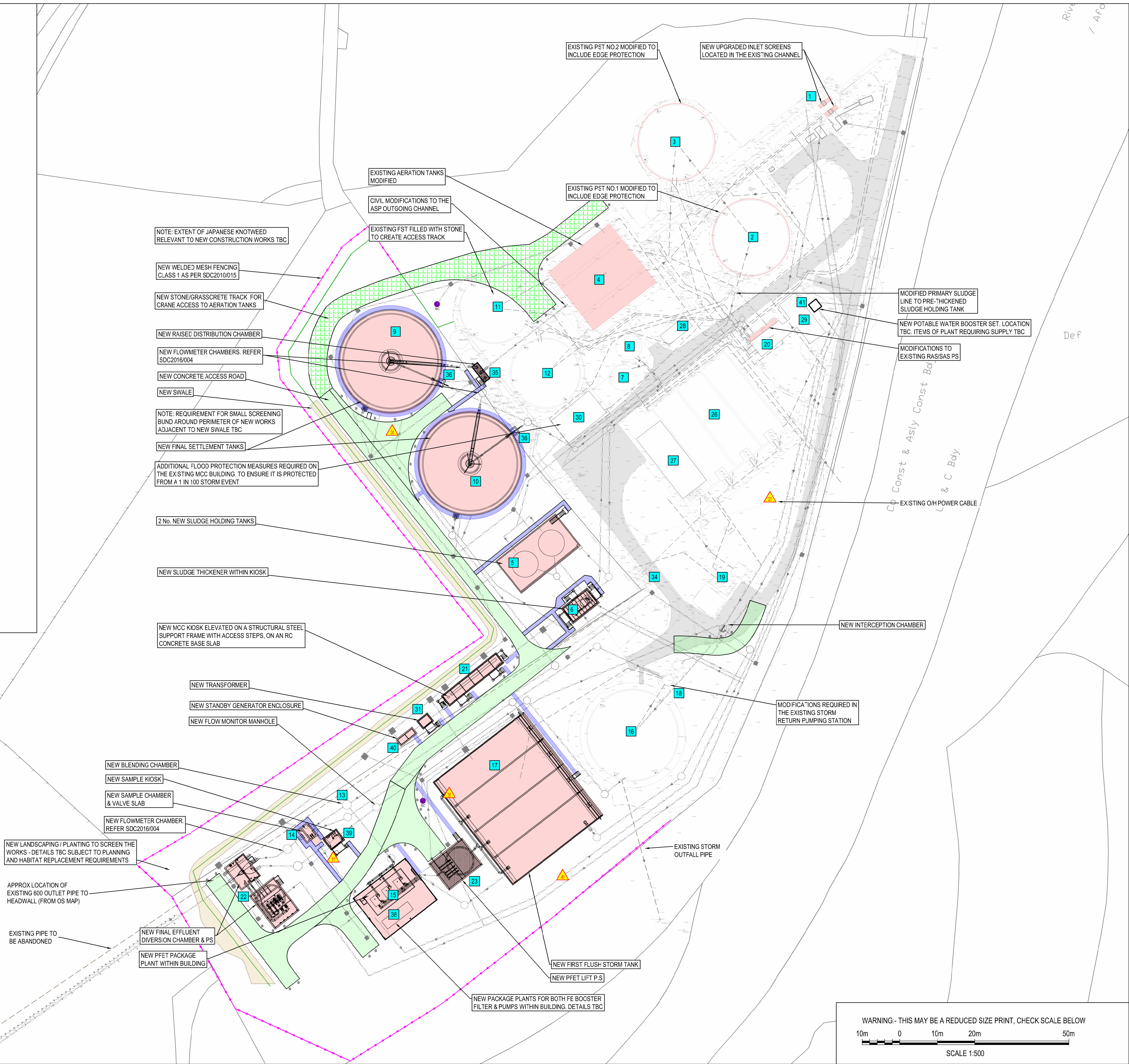


PROCESS LOCATION KEY:

- EXISTING INLET SCREENS.
- EXISTING PST No.1.
- EXISTING PST No.2.
- EXISTING ASP - ACTIVATED SLUDGE PROCESS.
- NEW RAW SLUDGE TANKS.
- NEW SLUDGE THICKENER.
- EXISTING SLUDGE HOLDING TANK No. 1.
- EXISTING SLUDGE HOLDING TANK No. 2.
- NEW FST No.1.
- NEW FST No.2.
- EXISTING ABANDONED FST No.1.
- EXISTING ABANDONED FST No.2.
- NEW BLENDING CHAMBER.
- NEW SAMPLE CHAMBER.
- NEW PFET PACKAGE.
- EXISTING STORM TANK.
- NEW FIRST FLUSH STORM TANK.
- EXISTING STORM RETURN PUMPING STATION.
- EXISTING STORM LIFT PUMPING STATION.
- EXISTING RAS/SAS PUMPING STATION.
- NEW MCC KIOSK.
- NEW DIVERSION CHAMBER & PUMPING STATION.
- NEW PFET LIFT & STORM RETURN PUMPS.
- NEW INTERCEPTION CHAMBER.
- N/A.
- EXISTING ABANDONED STORM TANKS.
- EXISTING HIGH RATE FILTER PLANT.
- EXISTING CHEMICAL STORAGE AND DOSING KIOSK.
- EXISTING ADMIN BUILDING.
- EXISTING MAIN CONTROL BUILDING.
- NEW TRANSFORMER.
- N/A.
- N/A.
- EXISTING FLOW DIVERSION CHAMBER & SAMPLING POINT.
- NEW FST DISTRIBUTION CHAMBER.
- NEW RAS/SAS BELLMOUTH CHAMBERS.
- N/A.
- NEW FE BOOSTER SET.
- NEW FE SAMPLING KIOSK.
- NEW STANDBY GENERATOR ENCLOSURE.
- NEW POTABLE WATERBOOSTER SET.

PROCESS No & DRAWING REFERENCE:

- B16421-102503-02-ZZ-DR-MA-ME2000
- B16421-102503-03-ZZ-DR-MA-ME2001
- B16421-102503-04-ZZ-DR-MA-MM6001
- B16421-102503-06-ZZ-DR-MA-MM6016
- B16421-102503-05-ZZ-DR-EA-EF3003
- B16421-102503-05-ZZ-DR-CA-MM6003
- B16421-102503-08-ZZ-DR-CA-MM6008
- B16421-102503-08-ZZ-DR-MA-MM6007
- B16421-102503-08-ZZ-DR-CA-MM6009
- B16421-102503-05-ZZ-DR-CA-MM6005
- B16421-102503-05-ZZ-DR-EA-EF3001
- B16421-102503-08-ZZ-DR-MA-MM6019/6020
- B16421-102503-08-ZZ-DR-CA-MM6006
- B16421-102503-ZZ-DR-CA-CI5003
- B16421-102503-05-ZZ-DR-EA-EF3004
- B16421-102503-05-ZZ-DR-MA-MM6004
- B16421-102503-05-ZZ-DR-EA-EF3002
- B16421-102503-05-ZZ-DR-EA-EF3005



NOTES:

- REFER TO GENERAL NOTES.
- ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

LEGEND:

- NEW WORKS/MODIFICATIONS
- NEW ROAD
- NEW STONE/GRASSCRETE
- NEW FOOTPATH
- NEW SWALE
- NEW DRAW PITS & DUCTS
- SC NEW SECURITY CAMERA (2 No.)
- NEW FENCELINE
- NEW LINE OF VEGETATION SCREENING WORKS
- ST EXISTING STORM
- FE EXISTING FINAL EFFLUENT
- EXISTING PROCESS
- EXISTING RISING MAIN
- PW EXISTING POTABLE WATER
- FE NEW FINAL EFFLUENT
- ST NEW STORM
- SL NEW SLUDGE
- PF NEW PFET
- DF NEW DUTY FLOW
- SR NEW SAMPLE RETURN
- SD NEW STORM DRAINDOWN
- DT NEW DUCTS

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:

- CONSTRUCTION
 - WORKING WITH CHEMICALS
 - WORKING WITHIN CLOSE PROXIMITY TO EXISTING OVERHEAD CABLES - RISK OF ELECTROCUTION
 - FINAL GROUND CONDITIONS UNKNOWN - RISK OF CONTAMINATED LAND
 - JAPANESE KNOTWEED PRESENT
 - MAINTENANCE / CLEANING / OPERATION
- DECOMMISSIONING / DEMOLITION

Rev.	Description	Drawn	Chkd	Appd.	Issue Date
P03	FOR INFORMATION		TD	OM	BMB 21.12.23
P02	FOR INFORMATION		TD	GS	BMB 15.09.23
P01	FOR INFORMATION		TD	GS	BMB 14.07.23



Ty Awen, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name:
TREBANOS WwTW

Drawing Title:
PROPOSED SITE GENERAL ARRANGEMENT

Subsidiary:
FOR INFORMATION

Internal Project Number:
275281

Drawing Number:
B16421-102503-ZZ-ZZ-DR-CA-MM6103

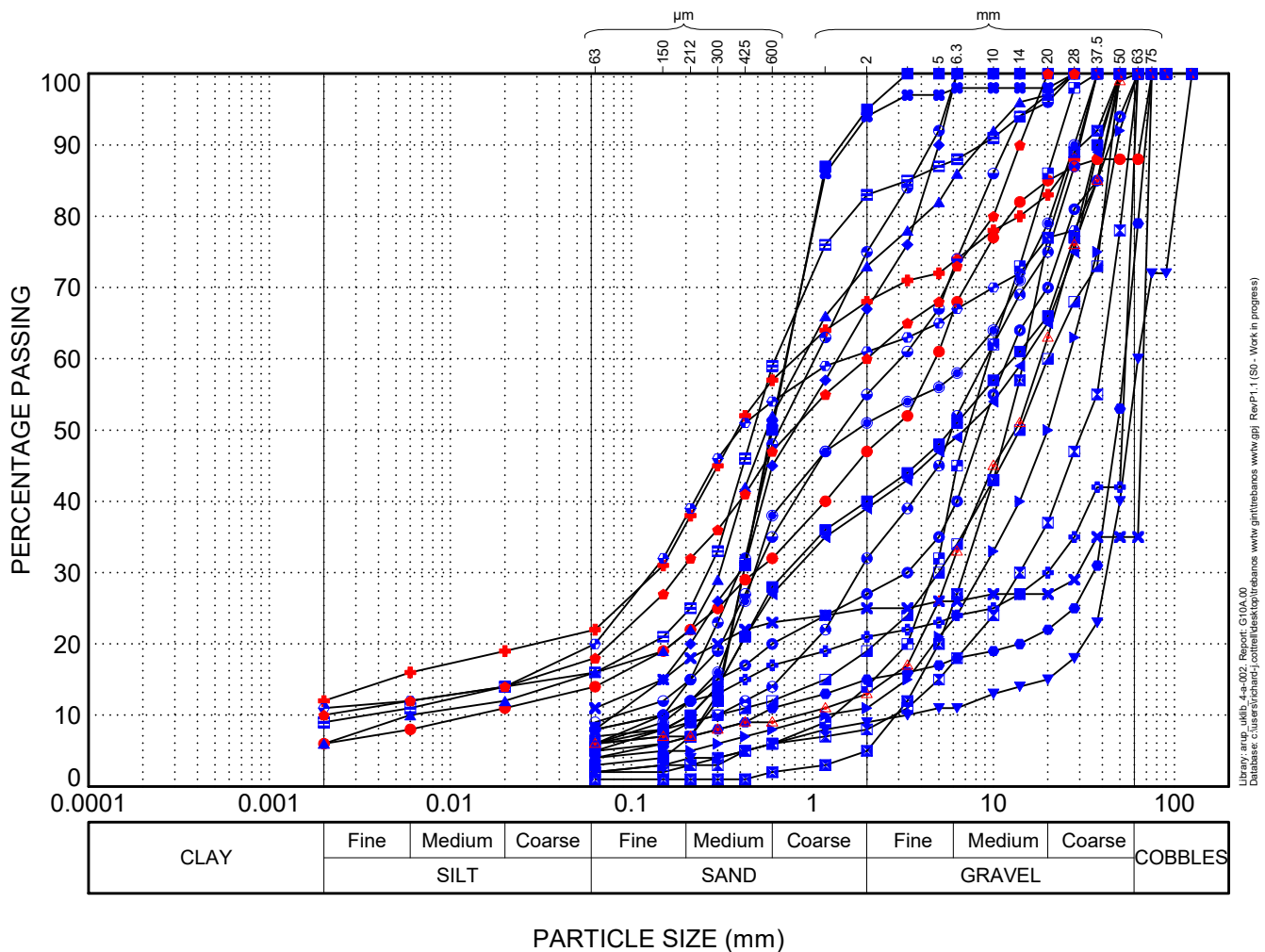
A1

WARNING:- THIS MAY BE A REDUCED SIZE PRINT, CHECK SCALE BELOW

10m 0 10m 20m 50m

SCALE 1:500

F.2 Geotechnical Plots and Sections

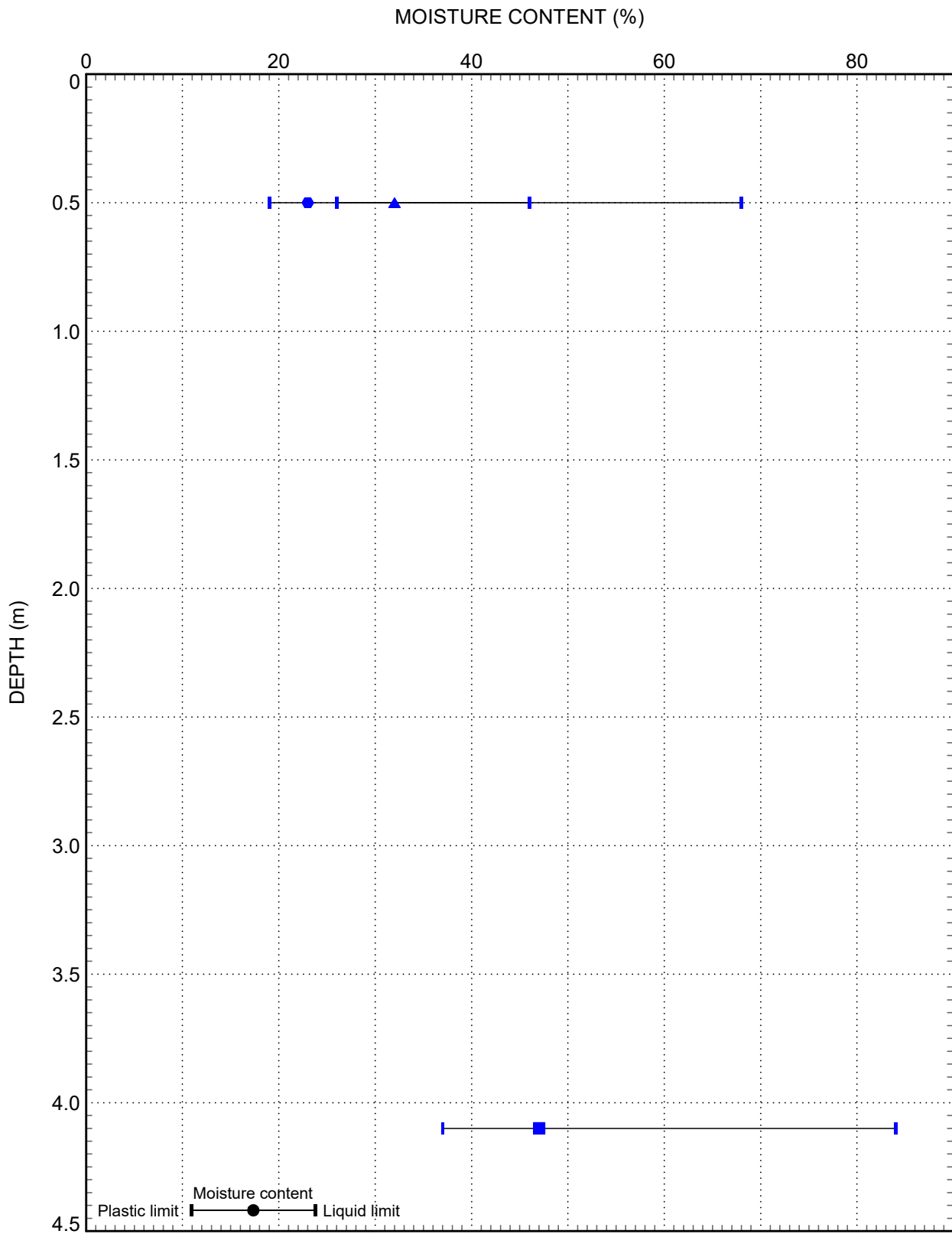


- Made Ground (MG)
- Alluvium (ALV)
- BH101, 1.00m
- BH101, 2.70m
- ▲ BH101, 7.20m
- ✱ BH101, 10.20m
- BH101, 14.70m
- ▼ BH101, 16.20m
- ✚ BH102, 1.00m
- BH102, 1.40m
- ▲ BH102, 3.35m
- ▼ BH102, 7.00m
- ✱ BH103, 2.20m
- BH103, 8.80m
- BH105, 1.70m
- ◆ BH105, 4.70m
- BH105, 7.70m
- ✚ BH106, 0.50m
- ✚ BH106, 1.20m
- ✱ BH106, 2.70m
- BH106, 5.70m
- BH106, 8.60m
- BH106, 13.20m
- △ TP101, 1.00m
- ✱ TP102, 0.50m
- TP103, 1.00m
- TP104, 1.50m
- TP105, 0.50m

TREBANOS WWTW GIR PARTICLE SIZE DISTRIBUTION

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FIGURE 1

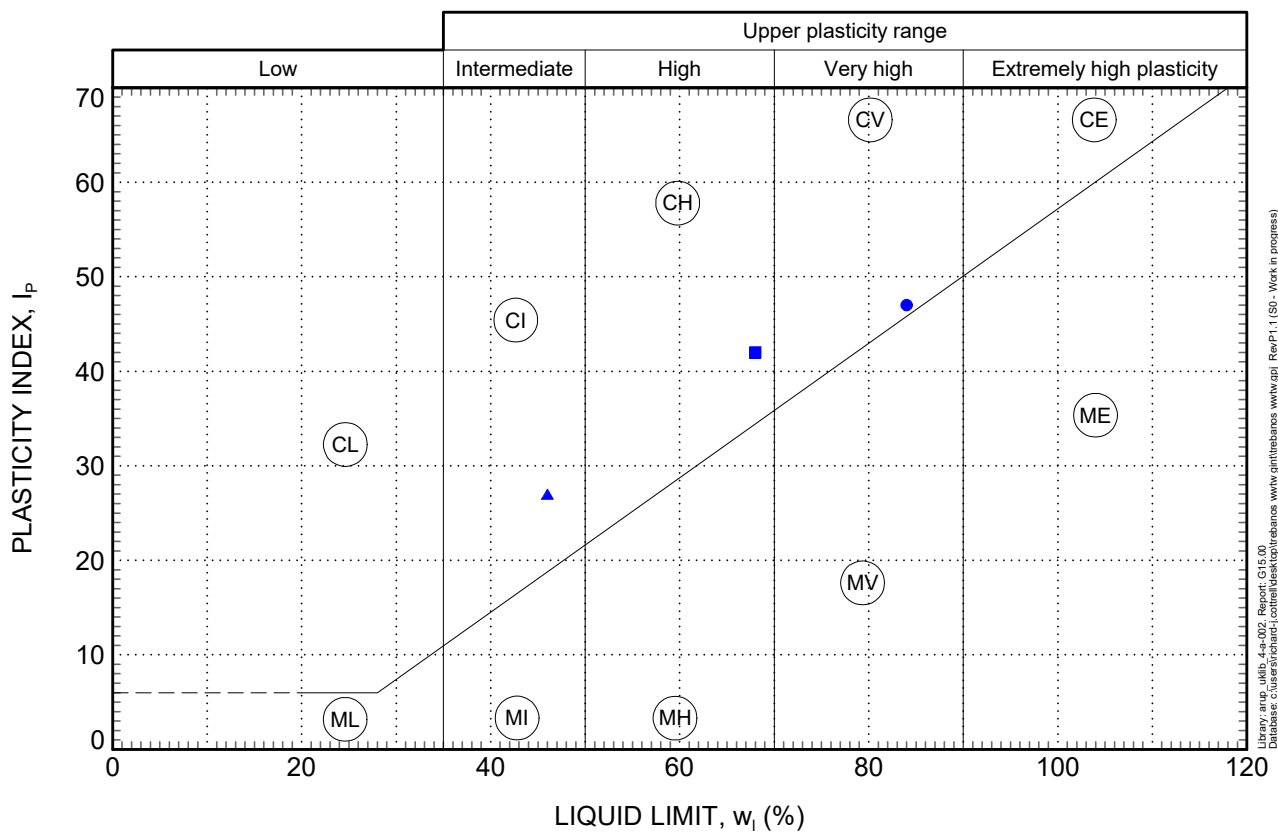


\\gnt\map\util\As-202\Report\G16.61.D
Database: c:\user\richardj\conf\trabanos\www.gnt\trabanos\www.gnt\RevP1.1 (SD - Work in progress)

TREBANOS WWTW GIR ATTERBERG LIMITS

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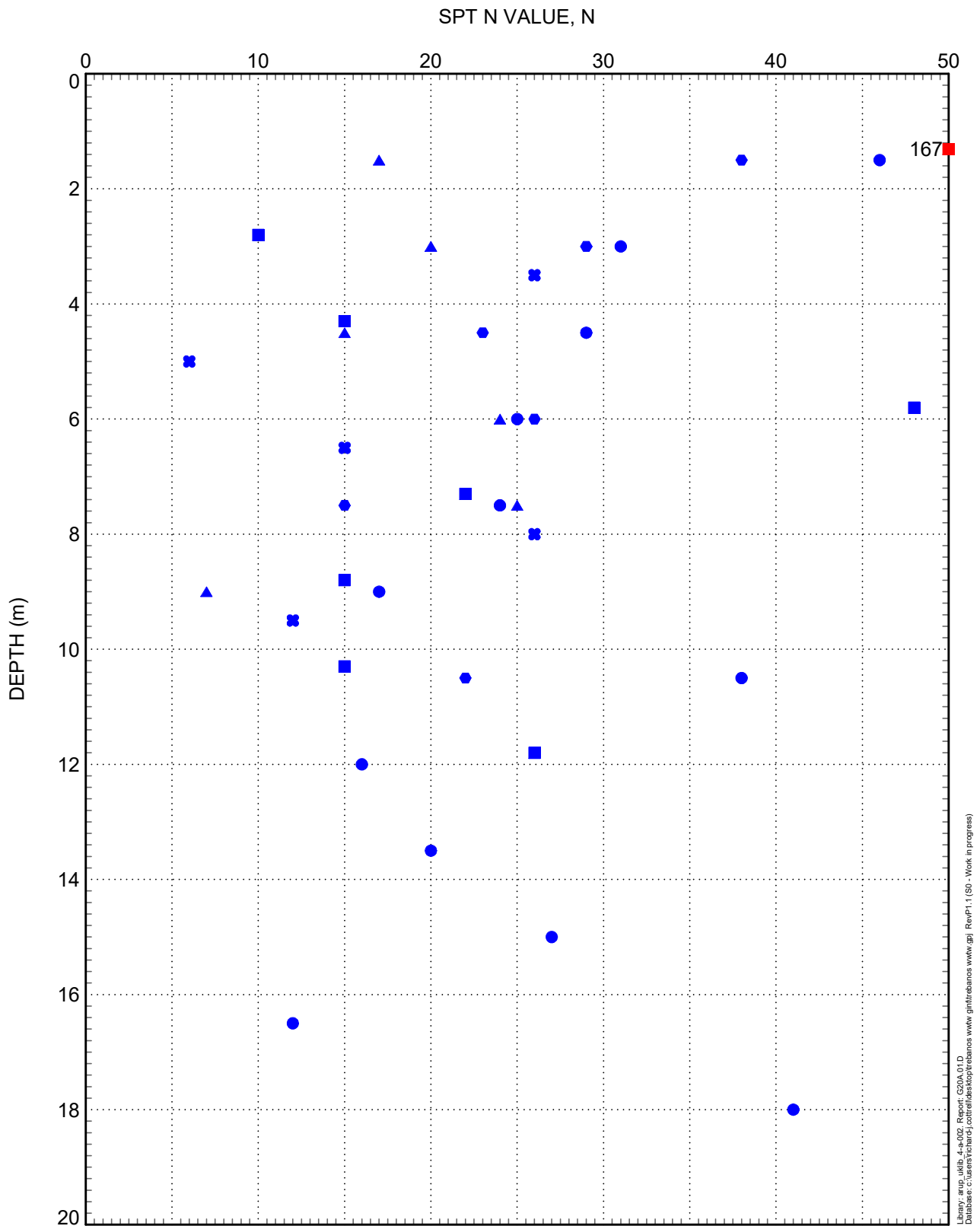
FIGURE **2**



TREBANOS WWTW GIR PLASTICITY CHART

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FIGURE 3

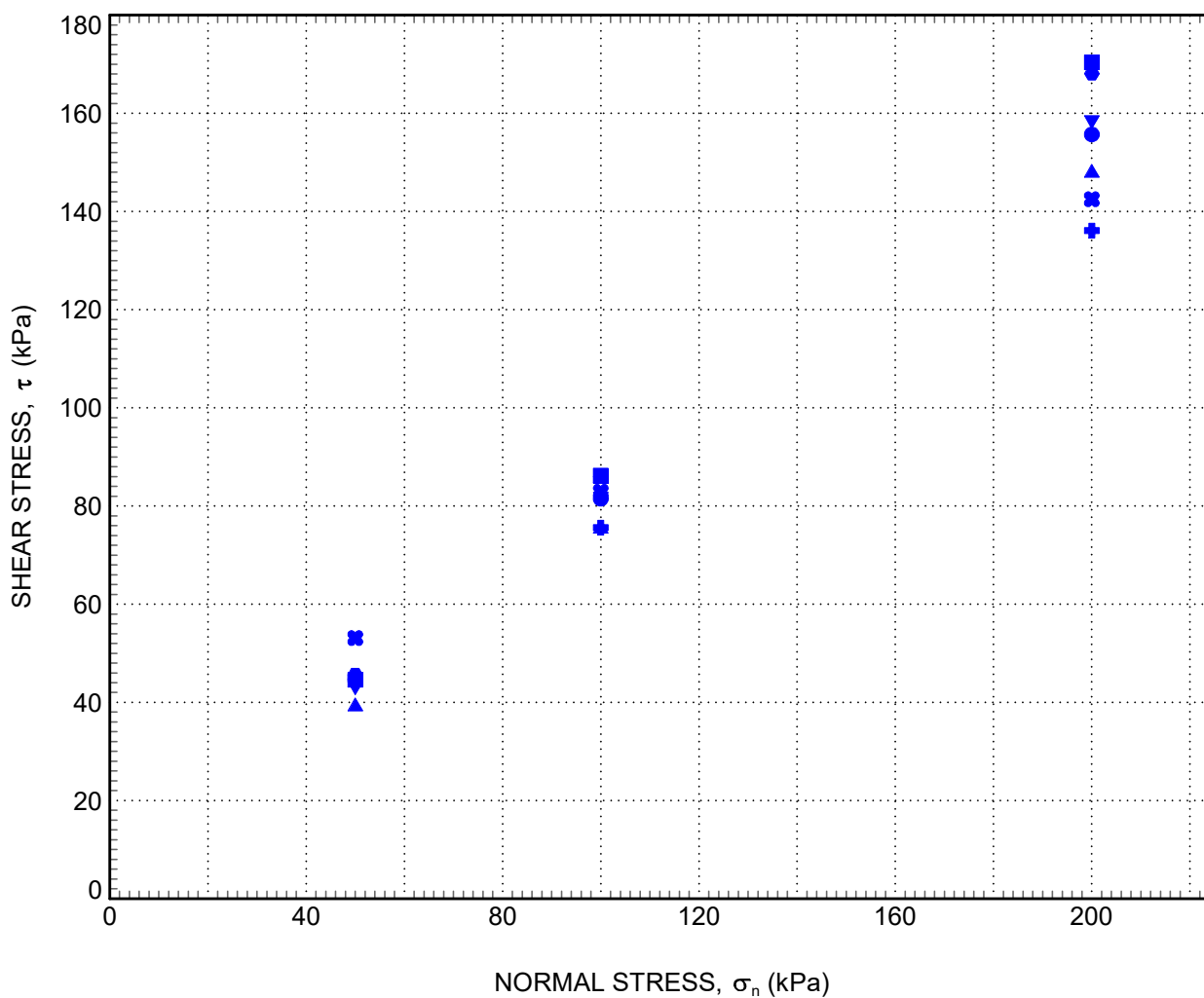


- Made Ground (MG)
- Alluvium (ALV)
- BH101
- BH102
- ▲ BH103
- ✕ BH105
- BH106

TREBANOS WWTW GIR STANDARD PENETRATION TESTS

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FIGURE **4**



- Alluvium (ALV)
- BH101, 2.70m
- BH101, 7.20m
- ▲ BH102, 3.35m
- ✱ BH102, 7.00m
- BH103, 2.20m
- ▼ BH105, 4.70m
- ✱ BH106, 2.70m

TREBANOS WWTW GIR SHEAR BOX TESTS

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FIGURE **5**

F.3 Chemical Screening Tables

Soils - Existing WwTW

Client: Trebanos WWTW																	
Client: Spencer Quantum Ltd		Residential (without) plant uptake	Commercial	23-36513		23-36902		23-36902		23-37272		23-37272		23-36901		23-36901	
Quotation No.:				1725272		1726805		1726806		1728227		1728228		1726796		1726797	
Order No.: Q1402				ES2		ES3		ES4		ES2		ES1		1		2	
				BH102		TP103		TP103		TP101		TP101		TP104		TP104	
				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
				0.50		1.0		1.3		0.5		0.2		0.2		0.5	
				30-Oct-2023		01-Nov-2023		01-Nov-2023		03-Nov-2023		03-Nov-2023		01-Nov-2023		01-Nov-2023	
				DURHAM		COVENTRY		-		COVENTRY		COVENTRY		DURHAM		DURHAM	
Determinand				Units		MG: Grass over grey slightly silty sandy fine to coarse mudstone, siltstone, sandstone, brick, slag GRAVEL		MG: Dark brownish grey mottled gravelly SILT with coal and brick fragments		Brown very gravelly medium to coarse SAND.		MG: Dark greyish brown sandy silty medium to coarse GRAVEL of concrete, brick and slag		MG: Greyish brown sandy silty fine to coarse GRAVEL of concrete, limestone and brick		Topsoil	
ACM Type				-		-		-		-		-		-		-	
Asbestos Identification				No Asbestos Detected		No Asbestos Detected		-		No Asbestos Detected		No Asbestos Detected		No Asbestos Detected		No Asbestos Detected	
Moisture		%		14		18		9.0		14		17		21		19	
Soil Colour				Brown		Brown		Brown		Brown		Brown		Brown		Brown	
Other Material				Stones		Stones		Stones		Stones		Stones		Stones		Stones	
Soil Texture				Loam		Sand		Sand		Sand		Sand		Sand		Sand	
pH at 20C				8.7		8.6		8.2		10.8		9.9		7.9		7.7	
Boron (Hot Water Soluble)				mg/kg		0.43											
Cyanide (Total)		40		640		mg/kg		< 0.50		< 0.50		< 0.50		< 0.50		< 0.50	
Arsenic				mg/kg		29		34		8.8		51		40		38	
Cadmium				mg/kg		2.1		1.5		0.19		3.5		2.3		2.1	
Chromium		910		8600		mg/kg		57		27		9.8		290		1100	
Copper				mg/kg		100		61		13		300		160		93	
Mercury				mg/kg		0.10		0.07		< 0.05		0.10		0.11		0.12	
Nickel				mg/kg		53		44		22		86		61		110	
Lead		310		2300		mg/kg		160		130		15		420		250	
Selenium				mg/kg		1.2		1.2		0.54		2.0		2.1		1.9	
Zinc				mg/kg		330		300		69		640		410		280	
Chromium (Hexavalent)				mg/kg		< 0.50		< 0.50		-		< 0.50		< 0.50		< 0.50	
LOI				%		5.9		1.0		-		3.6		5.0		9.3	
Total Organic Carbon				%		3.6		2.6		0.43		2.7		2.9		2.1	
Aliphatic TPH >C5-C8				mg/kg		< 1.0		-		-		-		-		-	
Aliphatic TPH >C6-C8				mg/kg		< 1.0		-		-		-		-		-	
Aliphatic TPH >C8-C10				mg/kg		< 1.0		-		-		-		-		-	
Aliphatic TPH >C10-C12				mg/kg		< 1.0		-		-		-		-		-	
Aliphatic TPH >C12-C16				mg/kg		< 1.0		-		-		-		-		-	
Aliphatic TPH >C16-C21				mg/kg		< 1.0		-		-		-		-		-	
Aliphatic TPH >C21-C35				mg/kg		< 1.0		-		-		-		-		-	
Aliphatic TPH >C35-C44				mg/kg		< 1.0		-		-		-		-		-	
Total Aliphatic Hydrocarbons				mg/kg		< 5.0		-		-		-		-		-	
Aromatic TPH >C5-C7				mg/kg		< 1.0		-		-		-		-		-	
Aromatic TPH >C7-C8				mg/kg		< 1.0		-		-		-		-		-	
Aromatic TPH >C8-C10				mg/kg		< 1.0		-		-		-		-		-	
Aromatic TPH >C10-C12				mg/kg		< 1.0		-		-		-		-		-	
Aromatic TPH >C12-C16				mg/kg		< 1.0		-		-		-		-		-	
Aromatic TPH >C16-C21				mg/kg		< 1.0		-		-		-		-		-	
Aromatic TPH >C21-C35				mg/kg		< 1.0		-		-		-		-		-	
Aromatic TPH >C35-C44				mg/kg		< 1.0		-		-		-		-		-	
Total Aromatic Hydrocarbons				mg/kg		< 5.0		-		-		-		-		-	
Total Petroleum Hydrocarbons				mg/kg		< 10		-		-		-		-		-	
Aliphatic VPH >C5-C8				mg/kg		-		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05	
Aliphatic VPH >C6-C7				mg/kg		-		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05	
Aliphatic VPH >C7-C8				mg/kg		-		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05	
Aliphatic VPH >C8-C8 (Sum)				mg/kg		-		< 0.10		< 0.10		< 0.10		< 0.10		< 0.10	
Aliphatic VPH >C8-C10				mg/kg		-		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05	
Total Aliphatic VPH >C5-C10				mg/kg		-		< 0.25		< 0.25		< 0.25		< 0.25		< 0.25	
Aliphatic EPH >C10-C12				mg/kg		-		< 2.0		< 2.0		< 2.0		< 2.0		< 2.0	
Aliphatic EPH >C12-C16				mg/kg		-		< 1.0		< 1.0		1.1		< 1.0		< 1.0	
Aliphatic EPH >C16-C21				mg/kg		-		< 2.0		< 2.0		3.6		< 2.0		< 2.0	
Aliphatic EPH >C21-C35				mg/kg		-		< 3.0		< 3.0		< 3.0		< 3.0		< 3.0	
Aliphatic EPH >C35-C40				mg/kg		-		< 10		< 10		< 10		< 10		< 10	
Total Aliphatic EPH >C10-C35				mg/kg		-		< 5.0		< 5.0		5.3		< 5.0		< 5.0	
Total Aliphatic EPH >C10-C40				mg/kg		-		< 10		< 10		< 10		< 10		< 10	
Aromatic VPH >C5-C7				mg/kg		-		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05	
Aromatic VPH >C7-C8				mg/kg		-		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05	
Aromatic VPH >C8-C10				mg/kg		-		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05	
Total Aromatic VPH >C5-C10				mg/kg		-		< 0.25		< 0.25		< 0.25		< 0.25		< 0.25	
Aromatic EPH >C10-C12				mg/kg		-		< 1.0		< 1.0		< 1.0		< 1.0		< 1.0	
Aromatic EPH >C12-C16				mg/kg		-		< 1.0		< 1.0		< 1.0		< 1.0		< 1.0	
Aromatic EPH >C16-C21				mg/kg		-		< 2.0		< 2.0		2.3		3.7		< 2.0	
Aromatic EPH >C21-C35				mg/kg		-		4.3		2.1		< 2.0		7.3		6.1	
Aromatic EPH >C35-C40				mg/kg		-		< 1.0		9.9		< 1.0		120		< 1.0	
Total Aromatic EPH >C10-C35				mg/kg		-		6.3		< 5.0		< 5.0		11		8.1	
Total Aromatic EPH >C10-C40				mg/kg		-		< 10		< 10		< 10		130		< 10	
Total VPH >C5-C10				mg/kg		-		< 0.50		< 0.50		< 0.50		< 0.50		< 0.50	
Total EPH >C10-C35				mg/kg		-		< 10		< 10		< 10		11		< 10	
Total EPH >C10-C40				mg/kg		-		< 10		< 10		< 10		130		< 10	
Benzene				mg/kg		< 0.0010		-		-		-		-		-	
Toluene				mg/kg		< 0.0010		-		-		-		-		-	
Ethylbenzene				mg/kg		< 0.0010		-		-		-		-		-	
m & p-Xylene				mg/kg		< 0.0010		-		-		-		-		-	
o-Xylene				mg/kg		< 0.0010		-		-		-		-		-	
Naphthalene				mg/kg		0.31		-		< 0.10		-		< 0.10		-	
Acenaphthylene				mg/kg		< 0.10		-		< 0.10		-		< 0.10		-	
Acenaphthene				mg/kg		< 0.10		-		< 0.10		-		< 0.10		-	
Fluorene				mg/kg		< 0.10		-		< 0.10		-		< 0.10		-	
Phenanthrene				mg/kg		0.23		-		< 0.10		-		< 0.10		-	
Anthracene				mg/kg		< 0.10		-		< 0.10		-		< 0.10		-	
Fluoranthene				mg/kg		0.53		-		< 0.10		-		< 0.10		-	
Pyrene				mg/kg		0.46		-		< 0.10		-		< 0.10		-	
Benzo[a]anthracene				mg/kg		0.23		-		< 0.10		-		< 0.10		-	
Chrysene				mg/kg		0.20		-		< 0.10		-		< 0.10		-	
Benzo[b]fluoranthene				mg/kg		0.46		-		< 0.10		-		< 0.10		-	
Benzo[k]fluoranthene				mg/kg		0.13		-		< 0.10		-		< 0.10		-	
Benzo[a]pyrene				mg/kg		0.33		-		< 0.10		-		< 0.10		-	
Indeno[1,2,3-c,d]pyrene				mg/kg		0.29		-		< 0.10		-		< 0.10		-	
Dibenz[a,h]Anthracene				mg/kg		< 0.10		-		< 0.10		-		< 0.10		-	
Benzo[g,h,i]perylene				mg/kg		0.28		-		< 0.10		-		< 0.10		-	
Total Of 16 PAH's				mg/kg		3.5		-		< 2.0		-		< 2.0		-	
PCB 28				mg/kg		< 0.010		-		-		-		-		-	
PCB 52				mg/kg		< 0.010		-		-		-		-		-	
PCB 90+101				mg/kg		< 0.010		-		-		-		-		-	
PCB 118				mg/kg		< 0.010		-		-		-		-		-	
PCB 153				mg/kg		< 0.010		-		-		-		-		-	
PCB 138				mg/kg		< 0.010		-		-		-		-		-	
PCB 180				mg/kg		< 0.010		-		-		-		-		-	
Total PCBs (7 Congeners)				mg/kg		< 0.10		-		-		-		-		-	
Total Phenols				mg/kg		< 0.10		< 0.10		< 0.10		< 0.10		< 0.10		< 0.10	
PCB 81				mg/kg		-		< 0.010		-		< 0.010		-		< 0.010	
PCB 77				mg/kg		-		< 0.010		-		< 0.010		-		< 0.010	
PCB 105				mg/kg		-		< 0.010		-		< 0.010		-		< 0.010	
PCB 114				mg/kg		-		< 0.010		-		< 0.010		-		< 0.010	
PCB 118				mg/kg		-		< 0.010		-							

Chloromethane			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Vinyl Chloride			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Bromomethane			µg/kg	-	< 20	-	< 20	< 20	-	< 20
Chloroethane			µg/kg	-	< 2.0	-	< 2.0	< 2.0	-	< 2.0
Trichlorofluoromethane			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,1-Dichloroethene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Dichloromethane			µg/kg	-	< 50	-	< 50	< 50	-	< 50
Trans 1,2-Dichloroethene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,1-Dichloroethane			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
cis 1,2-Dichloroethene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Bromochloromethane			µg/kg	-	< 5.0	-	< 5.0	< 5.0	-	< 5.0
Trichloromethane			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,1,1-Trichloroethane			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Tetrachloromethane			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,1-Dichloropropene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Benzene			µg/kg	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane			µg/kg	-	< 2.0	-	< 2.0	< 2.0	-	< 2.0
Trichloroethene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,2-Dichloropropane			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Dibromomethane			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Bromodichloromethane			µg/kg	-	< 5.0	-	< 5.0	< 5.0	-	< 5.0
cis-1,3-Dichloropropene			µg/kg	-	< 10	-	< 10	< 10	-	< 10
Toluene			µg/kg	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene			µg/kg	-	< 10	-	< 10	< 10	-	< 10
1,1,2-Trichloroethane			µg/kg	-	< 10	-	< 10	< 10	-	< 10
Tetrachloroethene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,3-Dichloropropane			µg/kg	-	< 2.0	-	< 2.0	< 2.0	-	< 2.0
Dibromochloromethane			µg/kg	-	< 10	-	< 10	< 10	-	< 10
1,2-Dibromoethane			µg/kg	-	< 5.0	-	< 5.0	< 5.0	-	< 5.0
Chlorobenzene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,1,1,2-Tetrachloroethane			µg/kg	-	< 2.0	-	< 2.0	< 2.0	-	< 2.0
Ethylbenzene			µg/kg	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene			µg/kg	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene			µg/kg	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Tribromomethane			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Isopropylbenzene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Bromobenzene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,2,3-Trichloropropane			µg/kg	-	< 50	-	< 50	< 50	-	< 50
N-Propylbenzene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
2-Chlorotoluene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,3,5-Trimethylbenzene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
4-Chlorotoluene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Tert-Butylbenzene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,2,4-Trimethylbenzene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Sec-Butylbenzene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,3-Dichlorobenzene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
4-Isopropyltoluene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,4-Dichlorobenzene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
N-Butylbenzene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,2-Dichlorobenzene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,2-Dibromo-3-Chloropropane			µg/kg	-	< 50	-	< 50	< 50	-	< 50
1,2,4-Trichlorobenzene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
Hexachlorobutadiene			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
1,2,3-Trichlorobenzene			µg/kg	-	< 2.0	-	< 2.0	< 2.0	-	< 2.0
Methyl Tert-Butyl Ether			µg/kg	-	< 1.0	-	< 1.0	< 1.0	-	< 1.0
N-Nitrosodimethylamine			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Phenol			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
2-Chlorophenol			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Bis(2-Chloroethyl)Ether			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
1,3-Dichlorobenzene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
1,4-Dichlorobenzene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
1,2-Dichlorobenzene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
2-Methylphenol			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Bis(2-Chloroisopropyl)Ether			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Hexachloroethane			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
N-Nitrosodi-n-propylamine			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
4-Methylphenol			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Nitrobenzene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Isophorone			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
2-Nitrophenol			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
2,4-Dimethylphenol			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Bis(2-Chloroethoxy)Methane			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
2,4-Dichlorophenol			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
1,2,4-Trichlorobenzene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Naphthalene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
4-Chloroaniline			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Hexachlorobutadiene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
4-Chloro-3-Methylphenol			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
2-Methylnaphthalene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
4-Nitrophenol			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Hexachlorocyclopentadiene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
2,4,6-Trichlorophenol			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
2,4,5-Trichlorophenol			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
3-Chloronaphthalene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
2-Nitroaniline			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Acenaphthylene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Dimethylphthalate			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
2,6-Dinitrotoluene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Acenaphthene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
3-Nitroaniline			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Dibenzofuran			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
4-Chlorophenylphenylether			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
2,4-Dinitrotoluene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Fluorene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Diethyl Phthalate			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
4-Nitroaniline			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Azobenzene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
4-Bromophenylphenyl Ether			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Hexachlorobenzene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Phenanthrene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Anthracene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Carbazole			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Di-N-Butyl Phthalate			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Fluoranthene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Pyrene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Butylbenzyl Phthalate			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Benzo[a]anthracene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Chrysene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Bis(2-Ethylhexyl)Phthalate			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Di-N-Octyl Phthalate			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Benzo[b]fluoranthene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Benzo[k]fluoranthene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Benzo[a]pyrene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Indeno(1,2,3-c,d)Pyrene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Dibenz(a,h)Anthracene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50
Benzo[g,h,i]perylene			mg/kg	-	< 0.50	-	< 0.50	< 0.50	-	< 0.50

Soils - Field

Project: Trebanos WWTW													
Client: Spencer Quantum Ltd													
Quotation No.:													
Order No.: Q1402													
Residential (without) plant uptake			Commercial										
			23-36902	23-36902	23-36904	23-36904	23-36904	23-36904	23-37272	23-37645	23-37649	23-37649	
			1726800	1726802	1726808	1726810	1726811	1726813	1729772	1729972	1729989	1729991	
			ES3	ES2	ES2	ES1	ES1	ES3	ES3	ES2	ES4	ES5	
			BH105	BH105	TP105	TP105	TP102	TP102	BH103	BH103	BH106	BH106	
			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
			1	0.5	0.5	0.2	0.2	1.0	1.7	0.5	2.5	5.8	
			01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023	03-Nov-2023	03-Nov-2023	06-Nov-2023	08-Nov-2023	
			COVENTRY	COVENTRY		NEW-ASB	NEW-ASB						
Determinand			Units	MG: Dark greyish brown slightly gravelly very sandy SILT (mudstone and gravel)	MG: Dark greyish brown sandy very gravelly CLAY. Gravel limestone and mudstone.	Greyish brown orange mottled sandy SILT	Topsoil (with brick fragments)	Topsoil	Brown very sandy fine to coarse GRAVEL	Medium dense brown very gravelly coarse SAND	Soft greyish brown slightly gravelly sandy CLAY.	Dense brown to brownish grey very gravelly medium SAND	Medium dense greyish brown slightly gravelly medium SAND.
ACM Type				-	-	-	-	-	-	-	-	-	-
Asbestos Identification				No Asbestos Detected	No Asbestos Detected	-	No Asbestos Detected	No Asbestos Detected	-	-	-	-	-
Moisture			%	20	25	25	13	23	11	15	24	6.7	9.7
Soil Colour				Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material				Stones	Stones	Stones	Stones	Stones and Roots	Stones	Stones	Stones	Stones	Stones
Soil Texture				Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Loam	Sand
pH at 20C			mg/kg	8.4	8.5	8.9	7.9	7.7	8.2	10.9	8.7	8.6	8.4
Boron (Hot Water Soluble)			mg/kg	-	-	-	-	-	-	-	-	-	-
Cyanide (Total)			mg/kg	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	40	640	mg/kg	15	48	59	73	30	11	52	8.7	6.4	9.7
Cadmium			mg/kg	0.40	1.8	1.4	3.9	1.8	0.32	2.8	0.20	0.18	0.20
Chromium	910	8600	mg/kg	13	25	10	29	22	14	2000	12	15	14
Copper			mg/kg	30	150	52	290	120	30	380	18	29	22
Mercury			mg/kg	< 0.05	0.08	0.05	0.12	0.07	< 0.05	0.13	< 0.05	0.09	0.06
Nickel			mg/kg	30	60	30	68	64	35	80	20	35	30
Lead	310	2300	mg/kg	23	240	53	840	290	31	260	16	35	47
Selenium			mg/kg	0.96	1.4	1.5	1.4	0.95	0.89	3.2	0.58	0.98	0.84
Zinc			mg/kg	100	620	150	2400	750	120	490	51	110	74
Chromium (Hexavalent)			mg/kg	-	< 0.50	-	-	< 0.50	-	-	< 0.50	-	< 0.50
LOI			%	-	10	-	-	14	-	-	5.8	-	-
Total Organic Carbon			%	0.87	8.4	2.1	6.7	11	0.85	2.2	1.6	0.93	0.48
Aliphatic TPH >C5-C6			mg/kg	-	-	-	-	-	-	-	-	-	-
Aliphatic TPH >C6-C8			mg/kg	-	-	-	-	-	-	-	-	-	-
Aliphatic TPH >C8-C10			mg/kg	-	-	-	-	-	-	-	-	-	-
Aliphatic TPH >C10-C12			mg/kg	-	-	-	-	-	-	-	-	-	-
Aliphatic TPH >C12-C16			mg/kg	-	-	-	-	-	-	-	-	-	-
Aliphatic TPH >C16-C21			mg/kg	-	-	-	-	-	-	-	-	-	-
Aliphatic TPH >C21-C35			mg/kg	-	-	-	-	-	-	-	-	-	-
Aliphatic TPH >C35-C44			mg/kg	-	-	-	-	-	-	-	-	-	-
Total Aliphatic Hydrocarbons			mg/kg	-	-	-	-	-	-	-	-	-	-
Aromatic TPH >C5-C7			mg/kg	-	-	-	-	-	-	-	-	-	-
Aromatic TPH >C7-C8			mg/kg	-	-	-	-	-	-	-	-	-	-
Aromatic TPH >C8-C10			mg/kg	-	-	-	-	-	-	-	-	-	-
Aromatic TPH >C10-C12			mg/kg	-	-	-	-	-	-	-	-	-	-
Aromatic TPH >C12-C16			mg/kg	-	-	-	-	-	-	-	-	-	-
Aromatic TPH >C16-C21			mg/kg	-	-	-	-	-	-	-	-	-	-
Aromatic TPH >C21-C35			mg/kg	-	-	-	-	-	-	-	-	-	-
Aromatic TPH >C35-C44			mg/kg	-	-	-	-	-	-	-	-	-	-
Total Aromatic Hydrocarbons			mg/kg	-	-	-	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons			mg/kg	-	-	-	-	-	-	-	-	-	-
Aliphatic VPH >C5-C6			mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7			mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8			mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C8-C8 (Sum)			mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10			mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10			mg/kg	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12			mg/kg	< 2.0	2.2	2.1	2.2	2.3	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16			mg/kg	< 1.0	< 1.0	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.4
Aliphatic EPH >C16-C21			mg/kg	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35			mg/kg	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Aliphatic EPH >C35-C40			mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35			mg/kg	< 5.0	< 5.0	< 5.0	5.3	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Aliphatic EPH >C10-C40			mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic VPH >C5-C7			mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8			mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10			mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10			mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10			mg/kg	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12			mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16			mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21			mg/kg	3.9	3.9	< 2.0	< 2.0	< 2.0	< 2.0	4.1	5.3	2.9	2.9
Aromatic EPH >C21-C35			mg/kg	4.9	6.3	4.1	3.3	8.4	< 2.0	3.1	< 2.0	2.0	3.1
Aromatic EPH >C35-C40			mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	1.1	< 1.0	4.4	2.0	< 1.0	< 1.0
Total Aromatic EPH >C10-C35			mg/kg	8.8	10	6.1	5.1	10	< 5.0	< 5.0	< 5.0	7.3	6.0
Total Aromatic EPH >C10-C40			mg/kg	< 10	< 10	< 10	< 10	11	< 10	< 10	< 10	< 10	< 10
Total VPH >C5-C10			mg/kg	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35			mg/kg	11	14	11	10	15	< 10	< 10	< 10	< 10	< 10
Total EPH >C10-C40			mg/kg	11	14	11	10	16	< 10	< 10	< 10	< 10	< 10
Benzene			mg/kg	-	-	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0
Toluene			mg/kg	-	-	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene			mg/kg	-	-	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene			mg/kg	-	-	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene			mg/kg	-	-	-	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene			mg/kg	< 0.10	0.79	-	1.8	1.7	< 0.10	0.48	< 0.10	< 0.10	< 0.10
Acenaphthylene			mg/kg	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene			mg/kg	< 0.10	0.17	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene			mg/kg	< 0.10	0.12	-	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene			mg/kg	< 0.10	0.59	-	0.53	0.90	< 0.10	0.41	<		

cis-1,2-Dichloroethene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
Bromochloromethane	µg/kg	-	-	< 5.0	-	-	-	-	-	-	-	-
Trichloromethane	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
Tetrachloromethane	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
1,1-Dichloropropene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
Benzene	µg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-
1,2-Dichloroethane	µg/kg	-	-	< 2.0	-	-	-	-	-	-	-	-
Trichloroethene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
1,2-Dichloropropane	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
Dibromomethane	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
Bromodichloromethane	µg/kg	-	-	< 5.0	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	µg/kg	-	-	< 10	-	-	-	-	-	-	-	-
Toluene	µg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-
Trans-1,3-Dichloropropene	µg/kg	-	-	< 10	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	-	-	< 10	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
1,3-Dichloropropane	µg/kg	-	-	< 2.0	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/kg	-	-	< 10	-	-	-	-	-	-	-	-
1,2-Dibromoethane	µg/kg	-	-	< 5.0	-	-	-	-	-	-	-	-
Chlorobenzene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	-	-	< 2.0	-	-	-	-	-	-	-	-
Ethylbenzene	µg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-
m- & p-Xylene	µg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-
o-Xylene	µg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-
Styrene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
Triisobromomethane	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
Isopropylbenzene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
Bromobenzene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	µg/kg	-	-	< 50	-	-	-	-	-	-	-	-
N-Propylbenzene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
4-Chlorotoluene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
tert-Butylbenzene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
Sec-Butylbenzene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
4-Isopropyltoluene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
N-Butylbenzene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
1,2-Dibromo-3-Chloropropane	µg/kg	-	-	< 50	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	-	-	< 2.0	-	-	-	-	-	-	-	-
Methyl tert-Butyl Ether	µg/kg	-	-	< 1.0	-	-	-	-	-	-	-	-
N-Nitrosodimethylamine	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Phenol	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
2-Chlorophenol	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Bis-(2-Chloroethyl)Ether	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
2-Methylphenol	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Bis(2-Chloroisopropyl)Ether	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Hexachloroethane	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
4-Methylphenol	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Nitrobenzene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Isophorone	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
2-Nitrophenol	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Bis(2-Chloroethoxy)Methane	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
4-Chloroaniline	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Hexachlorobutadiene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
4-Chloro-3-Methylphenol	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
2-Methylnaphthalene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
4-Nitrophenol	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
2-Chloronaphthalene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
2-Nitroaniline	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Dimethylphthalate	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Acenaphthene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
3-Nitroaniline	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Dibenzofuran	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
4-Chlorophenylphenylether	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Fluorene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Diethyl Phthalate	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
4-Nitroaniline	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Azobenzene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
4-Bromophenylphenyl Ether	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Hexachlorobenzene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Antiraxene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Carbazole	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Di-N-Butyl Phthalate	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Pyrene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Butylbenzyl Phthalate	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Benzo[<i>b</i>]anthracene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Chrysene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Bis(2-Ethylhexyl)Phthalate	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Di-N-Octyl Phthalate	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Benzo[<i>b</i>]fluoranthene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Benzo[<i>a</i>]fluoranthene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Benzo[<i>a</i>]pyrene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Indeno[1,2,3- <i>c,d</i>]pyrene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Dibenz[<i>a,h</i>]Anthracene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-
Benzo[<i>ghi</i>]perylene	mg/kg	-	-	< 0.50	-	-	-	-	-	-	-	-

Soil Leachate Results

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd	Freshwater EQS			23-36904	23-37272	23-37649	23-36901	23-36902	23-36902	-	-	-	-	-	-	-	-	-	-	-
Quotation No.: Q23-33011				1726810	1728228	1729889	1726797	1726800	1726805	-	-	-	-	-	-	-	-	-	-	-
Order No.:				ES1	ES1	ES4	2	ES3	ES3	-	-	-	-	-	-	-	-	-	-	-
				TP105	TP101	BH106	TP104	BH105	TP103	BH102	TP104	BH105	TP103	TP105	TP102	TP102	BH106	BH103	TP101	BH103
2:1				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	-	-	-	-	-	-	-	-	-	-	-
10:1				0.2	0.2	2.5	0.5	1	1.0	0.5	0.2	0.5	1.3	0.5	0.2	1.0	5.8	1.7	0.5	0.5
				01-Nov-2023	03-Nov-2023	08-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023	-	-	-	-	-	-	-	-	-	-
				AV ZONE	Number 1	Number 2	Number 1	Number 2	Number 1	Number 2	Number 2	Number 2	Number 1	Number 1	Number 1	Number 1	Number 1	Number 1	Number 2	Number 1
Determinand			Units	Topsoil (with brick fragments)	MG: Greyish brown sandy silty fine to coarse GRAVEL of concrete, limestone and brick	Dense brown to brownish grey very gravely medium SAND	MG: Dark brownish mottled sandy gravely SILT with brick fragments.	MG: Dark brownish mottled sandy gravely very sand, SILT (mudstone gravel)	MG: Dark brownish grey mottled gravely SILT with coal and brick fragments	MG: Grass over grey slightly silty sandy fine to coarse mudstone, siltstone, sandstone, brick, slag GRAVEL	Topsoil	MG: Dark greyish brown gritty gravely very sandy SILT (mudstone gravel)	MG: Dark brownish grey mottled gravely SILT with coal and brick fragments	Greyish brown orange mottled sandy SILT	Topsoil	Brown very sandy fine to coarse GRAVEL	Medium dense slightly gravely medium SAND	Medium dense brown very gravely coarse SAND	MG: Dark greyish brown sandy silty medium to coarse GRAVEL of concrete brick and slag	Soft greyish brown slightly gravely sandy CLAY.
pH at 20C		6 to 9		7.7	11.0	8.7	7.8	7.2	7.6	8.7	7.9	8.5	8.2	8.9	7.7	8.2	8.6	10.9	10.8	8.7
Chloride		mg/l	1.1	2.6	1.1	1.9	1.4	< 1.0	<1	<1	2	1	<1	1	3	2	15	14	3	
Ammoniacal Nitrogen	0.3	mg/l	< 0.050	0.12	0.078	0.068	0.42	0.062	-	-	-	-	-	-	-	-	-	-	-	
Cyanide (Total)	0.001	mg/l	< 0.050	< 0.050	0.20	< 0.050	< 0.050	< 0.050	-	-	-	-	-	-	-	-	-	-	-	
Calcium		mg/l	5.6	55	4.2	3.6	3.6	23	-	-	-	-	-	-	-	-	-	-	-	
Arsenic (Dissolved)	50	µg/l	15	3.0	0.66	3.2	5.8	4.7	13	0.3	5.3	0.5	1.3	3.6	0.6	0.5	0.7	0.5	7.5	
Beryllium (Dissolved)		µg/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-	-	-	-	-	-	-	-	-	
Cadmium (Dissolved)	0.09	µg/l	0.28	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	
Chromium (Dissolved)	3.4	µg/l	3.4	24	< 0.50	0.76	1.6	1.7	4	< 0.5	3	2	< 0.5	< 0.5	< 0.5	< 0.5	57	39	1	
Copper (Dissolved)		µg/l	32	11	1.2	3.6	17	2.8	1	1	19	1	3	4	3	< 0.5	9	8	14	
Bioavailable copper	1	µg/l	2.96	1.02	0.11	0.33	1.57	0.26	0.12	0.12	1.76	0.07	0.31	0.34	0.25	0.05	0.79	0.73	1.29	
Mercury (Dissolved)	0.07	µg/l	< 0.05	0.17	< 0.05	< 0.05	< 0.05	< 0.05	0.37	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	2.4	1.6	< 0.05	
Manganese (Dissolved)		µg/l	65	< 0.50	8.9	56	170	4.3	-	-	-	-	-	-	-	-	-	-	-	
Bioavailable manganese	123	µg/l	65.00	0.50	8.90	56.00	170.00	4.30	-	-	-	-	-	-	-	-	-	-	-	
Nickel (Dissolved)		µg/l	4.3	0.75	0.92	1.3	4.4	0.71	< 0.5	1	5	< 0.5	1	2	2	1	2	1	6	
Bioavailable nickel	4	µg/l	2.65	0.46	0.57	0.80	2.71	0.44	0.31	0.37	3.15	0.31	0.43	1.05	1.05	0.43	0.93	0.43	3.95	
Lead (Dissolved)		µg/l	98	< 0.50	0.86	3.0	6.0	0.87	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1	9	
Bioavailable lead	1.2	µg/l	27.22	0.14	0.24	0.83	1.67	0.24	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.28	2.50	
Antimony (Dissolved)	1.7	µg/l	1.7	1.4	< 0.50	< 0.50	0.70	0.69	1	< 0.5	1	1	< 0.5	1	< 0.5	< 0.5	6	1	1	
Selenium (Dissolved)	10	µg/l	1.2	4.2	0.52	< 0.50	0.74	0.62	1	1	1	< 0.50	1	1	< 0.5	1	9	6	1	
Vanadium (Dissolved)		µg/l	7.6	110	< 0.50	1.0	2.7	5.3	-	-	-	-	-	-	-	-	-	-	-	
Zinc (Dissolved)		µg/l	100	< 2.5	4.5	10	12	6.3	< 3	6	7	3	< 3	3	< 3	4	< 3	< 3	15	
Bioavailable zinc	12.3	µg/l	48.34	1.21	2.18	4.83	5.80	3.05	1.45	2.90	3.36	1.45	1.45	1.45	1.45	1.93	1.45	1.45	7.25	
Benzene	10	µg/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-	-	-	-	-	-	-	-	-	
Toluene	74	µg/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-	-	-	-	-	-	-	-	-	
Ethylbenzene		µg/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-	-	-	-	-	-	-	-	-	
m & p-Xylene		µg/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-	-	-	-	-	-	-	-	-	
o-Xylene		µg/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	-	-	-	-	-	-	-	-	-	-	
Naphthalene	2	µg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Acenaphthylene		µg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Acenaphthene		µg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Fluorene		µg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Phenanthrene		µg/l	< 0.10	< 0.10	1.1	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Anthracene	0.1	µg/l	< 0.10	< 0.10	0.32	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Fluoranthene	0.0063	µg/l	< 0.10	< 0.10	1.5	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Pyrene		µg/l	< 0.10	< 0.10	2.2	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Benzo[a]anthracene		µg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Chrysene		µg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Benzo[b]fluoranthene		µg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Benzo[k]fluoranthene		µg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Benzo[a]pyrene	0.00017	µg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Indeno[1,2,3-c,d]Pyrene		µg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Dibenz[a,h]Anthracene		µg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Dibenz[g,h,i]perylene		µg/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	-	-	-	-	-	-	-	-	-	-	-	
Total Of 16 PAH's		µg/l	< 2.0	< 2.0	5.1	< 2.0	< 2.0	< 2.0	-	-	-	-	-	-	-	-	-	-	-	
PCB 28		µg/l	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	-	-	-	-	-	-	-	-	-	-	-	
PCB 52		µg/l	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	-	-	-	-	-	-	-	-	-	-	-	
PCB 101		µg/l	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	-	-	-	-	-	-	-	-	-	-	-	
PCB 118		µg/l	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	-	-	-	-	-	-	-	-	-	-	-	
PCB 153		µg/l	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	-	-	-	-	-	-	-	-	-	-	-	
PCB 138		µg/l	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	-	-	-	-	-	-	-	-	-	-	-	
PCB 180		µg/l	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	-	-	-	-	-	-	-	-	-	-	-	
Total PCBs (7 congeners)		µg/l	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	-	-	-	-	-	-	-	-	-	-	-	
Total Phenols		mg/l	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	-	-	-	-	-	-	-	-	-	-	-	

Groundwater Results

[illegible]

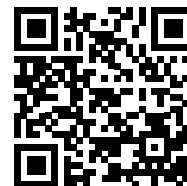
Ca	25
pH	8.0
DOC	3.6
Hardness	83

F.4 Waste Assessment

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)



MP1AL-CVRMF-RMMOM

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

Job name

DCWW Trebanos WwTW

Description/Comments

Preliminary waste assessment of GI arisings in order to inform potential off-site disposal classification.

Project

Trebanos WwTW

Site

Trebanos WwTW

Classified by

Name: **Ellis Krishan**
Date: **12 Feb 2024 15:07 GMT**
Telephone: **029 2005 4185**

Company: **Ove Arup**
4 Pierhead Street
Cardiff Bay
Cardiff
CF10 4QP

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
08 Oct 2020
01 Aug 2023

Next 3 year Refresher due by Aug 2026

Purpose of classification

2 - Material Characterisation

Address of the waste

N/A

Post Code N/A

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Asset upgrades of the existing WwTW.

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

Wastes created during construction works.

Description of the waste

Made Ground and alluvial soils.

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	BH102	0.5	Non Hazardous		3
2	BH105	1	Non Hazardous		5
3	BH105(A)	0.5	Non Hazardous		8
4	TP103	1	Non Hazardous		11
5	TP103(A)	1.3	Non Hazardous		13
6	TP105	0.5	Non Hazardous		15
7	TP105(A)	0.2	Hazardous	HP 14	18
8	TP102	0.2	Non Hazardous		21
9	TP102(A)	1	Non Hazardous		24
10	BH103	1.7	Non Hazardous		26
11	TP101	0.5	Non Hazardous		28
12	TP101(A)	0.2	Non Hazardous		30
13	BH103(A)	0.5	Non Hazardous		33
14	BH106	2.5	Non Hazardous		35
15	BH106(A)	5.8	Non Hazardous		37
16	TP104	0.2	Non Hazardous		39
17	TP104(A)	0.5	Non Hazardous		41

Related documents

#	Name	Description
1	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Ellis Krishan

Created date: 12 Feb 2024 15:07 GMT

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Appendix B: Rationale for selection of metal species	44
Appendix C: Version	45

Classification of sample: BH102


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

Sample details

Sample name:	LoW Code:
BH102	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.5 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14%	
(wet weight correction)	

Hazard properties

None identified

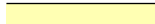
Determinands

Moisture content: 14% Wet Weight Moisture Correction applied (MC)

#		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							
1		arsenic { arsenic trioxide }				29 mg/kg	1.32	32.929 mg/kg	0.00329 %	✓	
		033-003-00-0	215-481-4	1327-53-3							
2		cadmium { cadmium oxide }				2.1 mg/kg	1.142	2.063 mg/kg	0.000206 %	✓	
		048-002-00-0	215-146-2	1306-19-0							
3		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }				57 mg/kg	1.462	71.645 mg/kg	0.00716 %	✓	
			215-160-9	1308-38-9							
4		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
		024-017-00-8									
5		copper { dicopper oxide; copper (I) oxide }				100 mg/kg	1.126	96.826 mg/kg	0.00968 %	✓	
		029-002-00-X	215-270-7	1317-39-1							
6		lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	160 mg/kg		137.6 mg/kg	0.0138 %	✓	
		082-001-00-6									
7		mercury { mercury dichloride }				0.1 mg/kg	1.353	0.116 mg/kg	0.0000116 %	✓	
		080-010-00-X	231-299-8	7487-94-7							
8		nickel { nickel chromate }				53 mg/kg	2.976	135.658 mg/kg	0.0136 %	✓	
		028-035-00-7	238-766-5	14721-18-7							
9		selenium { nickel selenate }				1.2 mg/kg	2.554	2.636 mg/kg	0.000264 %	✓	
		028-031-00-5	239-125-2	15060-62-5							
10		zinc { zinc oxide }				330 mg/kg	1.245	353.25 mg/kg	0.0353 %	✓	
		030-013-00-7	215-222-5	1314-13-2							
11		benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2							
12		toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3							
13		ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4							
14		xylene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							

#	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							
15	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 }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
	006-007-00-5									
16	pH				8.7 pH		8.7 pH	8.7 pH		
			PH							
17	naphthalene				0.31 mg/kg		0.267 mg/kg	0.0000267 %	✓	
	601-052-00-2	202-049-5	91-20-3							
18	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-917-1	208-96-8							
19	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-469-6	83-32-9							
20	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-695-5	86-73-7							
21	phenanthrene				0.23 mg/kg		0.198 mg/kg	0.0000198 %	✓	
		201-581-5	85-01-8							
22	anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		204-371-1	120-12-7							
23	fluoranthene				0.53 mg/kg		0.456 mg/kg	0.0000456 %	✓	
		205-912-4	206-44-0							
24	pyrene				0.46 mg/kg		0.396 mg/kg	0.0000396 %	✓	
		204-927-3	129-00-0							
25	benzo[a]anthracene				0.23 mg/kg		0.198 mg/kg	0.0000198 %	✓	
	601-033-00-9	200-280-6	56-55-3							
26	chrysene				0.2 mg/kg		0.172 mg/kg	0.0000172 %	✓	
	601-048-00-0	205-923-4	218-01-9							
27	benzo[b]fluoranthene				0.46 mg/kg		0.396 mg/kg	0.0000396 %	✓	
	601-034-00-4	205-911-9	205-99-2							
28	benzo[k]fluoranthene				0.13 mg/kg		0.112 mg/kg	0.0000112 %	✓	
	601-036-00-5	205-916-6	207-08-9							
29	benzo[a]pyrene; benzo[def]chrysene				0.33 mg/kg		0.284 mg/kg	0.0000284 %	✓	
	601-032-00-3	200-028-5	50-32-8							
30	indeno[123-cd]pyrene				0.29 mg/kg		0.249 mg/kg	0.0000249 %	✓	
		205-893-2	193-39-5							
31	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
32	benzo[ghi]perylene				0.28 mg/kg		0.241 mg/kg	0.0000241 %	✓	
		205-883-8	191-24-2							
33	phenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
Total:								0.0838 %		

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

Classification of sample: BH105


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

Sample details

Sample name:	LoW Code:
BH105	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
20%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 20% Wet Weight Moisture Correction applied (MC)

#		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							
1		arsenic { arsenic trioxide }				15 mg/kg	1.32	15.844 mg/kg	0.00158 %	✓	
		033-003-00-0	215-481-4	1327-53-3							
2		cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.366 mg/kg	0.0000366 %	✓	
		048-002-00-0	215-146-2	1306-19-0							
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	15.2 mg/kg	0.00152 %	✓	
			215-160-9	1308-38-9							
4		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				13 mg/kg	2.27	23.608 mg/kg	0.00236 %	✓	
		024-017-00-8									
5		copper { dicopper oxide; copper (I) oxide }				30 mg/kg	1.126	27.021 mg/kg	0.0027 %	✓	
		029-002-00-X	215-270-7	1317-39-1							
6		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	23 mg/kg		18.4 mg/kg	0.00184 %	✓	
		082-001-00-6									
7		mercury { mercury dichloride }				<0.5 mg/kg	1.353	<0.677 mg/kg	<0.0000677 %		<LOD
		080-010-00-X	231-299-8	7487-94-7							
8		nickel { nickel chromate }				30 mg/kg	2.976	71.43 mg/kg	0.00714 %	✓	
		028-035-00-7	238-766-5	14721-18-7							
9		selenium { nickel selenate }				0.96 mg/kg	2.554	1.961 mg/kg	0.000196 %	✓	
		028-031-00-5	239-125-2	15060-62-5							
10		zinc { zinc oxide }				100 mg/kg	1.245	99.577 mg/kg	0.00996 %	✓	
		030-013-00-7	215-222-5	1314-13-2							
11		TPH (C6 to C40) petroleum group				11 mg/kg		8.8 mg/kg	0.00088 %	✓	
				TPH							
12		benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2							
13		toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3							
14		ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4							

#	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								
15	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
16	 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				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
17	 pH		PH		8.4 pH		8.4 pH	8.4 pH			
18	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
19	 acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
20	 acenaphthene	201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
21	 fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
22	 phenanthrene	201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
23	 anthracene	204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
24	 fluoranthene	205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
25	 pyrene	204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
26	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
27	chrysene 601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
28	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
29	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
30	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
31	 indeno[123-cd]pyrene 205-893-2	193-39-5			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
32	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
33	 benzo[ghi]perylene 205-883-8	191-24-2			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
34	phenol 604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
Total:									0.0286 %		

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

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 Samples with detectable concentrations of TPH and BTEX are initially classed as Hazardous within the model on account of HP 3(i); 'Flammable liquid waste' defined as 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). The flammability risk of the materials can only be confirmed by means of flash point testing, which was not undertaken as part of the ground investigation. However, the hazardous property HP3(i) relates to liquid waste and the materials sampled were solid soils. In addition, sampling records and logs indicated that no free product, liquid hydrocarbons or any other visual or olfactory evidence of hydrocarbon contamination were observed during the sampling campaign across the site.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00088%)

Classification of sample: BH105(A)


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

Sample details

Sample name:	LoW Code:
BH105(A)	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.5 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
25%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 25% Wet Weight Moisture Correction applied (MC)

#	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							
1	arsenic { arsenic trioxide }				48 mg/kg	1.32	47.532 mg/kg	0.00475 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				1.8 mg/kg	1.142	1.542 mg/kg	0.000154 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				25 mg/kg	1.462	27.404 mg/kg	0.00274 %	✓	
		215-160-9	1308-38-9							
4	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
	024-017-00-8									
5	copper { dicopper oxide; copper (I) oxide }				150 mg/kg	1.126	126.662 mg/kg	0.0127 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	240 mg/kg		180 mg/kg	0.018 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				0.1 mg/kg	1.353	0.102 mg/kg	0.0000102 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				60 mg/kg	2.976	133.932 mg/kg	0.0134 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { nickel selenate }				1.4 mg/kg	2.554	2.682 mg/kg	0.000268 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
10	zinc { zinc oxide }				620 mg/kg	1.245	578.792 mg/kg	0.0579 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
11	TPH (C6 to C40) petroleum group				14 mg/kg		10.5 mg/kg	0.00105 %	✓	
			TPH							
12	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
13	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
14	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							

#	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							
15	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
16	 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				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
17	 pH				8.5 pH		8.5 pH	8.5 pH		
18	naphthalene 601-052-00-2	202-049-5	91-20-3		0.79 mg/kg		0.593 mg/kg	0.0000593 %	✓	
19	 acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
20	 acenaphthene	201-469-6	83-32-9		0.17 mg/kg		0.128 mg/kg	0.0000128 %	✓	
21	 fluorene	201-695-5	86-73-7		0.12 mg/kg		0.09 mg/kg	0.000009 %	✓	
22	 phenanthrene	201-581-5	85-01-8		0.59 mg/kg		0.443 mg/kg	0.0000442 %	✓	
23	 anthracene	204-371-1	120-12-7		0.13 mg/kg		0.0975 mg/kg	0.00000975 %	✓	
24	 fluoranthene	205-912-4	206-44-0		1 mg/kg		0.75 mg/kg	0.000075 %	✓	
25	 pyrene	204-927-3	129-00-0		0.75 mg/kg		0.563 mg/kg	0.0000563 %	✓	
26	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.47 mg/kg		0.353 mg/kg	0.0000352 %	✓	
27	chrysene 601-048-00-0	205-923-4	218-01-9		0.47 mg/kg		0.353 mg/kg	0.0000352 %	✓	
28	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		0.68 mg/kg		0.51 mg/kg	0.000051 %	✓	
29	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.21 mg/kg		0.158 mg/kg	0.0000158 %	✓	
30	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.47 mg/kg		0.353 mg/kg	0.0000352 %	✓	
31	 indeno[123-cd]pyrene 205-893-2		193-39-5		0.37 mg/kg		0.278 mg/kg	0.0000278 %	✓	
32	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
33	 benzo[ghi]perylene 205-883-8		191-24-2		0.39 mg/kg		0.293 mg/kg	0.0000293 %	✓	
34	phenol 604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
35	 polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.12 mg/kg		<0.12 mg/kg	<0.000012 %		<LOD
Total:								0.112 %		

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

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 Samples with detectable concentrations of TPH and BTEX are initially classed as Hazardous within the model on account of HP 3(i); 'Flammable liquid waste' defined as 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). The flammability risk of the materials can only be confirmed by means of flash point testing, which was not undertaken as part of the ground investigation. However, the hazardous property HP3(i) relates to liquid waste and the materials sampled were solid soils. In addition, sampling records and logs indicated that no free product, liquid hydrocarbons or any other visual or olfactory evidence of hydrocarbon contamination were observed during the sampling campaign across the site.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00105%)

Classification of sample: TP103


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

Sample details

Sample name:	LoW Code:
TP103	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
18%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#		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							
1		arsenic { arsenic trioxide }				34 mg/kg	1.32	36.811 mg/kg	0.00368 %	✓	
		033-003-00-0	215-481-4	1327-53-3							
2		cadmium { cadmium oxide }				1.5 mg/kg	1.142	1.405 mg/kg	0.000141 %	✓	
		048-002-00-0	215-146-2	1306-19-0							
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				27 mg/kg	1.462	32.359 mg/kg	0.00324 %	✓	
			215-160-9	1308-38-9							
4		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
		024-017-00-8									
5		copper { dicopper oxide; copper (I) oxide }				61 mg/kg	1.126	56.317 mg/kg	0.00563 %	✓	
		029-002-00-X	215-270-7	1317-39-1							
6		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	130 mg/kg		106.6 mg/kg	0.0107 %	✓	
		082-001-00-6									
7		mercury { mercury dichloride }				0.1 mg/kg	1.353	0.111 mg/kg	0.0000111 %	✓	
		080-010-00-X	231-299-8	7487-94-7							
8		nickel { nickel chromate }				44 mg/kg	2.976	107.384 mg/kg	0.0107 %	✓	
		028-035-00-7	238-766-5	14721-18-7							
9		selenium { nickel selenate }				1.2 mg/kg	2.554	2.513 mg/kg	0.000251 %	✓	
		028-031-00-5	239-125-2	15060-62-5							
10		zinc { zinc oxide }				300 mg/kg	1.245	306.2 mg/kg	0.0306 %	✓	
		030-013-00-7	215-222-5	1314-13-2							
11		TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
				TPH							
12		benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2							
13		toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3							
14		ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4							

#	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								
15	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
16	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				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
17	 pH PH				8.6 pH		8.6 pH	8.6 pH			
18	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
19	 acenaphthylene 205-917-1	208-96-8			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
20	 acenaphthene 201-469-6	83-32-9			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
21	 fluorene 201-695-5	86-73-7			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
22	 phenanthrene 201-581-5	85-01-8			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
23	 anthracene 204-371-1	120-12-7			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
24	 fluoranthene 205-912-4	206-44-0			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
25	 pyrene 204-927-3	129-00-0			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
26	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
27	chrysene 601-048-00-0	205-923-4	218-01-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
28	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
29	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
30	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
31	 indeno[123-cd]pyrene 205-893-2	193-39-5			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
32	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
33	 benzo[ghi]perylene 205-883-8	191-24-2			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
34	phenol 604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
35	 polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.12 mg/kg		<0.12 mg/kg	<0.000012 %			<LOD
Total:									0.067 %		

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

Classification of sample: TP103(A)


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

Sample details

Sample name:	LoW Code:
TP103(A)	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1.3 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 9% Wet Weight Moisture Correction applied (MC)

#	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							
1	arsenic { arsenic trioxide }				8.8 mg/kg	1.32	10.573 mg/kg	0.00106 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.19 mg/kg	1.142	0.198 mg/kg	0.0000198 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.8 mg/kg	1.462	13.034 mg/kg	0.0013 %	✓	
		215-160-9	1308-38-9							
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				9.8 mg/kg	2.27	20.244 mg/kg	0.00202 %	✓	
	024-017-00-8									
5	copper { dicopper oxide; copper (I) oxide }				13 mg/kg	1.126	13.319 mg/kg	0.00133 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	15 mg/kg		13.65 mg/kg	0.00137 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				22 mg/kg	2.976	59.585 mg/kg	0.00596 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { nickel selenate }				0.54 mg/kg	2.554	1.255 mg/kg	0.000125 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
10	zinc { zinc oxide }				69 mg/kg	1.245	78.156 mg/kg	0.00782 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
11	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
12	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
13	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
14	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							

#	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								
15	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
16	 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				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
17	 pH		PH		8.2 pH		8.2 pH	8.2 pH			
18	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
19	 acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
20	 acenaphthene	201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
21	 fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
22	 phenanthrene	201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
23	 anthracene	204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
24	 fluoranthene	205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
25	 pyrene	204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
26	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
27	chrysene 601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
28	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
29	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
30	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
31	 indeno[123-cd]pyrene 205-893-2	193-39-5			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
32	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
33	 benzo[ghi]perylene 205-883-8	191-24-2			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
34	phenol 604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
Total:									0.0223 %		

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

Classification of sample: TP105


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

Sample details

Sample name:	LoW Code:
TP105	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.5 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
25%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 25% Wet Weight Moisture Correction applied (MC)

#		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								
1		arsenic { arsenic trioxide }			59	mg/kg	1.32	58.424	mg/kg	0.00584 %	✓	
		033-003-00-0	215-481-4	1327-53-3								
2		cadmium { cadmium oxide }			1.4	mg/kg	1.142	1.199	mg/kg	0.00012 %	✓	
		048-002-00-0	215-146-2	1306-19-0								
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }			10	mg/kg	1.462	10.962	mg/kg	0.0011 %	✓	
			215-160-9	1308-38-9								
4		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }			10	mg/kg	2.27	17.025	mg/kg	0.0017 %	✓	
		024-017-00-8										
5		copper { dicopper oxide; copper (I) oxide }			52	mg/kg	1.126	43.91	mg/kg	0.00439 %	✓	
		029-002-00-X	215-270-7	1317-39-1								
6		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }		1	53	mg/kg		39.75	mg/kg	0.00398 %	✓	
		082-001-00-6										
7		mercury { mercury dichloride }			0.1	mg/kg	1.353	0.102	mg/kg	0.0000102 %	✓	
		080-010-00-X	231-299-8	7487-94-7								
8		nickel { nickel chromate }			30	mg/kg	2.976	66.966	mg/kg	0.0067 %	✓	
		028-035-00-7	238-766-5	14721-18-7								
9		selenium { nickel selenate }			1.5	mg/kg	2.554	2.873	mg/kg	0.000287 %	✓	
		028-031-00-5	239-125-2	15060-62-5								
10		zinc { zinc oxide }			150	mg/kg	1.245	140.03	mg/kg	0.014 %	✓	
		030-013-00-7	215-222-5	1314-13-2								
11		TPH (C6 to C40) petroleum group			11	mg/kg		8.25	mg/kg	0.000825 %	✓	
				TPH								
12		benzene			<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2								
13		toluene			<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3								
14		ethylbenzene			<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4								

#	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								
15	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
16	 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				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
17	 pH PH				8.9 pH		8.9 pH	8.9 pH			
18	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
19	 acenaphthylene 205-917-1	208-96-8			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
20	 acenaphthene 201-469-6	83-32-9			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
21	 fluorene 201-695-5	86-73-7			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
22	 phenanthrene 201-581-5	85-01-8			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
23	 anthracene 204-371-1	120-12-7			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
24	 fluoranthene 205-912-4	206-44-0			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
25	 pyrene 204-927-3	129-00-0			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
26	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
27	chrysene 601-048-00-0	205-923-4	218-01-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
28	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
29	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
30	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
31	 indeno[123-cd]pyrene 205-893-2	193-39-5			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
32	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
33	 benzo[ghi]perylene 205-883-8	191-24-2			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
34	phenol 604-001-00-2	203-632-7	108-95-2		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
Total:									0.0399 %		

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

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 Samples with detectable concentrations of TPH and BTEX are initially classed as Hazardous within the model on account of HP 3(i); 'Flammable liquid waste' defined as 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). The flammability risk of the materials can only be confirmed by means of flash point testing, which was not undertaken as part of the ground investigation. However, the hazardous property HP3(i) relates to liquid waste and the materials sampled were solid soils. In addition, sampling records and logs indicated that no free product, liquid hydrocarbons or any other visual or olfactory evidence of hydrocarbon contamination were observed during the sampling campaign across the site.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00082%)

Classification of sample: TP105(A)

 **Hazardous Waste**
 Classified as **17 05 03 ***
 in the List of Waste

Sample details

Sample name:	LoW Code:
TP105(A)	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 03 * (Soil and stones containing hazardous substances)
0.2 m	
Moisture content:	
13%	
(wet weight correction)	

Hazard properties

HP 14: Ecotoxic "waste which presents or may present immediate or delayed risks for one or more sectors of the environment"

Hazard Statements hit:

Aquatic Chronic 1; H410 "Very toxic to aquatic life with long lasting effects."

Because of determinand:

zinc oxide: (compound conc.: 0.26%)

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#		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								
1		arsenic { arsenic trioxide }				73 mg/kg	1.32	83.854 mg/kg	0.00839 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		cadmium { cadmium oxide }				3.9 mg/kg	1.142	3.876 mg/kg	0.000388 %	✓		
		048-002-00-0	215-146-2	1306-19-0								
3		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }				29 mg/kg	1.462	36.875 mg/kg	0.00369 %	✓		
			215-160-9	1308-38-9								
4		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				29 mg/kg	2.27	57.272 mg/kg	0.00573 %	✓		
		024-017-00-8										
5		copper { dicopper oxide; copper (I) oxide }				290 mg/kg	1.126	284.062 mg/kg	0.0284 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
6		lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	840 mg/kg		730.8 mg/kg	0.0731 %	✓		
		082-001-00-6										
7		mercury { mercury dichloride }				0.1 mg/kg	1.353	0.118 mg/kg	0.0000118 %	✓		
		080-010-00-X	231-299-8	7487-94-7								
8		nickel { nickel chromate }				68 mg/kg	2.976	176.076 mg/kg	0.0176 %	✓		
		028-035-00-7	238-766-5	14721-18-7								
9		selenium { nickel selenate }				1.4 mg/kg	2.554	3.111 mg/kg	0.000311 %	✓		
		028-031-00-5	239-125-2	15060-62-5								
10		zinc { zinc oxide }				2400 mg/kg	1.245	2598.963 mg/kg	0.26 %	✓		
		030-013-00-7	215-222-5	1314-13-2								
11		TPH (C6 to C40) petroleum group				10 mg/kg		8.7 mg/kg	0.00087 %	✓		
				TPH								
12		benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD	
		601-020-00-8	200-753-7	71-43-2								

#	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								
13	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
14	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
15	xylene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
16	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 }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
17	pH				7.9 pH		7.9 pH	7.9 pH			
			PH								
18	naphthalene				1.8 mg/kg		1.566 mg/kg	0.000157 %		✓	
	601-052-00-2	202-049-5	91-20-3								
19	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-917-1	208-96-8								
20	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-469-6	83-32-9								
21	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-695-5	86-73-7								
22	phenanthrene				0.53 mg/kg		0.461 mg/kg	0.0000461 %		✓	
		201-581-5	85-01-8								
23	anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		204-371-1	120-12-7								
24	fluoranthene				0.8 mg/kg		0.696 mg/kg	0.0000696 %		✓	
		205-912-4	206-44-0								
25	pyrene				0.72 mg/kg		0.626 mg/kg	0.0000626 %		✓	
		204-927-3	129-00-0								
26	benzo[a]anthracene				0.5 mg/kg		0.435 mg/kg	0.0000435 %		✓	
	601-033-00-9	200-280-6	56-55-3								
27	chrysene				0.5 mg/kg		0.435 mg/kg	0.0000435 %		✓	
	601-048-00-0	205-923-4	218-01-9								
28	benzo[b]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
29	benzo[k]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
30	benzo[a]pyrene; benzo[def]chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
31	indeno[123-cd]pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-893-2	193-39-5								
32	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
33	benzo[ghi]perylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-883-8	191-24-2								
34	phenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
Total:									0.399 %		

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

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 Samples with detectable concentrations of TPH and BTEX are initially classed as Hazardous within the model on account of HP 3(i); 'Flammable liquid waste' defined as 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). The flammability risk of the materials can only be confirmed by means of flash point testing, which was not undertaken as part of the ground investigation. However, the hazardous property HP3(i) relates to liquid waste and the materials sampled were solid soils. In addition, sampling records and logs indicated that no free product, liquid hydrocarbons or any other visual or olfactory evidence of hydrocarbon contamination were observed during the sampling campaign across the site.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00087%)

Classification of sample: TP102


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

Sample details

Sample name:	LoW Code:
TP102	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.2 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
23%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 23% Wet Weight Moisture Correction applied (MC)

#		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								
1		arsenic { arsenic trioxide }			30	mg/kg	1.32	30.5	mg/kg	0.00305 %	✓	
		033-003-00-0	215-481-4	1327-53-3								
2		cadmium { cadmium oxide }			1.8	mg/kg	1.142	1.583	mg/kg	0.000158 %	✓	
		048-002-00-0	215-146-2	1306-19-0								
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }			22	mg/kg	1.462	24.759	mg/kg	0.00248 %	✓	
			215-160-9	1308-38-9								
4		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }			<0.5	mg/kg	2.27	<1.135	mg/kg	<0.000113 %		<LOD
			024-017-00-8									
5		copper { dicopper oxide; copper (I) oxide }			120	mg/kg	1.126	104.032	mg/kg	0.0104 %	✓	
			029-002-00-X	215-270-7 1317-39-1								
6		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }		1	260	mg/kg		200.2	mg/kg	0.02 %	✓	
			082-001-00-6									
7		mercury { mercury dichloride }			0.1	mg/kg	1.353	0.104	mg/kg	0.0000104 %	✓	
			080-010-00-X	231-299-8 7487-94-7								
8		nickel { nickel chromate }			64	mg/kg	2.976	146.67	mg/kg	0.0147 %	✓	
			028-035-00-7	238-766-5 14721-18-7								
9		selenium { nickel selenate }			0.95	mg/kg	2.554	1.868	mg/kg	0.000187 %	✓	
			028-031-00-5	239-125-2 15060-62-5								
10		zinc { zinc oxide }			750	mg/kg	1.245	718.822	mg/kg	0.0719 %	✓	
			030-013-00-7	215-222-5 1314-13-2								
11		TPH (C6 to C40) petroleum group			16	mg/kg		12.32	mg/kg	0.00123 %	✓	
				TPH								
12		benzene			<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
			601-020-00-8	200-753-7 71-43-2								
13		toluene			<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
			601-021-00-3	203-625-9 108-88-3								
14		ethylbenzene			<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
			601-023-00-4	202-849-4 100-41-4								

#	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								
15	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
16	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				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
17	 pH PH				7.7 pH		7.7 pH	7.7 pH			
18	naphthalene 601-052-00-2	202-049-5	91-20-3		1.7 mg/kg		1.309 mg/kg	0.000131 %		✓	
19	 acenaphthylene 205-917-1	208-96-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
20	 acenaphthene 201-469-6	83-32-9			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
21	 fluorene 201-695-5	86-73-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
22	 phenanthrene 201-581-5	85-01-8			0.9 mg/kg		0.693 mg/kg	0.0000693 %		✓	
23	 anthracene 204-371-1	120-12-7			0.25 mg/kg		0.193 mg/kg	0.0000193 %		✓	
24	 fluoranthene 205-912-4	206-44-0			0.89 mg/kg		0.685 mg/kg	0.0000685 %		✓	
25	 pyrene 204-927-3	129-00-0			0.67 mg/kg		0.516 mg/kg	0.0000516 %		✓	
26	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.5 mg/kg		0.385 mg/kg	0.0000385 %		✓	
27	chrysene 601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
28	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
29	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
30	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
31	 indeno[123-cd]pyrene 205-893-2	193-39-5			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
32	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
33	 benzo[ghi]perylene 205-883-8	191-24-2			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
34	phenol 604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
35	 polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.12 mg/kg		<0.12 mg/kg	<0.000012 %			<LOD
Total:									0.125 %		

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

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 Samples with detectable concentrations of TPH and BTEX are initially classed as Hazardous within the model on account of HP 3(i); 'Flammable liquid waste' defined as 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). The flammability risk of the materials can only be confirmed by means of flash point testing, which was not undertaken as part of the ground investigation. However, the hazardous property HP3(i) relates to liquid waste and the materials sampled were solid soils. In addition, sampling records and logs indicated that no free product, liquid hydrocarbons or any other visual or olfactory evidence of hydrocarbon contamination were observed during the sampling campaign across the site.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00123%)

Classification of sample: TP102(A)


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

Sample details

Sample name:	LoW Code:
TP102(A)	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
11%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	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							
1	arsenic { arsenic trioxide }				11 mg/kg	1.32	12.926 mg/kg	0.00129 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.32 mg/kg	1.142	0.325 mg/kg	0.0000325 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14 mg/kg	1.462	18.211 mg/kg	0.00182 %	✓	
		215-160-9	1308-38-9							
4	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				14 mg/kg	2.27	28.284 mg/kg	0.00283 %	✓	
	024-017-00-8									
5	copper { dicopper oxide; copper (I) oxide }				30 mg/kg	1.126	30.061 mg/kg	0.00301 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	31 mg/kg		27.59 mg/kg	0.00276 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				35 mg/kg	2.976	92.711 mg/kg	0.00927 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { nickel selenate }				0.89 mg/kg	2.554	2.023 mg/kg	0.000202 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
10	zinc { zinc oxide }				120 mg/kg	1.245	132.935 mg/kg	0.0133 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
11	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
12	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
13	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
14	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							

#		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									
15		xylene				<0.001 mg/kg			<0.001 mg/kg		<0.0000001 %		<LOD
		601-022-00-9											
		202-422-2 [1]											
		203-396-5 [2]											
		203-576-3 [3]											
215-535-7 [4]													
1330-20-7 [4]													
16		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 }				<0.5 mg/kg		1.884	<0.942 mg/kg		<0.0000942 %		<LOD
		006-007-00-5											
17		pH				8.2 pH			8.2 pH		8.2 pH		
		PH											
18		naphthalene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		601-052-00-2											
19		acenaphthylene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		205-917-1											
20		acenaphthene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		201-469-6											
21		fluorene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		201-695-5											
22		phenanthrene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		201-581-5											
23		anthracene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		204-371-1											
24		fluoranthene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		205-912-4											
25		pyrene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		204-927-3											
26		benzo[a]anthracene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		601-033-00-9											
27		chrysene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		601-048-00-0											
28		benzo[b]fluoranthene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		601-034-00-4											
29		benzo[k]fluoranthene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		601-036-00-5											
30		benzo[a]pyrene; benzo[def]chrysene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		601-032-00-3											
31		indeno[123-cd]pyrene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		205-893-2											
32		dibenz[a,h]anthracene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		601-041-00-2											
33		benzo[ghi]perylene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		205-883-8											
34		phenol				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %		<LOD
		604-001-00-2											
Total:												0.0358 %	

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

Classification of sample: BH103


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

Sample details

Sample name:	LoW Code:
BH103	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1.7 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
15%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#	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							
1	arsenic { arsenic trioxide }				52 mg/kg	1.32	58.358 mg/kg	0.00584 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				290 mg/kg	1.142	281.584 mg/kg	0.0282 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				2000 mg/kg	1.462	2484.645 mg/kg	0.248 %	✓	
		215-160-9	1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }				380 mg/kg	1.126	363.662 mg/kg	0.0364 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
5	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	260 mg/kg		221 mg/kg	0.0221 %	✓	
	082-001-00-6									
6	mercury { mercury dichloride }				0.1 mg/kg	1.353	0.115 mg/kg	0.0000115 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
7	nickel { nickel chromate }				80 mg/kg	2.976	202.386 mg/kg	0.0202 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
8	selenium { nickel selenate }				3.2 mg/kg	2.554	6.946 mg/kg	0.000695 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
9	zinc { zinc oxide }				490 mg/kg	1.245	518.423 mg/kg	0.0518 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
10	TPH (C6 to C40) petroleum group		TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
11	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
12	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
13	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
14	xylene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							

#	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								
15	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 }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
16	pH				10.9 pH		10.9 pH	10.9 pH			
			PH								
17	naphthalene				0.48 mg/kg		0.408 mg/kg	0.0000408 %	✓		
	601-052-00-2	202-049-5	91-20-3								
18	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-917-1	208-96-8								
19	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-469-6	83-32-9								
20	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-695-5	86-73-7								
21	phenanthrene				0.41 mg/kg		0.349 mg/kg	0.0000349 %	✓		
		201-581-5	85-01-8								
22	anthracene				0.11 mg/kg		0.0935 mg/kg	0.00000935 %	✓		
		204-371-1	120-12-7								
23	fluoranthene				0.58 mg/kg		0.493 mg/kg	0.0000493 %	✓		
		205-912-4	206-44-0								
24	pyrene				0.84 mg/kg		0.714 mg/kg	0.0000714 %	✓		
		204-927-3	129-00-0								
25	benzo[a]anthracene				0.43 mg/kg		0.366 mg/kg	0.0000366 %	✓		
	601-033-00-9	200-280-6	56-55-3								
26	chrysene				0.7 mg/kg		0.595 mg/kg	0.0000595 %	✓		
	601-048-00-0	205-923-4	218-01-9								
27	benzo[b]fluoranthene				0.56 mg/kg		0.476 mg/kg	0.0000476 %	✓		
	601-034-00-4	205-911-9	205-99-2								
28	benzo[k]fluoranthene				0.18 mg/kg		0.153 mg/kg	0.0000153 %	✓		
	601-036-00-5	205-916-6	207-08-9								
29	benzo[a]pyrene; benzo[def]chrysene				0.29 mg/kg		0.247 mg/kg	0.0000246 %	✓		
	601-032-00-3	200-028-5	50-32-8								
30	indeno[123-cd]pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-893-2	193-39-5								
31	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
32	benzo[ghi]perylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-883-8	191-24-2								
33	phenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
Total:									0.415 %		

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

Classification of sample: TP101


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

Sample details

Sample name:	LoW Code:
TP101	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.5 m	
Moisture content:	
14%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 14% Wet Weight Moisture Correction applied (MC)

#		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							
1		arsenic { arsenic trioxide }				51 mg/kg	1.32	57.909 mg/kg	0.00579 %	✓	
		033-003-00-0	215-481-4	1327-53-3							
2		cadmium { cadmium oxide }				3.5 mg/kg	1.142	3.438 mg/kg	0.000344 %	✓	
		048-002-00-0	215-146-2	1306-19-0							
3		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }				290 mg/kg	1.462	364.512 mg/kg	0.0365 %	✓	
			215-160-9	1308-38-9							
4		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
		024-017-00-8									
5		copper { dicopper oxide; copper (I) oxide }				300 mg/kg	1.126	290.479 mg/kg	0.029 %	✓	
		029-002-00-X	215-270-7	1317-39-1							
6		 lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	420 mg/kg		361.2 mg/kg	0.0361 %	✓	
		082-001-00-6									
7		mercury { mercury dichloride }				0.1 mg/kg	1.353	0.116 mg/kg	0.0000116 %	✓	
		080-010-00-X	231-299-8	7487-94-7							
8		nickel { nickel chromate }				86 mg/kg	2.976	220.125 mg/kg	0.022 %	✓	
		028-035-00-7	238-766-5	14721-18-7							
9		selenium { nickel selenate }				2 mg/kg	2.554	4.393 mg/kg	0.000439 %	✓	
		028-031-00-5	239-125-2	15060-62-5							
10		zinc { zinc oxide }				640 mg/kg	1.245	685.091 mg/kg	0.0685 %	✓	
		030-013-00-7	215-222-5	1314-13-2							
11		TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
				TPH							
12		benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2							
13		toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3							
14		ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4							

#	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							
15	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
16	 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				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
17	 pH PH				10.8 pH		10.8 pH	10.8 pH		
18	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
19	 acenaphthylene 205-917-1	208-96-8			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
20	 acenaphthene 201-469-6	83-32-9			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
21	 fluorene 201-695-5	86-73-7			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
22	 phenanthrene 201-581-5	85-01-8			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
23	 anthracene 204-371-1	120-12-7			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
24	 fluoranthene 205-912-4	206-44-0			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
25	 pyrene 204-927-3	129-00-0			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
26	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
27	chrysene 601-048-00-0	205-923-4	218-01-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
28	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
29	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
30	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
31	 indeno[123-cd]pyrene 205-893-2	193-39-5			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
32	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
33	 benzo[ghi]perylene 205-883-8	191-24-2			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
34	phenol 604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
35	 polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.12 mg/kg		<0.12 mg/kg	<0.000012 %		<LOD
Total:								0.201 %		

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

Classification of sample: TP101(A)


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

Sample details

Sample name:	LoW Code:
TP101(A)	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.2 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
17%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

#		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								
1	 arsenic { arsenic trioxide }				40	mg/kg	1.32	43.835	mg/kg	0.00438 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	 cadmium { cadmium oxide }				2.3	mg/kg	1.142	2.181	mg/kg	0.000218 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
3	 chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				1100	mg/kg	1.462	1334.4	mg/kg	0.133 %	✓	
		215-160-9	1308-38-9									
4	 chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.5	mg/kg	2.27	<1.135	mg/kg	<0.000113 %		<LOD
	024-017-00-8											
5	 copper { dicopper oxide; copper (I) oxide }				160	mg/kg	1.126	149.518	mg/kg	0.015 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	 lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	250	mg/kg		207.5	mg/kg	0.0208 %	✓	
	082-001-00-6											
7	 mercury { mercury dichloride }				0.11	mg/kg	1.353	0.124	mg/kg	0.0000124 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
8	 nickel { nickel chromate }				61	mg/kg	2.976	150.688	mg/kg	0.0151 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
9	 selenium { nickel selenate }				2.1	mg/kg	2.554	4.451	mg/kg	0.000445 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
10	 zinc { zinc oxide }				410	mg/kg	1.245	423.576	mg/kg	0.0424 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
11	 TPH (C6 to C40) petroleum group				130	mg/kg		107.9	mg/kg	0.0108 %	✓	
			TPH									
12	benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
13	toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									
14	 ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4									

#		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										
15		xylene				<0.001 mg/kg			<0.001 mg/kg		<0.0000001 %			<LOD
		601-022-00-9												
		202-422-2 [1]												
		203-396-5 [2]												
		203-576-3 [3]												
215-535-7 [4]														
1330-20-7 [4]														
16		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 }				<0.5 mg/kg		1.884	<0.942 mg/kg		<0.0000942 %			<LOD
		006-007-00-5												
17		pH				9.9 pH			9.9 pH		9.9 pH			
		PH												
18		naphthalene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		601-052-00-2												
202-049-5			91-20-3											
19		acenaphthylene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		205-917-1												
208-96-8														
20		acenaphthene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		201-469-6												
83-32-9														
21		fluorene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		201-695-5												
86-73-7														
22		phenanthrene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		201-581-5												
85-01-8														
23		anthracene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		204-371-1												
120-12-7														
24		fluoranthene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		205-912-4												
206-44-0														
25		pyrene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		204-927-3												
129-00-0														
26		benzo[a]anthracene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		601-033-00-9												
200-280-6			56-55-3											
27		chrysene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		601-048-00-0												
205-923-4			218-01-9											
28		benzo[b]fluoranthene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		601-034-00-4												
205-911-9			205-99-2											
29		benzo[k]fluoranthene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		601-036-00-5												
205-916-6			207-08-9											
30		benzo[a]pyrene; benzo[def]chrysene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		601-032-00-3												
200-028-5			50-32-8											
31		indeno[123-cd]pyrene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		205-893-2												
193-39-5														
32		dibenz[a,h]anthracene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		601-041-00-2												
200-181-8			53-70-3											
33		benzo[ghi]perylene				<0.5 mg/kg			<0.5 mg/kg		<0.00005 %			<LOD
		205-883-8												
191-24-2														
34		phenol				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %			<LOD
		604-001-00-2												
203-632-7			108-95-2											
Total:											0.243 %			

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

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 Samples with detectable concentrations of TPH and BTEX are initially classed as Hazardous within the model on account of HP 3(i); 'Flammable liquid waste' defined as 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). The flammability risk of the materials can only be confirmed by means of flash point testing, which was not undertaken as part of the ground investigation. However, the hazardous property HP3(i) relates to liquid waste and the materials sampled were solid soils. In addition, sampling records and logs indicated that no free product, liquid hydrocarbons or any other visual or olfactory evidence of hydrocarbon contamination were observed during the sampling campaign across the site.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0108%)

Classification of sample: BH103(A)


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

Sample details

Sample name:	LoW Code:
BH103(A)	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.5 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
24%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 24% Wet Weight Moisture Correction applied (MC)

#	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							
1	arsenic { arsenic trioxide }				8.7 mg/kg	1.32	8.73 mg/kg	0.000873 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.174 mg/kg	0.0000174 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12 mg/kg	1.462	13.329 mg/kg	0.00133 %	✓	
		215-160-9	1308-38-9							
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
	024-017-00-8									
5	copper { dicopper oxide; copper (I) oxide }				18 mg/kg	1.126	15.402 mg/kg	0.00154 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	16 mg/kg		12.16 mg/kg	0.00122 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				20 mg/kg	2.976	45.239 mg/kg	0.00452 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { nickel selenate }				0.58 mg/kg	2.554	1.126 mg/kg	0.000113 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
10	zinc { zinc oxide }				51 mg/kg	1.245	48.245 mg/kg	0.00482 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
11	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
12	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
13	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
14	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							

#	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								
15	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
16	 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				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
17	 pH		PH		8.7 pH		8.7 pH	8.7 pH			
18	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
19	 acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
20	 acenaphthene	201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
21	 fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
22	 phenanthrene	201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
23	 anthracene	204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
24	 fluoranthene	205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
25	 pyrene	204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
26	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
27	chrysene 601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
28	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
29	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
30	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
31	 indeno[123-cd]pyrene 205-893-2	193-39-5			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
32	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
33	 benzo[ghi]perylene 205-883-8	191-24-2			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
34	phenol 604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
Total:									0.0158 %		

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

Classification of sample: BH106


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

Sample details

Sample name:	LoW Code:
BH106	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
2.5 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
6.7%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 6.7% Wet Weight Moisture Correction applied (MC)

#	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							
1	arsenic { arsenic trioxide }				6.4 mg/kg	1.32	7.884 mg/kg	0.000788 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.18 mg/kg	1.142	0.192 mg/kg	0.0000192 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15 mg/kg	1.462	20.454 mg/kg	0.00205 %	✓	
		215-160-9	1308-38-9							
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				15 mg/kg	2.27	31.769 mg/kg	0.00318 %	✓	
	024-017-00-8									
5	copper { dicopper oxide; copper (I) oxide }				29 mg/kg	1.126	30.463 mg/kg	0.00305 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	35 mg/kg		32.655 mg/kg	0.00327 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				0.09 mg/kg	1.353	0.114 mg/kg	0.0000114 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				35 mg/kg	2.976	97.19 mg/kg	0.00972 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { nickel selenate }				0.98 mg/kg	2.554	2.335 mg/kg	0.000234 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
10	zinc { zinc oxide }				110 mg/kg	1.245	127.745 mg/kg	0.0128 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
11	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
12	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
13	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
14	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							

#	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								
15	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
16	 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				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
17	 pH PH				8.6 pH		8.6 pH	8.6 pH			
18	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
19	 acenaphthylene 205-917-1	208-96-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
20	 acenaphthene 201-469-6	83-32-9			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
21	 fluorene 201-695-5	86-73-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
22	 phenanthrene 201-581-5	85-01-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
23	 anthracene 204-371-1	120-12-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
24	 fluoranthene 205-912-4	206-44-0			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
25	 pyrene 204-927-3	129-00-0			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
26	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
27	chrysene 601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
28	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
29	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
30	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
31	 indeno[123-cd]pyrene 205-893-2	193-39-5			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
32	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
33	 benzo[ghi]perylene 205-883-8	191-24-2			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
34	phenol 604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
Total:									0.0363 %		

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

Classification of sample: BH106(A)


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

Sample details

Sample name:	LoW Code:
BH106(A)	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
5.8 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9.7%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 9.7% Wet Weight Moisture Correction applied (MC)

#	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							
1	arsenic { arsenic trioxide }				9.7 mg/kg	1.32	11.565 mg/kg	0.00116 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.206 mg/kg	0.0000206 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14 mg/kg	1.462	18.477 mg/kg	0.00185 %	✓	
		215-160-9	1308-38-9							
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
	024-017-00-8									
5	copper { dicopper oxide; copper (I) oxide }				22 mg/kg	1.126	22.367 mg/kg	0.00224 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	47 mg/kg		42.441 mg/kg	0.00424 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				0.06 mg/kg	1.353	0.0733 mg/kg	0.00000733 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				30 mg/kg	2.976	80.627 mg/kg	0.00806 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { nickel selenate }				0.84 mg/kg	2.554	1.937 mg/kg	0.000194 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
10	zinc { zinc oxide }				74 mg/kg	1.245	83.174 mg/kg	0.00832 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
11	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
12	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
13	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
14	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							

#	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								
15	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
16	 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				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
17	 pH		PH		8.4 pH		8.4 pH	8.4 pH			
18	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
19	 acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
20	 acenaphthene	201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
21	 fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
22	 phenanthrene	201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
23	 anthracene	204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
24	 fluoranthene	205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
25	 pyrene	204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
26	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
27	chrysene 601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
28	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
29	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
30	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
31	 indeno[123-cd]pyrene 205-893-2	193-39-5			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
32	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
33	 benzo[ghi]perylene 205-883-8	191-24-2			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
34	phenol 604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
Total:									0.0275 %		

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

Classification of sample: TP104


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

Sample details

Sample name:	LoW Code:
TP104	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.2 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
21%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 21% Wet Weight Moisture Correction applied (MC)

#	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							
1	arsenic { arsenic trioxide }				38 mg/kg	1.32	39.636 mg/kg	0.00396 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				2.1 mg/kg	1.142	1.895 mg/kg	0.00019 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	18.474 mg/kg	0.00185 %	✓	
		215-160-9	1308-38-9							
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.5 mg/kg	2.27	<1.135 mg/kg	<0.000113 %		<LOD
	024-017-00-8									
5	copper { dicopper oxide; copper (I) oxide }				93 mg/kg	1.126	82.719 mg/kg	0.00827 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	120 mg/kg		94.8 mg/kg	0.00948 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				0.12 mg/kg	1.353	0.128 mg/kg	0.0000128 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				110 mg/kg	2.976	258.637 mg/kg	0.0259 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { nickel selenate }				1.9 mg/kg	2.554	3.833 mg/kg	0.000383 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
10	zinc { zinc oxide }				280 mg/kg	1.245	275.331 mg/kg	0.0275 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
11	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
12	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
13	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
14	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							

#	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								
15	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
16	 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				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
17	 pH PH				7.9 pH		7.9 pH	7.9 pH			
18	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
19	 acenaphthylene 205-917-1	208-96-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
20	 acenaphthene 201-469-6	83-32-9			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
21	 fluorene 201-695-5	86-73-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
22	 phenanthrene 201-581-5	85-01-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
23	 anthracene 204-371-1	120-12-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
24	 fluoranthene 205-912-4	206-44-0			0.3 mg/kg		0.237 mg/kg	0.0000237 %		✓	
25	 pyrene 204-927-3	129-00-0			0.26 mg/kg		0.205 mg/kg	0.0000205 %		✓	
26	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.22 mg/kg		0.174 mg/kg	0.0000174 %		✓	
27	chrysene 601-048-00-0	205-923-4	218-01-9		0.2 mg/kg		0.158 mg/kg	0.0000158 %		✓	
28	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
29	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
30	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
31	 indeno[123-cd]pyrene 205-893-2	193-39-5			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
32	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
33	 benzo[ghi]perylene 205-883-8	191-24-2			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
34	phenol 604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
Total:									0.079 %		

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

Classification of sample: TP104(A)


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

Sample details

Sample name:	LoW Code:
TP104(A)	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.5 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
19%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 19% Wet Weight Moisture Correction applied (MC)

#	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							
1	arsenic { arsenic trioxide }				34 mg/kg	1.32	36.362 mg/kg	0.00364 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.39 mg/kg	1.142	0.361 mg/kg	0.0000361 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14 mg/kg	1.462	16.574 mg/kg	0.00166 %	✓	
		215-160-9	1308-38-9							
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				14 mg/kg	2.27	25.742 mg/kg	0.00257 %	✓	
	024-017-00-8									
5	copper { dicopper oxide; copper (I) oxide }				31 mg/kg	1.126	28.271 mg/kg	0.00283 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	21 mg/kg		17.01 mg/kg	0.0017 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				28 mg/kg	2.976	67.502 mg/kg	0.00675 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { nickel selenate }				0.79 mg/kg	2.554	1.634 mg/kg	0.000163 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
10	zinc { zinc oxide }				80 mg/kg	1.245	80.657 mg/kg	0.00807 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
11	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
12	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
13	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
14	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							

#	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								
15	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
16	 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				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
17	 pH		PH		7.7 pH		7.7 pH	7.7 pH			
18	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
19	 acenaphthylene	205-917-1	208-96-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
20	 acenaphthene	201-469-6	83-32-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
21	 fluorene	201-695-5	86-73-7		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
22	 phenanthrene	201-581-5	85-01-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
23	 anthracene	204-371-1	120-12-7		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
24	 fluoranthene	205-912-4	206-44-0		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
25	 pyrene	204-927-3	129-00-0		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
26	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
27	chrysene 601-048-00-0	205-923-4	218-01-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
28	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
29	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
30	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
31	 indeno[123-cd]pyrene 205-893-2	193-39-5			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
32	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
33	 benzo[ghi]perylene 205-883-8	191-24-2			<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
34	phenol 604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
35	 polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.12 mg/kg		<0.12 mg/kg	<0.000012 %			<LOD
Total:									0.0293 %		

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

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

lead compounds with the exception of those specified elsewhere in this Annex (worst case)

GB MCL index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

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 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015**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

■ **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

■ **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

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.

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.

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.

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.

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. Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Based on the HazWasteOnline™ - Wiki, this is the most representative species given that the entry represents soils originating from an industrial site developed only as a wastewater treatment works. Other species in the Wiki are associated with specific chemical processes which do not fit with the site development.

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight.

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight.

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight.

zinc {zinc oxide}

Not enough Cr(VI) for chromate species to be present. Zinc oxide considered to be the worst case CLP species based on the HazWasteOnline™ Wiki page information.

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]

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

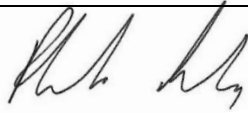
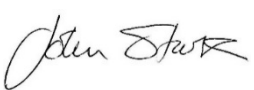
F.5 Factual Report

TREBANOS WASTEWATER TREATMENT WORKS, TREBANOS, SWANSEA

GROUND INVESTIGATION FACTUAL REPORT

Report No. Q1402/FR**January 2024****DOCUMENT CONTROL**

Contract Name: Trebanos WwTW
Contract Reference: Q1402
Report Type: Ground Investigation Factual Report
Report Reference: Q1402/FR
Date of Report Production: January 2024
Client: Morgan Sindall

Version:	Date:	Prepared by:	Checked by:	Approved by:
DRAFT	20/12/23	L. Simlett	P. Darby	J. Stark
				
FINAL	11/01/24	Senior Engineering Geologist B.Sc.(Hons). F.G.S.	Principal Engineering Geologist B.Sc.(Hons).,M.Sc., C.Geol., F.G.S.	Technical Manager B.Sc.(Hons).,M.Sc., C.Geol., F.G.S.
<i>Disclaimer: Quantum Geotechnic Limited has prepared this report in accordance with the instructions of the above-named Client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.</i> Quantum Geotechnic Ltd, Plas Newydd, Llanedi, Swansea, SA4 0FQ. T: 01554 744880 E: enquiries@spencerquantum.co.uk Website: http://www.spencerquantum.co.uk/				

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0.0 FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

0.1 General

Recommendations made and opinions expressed in the report are based on the strata observed in the excavations, together with the results of site and laboratory tests. No responsibility can be held for conditions which have not been revealed by the Exploratory Holes or which occur between Exploratory Holes. Whilst the report may suggest the likely configuration of strata, both between Exploratory Holes and below the maximum depth of investigation, this is only indicative, and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

0.2 Investigation Procedures

Rotary Percussive (dynamic sampled / rotary cored) Boreholes and Machine excavated pitting techniques for ground investigation have been employed within the project. All Exploratory Hole operations, sampling and logging of soils, rocks and in-situ testing complies with the recommendations of the British Code of Practice BS 5930: 2015 'Site Investigations', British Code of Practice BS 10175: A2:2017 'Investigation of Potentially Contaminated Sites' and BS 1377: 1990, 'Methods of Test for Soils for Engineering Purposes'.

0.3 Routine Sampling

Representative bulk disturbed and environmental samples of the different strata are taken following completion of logging. These samples are sealed and labelled in clear plastic bags and 2kg plastic tubs. Soil samples obtained for environmental testing are sampled and sealed in borosilicate amber jars or in specialist vessels where required. Ground Water samples were sampled and sealed in borosilicate amber bottles or in specialist vessels where required. All samples are returned from site to QGL's laboratory for controlled storage within 24 hours of sampling to await test scheduling/requirements.

0.4 In-Situ Testing, Surveying & Instrumentation

In-situ testing comprised:

- Standard Penetration Testing within Boreholes (SPT)
- All exploratory hole locations to be surveyed for location and elevation.
- TRL DCP

0.5 Groundwater

Where possible, the depth of entry of any influx of groundwater is recorded during the course of excavation or boring operations. The rate of inflow into the excavation or borehole is monitored during the course of the excavation or during boring procedures. Upon encountering any water strikes, work is temporarily halted, and the water levels monitored for a standard twenty-minute period recording the change in water level at the end of the twenty minutes.

Groundwater conditions observed in the excavations are those appertaining to the period of investigation. It should be noted, however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions or other causes.

0.6 Retention of Samples

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded. Further to notifying the Engineer/ Client with one week's notice all soil and/or rock samples not tested will be discarded 28 days after submission of the approved final report.

INTRODUCTION

1.1 General

Upon the instructions of Morgan Sindall, the Client, on behalf of Welsh Water, Quantum Geotechnic Limited (QGL) was commissioned to undertake a ground investigation for the construction of the proposed new water treatment works across the site. The specification for the investigation was prepared by ARUP and acted as Investigation Supervisor / Designer.

The siteworks were carried out between 30th October and 8th November 2023.

Other available sources of information that have been consulted in the preparation of this Factual Report include the published geological maps for the area and online databases.

General notes on the techniques employed by QGL are described in the Foreword together with the limitations inherent in carrying out site investigation work.

1.2 Purpose of Ground Investigation

The purpose of the ground investigation is to provide geotechnical information to support the design of the proposed re-development of the treatment works that will include the construction of the below items/ structures:

- FE water tank (~12.5m²)
- 935m² of access track PFET filter (20m×30m)
- Above ground store tank (1,500m³, 25m×25m×2.5m)
- MCC and access platform (25m×7.5m×1m)
- KG DS/d thickener (1,500kg, 50m²)
- Weir flow split chamber (8m², 1.5-2m deep)
- Transformer (8m²)
- Concrete containment bund including drainage, kerbs, bollards, and lighting (7.5m×20m)
- Sludge holding tank (~18.8m², 5.2m high)
- Two FST's (~39m² each)
- FST lift pumping station (7.8m², 5m deep)
- Diffused air aeration system (built on existing structure footprint)
- Air blowers

1.3 Scope of Work

The initial scope of works finalised by the Investigation Supervisor / Designer comprised the following:

- 5 No. Dynamic Sampled / Rotary Cored Boreholes
- 5 No. Machine Excavated Trial Pits
- 2 No. TRL-DCPs
- In-Situ Testing

- Post fieldwork ground gas / water monitoring

General

- Geotechnical and Geo-environmental Laboratory Testing.
- Provide a factual report detailing the investigation.

2.0 SITE DETAIL

2.1 Site Description

The Trebanos Wastewater Treatment Works (WwTW) site is located within the flood plain of the west bank of the River Tawe, to the east of the village of Trebanos. The site is situated along the northern bank of a meander to the river, which flows in a NE-SW direction through Trebanos. Swansea canal bounds the north of the site, creating a parcel of land between the Tawe River and the canal in which the site is situated.

The site itself relatively flat and is situated on the valley floor, with the hills of the Swansea valley located to the northwest and southeast of the site. The elevation of the land outside the site rapidly increases in both of these directions. Topographical mapping shows the site's elevation to be at around 24mOD. The part of the site that is currently being used as a WwTW appears to typically be raised by around 1m to 1.5m above the natural floor to the valley and contains five large tanks and a number of smaller structures. The rest of the site appears to be used as farmland for livestock. Two small, wooded areas are located along the western bank of the River Tawe and cover part of the site. The wooded areas are present to the immediate north and south of the part of the site that is currently being used as a WwTW. Beyond the River Tawe and Swansea Canal, agricultural land surrounds the site in every direction with the exception of the northwest, where residential buildings within the village of Trebanos are located. The buildings run approximately parallel to the River Tawe. The general extent of the site is marked as shown in Figure 1 below.



Figure 1: Approximate Site Study Area (©Ordnance Survey)

2.2 Statutory Service Information

All service information was held by the client with the relevant plans and information made available to QGL prior to commencement of the intrusive works.

A permit to excavate was issued by QGL for all exploratory holes. Standard QGL procedures for breaking ground were followed and all areas were scanned using a cable avoidance tool. A hand dug trial pit was excavated to 1.2m prior to commencement of drilling where services may be at risk. All hand excavation was undertaken using insulated digging tools.

2.3 Published Geology

Details of the geology of the site are provided by British Geological Survey (BGS) Sheet 230 (Ammanford) 1:50,000 and Glamorgan VIII SE (Bedrock and Superficial edition) at 1:10,560 scale, and BGS's online tool Geology of Britain Viewer.

Superficial deposits comprise both Alluvium and Glaciofluvial Deposits mapped across the majority of the site whilst there are areas of the site. Alluvium has a lithological description of clay, silt, sand and gravel deposited by running water in a stream bed, on a floodplain, in an alluvial fan or beach, or in similar settings. Glaciofluvial deposits were deposited by meltwater streams. Includes mostly coarse-grained sediments (i.e. sand and gravel) with some finer-grained layers (i.e. clay and silt). Sand and gravel, locally with lenses of silt, clay or organic material.

Solid geology beneath the site is the Hughes Member (Pennant Series). The general lithological description is green-grey, lithic arenites ('Pennant sandstones'), with thin mudstone/siltstone and seatearth interbeds, and mainly thin coals. The bedrock in the area typically dips to the south at an angle between 5° and 10°.

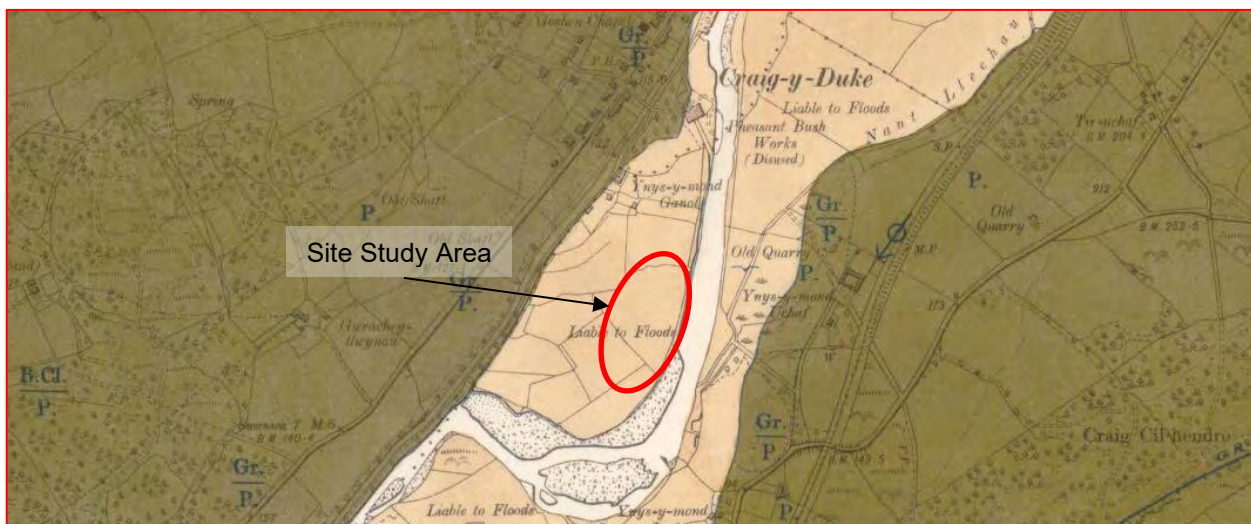


Figure 2: Glamorgan SE VIII 'Solid & Drift' (©BritishGeologicalSurvey)

3.0 FIELDWORK

3.1 General

A summary of the works completed and covered by this report are given below:

- 5 No. Dynamic Sampled / Rotary Cored Boreholes
- 5 No. Machine Excavated Trial Pits
- 2 No. TRL-DCPs
- In-situ testing and sampling
- Post fieldwork groundwater and ground gas monitoring

Full time site supervision and attendance from QGL was undertaken on all aspects of the site works and subsequent reinstatement works of all exploratory hole locations.

The borehole locations were subject to a 1.2m deep service / utility inspection pit prior to any drilling. Also, each area of investigation was fully eCAT4+ ('Cable Avoidance Tool') scanned prior to breaking ground.

3.2 Exploratory Hole Locations

The exploratory hole locations were specified by the Investigation Supervisor / Designer and set out on site by QGL in liaison with the Client.

An Exploratory Hole Location Plan is presented as Figure 2 in Appendix I and the Exploratory Hole co-ordinates and levels are detailed within Table 1.

Table 1: Exploratory Hole Co-Ordinates & Levels

Exploratory Hole	Easting	Northing	Height (mAOD)	Exploratory Hole	Easting	Northing	Height (mAOD)
BH101	271107.13	202202.15	23.95	TP101	271129.39	202233.07	18.19
BH102	271144.38	202230.60	23.89	TP102	271114.53	202325.55	23.11
BH103	271134.91	202269.62	22.84	TP103	271181.54	202275.07	24.28
BH105	271156.06	202272.31	23.72	TP104	271203.49	202303.12	23.97
BH106	271113.70	202321.64	23.18	TP105	271136.81	202287.88	22.98

3.3 Boreholes

Dynamic Sampling / Rotary Cored Boreholes

One Comacchio MC450P was used to progress the five boreholes across the site study area.

Each Borehole was drilled using dynamic sampling methods through the superficial deposits with an ODEX casing system. Dynamic Sampling is a technique whereby a hydraulically driven percussive hammer attached to the head of the drill rig mast is used to drive a 1.00m length, 116mm diameter, steel sampling tube through the soils to obtain undisturbed samples within 101mm core liner.

On encountering an obstruction or refusal of the Dynamic sample barrel, all boreholes were continued and kept open using an ODEX casing system of 140mm diameter. A combined air/mist flush was used to clear the hole of returns and debris.

In-situ testing was carried out in all vertical boreholes (see section 3.6).

Rock coring methods utilising the T6-116 size core bit (core diameter 92mm) used with a water flush medium to specified depths. Rigid plastic liner (coreliner) was employed where possible to reduce disturbance of the core both during drilling and subsequent handling, giving a triple lined approach to coring.

Bedrock was not observed during the intrusive investigation therefore, no coring practices were employed.

The recovered rock sample liners were split and logged in accordance with BS5930: (2015)+A1 2020; BS EN ISO 14688-1:2002; BS EN ISO 14688-2:2005 and BS EN ISO 14689-1:2003, including fracture spacing, by a QGL Engineering Geologist. All retrieved core is stored in wooden lockable boxes and was logged and photographed on site prior to being transported back to QGL premises for storage.

Selected rock cores were sub-sampled for laboratory testing by QGL onsite prior to core boxes being transported. All sub-sampled rock core specimens were labelled, sealed and wrapped in bubble pack ready for shipment to the dedicated laboratory testing houses. A complete set of Engineering Geologist's logs for the Boreholes are presented in Appendix II.

Details of the exploratory holes, including final depths in metres below ground level (mbgl) and SPT Hammer used are provided below in Table 2.

Table 2: Borehole details

Exploratory Hole ID	SPT Hammer Reference	Termination Depth (mbgl)	Notes/Reason for Termination
BH101	Q1 (72.56%)	19.50	Engineers (Arup) Instruction
BH102	Q1 (72.56%)	13.00	Engineers (Arup) Instruction
BH103	Q1 (72.56%)	10.20	Engineers (Arup) Instruction
BH105	Q1 (72.56%)	10.20	Engineers (Arup) Instruction

Exploratory Hole ID	SPT Hammer Reference	Termination Depth (mbgl)	Notes/Reason for Termination
BH106	Q1 (72.56%)	14.70	Engineers (Arup) Instruction

The Engineering Geologist's borehole logs are presented within Appendix II.

3.4 Machine Excavated Trial Pits

5 No. trial pits and 1 No. trial trench were excavated using a 360degree 9 tonne excavator owned and operated by Morgan Sindall. The exploratory hole positions are shown on the exploratory hole location plan in Figure 2 in Appendix I.

This method of investigation allows direct sampling of the near surface deposits for identification purposes, locating of buried services, as well as assessment of any salient features and Made Ground or disturbed ground. The trial pits were logged in accordance with BS5930:2015+A1:2020; BS EN ISO 14688-1:2018 and BS EN ISO 14688-2:2018, and supervised at all times by an Engineering Geologist from QGL.

All trial pits were backfilled with compacted layers of arisings upon completion.

Geotechnical and Environmental samples were taken within the superficial deposits for laboratory testing purposes.

Details of the Trial pits including final depths in metres below ground level (mbgl) are provided in Table 3.

Table 3: Trial Pit Detail

Exploratory Hole ID	Final Depth (mbgl)	Reason for termination	Exploratory Hole ID	Final Depth (mbgl)	Reason for termination
TP101	1.10	Groundwater Ingress	TP104	1.60	Groundwater Ingress
TP102	1.40	Groundwater Ingress	TP105	1.20	Groundwater Ingress
TP103	1.90	Groundwater Ingress			

A complete set of Engineering Geologist's Trail Pit logs are presented within Appendix III.

3.5 Gas and Groundwater Monitoring

Five 50mm gas and groundwater standpipes were installed within each of the boreholes, with the exception of BH16 with the Engineer's instructions.

Table 4: Monitoring Installation Details

Exploratory Hole ID	Pipe ID	Installation Diameter	Installation Response Zone (mbgl)
BH101	A	50mm	0.60 – 2.00
BH102	A	50mm	1.50 – 3.00
BH103	A	50mm	0..50 – 2.00
BH104	A	50mm	5.00 – 7.50
BH105	A	50mm	3.00 – 5.00

Three monitoring sessions have been undertaken, as scheduled (28-11-23, 13-12-23 & 03-01-23). Water samples from each standpipe and surface sampling points were obtained during the post fieldwork monitoring. Water Quality parameters were also obtained on water samples with sufficient water volumes.

NB: Round(s) 1 and 3 indicated BH01 with insufficient samples volumes therefore, no water quality parameters were obtained.

Monitoring comprised groundwater and ground gas monitoring. Gas monitoring was undertaken using a GA2000 gas analyser to measure the following:

- Atmospheric pressure
- Flow rates (L/hr)
- Methane
- Carbon Dioxide
- Oxygen
- Carbon Monoxide
- Hydrogen Sulphide

The ground gas/water monitoring results are provided within Appendix IV.

3.6 In-Situ Testing

3.6.1 Standard Penetration Testing

Standard penetration tests (SPTs) were undertaken within all boreholes, at intervals detailed within the specification.

This is a dynamic test as described in BS EN ISO 22476-3:2005 + A1:2011. Within fine grained or cohesive soils, the test incorporates a small diameter tube (650mm length, 50mm external diameter and 35mm internal diameter) with a cutting shoe known as the 'split barrel sampler'. The sampler is forced into the soil

dynamically using blows from a 63.5kg hammer dropped through 760mm. The sampler is initially advanced 150mm into the soil with seating blows, then the number of blows required to advance the sampler each 75mm increment up to a depth of 300mm is recorded. This cumulative total number of blows over the 300mm test is referred to as the "N" value. For coarse gravels and bedrock, the split barrel is replaced by a 60° cone (SPT(C) - Standard Penetration Test (Cone)). SPT/SPT(C) results are detailed within the relevant borehole Logs. The SPT calibration certificates for the SPT hammer's used during this investigation are presented in Appendix II.

3.6.2 CBR Tests - TRL DCP Probes

The TRL (Transport Research Laboratory) Dynamic Cone Penetrometer (DCP) tests were undertaken at locations specified by the Scheme Engineer. The TRL DCP probe is used for rapid in-situ measurement of the structural properties of existing road pavement constructed with unbound materials. The unit incorporates an 8 kg weight with a drop of 575 mm, and a 20 mm diameter cone fitted to the end of the shaft, allowing measurements to be made down to a depth of approximately 900 mm. The tests were undertaken at a depth of 0.50mbgl within TP101 and TP103.

The TRL DCP Probe results are presented in Appendix V.

3.6.3 Variable Head Tests

Five Variable Head tests were attempted in accordance with BS EN ISO 22282-2 within boreholes diameters (140mm) of BH02, BH03, BH05, BH06 and BH07. However, due to the speed of the re-charge rate tests were unsuccessful.

During the monitoring phase variable head tests (rising head) were attempted within the 50mm standpipe installations. The testing involves lowering the water level within the standpipes, and recording the time it takes for the water to rise at set intervals. However, similarly to the borehole attempts the speed of re-charge rate resulted in unsuccessful attempts.

3.7 Soil Sampling

Disturbed samples of soil were taken in clear sealed plastic bags and white plastic tubs. Environmental samples were taken at various depths as noted on the relevant logs.

The environmental samples were dispatched to Chemtest, Coventry using a daily courier service for storage awaiting testing instructions from the Engineer. Environmental soil samples were taken in amber glass jars, vials and plastic tubs provided by the laboratory to suit the anticipated testing.

Geotechnical samples were returned from site to QGL's laboratory for controlled storage to await test scheduling/requirements. For specific details of laboratory testing see Section 4.0.

4.0 LABORATORY TESTING

4.1 General

The laboratory testing was scheduled by Arup and comprised a number of geotechnical classification and performance tests as well as chemical testing on selected soil samples and ground water samples recovered from the investigation.

4.2 Geotechnical Testing

Geotechnical classification and performance testing was undertaken at QGL's approved UKAS accredited laboratory at GSTL, Llanelli.

Geotechnical tests undertaken on selected soil samples are listed below. All the geotechnical soil testing work was carried out in accordance with the procedures stipulated in the various sections of BS 1377:1990 "Methods of test for soils for civil engineering purposes" and to UKAS accreditation where applicable and chemical testing carried out in accordance with BRE Special Digest 1:2005 "Concrete in aggressive ground".

Geotechnical soil testing undertaken:

- 3 No. Moisture content
- 3 No. Liquid limit, plastic limit and plasticity index
- 26 No. Particle size distribution by wet sieving
- 6 No. Particle size distribution: Sedimentation
- 18 No. Suite C
- 7 No. Direct Shear – set of 3 60 x 60mm shear box

Geotechnical Laboratory Test results are presented in Appendix VI.

4.3 Geo-Environmental Testing

Geo-Environmental chemical testing was undertaken at Eurofins Chemtest Ltd, Coventry. All testing was scheduled by ARUP. The following suites of testing were scheduled:

- 29 No. Suite E1
- 10 No. Suite E2a
- 19 No. Suite E3
- 13 No. Suite E4
- 6 No. Suite E5

- 7 No. Suite E6
- 11 No. Suite E9
- 9 No. Suite E16
- 7 No. Suite J1
- 7 No. Suite J2
- 6 No. Suite J3
- 13 No. Suite H
- 13 No. Suite I
- 13 No. WAC Preparation
- 21 No. Suite F1
- 19 No. Suite F2
- 19 No. Suite F3
- 7 No. Suite F5

Chemical Laboratory Test results are presented in Appendix VII.

5.0 REFERENCES

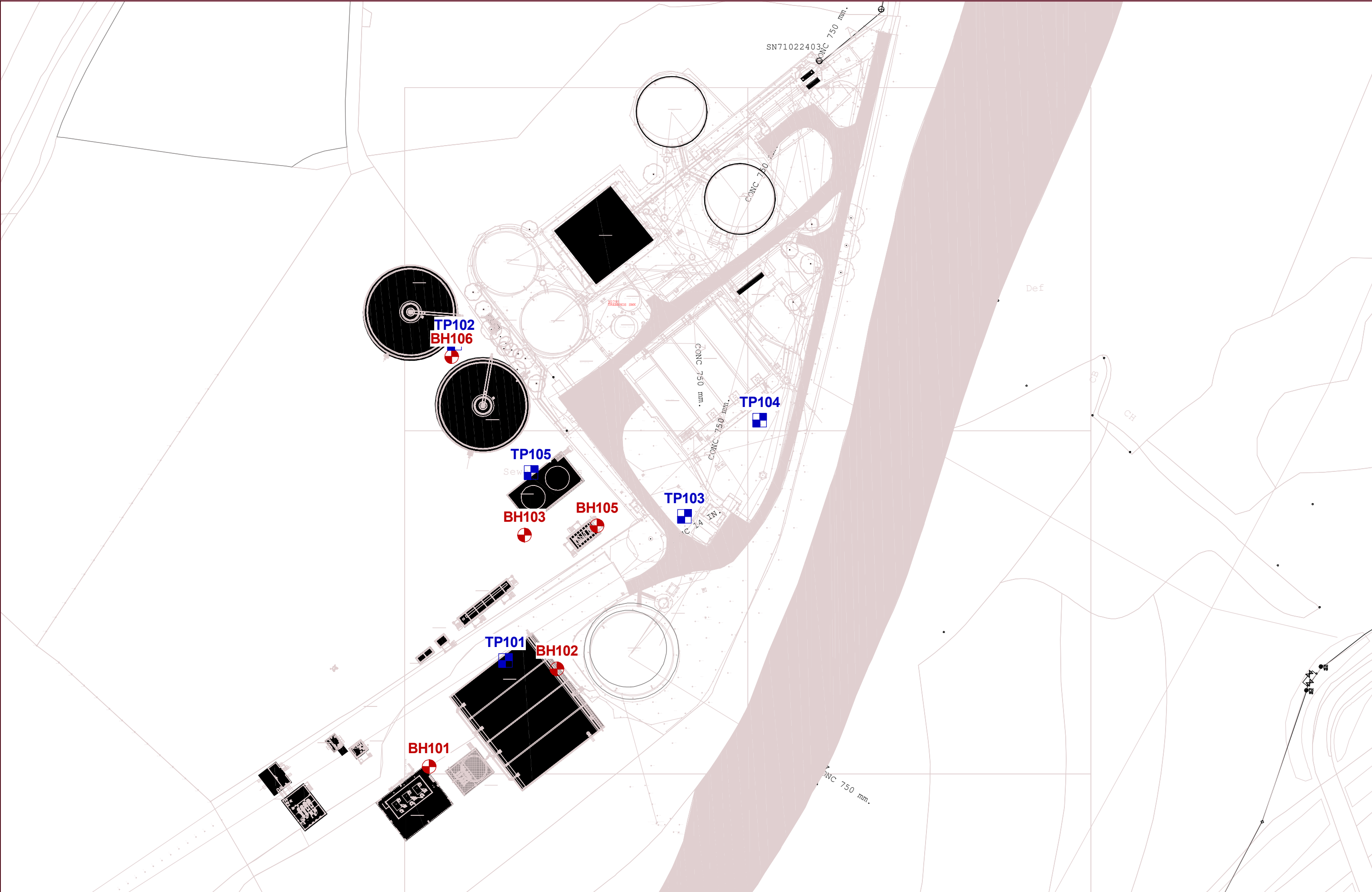
British Geological Survey (BGS)

- BGS Sheet Glamorgan VIII SE at 1:10,560 scale.
- BGS online maps and lexicon database – www.bgs.co.uk

British Standards / Eurocode

- British Code of Practice BS 5930:2015 '*Code of Practice for Site Investigations*'
- British Code of Practice BS 1377:1990 '*Methods of test for soils for civil engineering purposes*.'
- British Code of Practice BS EN ISO 14688-1:2002+A2:2013 '*Geotechnical investigation and testing – Identification and classification of soil – Part 1: Identification and description*'
- British Code of Practice BS EN ISO 14688-2:2004+A2:2013 '*Geotechnical investigation and testing – Identification and classification of soil – Part 2: Principles for a classification*'
- British Code of Practice BS EN ISO 22475-1:2006 '*Geotechnical investigation and testing – Sampling methods and groundwater measurements*'
- British Code of Practice BS EN ISO 22476-3:2005+A1:2011 '*Geotechnical investigation and testing – Field Testing – Part 3: Standard penetration test*'

APPENDIX I – SITE PLANS AND FIGURES



 Plas Newydd, Llanedi, Pontarddulais SA4 0FQ Tel: 01554 744880 Fax: Email:	KEY  Borehole  Trial Pit  Monitoring / Test Point  Window Sample  Dynamic Probe  Historical Hole  Sampling Point	PROJECT TREBANOS WWTW		DRAWING TITLE: EXPLORATORY HOLE LOCATION PLAN	JOB NO. Q1402	FIGURE NO. 1
					DATE 13/12/23	SCALE 1:1000

APPENDIX II – BOREHOLE LOGS

KEY TO BOREHOLE AND TRIAL PIT LOGS

m.A.O.D. metres Above Ordnance Datum.

SAMPLE AND TEST TYPES

U	Undisturbed driven tube sample - 102mm diameter, 450mm long.
P	Undisturbed pushed piston sample - 102mm diameter, 1000mm long.
TW	Undisturbed thin walled push in sample - 100mm diameter, 750mm long.
B	Bulk disturbed sample.
BLK	Block Sample
CBR	Heavy duty undisturbed sample - 154 mm diameter (CBR mould).
D	Small disturbed sample.
LB	Large Bulk disturbed sample (for earthworks testing)
C	Core sample
W	Water sample
G	Gas sample
ES	Environmental sample (soil)
j	Jar sample
t	Tub sample
p	Pot sample
s	Small sample
v	Vial sample
S	Standard Penetration Test using split spoon sampler. (See Note).
C	Standard Penetration Test using a solid 60 degree cone. (See Note).

NOTE: Where a single value is quoted this is the N value for 300 mm penetration following a seating drive of 150 mm. Where this full penetration is not achieved the number of blows is quoted for the penetration below the seating drive eg. 63/160 mm.

Where total penetration is less than the seating drive this is indicated by a + and the number of blows for total penetration is quoted eg. +50/75 mm.

HV	Hand Vane Test. Vane undrained shear strength, c_u , quoted in kPa.
V	Borehole Vane Test. Vane undrained shear strength, c_u , quoted in kPa.
FHT/RHT	Falling / Rising Head Permeability Test.

CORE RUN DETAILS

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
FI	Fracture Index. NI - Non intact where > 25 No. per metre length.

WATER COLUMN SYMBOLS

	First water strike, second water strike etc.
	Standing water level after first strike, second strike etc.
	Seepage.

NOTE:
Legend symbols in accordance with BS 5930 (2015)

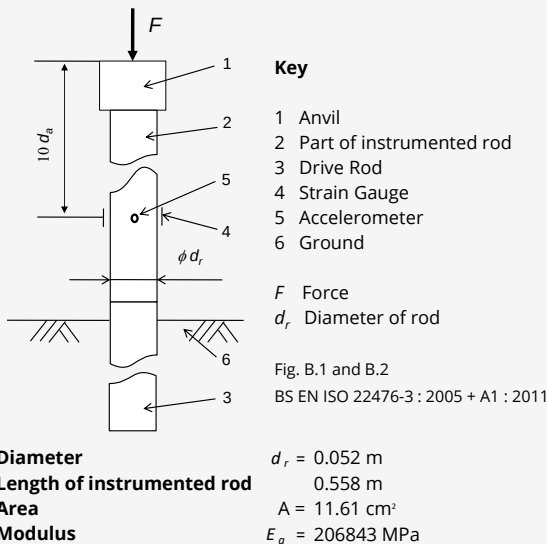
SPT Calibration Report

Hammer Energy Measurement Report

Type of Hammer SPT HAMMER
Test No EQU2023_113
Client QUANTUM GEOTECH

Test Depth (m) 11.70
Mass of hammer $m = 63.5\text{kg}$
Falling height $h = 0.76\text{m}$
 $E_{\text{theor}} = m \times g \times h = 473\text{J}$

Characteristics of the instrumented rod

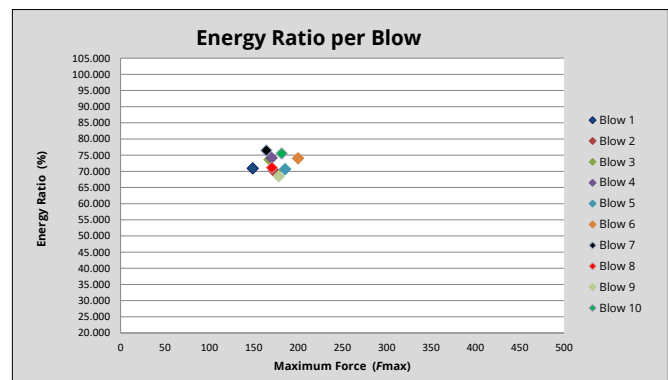
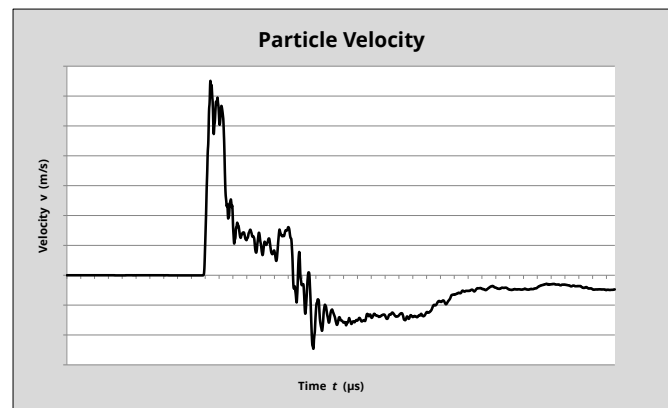
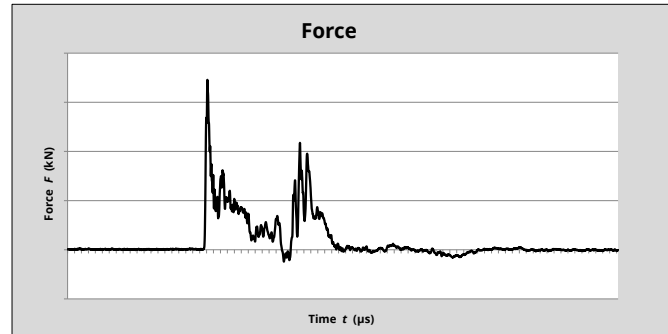
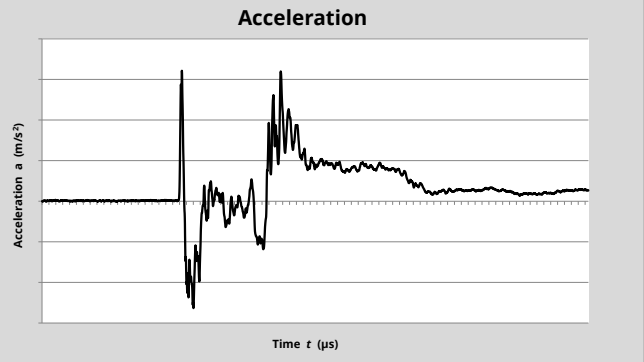


DATE OF TEST	VALID UNTIL	HAMMER ID
16/06/2023	15/06/2024	Q1

$E_{\text{meas}} = 0.343\text{ kN-m}$

$E_{\text{theor}} = 0.473\text{ kN-m}$

Comments



$$\text{Energy Ratio (Er)} = \frac{E_{\text{meas}}}{E_{\text{theor}}}$$

72.56%
© COPYRIGHT 2023

Equipe SPT Analyzer Operator

JL

Certificate prepared by

Equipe

Certificate checked by

Equipe

Certificate date

19/06/2023

Contract : Trebanos WwTW Client : Morgan Sindall												Borehole No. BH101	
Date : 3/11/23 Location : WwTW						Job Number : Q1402 Engineer : Arup				Ground Level : 23.95 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271107.13 E 202202.15 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
0									0.00 - 0.20	ES1	(0.15)	CONCRETE HARDSTANDING (MADE GROUND).		(0.15)		
									0.20	B1 D1	0.15			23.80		
									0.50	B2 D2	(0.45)	MADE GROUND: Greyish brown sandy silty fine to coarse subrounded to angular GRAVEL of concrete, limestone and brick. Sand is medium to coarse		(0.45)		
									0.50 - 0.70	ES2	0.60			23.35		
1									1.00	B3 D3	(0.60)			(0.60)		
									1.00 - 1.20	ES3	1.20	[RE-WORKED GROUND] MADE GROUND: Brown sandy very silty fine to coarse subrounded to angular GRAVEL of brick concrete and slag. Sand is medium to coarse [RE-WORKED GROUND]		22.75		
2											(1.50)	No Recovery - Drillers Description: Sand & Gravel		(1.50)		
									2.70	SPT (C) 46 (1-3-7-8-10-21)	2.70					
									2.70 - 4.20	B4 D4	2.70	Brown very sandy fine to coarse GRAVEL of mustone, sandstone and quartz. Sand is medium [ALLUVIUM]		21.25		
3									2.80 - 3.00	ES4	(1.50)			(1.50)		
4																
									4.20	SPT (C) 31 (2-4-7-8-8-8)	4.20					
									4.20 - 5.70	B5 D5	4.20	Brown red and grey medium to coarse sub-rounded to sub-angular mudstone sandstone quartz GRAVEL [ALLUVIUM]		19.75		
5											(1.50)			(1.50)		
									5.70	SPT (C) 29 (4-7-4-9-9-7)	5.70	No Recovery - Drillers Description: Sand & Gravel		18.25		
6											(1.50)			(1.50)		

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns

Remarks: MC450 Groundwater encountered at 1.7m.

	Plas Newydd, Llanedi, Pontarddulais SA4 0FQ Tel: 01554 744880 Fax: email:	Operator: RM & MW	Logged By: B. Thomas	Sheet No. 1 Of 3	m Per Page 7	All measurements in metres unless otherwise stated	
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Contract : Trebanos WwTW Client : Morgan Sindall												Borehole No. BH101	
Date : 3/11/23 Location : WwTW						Job Number : Q1402 Engineer : Arup				Ground Level : 23.95 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271107.13 E 202202.15 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill	
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.			
7							7.2	SPT (C) 24 (7-4-7-6-4-7)	7.20 - 8.70 7.20	B6 D6	7.20	Medium dense dark greyish brown slightly gravelly medium SAND. Gravel is fine to medium, subangular to subrounded of mudstone and sandstone. [ALLUVIUM]		16.75			
8											(1.50)		(1.50)				
9							8.7	SPT (C) 17 (2-3-4-5-4-4)	8.70 - 9.00 8.70	B7 D7	8.70 (0.30)	Medium dense brown medium SAND. [ALLUVIUM]		15.25 (0.30)			
											9.00 - 10.20 9.00	B8 D9	9.00	Medium dense brown sandy fine to medium subrounded to subangular GRAVEL of mudstone, quartz and sandstone. [ALLUVIUM]			14.95 (1.20)
10							10.2	SPT (C) 38 (4-7-10-8-8-12)	10.20 - 13.65 10.20	B9 D9	10.20	Dense brown gravelly medium SAND. Gravel is subrounded to rounded, fine to medium of quartz, mudstone and sandstone. [ALLUVIUM]		13.75			
11											(1.85)		(1.85)				
12							11.7	SPT (C) 16 (1-3-4-4-4-4)									
											12.05	Medium dense brown and red very sandy fine to medium subrounded to rounded GRAVEL of mudstone, sandstone and quartz. Sand is coarse [ALLUVIUM]		11.90 (1.15)			
13							13.2	SPT (C) 20 (5-6-6-6-4-4)	13.65 - 14.70 13.65	B10 D10	13.20 (0.45)	Medium dense brown gravelly medium SAND. Gravel is subrounded to rounded, fine to medium of quartz, mudstone and sandstone (ALLUVIAL DEPOSITS).		10.75 (0.45)			
											13.65			10.30			

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns

Remarks: MC450

Plas Newydd, Llanedi, Pontarddulais
 SA4 0FQ
 Tel: 01554 744880
 Fax:
 email:

Operator:
 RM & MW

Logged By:
 B. Thomas

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m Per Page
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All measurements in metres unless otherwise stated

Contract : Trebanos WwTW Client : Morgan Sindall												Borehole No. BH101													
Date : 3/11/23 Location : WwTW						Job Number : Q1402 Engineer : Arup				Ground Level : 23.95 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271107.13 E 202202.15 N <i>Co-ordinates to National Grid</i>															
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill									
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.											
14											(1.05)	Medium Dense brown and red very sandy fine to medium subrounded to rounded GRAVEL of mudstone, sandstone and quartz. Sand is coarse [ALLUVIUM]		(1.05)											
											14.70	Medium dense brown gravelly medium SAND. Gravel is subrounded to rounded, fine to medium of quartz, mudstone and sandstone [ALLUVIUM]		9.25											
15																									
16																									
17																									
18																									
19																									
20																									
											19.50	Borehole Terminated at 19.50mbgl Upon Scheme Engineer Instruction - Issues with 'blowing sands' from 7.20 to 19.50mbgl		4.45											
Hole Progress / Water Obs				Casing				Groundwater				Flush													
Date / Time		H. Depth		C. Depth		Water		Depth		Diam.		Struck		Rose To		Behaviour		Sealed		Depth		Type		Returns	
Remarks: MC450																									
						Plas Newydd, Llanedi, Pontarddulais SA4 0FQ Tel: 01554 744880 Fax: email:						Operator: RM & MW		Logged By: B. Thomas		Sheet No. 3 Of 3		m Per Page 7		All measurements in metres unless otherwise stated					

Contract : Trebanos WwTW Client : Morgan Sindall			Borehole No. BH101
Date : 3/11/23 Location : WwTW	Job Number : Q1402 Engineer : Arup	Ground Level : 23.95 m A.O.D. <i>Level to Ordnance Datum</i>	Coordinates: 271107.13 E 202202.15 N <i>Co-ordinates to National Grid</i>
		Coordinates: 271107.13 E 202202.15 N <i>Co-ordinates to National Grid</i>	



Contract : Trebanos WwTW

Client : Morgan Sindall

Borehole No.

BH101

Date : 3/11/23

Job Number : Q1402

Ground Level : 23.95 m A.O.D.
Level to Ordnance Datum

Location : WwTW

Engineer : Arup

Coordinates: 271107.13 E
202202.15 N
Co-ordinates to National Grid



Contract : Trebanos WwTW Client : Morgan Sindall												Borehole No. BH102	
Dates : 30/10/23 - 31/10/23 Location : WwTW						Job Number : Q1402 Engineer : Arup				Ground Level : 23.89 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271144.38 E 20230.38 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill		
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.				
0	1.20	100	0	0			1.2	SPT (C) 50/90mm (25/69mm-35-15/15mm-)	0.00 - 0.20	B1	(1.40)	MADE GROUND: Grass over grey slightly silty sandy fine to coarse sub-angular to well-rounded mudstone siltstone sandstone brick slag GRAVEL with high sub-rounded siltstone sandstone slag cobble content. Sand is fine to coarse. [RE-WORKED GROUND]		(1.40)				
0.20									D1 ES1									
0.50 - 0.70									B2 D2 ES2									
0.50																		
1.00 - 1.20									B3 D3 ES3 D4									
1	2.50						2.5	SPT (C) 10 (1-1-2-2-3-3)	1.20 - 1.40		1.40	Description Derived from Pot Sample: Grey brown sandy fine to coarse angular to well-rounded mudstone siltstone sandstone GRAVEL [ALLUVIUM] Additional Description: - Dynamic Sample Refused 1.20 - 1.40mbgl (Openhole) 1.40 - 2.50mbgl (Pot Sample)		22.49				
1.40 - 2.50									D5									
2	4.00	43	0	0			4	SPT (C) 15 (11-1-4-4-3-4) Vane - P=21 - R=8kN/m2	3.35 - 4.00	B4	(0.65)	Medium dense grey brown slightly silty gravelly fine to coarse SAND. Gravel is fine to coarse sub-angular to well-rounded mudstone siltstone sandstone. [ALLUVIUM]		20.54				
3									4.10 - 4.25	D6	(0.25)	Additional Description: Fining Up Sequence between 3.35 - 4.00mbgl 4.00-4.10m: Additional Description: Wood (Organics) between 4.00 - 4.10mbgl (Alluvial Debris) Very Soft dark grey slightly silty slightly sandy CLAY. Sand is fine to medium.		19.89				
4									33	0						0	4.25 - 4.50	B5

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
30/10/2023 08:00	0.00	0.00	0.00			2.20	1.10	Medium Groundwater Ingress		0.00 - 13.00	Air Mist	100

Remarks: MC450

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		RM & MW	L. Simlett	1 Of 3	5		

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Contract : Trebanos WwTW Client : Morgan Sindall												Borehole No. BH102	
Dates : 30/10/23 - 31/10/23 Location : WwTW				Job Number : Q1402 Engineer : Arup				Ground Level : 23.89 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271144.38 E 20230.38 N <i>Co-ordinates to National Grid</i>					

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
5	5.50	33	0	0			5.5	SPT (C) 48 (2-3-7-8-13-20)	5.50 - 5.90	B6	(1.00)	[ALLUVIUM] Medium dense grey slightly clayey slightly silty sandy fine to coarse angular to well-rounded mudstone siltstone sandstone GRAVEL with high sub-angular sandstone cobble content. [ALLUVIUM]		(1.00)		
5.50												18.39				
(0.40)												(0.40)				
5.90											Assumed Zone Core Loss [AZCL] - Drillers Description: SAND & GRAVEL		17.99			
6	27	0	0			7	SPT (C) 22 (3-4-5-4-4-9)	7.00 - 7.70	B7	(1.10)	Dense grey brown sandy fine to coarse sub-angular to well-rounded mudstone siltstone sandstone GRAVEL with high sub-rounded sandstone cobble content. [ALLUVIUM]		(1.10)			
7.00											16.89					
(0.70)										Medium dense grey brown sandy fine to coarse sub-angular to well-rounded mudstone siltstone sandstone GRAVEL with high sub-rounded sandstone cobble content. [ALLUVIUM]		(0.70)				
7.70										Assumed Zone Core Loss [AZCL] - Drillers Description: SAND, GRAVEL & COBBLES		16.19				
8	8.5	47	0	0			8.5	SPT (C) 15 (2-3-4-3-4-4)			(1.40)			(1.40)		
9																
9.10											Grey sandy fine to coarse sub-angular to well-rounded mudstone siltstone sandstone GRAVEL. Sand is fine to coarse. [ALLUVIUM]		14.79			
(0.50)												(0.50)				
											(0.40)	Medium dense brown slightly gravelly fine to coarse SAND. Gravel is fine to coarse sub-angular to sub-rounded		14.29		

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
30/10/2023 17:00	8.50	8.50	1.10									
31/10/2023 08:00	8.50	8.50	1.10									

Remarks: MC450

	Plas Newydd, Llanedi, Pontarddulais SA4 0FO Tel: 01554 744880 Fax: email:	Operator:	Logged By:	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		RM & MW	L. Simlett	2 Of 3	5		

Contract : Trebanos WwTW Client : Morgan Sindall												Borehole No. BH102					
Dates : 30/10/23 - 31/10/23 Location : WwTW						Job Number : Q1402 Engineer : Arup				Ground Level : 23.89 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271144.38 E 20230.38 N <i>Co-ordinates to National Grid</i>							
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill	
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.			
10							10	SPT (C) 15 (4-6-4-4-3)			10.00	mudstone siltstone sandstone. [ALLUVIUM] Assumed Zone Core Loss [AZCL] - Drillers Description: SAND, GRAVEL & COBBLES		13.89			
										(1.00)			(1.00)				
11										11.00	Medium dense grey brown sandy fine to coarse sub-angular to well-rounded mudstone siltstone sandstone GRAVEL. Sand is fine to coarse. [ALLUVIUM]		12.89				
										(0.50)			(0.50)				
							11.5	SPT (C) 26 (3-5-7-6-5-8)			11.50	Assumed Zone Core Loss [AZCL] - Drillers Description: SAND		12.39			
										(0.60)			(0.60)				
12										12.10	Brown very sandy fine to coarse sub-angular to well-rounded mudstone siltstone sandstone GRAVEL. Sand is fine to coarse. [ALLUVIUM]		11.79				
										(0.20)			(0.20)				
										12.30	Brown grey slightly gravelly fine to coarse SAND. Gravel is fine to coarse sub-angular mudstone siltstone sandstone. [ALLUVIUM]		11.59				
										(0.70)			(0.70)				
13										13.00	Borehole Terminated at 13.00mbgl Upon Scheme Engineer Instruction - - Issues with 'blowing sands' at 13.00mbgl		10.89				
14																	
Hole Progress / Water Obs				Casing		Groundwater				Flush							
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns					
31/10/2023 17:00	13.00	13.00	1.10	13.00	140.00												
Remarks: MC450																	
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Contract : Trebanos WwTW Client : Morgan Sindall		Borehole No. BH102
Dates : 30/10/23 - 31/10/23 Location : WwTW	Job Number : Q1402 Engineer : Arup	Ground Level : 23.89 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271144.38 E 20230.38 N <i>Co-ordinates to National Grid</i>



Contract : Trebanos WwTW Client : Morgan Sindall														Borehole No. BH103																																									
Dates : 2/11/23 - 3/11/23 Location : WwTW						Job Number : Q1402 Engineer : Arup				Ground Level : 22.85 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271134.91 E 202269.62 N <i>Co-ordinates to National Grid</i>																																													
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill																																							
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.																																									
0									0.20	B1	(0.25)	Brown sandy gravelly CLAY. Sand is medium. Gravel is fine to medium, subrounded to subangular of mudstone and sandstone. Occasional fine rootlets present. [TOPSOIL]		(0.25)																																									
											0.25			22.60																																									
								0.50	B2 D2 ES2	(0.35)				(0.35)																																									
1								1.00	B3			Soft greyish brown slightly gravelly sandy CLAY. Sand is medium. Gravel is subrounded to rounded of mudstone and sandstone. [ALLUVIUM]																																											
								1.20	D3 ES3 D4	(1.10)				(1.10)																																									
								1.70 - 2.20	B4					22.25																																									
2								1.70	ES4 D5		1.70	No Recovery. - Drillers Description: Sand & Gravel		21.15																																									
								2.20 - 2.80	B6		(0.50)	Medium dense brown very gravelly coarse SAND. Gravel is subrounded to rounded of mudstone, limestone and quartz [ALLUVIUM]		(0.50)																																									
								2.20	D6		2.20			20.65																																									
								2.7		(0.60)				(0.60)																																									
3											2.80	Medium dense brown and grey medium to coarse subrounded to angular GRAVEL of limestone, mudstone and quartz [ALLUVIUM]		20.05																																									
											(1.40)	No Recovery. - Drillers Description: Sand & Gravel		(1.40)																																									
4								4.20	B7		4.20	Medium dense brown and grey medium to coarse subrounded to angular GRAVEL of limestone, mudstone and quartz [ALLUVIUM]		18.65																																									
								5.55 - 5.70	D8					(1.35)																																									
								5.70 - 7.20	B9																																														
5																																																							
6								5.7	D9		5.70	Medium dense brown very gravelly coarse SAND. Gravel is medium to coarse subrounded to angular of limestone and mudstone. Small pocket of black organic material present [ALLUVIUM]		17.30																																									
											(0.15)	No Recovery. - Drillers Description: Sand & Gravel		(0.15)																																									
											(1.50)		17.15																																										
													(1.50)																																										
<table border="1"> <thead> <tr> <th colspan="4">Hole Progress / Water Obs</th> <th colspan="2">Casing</th> <th colspan="4">Groundwater</th> <th colspan="4">Flush</th> </tr> <tr> <th>Date / Time</th> <th>H. Depth</th> <th>C. Depth</th> <th>Water</th> <th>Depth</th> <th>Diam.</th> <th>Struck</th> <th>Rose To</th> <th>Behaviour</th> <th>Sealed</th> <th>Depth</th> <th>Type</th> <th>Returns</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0.50</td> <td>0.50</td> <td>Medium Groundwater Ingress</td> <td></td> <td>0.00 - 10.20</td> <td>Air Mist</td> <td>100</td> </tr> </tbody> </table>																Hole Progress / Water Obs				Casing		Groundwater				Flush				Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns							0.50	0.50	Medium Groundwater Ingress		0.00 - 10.20	Air Mist	100
Hole Progress / Water Obs				Casing		Groundwater				Flush																																													
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns																																											
						0.50	0.50	Medium Groundwater Ingress		0.00 - 10.20	Air Mist	100																																											
Remarks: MC450																																																							
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Contract : Trebanos WwTW Client : Morgan Sindall												Borehole No. BH103					
Dates : 2/11/23 - 3/11/23 Location : WwTW						Job Number : Q1402 Engineer : Arup				Ground Level : 22.85 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271134.91 E 202269.62 N <i>Co-ordinates to National Grid</i>							
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill	
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.			
7							7.2	SPT (C) 25 (3-4-4-5-8-8)	7.20 - 8.20 7.20	B10 D10	7.20	Medium dense brown gravelly medium to coarse SAND. Gravel is subrounded to subangular, fine to medium of sandstone, mudstone and quartz [ALLUVIUM]		15.65			
8											(1.00)		(1.00)				
9							8.7	SPT (C) 7 (1-0-1-2-2-2)	8.80 - 10.20 8.80	B11 D11	8.20	Loose reddish brown gravelly medium to coarse SAND. Gravel is subrounded to rounded, fine to medium of sandstone, mudstone and quartz. [ALLUVIUM]		14.65			
10											(2.00)		(2.00)				
11											10.20	Borehole Terminated at 10.20mbgl Upon Scheme Engineer Instruction - Specification Depth		12.65			
12																	
13																	
Hole Progress / Water Obs							Casing		Groundwater				Flush				
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour		Sealed	Depth	Type	Returns				
Remarks: MC450																	
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Contract : Trebanos WwTW Client : Morgan Sindall			Borehole No. BH103
Dates : 2/11/23 - 3/11/23 Location : WwTW	Job Number : Q1402	Ground Level : 22.85 m A.O.D. <i>Level to Ordnance Datum</i>	
	Engineer : Arup	Coordinates: 271134.91 E 202269.62 N <i>Co-ordinates to National Grid</i>	



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Contract : Trebanos WwTW Client : Morgan Sindall												Borehole No. BH105	
Dates : 1/11/23 - 2/11/23 Location : WwTW						Job Number : Q1402 Engineer : Arup				Ground Level : 23.72 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271156.06 E 2022772.31 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
0									0.20	ES1	(0.20)	MADE GROUND: Dark grey slightly clayey medium to coarse subangular to angular GRAVEL of limestone. [RE-WORKED GROUND]		(0.20)		
									0.50	B1 ES2	(0.60)			23.52		
									1.00	B2 ES3	(0.80)	MADE GROUND: Dark greyish brown sandy very gravelly CLAY. Sand is fine to medium. Gravel is fine to medium, angular to subrounded of limestone and mustone. [RE-WORKED GROUND]		22.92		
1									1.70	D1 B3 ES4	(0.70)			(0.70)		
									1.70 - 3.20		(1.50)			22.22		
									1.80		(0.20)	MADE GROUND: Dark greyish brown slightly gravelly very sandy SILT. Sand is fine. Gravel is fine to medium, angular to subangular of mudstone. [RE-WORKED GROUND]		(0.20)		
2											1.70			22.02		
											(1.90)	No Recovery. - Drillers Description: Sand & Gravel		(1.90)		
3									3.20	SPT (C) 26 (4-2-7-6-7-6)	3.20 - 4.70	D2	Medium dense brown very gravelly medium to coarse SAND. Gravel is fine to coarse, rounded to subrounded of sandstone and mudstone. [ALLUVIUM]		20.12	
											3.60					
4											(1.10)	No Recovery. - Drillers Description: Sand & Gravel		(1.10)		
									4.70	SPT (C) 6 (2-3-2-1-2-1)	4.70 - 6.20	D3 B4	Loose yellowish brown very sandy fine subrounded to rounded GRAVEL of mudstone and sandstone with occasional medium GRAVEL. Sand is medium to coarse. [ALLUVIUM]		19.02	
5											(1.50)			(1.50)		
6									6.20	SPT (C) 15 (4-7-6-2-3-4)	6.20 - 7.70	D4 B5	Medium dense dark greyish brown slightly clayey very gravelly medium SAND. Gravel is fine to medium, subrounded of sandstone and mudstone. [ALLUVIUM]		17.52	
											(1.00)			(1.00)		

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
						2.20	1.20	Medium to Fast Groundwater Ingress		0.00 - 10.20	Air Mist	100

Remarks: MC450

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Contract : Trebanos WwTW Client : Morgan Sindall												Borehole No. BH105	
Dates : 1/11/23 - 2/11/23 Location : WwTW				Job Number : Q1402 Engineer : Arup				Ground Level : 23.72 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271156.06 E 2022772.31 N <i>Co-ordinates to National Grid</i>					

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
7							7.7	SPT (C) 26 (4-7-9-9-4-4)	7.70 7.70 - 9.20	D5 B6	7.20 (0.50)	No Recovery. - Drillers Description: Sand & Gravel		16.52 (0.50)		
8											7.70 (0.40)	Medium dense brown very sandy fine to medium subrounded to rounded		16.02 (0.40)		
											8.10 (0.10)	GRAVEL of mudstone and sandstone. Sand is medium.		15.62 (0.10)		
											8.20 (1.00)	[ALLUVIUM] Medium Dense greyish brown slightly clayey very gravelly medium SAND. Gravel is fine to medium, subrounded of sandstone and mudstone.		15.52 (1.00)		
9							9.2	SPT (C) 12 (1-1-2-4-4-2)			9.20 (1.00)	No Recovery. - Drillers Description: Sand & Gravel		14.52 (1.00)		
10											10.20	Medium dense greyish brown slightly clayey very gravelly medium SAND. Gravel is fine to medium, subrounded of sandstone and mudstone.		13.52		
11												Borehole Terminated at 10.20mbgl Upon Scheme Engineer Instruction - Specification Depth				
12																
13																

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns

Remarks: MC450 .

	Plas Newydd, Llanedi, Pontarddulais SA4 0FQ Tel: 01554 744880 Fax: email:	Operator: RM & MW	Logged By: B. Thomas	Sheet No. 2 Of 2	m Per Page 7	All measurements in metres unless otherwise stated	
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Contract : Trebanos WwTW

Client : Morgan Sindall

Borehole No.

BH105

Dates : 1/11/23 - 2/11/23

Job Number : Q1402

Ground Level : 23.72 m A.O.D.
Level to Ordnance Datum

Location : WwTW

Engineer : Arup

Coordinates: 271156.06 E
2022772.31 N
Co-ordinates to National Grid



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Operator:
RM & MW

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B. Thomas

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1 Of 1

m Per
Page
2

All measurements in
metres unless
otherwise stated



Contract : Trebanos WwTW Client : Morgan Sindall												Borehole No. BH106	
Dates : 7/11/23 - 8/11/23 Location : WwTW				Job Number : Q1402 Engineer : Arup				Ground Level : 23.18 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271113.70 E 202321.64 N <i>Co-ordinates to National Grid</i>					

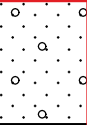
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
0											(0.30)	Brown sandy gravelly CLAY. Sand is medium. Gravel is subrounded to subangular of mudstone. [TOPSOIL]		(0.30)		
										(0.30)	Greyish brown very sandy gravelly SILT. Sand is medium. Gravel is fine to medium, subrounded to subangular of sandstone, mudstone and quartz. [ALLUVIUM]		22.88			
										(0.60)	Dense brown to brownish grey very gravelly medium SAND. Gravel is fine to medium, subrounded to subangular of mudstone and sandstone. [ALLUVIUM]		(0.60)			
1							SPT (C) 38 (5-7-8-8-10-12)	1.20 - 2.70 1.20	B3 D3	0.90			22.28			
										(1.80)			(1.80)			
2																
3							SPT (C) 29 (5-9-4-7-9-9)	2.70 - 4.20 2.70	B4 D4	2.70		Medium dense brown and red slightly sandy fine to coarse subrounded to angular GRAVEL with low cobble content. Sand is medium. Cobbles are subrounded of mudstone. [ALLUVIUM]		20.48		
4																
5																
6							SPT (C) 26 (4-4-6-6-7-7)	5.70 - 7.20 5.70 5.80	B6 D6 ES5	5.60 (0.10) 5.70		Soft greyish brown sandy SILT with high black organic content. [ALLUVIUM]		17.58 (0.10) 17.48		

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
						0.90	1.90	Medium Groundwater Ingress		0.00 - 14.70	Air Mist	100

Remarks: MC450.

	Plas Newydd, Llanedi, Pontarddulais SA4 0FQ Tel: 01554 744880 Fax: email:	Operator: RM & MW	Logged By: B. Thomas	Sheet No. 1 Of 3	m Per Page 7	All measurements in metres unless otherwise stated	
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Contract : Trebanos WwTW Client : Morgan Sindall												Borehole No. BH106						
Dates : 7/11/23 - 8/11/23 Location : WwTW						Job Number : Q1402 Engineer : Arup				Ground Level : 23.18 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271113.70 E 202321.64 N <i>Co-ordinates to National Grid</i>								
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill		
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.				
7							7.2	SPT (C) 15 (3-3-2-4-4-5)	7.20 - 8.60 7.20	B7 D7	(2.90)	Medium dense greyish brown slightly gravelly medium SAND. Gravel is fine, subrounded of sandstone and mudstone. [ALLUVIUM]		(2.90)				
8									8.60 - 10.20 8.60	B8 D8	8.60	Medium dense red and brown very sandy fine subrounded GRAVEL of quartz, sandstone and mudstone. Sand is coarse. [ALLUVIUM]		14.58				
9											(1.60)			(1.60)				
10							10.2	SPT (C) 22 (4-7-6-7-5-4)	10.20 - 11.70 10.20	B9 D9	10.20	Medium dense greyish brown slightly gravelly medium to coarse SAND. Gravel is fine, subrounded of sandstone and mudstone. [ALLUVIUM]		12.98				
11									11.70 - 13.20	D10								
12											(4.50)			(4.50)				
13									13.20 - 14.70	D11								
Hole Progress / Water Obs							Casing		Groundwater				Flush					
Date / Time		H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour		Sealed	Depth	Type	Returns				
Remarks: MC450 .																		
		Plas Newydd, Llanedi, Pontarddulais SA4 0FO Tel: 01554 744880 Fax: email:					Operator: RM & MW		Logged By: B. Thomas		Sheet No. 2 Of 3		m Per Page 7		All measurements in metres unless otherwise stated			

Contract : Trebanos WwTW Client : Morgan Sindall												Borehole No. BH106					
Dates : 7/11/23 - 8/11/23 Location : WwTW						Job Number : Q1402 Engineer : Arup				Ground Level : 23.18 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271113.70 E 202321.64 N <i>Co-ordinates to National Grid</i>							
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill	
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.			
14												Mediumdense greyish brown slightly gravelly medium to coarse SAND. Gravel is fine, subrounded of sandstone and mudstone. [ALLUVIUM]					
15											14.70	Borehole Terminated at 14.70mbgl Upon Scheme Engineer Instruction - Specification Depth		8.48			
16																	
17																	
18																	
19																	
20																	
Hole Progress / Water Obs				Casing				Groundwater				Flush					
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour		Sealed	Depth	Type	Returns				
Remarks: MC450																	
 Plas Newydd, Llanedi, Pontarddulais SA4 0FQ Tel: 01554 744880 Fax: email:						Operator: RM & MW		Logged By: B. Thomas		Sheet No. 3 Of 3		m Per Page 7		All measurements in metres unless otherwise stated			

Contract : Trebanos WwTW Client : Morgan Sindall			Borehole No. BH106
Dates : 7/11/23 - 8/11/23 Location : WwTW	Job Number : Q1402 Engineer : Arup	Ground Level : 23.18 m A.O.D. <i>Level to Ordnance Datum</i>	Coordinates: 271113.70 E 202321.64 N <i>Co-ordinates to National Grid</i>



APPENDIX III – TRIAL PIT LOGS

KEY TO BOREHOLE AND TRIAL PIT LOGS

MATERIAL LEGENDS

	Made Ground		Topsoil		Clay
	Gravel		Sand		Silt
	Peat		Boulders		Cobbles
	Chalk		Conglomerate		Volcaniclastic
	Asphalt		Void		Mudstone
	Siltstone		Sandstone		Limestone
	Ironstone		Mudstone / Siltstone		Breccia
	Coal		Coral		Bedrock
	Shale		Gypsum		Igneous (Coarse Grained)
	Igneous (Fine Grained)		Igneous (Medium Grained)		Metamorphic (Coarse Grained)
	Metamorphic (Fine Grained)		Metamorphic (Medium Grained)		

INSTALLATION / BACKFILL DETAILS

	Arisings		Concrete		Bentonite cement grout
	Bentonite seal		Filter		Pea Gravel
	Plain pipe		Slotted pipe		Piezometer / Standpipe tip

NOTE:
Legend symbols in accordance with BS 5930 (2015)

KEY TO BOREHOLE AND TRIAL PIT LOGS

m.A.O.D. metres Above Ordnance Datum.

SAMPLE AND TEST TYPES

U	Undisturbed driven tube sample - 102mm diameter, 450mm long.
P	Undisturbed pushed piston sample - 102mm diameter, 1000mm long.
TW	Undisturbed thin walled push in sample - 100mm diameter, 750mm long.
B	Bulk disturbed sample.
BLK	Block Sample
CBR	Heavy duty undisturbed sample - 154 mm diameter (CBR mould).
D	Small disturbed sample.
LB	Large Bulk disturbed sample (for earthworks testing)
C	Core sample
W	Water sample
G	Gas sample
ES	Environmental sample (soil)
j	Jar sample
t	Tub sample
p	Pot sample
s	Small sample
v	Vial sample
S	Standard Penetration Test using split spoon sampler. (See Note).
C	Standard Penetration Test using a solid 60 degree cone. (See Note).

NOTE: Where a single value is quoted this is the N value for 300 mm penetration following a seating drive of 150 mm. Where this full penetration is not achieved the number of blows is quoted for the penetration below the seating drive eg. 63/160 mm.

Where total penetration is less than the seating drive this is indicated by a + and the number of blows for total penetration is quoted eg. +50/75 mm.

HV	Hand Vane Test. Vane undrained shear strength, c_u , quoted in kPa.
V	Borehole Vane Test. Vane undrained shear strength, c_u , quoted in kPa.
FHT/RHT	Falling / Rising Head Permeability Test.

CORE RUN DETAILS

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
FI	Fracture Index. NI - Non intact where > 25 No. per metre length.

WATER COLUMN SYMBOLS

	First water strike, second water strike etc.
	Standing water level after first strike, second strike etc.
	Seepage.

NOTE:
Legend symbols in accordance with BS 5930 (2015)

Contract : Trebanos WwTW Client : Morgan Sindall							Trial Pit No. TP101	
Date : 3/11/23 Location : WwTW			Job Number : Q1402 Engineer : Arup		Ground Level : 18.19 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271129.39 E 202233.07 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 -	B1 ES1			0.15	GREY CONCRETE HARDSTANDING.			
					0.15	MADE GROUND: Greyish brown sandy silty fine to coarse subrounded to angular GRAVEL of concrete, limestone and brick. Sand is medium to coarse.		18.04	
					0.10	[RE-WORKED GROUND]		17.94	
	0.50 -	B2 ES2			0.25	MADE GROUND: Dark greyish brown sandy silty medium to coarse subrounded to angular GRAVEL of concrete, brick and slag with low cobble content. Cobbles are subrounded to angular of concrete and slag. [RE-WORKED GROUND]			
					0.35				
					0.60	MADE GROUND: Brown sandy very silty fine to coarse subrounded to angular GRAVEL of brick concrete and slag with high cobble content. Cobbles are subangular of concrete. Sand is medium to coarse. [RE-WORKED GROUND]		17.59	
	1.00 -	B3 ES3 B4			0.50				
					1.10	Trial Pit Terminated Due to Groundwater Ingress		17.09	

PLAN

Groundwater: Fast Groundwater Ingress

 Stability: Stable.

 Shoring:

Remarks : Water encountered at 1.2m, rising to 1m after 20 minutes.

Equipment Used:

Plas Newydd, Llanedi, Pontarddulais
 SA4 0FO
 Tel: 01554 744880
 Fax:
 email:

Operator:

Logged By:

Sheet No.
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m Per Page
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All measurements in metres unless otherwise stated

Form Name: TP LOG. Version 2.11.000, 22/05/15 Output By: Lee. Library File: C:\USERS\LEE\QUANTUM GEOTECHNIC LTD\QUANTUM GEOTECHNICAL - COMPANY\GINT\QUANTUM\LIBRARY\QUANTUM 4

Contract : Trebanos WwTW

Client : Morgan Sindall

Trial Pit No.

TP101

Date : 3/11/23

Job Number : Q1402

Ground Level : 18.19 m A.O.D.
Level to Ordnance Datum

Location : WwTW

Engineer : Arup

Coordinates: 271129.39 E
202233.07 N
Co-ordinates to National Grid



Plas Newydd, Llanedi, Pontarddulais
SA4 0FQ
Tel: 01554 744880
Fax:
email:

Operator:

Logged By.

Sheet No.
2 Of 2

m Per
Page

All measurements in
metres unless
otherwise stated



Contract : Trebanos WwTW Client : Morgan Sindall							Trial Pit No. TP102			
Date : 2/11/23 Location : WwTW			Job Number : Q1402 Engineer : Arup			Ground Level : 23.11 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271114.53 E 202325.55 N <i>Co-ordinates to National Grid</i>				
m B.G.L.	Samples		Tests		Strata				WATER	
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
1	0.20 -	B1 ES1			0.25	Grass over dark grey sandy gravelly SILT. Sand is fine. Gravel is subrounded to rounded of mudstone. [TOPSOIL]				
	0.50 -	B2 ES2			0.25 0.65	Dark brown very sandy gravelly SILT. Sand is fine to medium. Gravel is subrounded to rounded of mudstone and sandstone. [ALLUVIUM]		22.86		
	1.00 -	B3 ES3			0.90 0.50	Brown very sandy fine to coarse subrounded to rounded GRAVEL of mudstone and sandstone with low cobble content. Cobbles are subrounded of mudstone and sandstone. [ALLUVIUM]		22.21		
					1.40	Trial Pit Terminated Due to Groundwater Ingress		21.71		
PLAN 			Groundwater: Fast Groundwater Ingress Stability: Stable. Shoring:			Remarks : Water encountered at 1.4m and remained at 1.4m after 20 minutes.				
Equipment Used:										
			Plas Newydd, Llanedi, Pontarddulais SA4 0FQ Tel: 01554 744880 Fax: email:			Operator:		Logged By:		
					Sheet No. 1 Of 2		m Per Page 3		All measurements in metres unless otherwise stated	

Contract : Trebanos WwTW Client : Morgan Sindall			Trial Pit No. TP102
Date : 2/11/23 Location : WwTW	Job Number : Q1402 Engineer : Arup	Ground Level : 23.11 m A.O.D. <i>Level to Ordnance Datum</i>	Coordinates: 271114.53 E 202325.55 N <i>Co-ordinates to National Grid</i>



	Plas Newydd, Llanedi, Pontarddulais SA4 0FQ Tel: 01554 744880 Fax: email:	Operator:	Logged By:	Sheet No. 2 Of 2	m Per Page	All measurements in metres unless otherwise stated	
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Contract : Trebanos WwTW Client : Morgan Sindall							Trial Pit No. TP103		
Date : 1/11/23 Location : WwTW			Job Number : Q1402 Engineer : Arup			Ground Level : 24.28 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271181.54 E 202275.07 N <i>Co-ordinates to National Grid</i>			
m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 -	ES1			0.30	Grass over dark brown/ black sandy gravelly CLAY with many fine rootlets. Sand is medium. Gravel is fine to medium, subrounded to subangular of mudstone and brick. [TOPSOIL]			
	0.50 -	B1 ES2			0.30	MADE GROUND: Dark brownish grey mottled orange sandy gravelly SILT. Sand is medium. Gravel is fine to medium, subrounded to subangular of mudstone, coal and brick fragments. [RE-WORKED GROUND]		23.98	
	1.00 -	B2 ES3			0.80				
	1.30 -	ES4			1.10	Brown very gravelly medium to coarse SAND. Gravel is fine to coarse, subrounded to rounded of sandstone and mudstone. [ALLUVIUM]		23.18	
	1.50 -	B3			0.80				
					1.90	Trial Pit Terminated Due to Groundwater Ingress		22.38	
PLAN 			Groundwater: Fast Groundwater Ingress Stability: Stable. Shoring:			Remarks : Water encountered at 1.9m and remained at 1.9m after 20 minutes of monitoring.			
Equipment Used:									
			Plas Newydd, Llanedi, Pontarddulais SA4 0FQ Tel: 01554 744880 Fax: email:			Operator: Morgan Sindall		Logged By: B. Thomas	
Sheet No. 1 Of 2		m Per Page 3		All measurements in metres unless otherwise stated					

Contract : Trebanos WwTW

Client : Morgan Sindall

Trial Pit No.

TP103

Date : 1/11/23

Job Number : Q1402

Ground Level : 24.28 m A.O.D.
Level to Ordnance Datum

Location : WwTW

Engineer : Arup

Coordinates: 271181.54 E
202275.07 N
Co-ordinates to National Grid



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Fax:
email:

Operator:
Morgan
Sindall

Logged By:
B. Thomas

Sheet No.
2 Of 2

**m Per
Page**

All measurements in
metres unless
otherwise stated



Contract : Trebanos WwTW Client : Morgan Sindall							Trial Pit No. TP104		
Date : 1/11/23 Location : WwTW			Job Number : Q1402 Engineer : Arup			Ground Level : 23.97 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271203.49 E 202303.12 N <i>Co-ordinates to National Grid</i>			
m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 -	ES1			0.30	Grass over dark brown/ black sandy gravelly CLAY with many fine rootlets. Sand is medium. Gravel is fine to medium, subrounded to subangular of mudstone. [TOPSOIL]			
	0.50 -	B1 ES2			0.30	MADE GROUND: Dark brownish grey mottled orange sandy gravelly SILT. Sand is medium. Gravel is fine to medium, subrounded to subangular of mudstone and brick fragments. [RE-WORKED GROUND]		23.67	
	1.00 -	B2 ES3			0.90				
	1.50 -	B3 ES4			1.20	Brown very gravelly medium to coarse SAND. Gravel is fine to coarse, subrounded to rounded of sandstone and mudstone. [ALLUVIUM]		22.77	
					0.40				
					1.60	Trial Pit Terminated Due to Groundwater Ingress		22.37	
PLAN 			Groundwater: Fast Groundwater Ingress Stability: Stable. Shoring:			Remarks : Water encountered at 1.6m, rising to 1.5m after 20 minutes of monitoring.			
Equipment Used:									
			Plas Newydd, Llanedi, Pontarddulais SA4 0FO Tel: 01554 744880 Fax: email:			Operator: Morgan Sindall		Logged By: B. Thomas	
Sheet No. 1 Of 2		m Per Page 3		All measurements in metres unless otherwise stated					

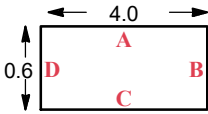
Contract : Trebanos WwTW Client : Morgan Sindall		Trial Pit No. TP104	
Date : 1/11/23 Location : WwTW	Job Number : Q1402 Engineer : Arup	Ground Level : 23.97 m A.O.D. <i>Level to Ordnance Datum</i>	Coordinates: 271203.49 E 202303.12 N <i>Co-ordinates to National Grid</i>



	Plas Newydd, Llanedi, Pontarddulais SA4 0FQ Tel: 01554 744880 Fax: email:	Operator: Morgan Sindall	Logged By. B. Thomas	Sheet No. 2 Of 2	m Per Page	All measurements in metres unless otherwise stated	

Contract : Trebanos WwTW Client : Morgan Sindall							Trial Pit No. TP105	
Date : 2/11/23 Location : WwTW			Job Number : Q1402 Engineer : Arup			Ground Level : 22.98 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 271136.81 E 202287.88 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 -	B1 ES1			0.30	Dark brownish grey sandy gravelly CLAY. Sand is medium. Gravel is fine to coarse, subrounded of mudstone, sandstone and brick fragments. [TOPSOIL]			
	0.50 -	B2 ES2			0.30	Greyish brown with orange mottles sandy SILT. Sand is medium (ALLUVIUM DEPOSITS).		22.68	
					0.90				
	1.00 -	B3 ES3			1.20	Trial Pit Terminated Due to Groundwater Ingress		21.78	

PLAN 		Groundwater: Fast Groudwater Ingress Stability: Stable. Shoring:		Remarks : Water encountered at 1.2m, rising to 1m after 20 minutes of monitoring.	
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Equipment Used:							
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	Plas Newydd, Llanedi, Pontarddulais SA4 0FO Tel: 01554 744880 Fax: email:	Operator: Morgan Sindall	Logged By: B. Thomas	Sheet No. 1 Of 2	m Per Page 3	All measurements in metres unless otherwise stated	
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Contract : Trebanos WwTW Client : Morgan Sindall		Trial Pit No. TP105	
Date : 2/11/23 Location : WwTW	Job Number : Q1402 Engineer : Arup	Ground Level : 22.98 m A.O.D. <i>Level to Ordnance Datum</i>	Coordinates: 271136.81 E 202287.88 N <i>Co-ordinates to National Grid</i>
		Coordinates: 271136.81 E 202287.88 N <i>Co-ordinates to National Grid</i>	



	Plas Newydd, Llanedi, Pontarddulais SA4 0FQ Tel: 01554 744880 Fax: email:	Operator: Morgan Sindall	Logged By: B. Thomas	Sheet No. 2 Of 2	m Per Page	All measurements in metres unless otherwise stated	

APPENDIX IV – GAS AND GROUNDWATER MONITORING RECORDS

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Project Name:	Trebanos storm outfall
Project No.:	Q1402
BH/TP No.:	BH101
Instruments Used:	Water Dip Meter Probe, GA2000 Gas Analyser

Installation Date:				
GL (mAOD)	Pipe	Type	Installation Depth (mbgl)	Response Zone (mbgl)
23.95	A	50mm	2.00	0.60 - 2.00

[illegible]

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Project Name:	Trebanos storm outfall
Project No.:	Q1402
BH/TP No.:	BH102
Instruments Used:	Water Dip Meter Probe, GA2000 Gas Analyser

Installation Date:				
GL (mAOD)	Pipe	Type	Installation Depth (mbgl)	Response Zone (mbgl)
23.89	A	50mm	3.00	1.50 - 3.00

[illegible]

Page 1 of 1

Project Name:	Trebanos storm outfall
Project No.:	Q1402
BH/TP No.:	BH103
Instruments Used:	Water Dip Meter Probe, GA2000 Gas Analyser

Installation Date:				
GL (mAOD)	Pipe	Type	Installation Depth (mbgl)	Response Zone (mbgl)
22.84	A	50mm	2.00	0.50 - 2.00

[illegible]

Page 1 of 1

Project Name:	Trebanos storm outfall
Project No.:	Q1402
BH/TP No.:	BH105
Instruments Used:	Water Dip Meter Probe, GA2000 Gas Analyser

Installation Date:				
GL (mAOD)	Pipe	Type	Installation Depth (mbgl)	Response Zone (mbgl)
23.72	A	50mm	7.50	5.00 - 7.50

[illegible]

Page 1 of 1

Project Name:	Trebanos storm outfall
Project No.:	Q1402
BH/TP No.:	BH106
Instruments Used:	Water Dip Meter Probe, GA2000 Gas Analyser

Installation Date:				
GL (mAOD)	Pipe	Type	Installation Depth (mbgl)	Response Zone (mbgl)
23.8	A	50mm	5.00	3.00 - 5.00

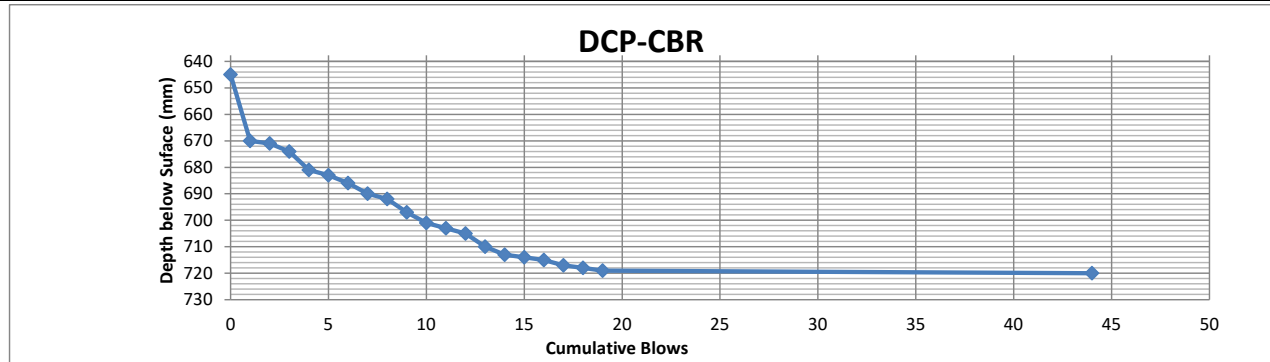
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APPENDIX V – TRL DCP TEST RESULTS

Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP
CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Morgan Sindall
Contract Name:	Trebanos WwTW
Contract No.:	Q1402

Site Reference:	TRL-DCP TP101	Lab. Reference:	n/a	Date Tested:	03/11/2023
Sample Location:	TP101				
Eastings:	202233.07	Northings:	271129.39	Level mAOD:	18.19
Supplier:	In-Situ			Source:	n/a
Depth Start of Test (mm)	500			Tested By:	BT



CBR Relationship - TRL Equation $\log_{10}(\text{CBR}) = 2.48 - 1.057 \cdot \log_{10}(\text{Penetration Rate})$

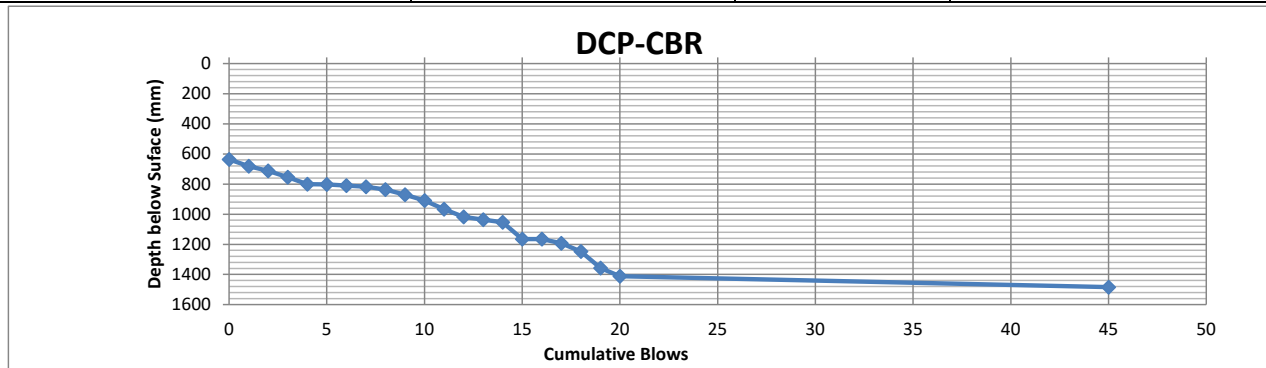
Layer No.	Number of Blows		Penetration (mm)		Rate of Penetration (mm/blow)	Equivalent CBR (%)	Remarks
	Start	Finish	Start	Finish			
1	0	44	645	720	1.70	172	Refusal

Signed: *B. Thomas*
Position: Senior Engineering Geologist
Dated: 3rd November 2023

Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP
CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

Client Name:	Morgan Sindall
Contract Name:	Trebanos WwTW
Contract No.:	Q1402

Site Reference:	TRL-DCP TP103	Lab. Reference:	n/a	Date Tested:	01/11/2023
Sample Location:	TP103				
Eastings:	271181.54	Northings:	202275.07	Level mAOD:	24.28
Supplier:	In-Situ			Source:	n/a
Depth Start of Test (mm)	500			Tested By:	BT



CBR Relationship - TRL Equation $\log_{10}(\text{CBR}) = 2.48 - 1.057 * \log_{10}(\text{Penetration Rate})$

Layer No.	Number of Blows		Penetration (mm)		Rate of Penetration (mm/blow)	Equivalent CBR (%)	Remarks
	Start	Finish	Start	Finish			
1	0	4	636	800	41.00	6	
2	4	45	480	1484	24.49	10	Refusal

Signed: *B. Thema*
Position: Senior Engineering Geologist
Dated: 1st November 2023

APPENDIX VI – GEOTECHNICAL LABORATORY TEST RESULTS



Laboratory Report



Contract Number: 69815

Client Ref: **Q1402**

Client PO: **Q1402**

Date Received: **28-11-2023**

Date Completed: **14-12-2023**

Report Date: **14-12-2023**

Client: **Spencer Quantum Ltd**
Plas Newydd
Llanedi
Pontarddulais
Swansea
SA4 0FQ

This report has been checked and approved by:

Brendan Evans
Office Administrator

Contract Title: **Trebanos WWTW**

For the attention of: **Lee Simlett**

Test Description	Qty
Moisture Content of Soil BS1377 : Part 2 : Clause 3.2 : 1990 - * UKAS	3
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	3
PSD Wet & Dry Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	26
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2 : 9.4 - * UKAS	6
Direct Shearbox - set of 3 - 60 x 60mm (3 days) BS 1377:1990 - Part 7 : 4 - * UKAS	7
BRE Suite C Brownfield Site (pyrite absent) includes pH, water soluble sulphate, magnesium, chloride and nitrate Sub-contracted Test	18
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation

* - denotes test included in laboratory scope of accreditation

- denotes test carried out by approved contractor

@ - denotes non accredited tests

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 test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

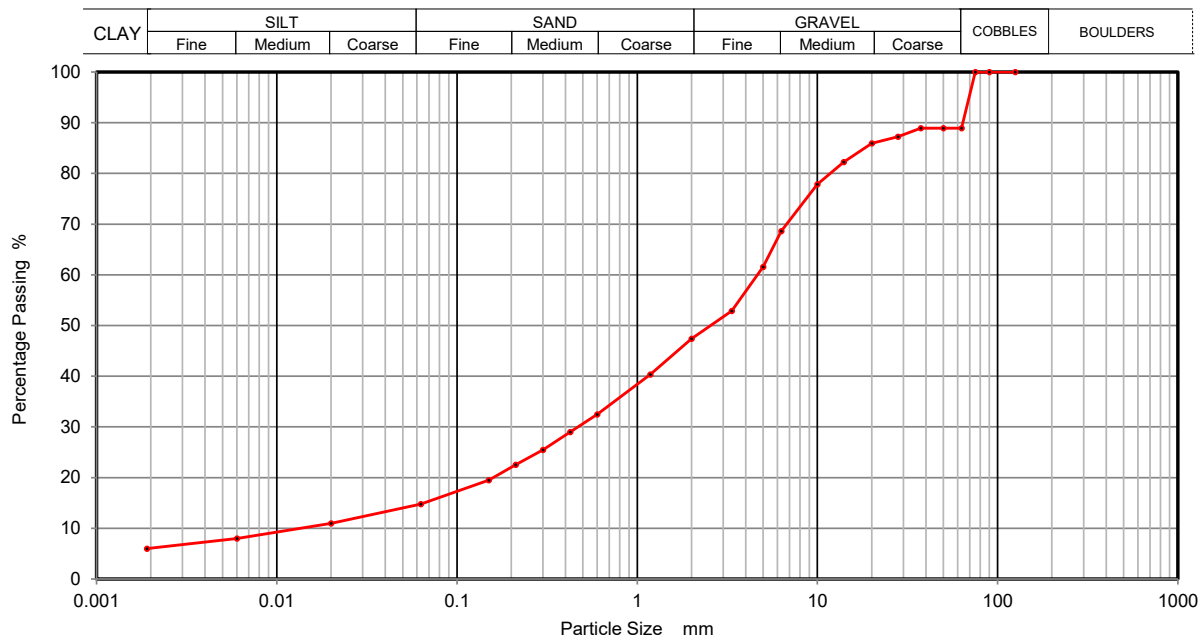
Approved Signatories:

Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**

Contract Number	69815
Borehole/Pit No.	BH101
Sample No.	3
Depth Top	1.00
Depth Base	
Sample Type	B

Project Name	Trebanos WWTW
Soil Description	Red brown clayey silty fine to coarse sandy fine to coarse GRAVEL (with cobbles)
Date Tested	11/12/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	11
90	100	0.0060	8
75	100	0.0020	6
63	89		
50	89		
37.5	89		
28	87		
20	86		
14	82		
10	78		
6.3	69		
5	62		
3.35	53		
2	47		
1.18	40		
0.6	32		
0.425	29		
0.3	25		
0.212	23		
0.15	19		
0.063	15		

Sample Proportions	% dry mass
Cobbles	11
Gravel	42
Sand	32
Silt	9
Clay	6

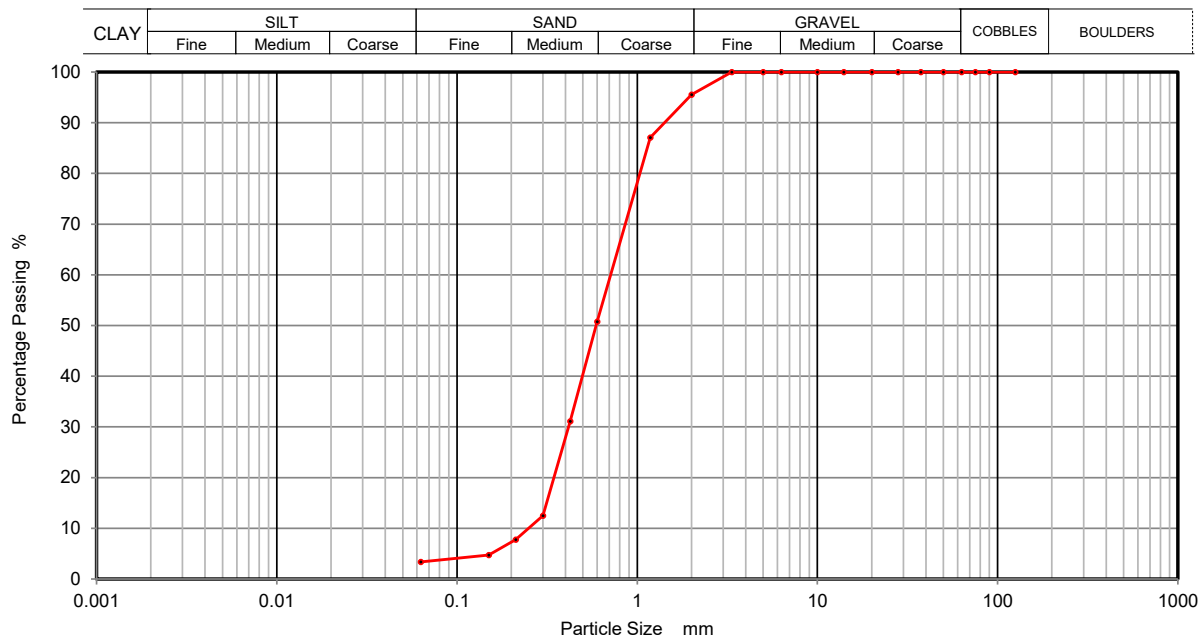
Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	69815	Project Name	Trebanos WWTW	Sample No.	4
Borehole/Pit No.	BH101	Soil Description	Brown slightly silty/clayey slightly gravelly fine to coarse SAND	Depth Top	2.70
				Depth Base	4.20
Date Tested	11/12/2023	Sample Type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	96		
1.18	87		
0.6	51		
0.425	31		
0.3	12		
0.212	8		
0.15	5		
0.063	3		

Sample Proportions	% dry mass
Cobbles	0
Gravel	4
Sand	93
Silt and Clay	3

Remarks
Preparation and testing in accordance with BS1377 unless noted below

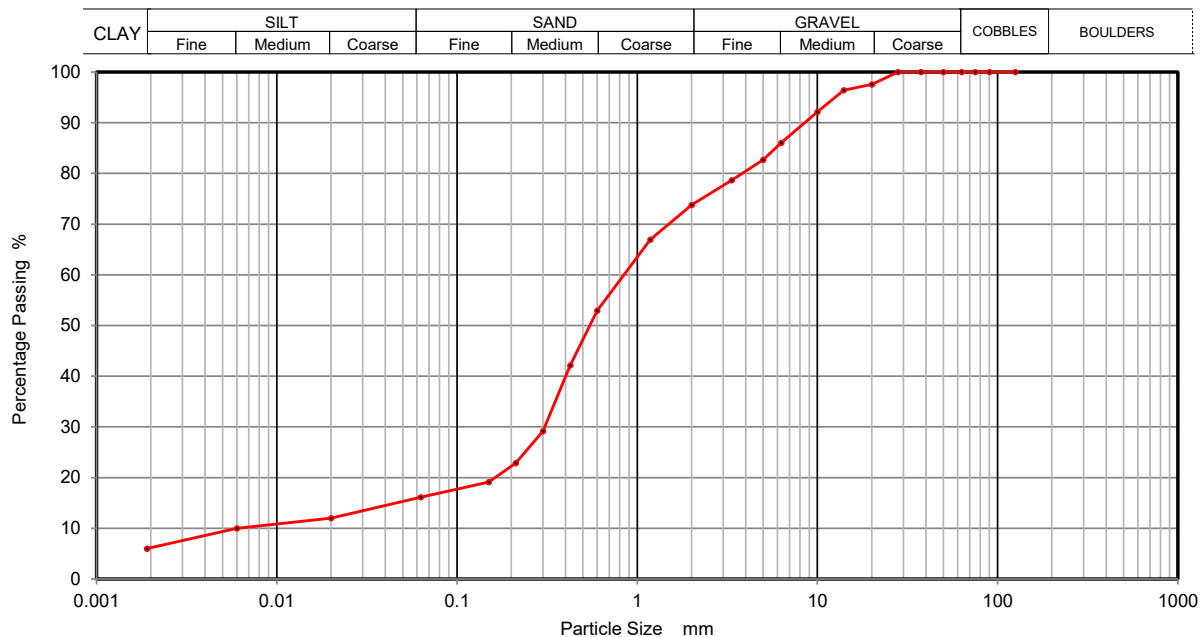
Operator
David Edwards



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	69815
Borehole/Pit No.	BH101
Sample No.	6
Depth Top	7.20
Depth Base	8.70
Sample Type	B

Project Name	Trebanos WWTW
Soil Description	Brown clayey silty fine to coarse gravelly fine to coarse SAND
Date Tested	11/12/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	12
90	100	0.0060	10
75	100	0.0020	6
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	96		
10	92		
6.3	86		
5	83		
3.35	79		
2	74		
1.18	67		
0.6	53		
0.425	42		
0.3	29		
0.212	23		
0.15	19		
0.063	16		

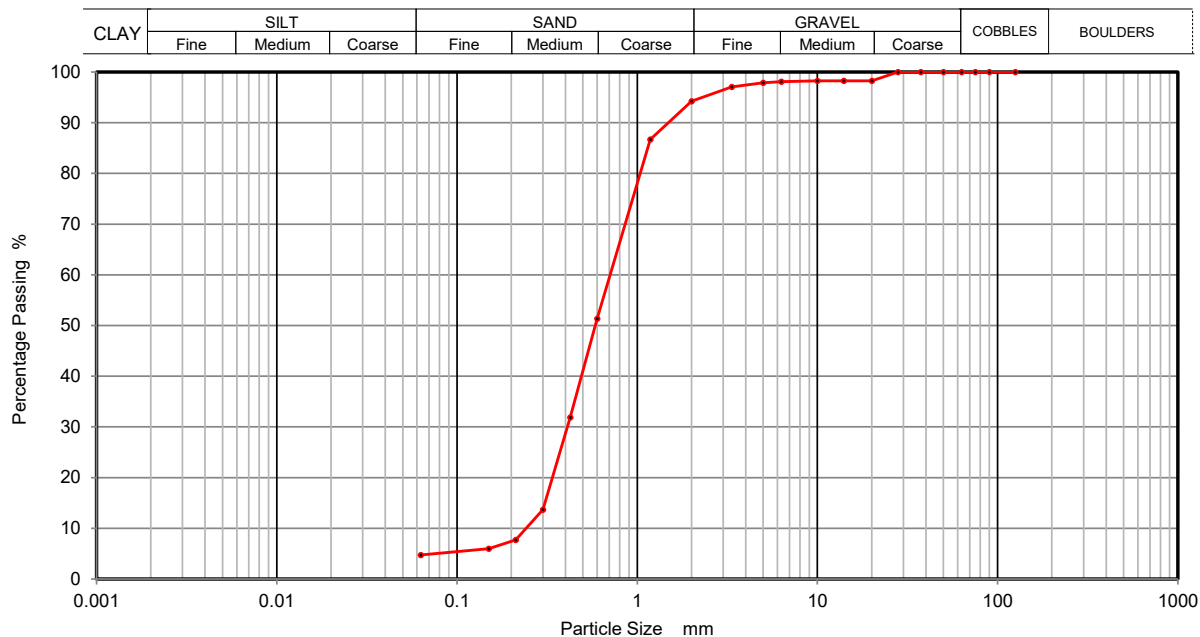
Sample Proportions	% dry mass
Cobbles	0
Gravel	26
Sand	58
Silt	10
Clay	6

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	69815	
	Borehole/Pit No.	
BH101		
Project Name	Trebanos WWTW	Sample No.
Soil Description	Brown silty/clayey fine to coarse gravelly fine to coarse SAND	8
Depth Top	10.20	
Depth Base	13.65	
Date Tested	11/12/2023	Sample Type
		B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	98		
10	98		
6.3	98		
5	98		
3.35	97		
2	94		
1.18	87		
0.6	51		
0.425	32		
0.3	14		
0.212	8		
0.15	6		
0.063	5		

Sample Proportions	% dry mass
Cobbles	0
Gravel	6
Sand	89
Silt and Clay	5

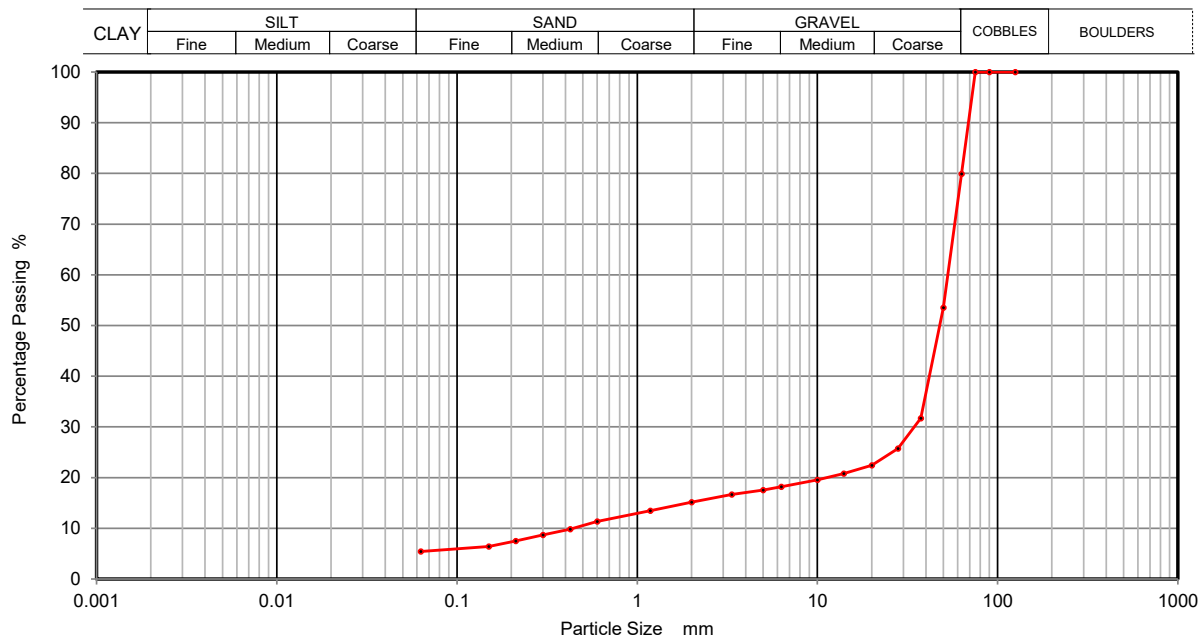
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

 PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	69815	
	Borehole/Pit No.	BH101	
Project Name	Trebanos WWTW	Sample No.	10
Soil Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	14.70
		Depth Base	16.20
Date Tested	11/12/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	80		
50	54		
37.5	32		
28	26		
20	22		
14	21		
10	20		
6.3	18		
5	18		
3.35	17		
2	15		
1.18	13		
0.6	11		
0.425	10		
0.3	9		
0.212	7		
0.15	6		
0.063	5		

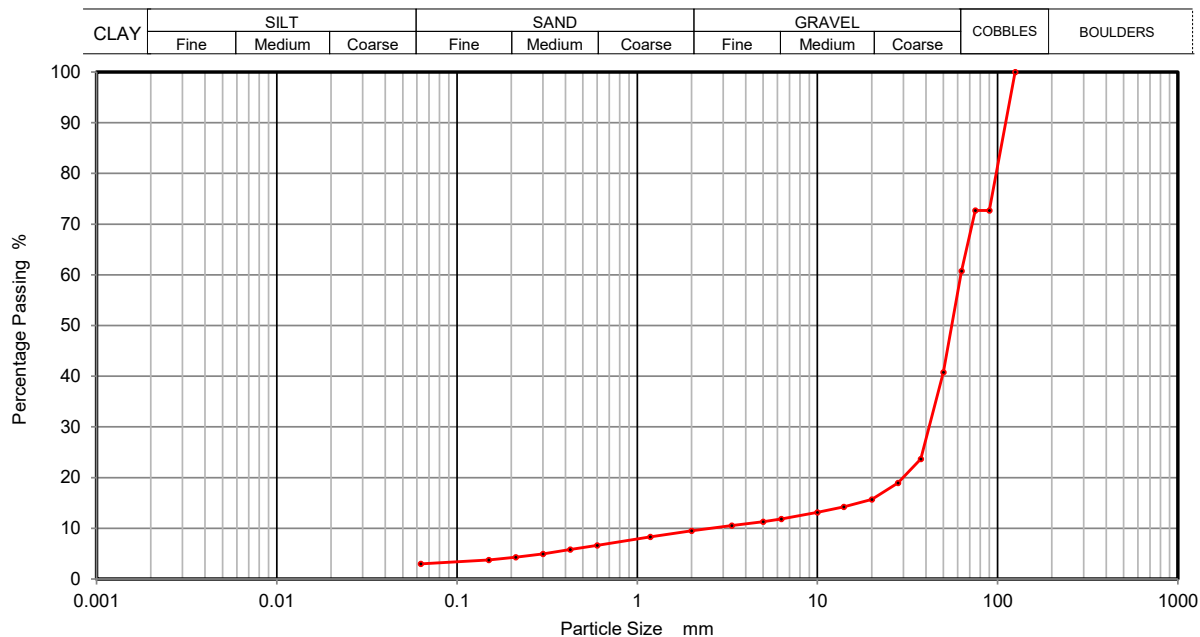
Sample Proportions	% dry mass
Cobbles	20
Gravel	65
Sand	10
Silt and Clay	5

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

 GEOTECHNICAL SITE & TESTING LABORATORIES	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	69815
		Borehole/Pit No.	BH101
Project Name	Trebanos WWTW	Sample No.	11
Soil Description	Brown slightly silty/clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	16.20
		Depth Base	19.50
Date Tested	11/12/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	73		
75	73		
63	61		
50	41		
37.5	24		
28	19		
20	16		
14	14		
10	13		
6.3	12		
5	11		
3.35	11		
2	10		
1.18	8		
0.6	7		
0.425	6		
0.3	5		
0.212	4		
0.15	4		
0.063	3		

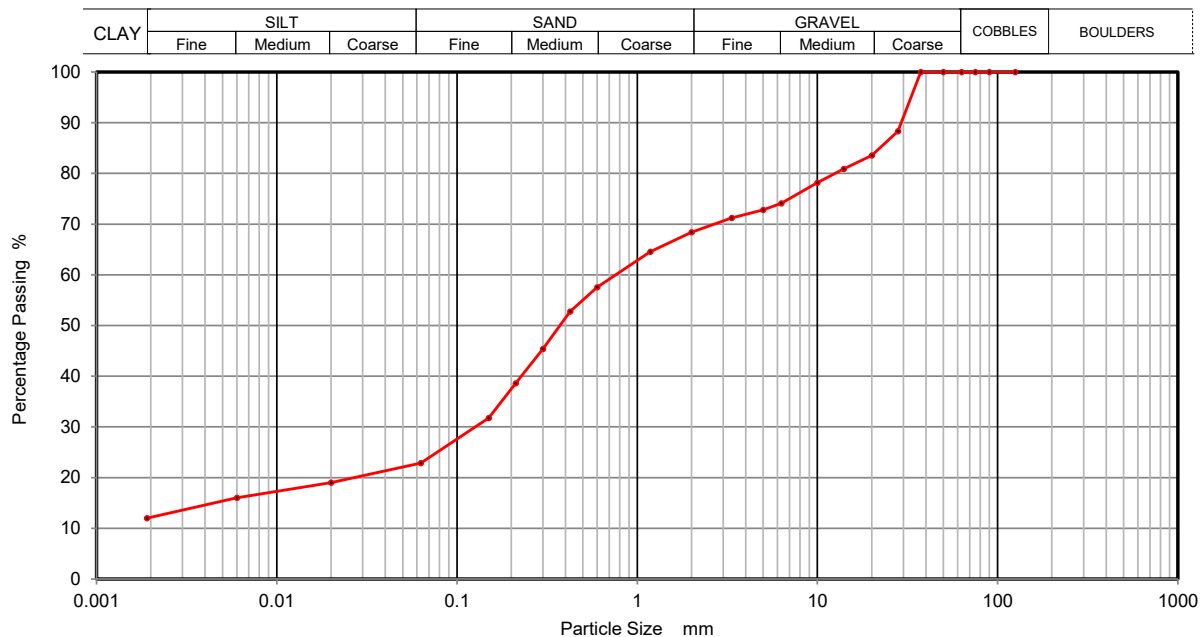
Sample Proportions	% dry mass
Cobbles	39
Gravel	51
Sand	7
Silt and Clay	3

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	69815	
	Borehole/Pit No.	
BH102		
Project Name	Trebanos WWTW	
Sample No.	3	
Soil Description	Brown silty clayey fine to coarse gravelly fine to coarse SAND	
Depth Top	1.00	
Depth Base	1.20	
Date Tested	11/12/2023	
Sample Type	B	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	19
90	100	0.0060	16
75	100	0.0020	12
63	100		
50	100		
37.5	100		
28	88		
20	84		
14	81		
10	78		
6.3	74		
5	73		
3.35	71		
2	68		
1.18	65		
0.6	58		
0.425	53		
0.3	45		
0.212	39		
0.15	32		
0.063	23		

Sample Proportions	% dry mass
Cobbles	0
Gravel	32
Sand	45
Silt	11
Clay	12

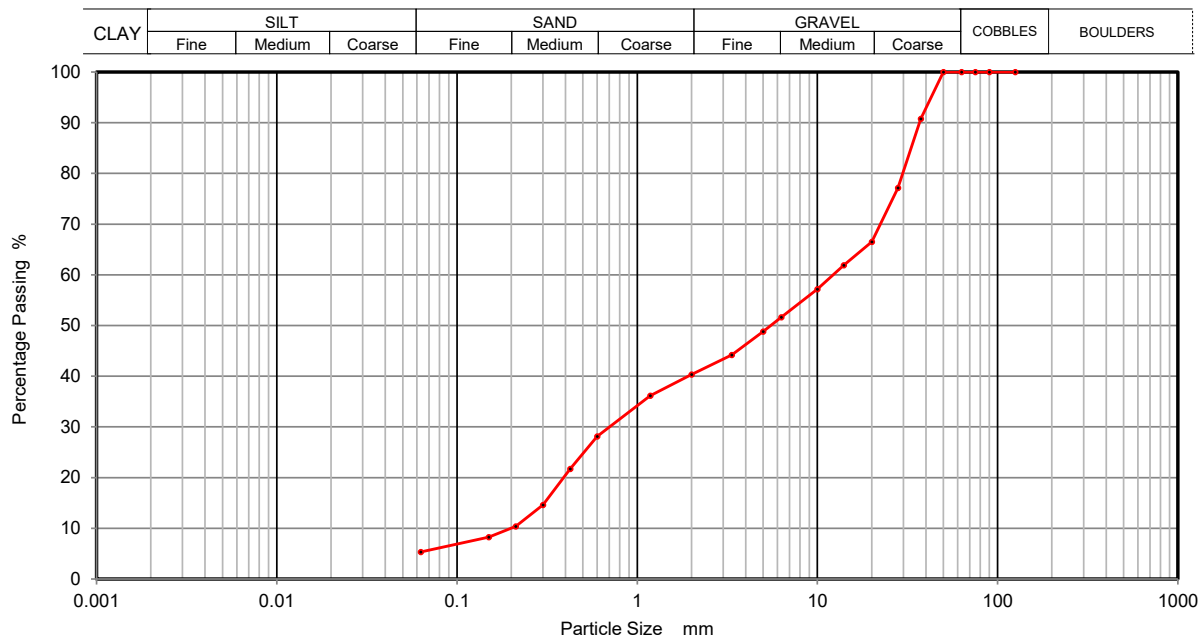
Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

 GEOTECHNICAL SITE & TESTING LABORATORIES	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	69815
		Borehole/Pit No.	BH102
Project Name	Trebanos WWTW	Sample No.	5
Soil Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.40
		Depth Base	2.50
Date Tested	11/12/2023	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	91		
28	77		
20	67		
14	62		
10	57		
6.3	52		
5	49		
3.35	44		
2	40		
1.18	36		
0.6	28		
0.425	22		
0.3	15		
0.212	10		
0.15	8		
0.063	5		

Sample Proportions	% dry mass
Cobbles	0
Gravel	60
Sand	35
Silt and Clay	5

Remarks

Preparation and testing in accordance with BS1377 unless noted below

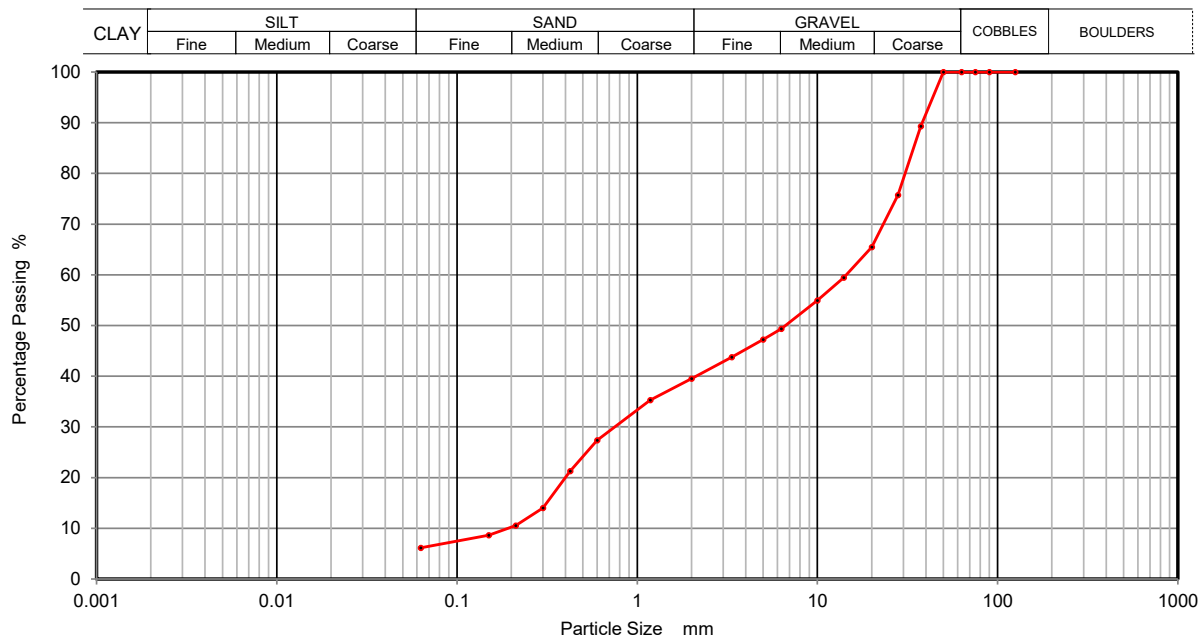
Operator
David Edwards



2788

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	69815	
	Borehole/Pit No.	
BH102		
Project Name	Trebanos WWTW	
Sample No.	4	
Soil Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top
		3.35
Depth Base		4.00
Date Tested	11/12/2023	
Sample Type	B	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	89		
28	76		
20	65		
14	59		
10	55		
6.3	49		
5	47		
3.35	44		
2	40		
1.18	35		
0.6	27		
0.425	21		
0.3	14		
0.212	11		
0.15	9		
0.063	6		

Sample Proportions	% dry mass
Cobbles	0
Gravel	60
Sand	34
Silt and Clay	6

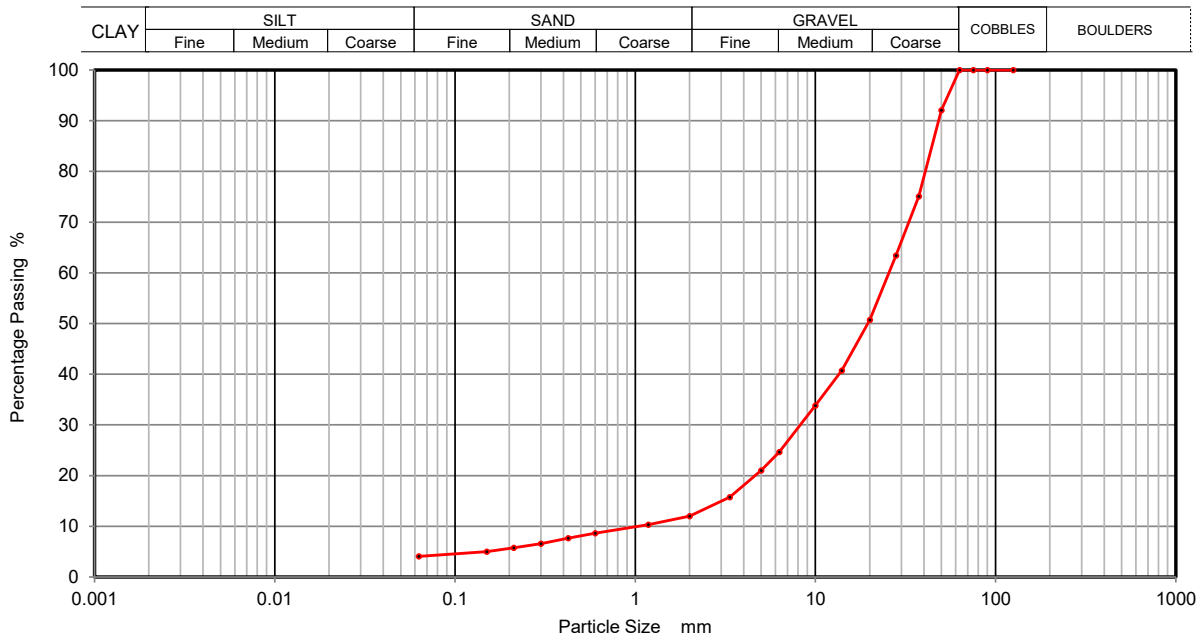
Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	69815	
	Borehole/Pit No.	
BH102		
Project Name	Trebanos WWTW	Sample No.
Soil Description	Brown slightly silty/clayey fine to coarse sandy fine to coarse GRAVEL	7
Depth Top		7.00
Depth Base		7.70
Date Tested	11/12/2023	Sample Type
		B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	92		
37.5	75		
28	63		
20	51		
14	41		
10	34		
6.3	25		
5	21		
3.35	16		
2	12		
1.18	10		
0.6	9		
0.425	8		
0.3	7		
0.212	6		
0.15	5		
0.063	4		

Sample Proportions	% dry mass
Cobbles	0
Gravel	88
Sand	8
Silt and Clay	4

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 69815

Borehole/Pit No. BH103

Project Name Trebanos WWTW

Sample No. 5

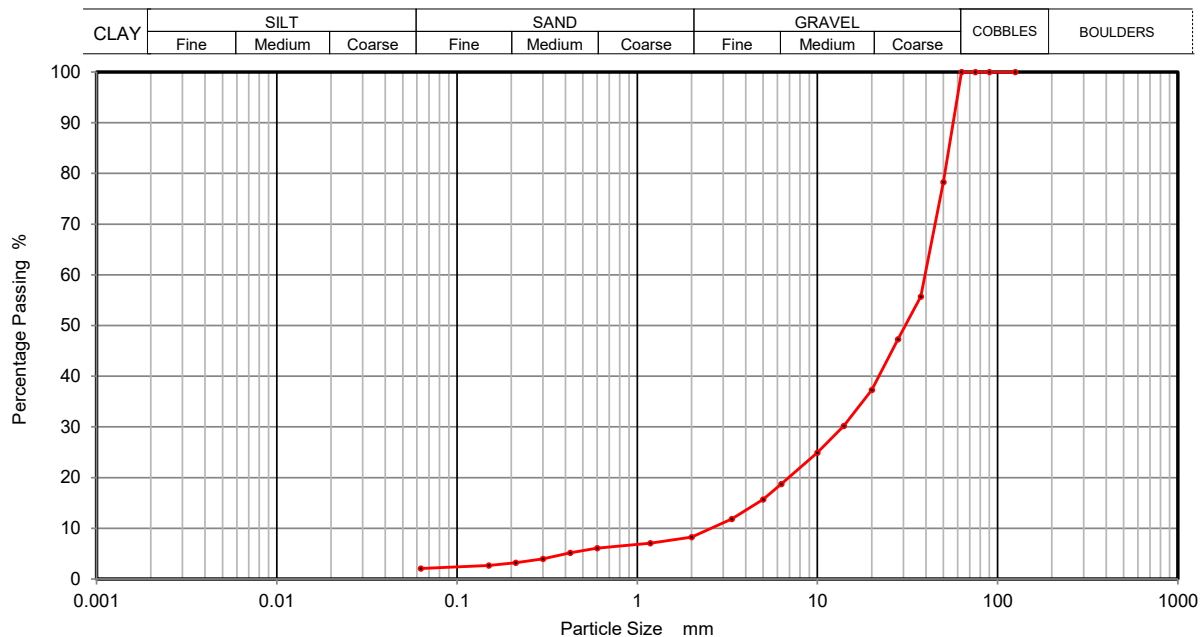
Soil Description Brown slightly silty/clayey fine to coarse sandy fine to coarse GRAVEL

Depth Top 2.20

Depth Base 2.80

Date Tested 11/12/2023

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	78		
37.5	56		
28	47		
20	37		
14	30		
10	25		
6.3	19		
5	16		
3.35	12		
2	8		
1.18	7		
0.6	6		
0.425	5		
0.3	4		
0.212	3		
0.15	3		
0.063	2		

Sample Proportions	% dry mass
Cobbles	0
Gravel	92
Sand	6
Silt and Clay	2

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator

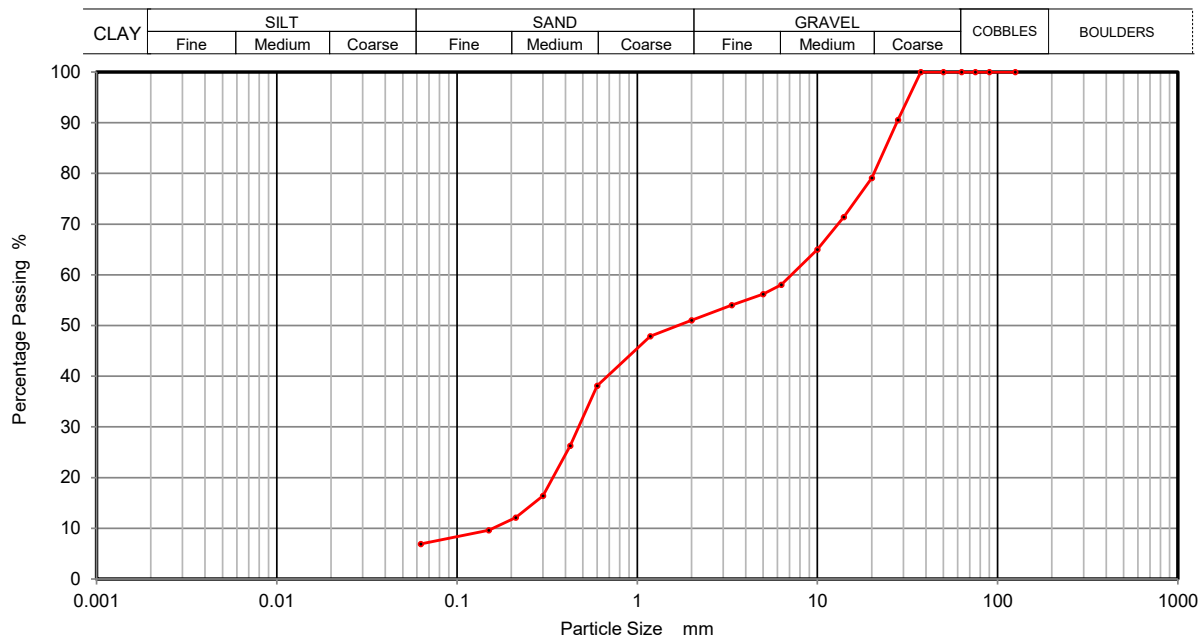
David Edwards



2788

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	69815	
	Borehole/Pit No.	
BH103		
Project Name	Trebanos WWTW	
Sample No.	10	
Soil Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	
Depth Top	8.80	
Depth Base	10.20	
Date Tested	11/12/2023	
Sample Type	B	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	91		
20	79		
14	71		
10	65		
6.3	58		
5	56		
3.35	54		
2	51		
1.18	48		
0.6	38		
0.425	26		
0.3	16		
0.212	12		
0.15	10		
0.063	7		

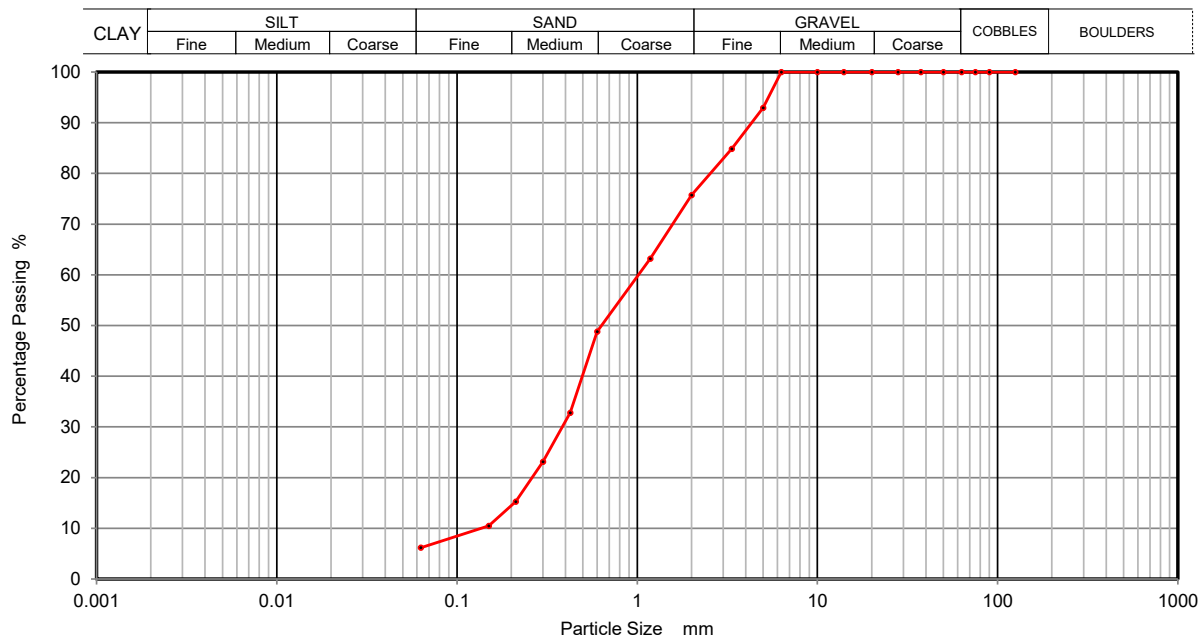
Sample Proportions	% dry mass
Cobbles	0
Gravel	49
Sand	44
Silt and Clay	7

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	69815	
	Borehole/Pit No.	
BH105		
Project Name	Trebanos WWTW	Sample No.
Soil Description	Brown silty/clayey fine gravelly fine to coarse SAND	4
Depth Top		1.70
Depth Base		3.20
Date Tested	11/12/2023	Sample Type
		B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	93		
3.35	85		
2	76		
1.18	63		
0.6	49		
0.425	33		
0.3	23		
0.212	15		
0.15	10		
0.063	6		

Sample Proportions	% dry mass
Cobbles	0
Gravel	24
Sand	70
Silt and Clay	6

Remarks

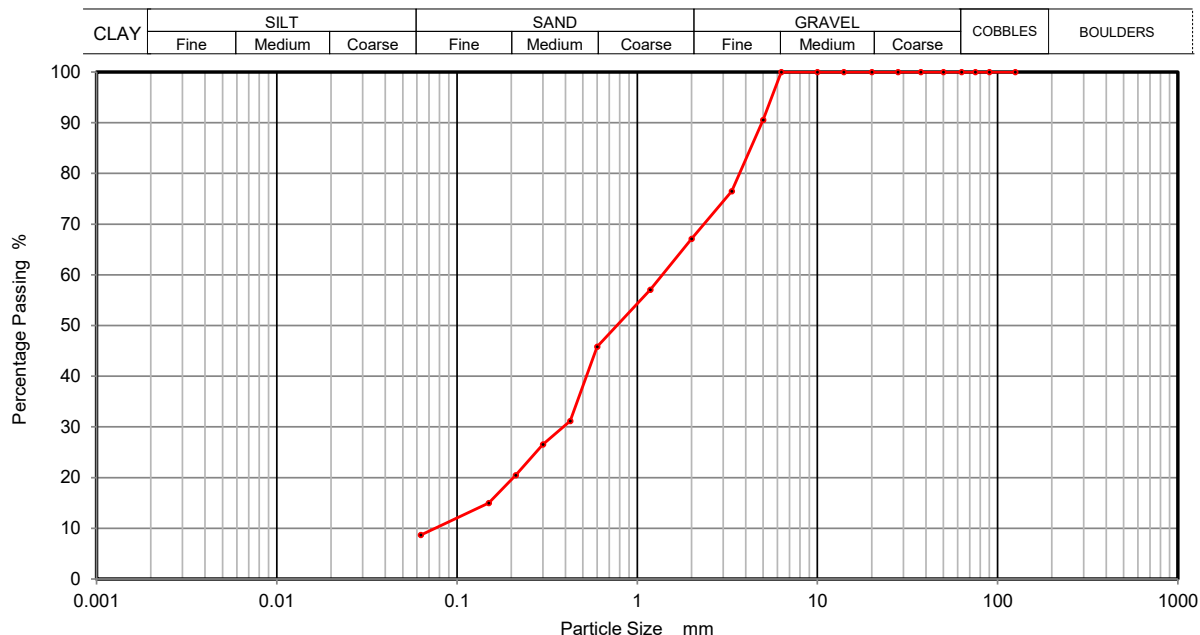
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	69815	
	Borehole/Pit No.	
BH105		
Project Name	Trebanos WWTW	Sample No.
Soil Description	Brown silty/clayey fine gravelly fine to coarse SAND	5
Depth Top		4.70
Depth Base		6.20
Date Tested	11/12/2023	Sample Type
		B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	91		
3.35	77		
2	67		
1.18	57		
0.6	46		
0.425	31		
0.3	27		
0.212	20		
0.15	15		
0.063	9		

Sample Proportions	% dry mass
Cobbles	0
Gravel	33
Sand	58
Silt and Clay	9

Remarks
Preparation and testing in accordance with BS1377 unless noted below

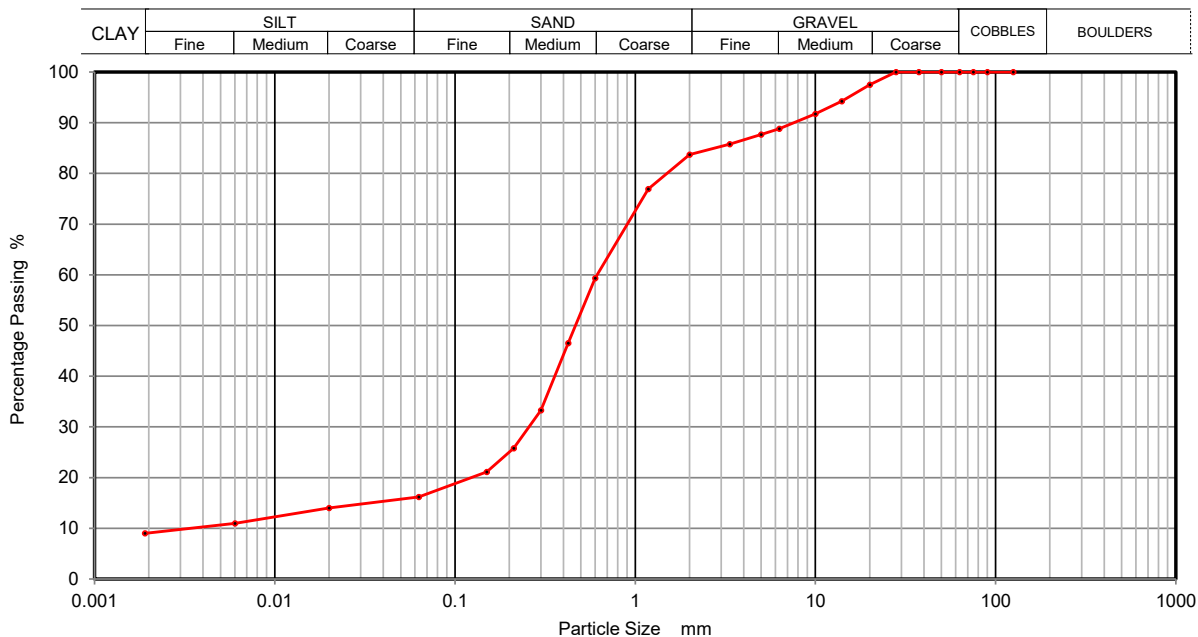
Operator
David Edwards



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	69815
Borehole/Pit No.	BH105
Sample No.	7
Depth Top	7.70
Depth Base	9.20
Sample Type	B

Project Name	Trebanos WWTW
Soil Description	Brown silty clayey fine to coarse gravelly fine to coarse SAND
Date Tested	11/12/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	14
90	100	0.0060	11
75	100	0.0020	9
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	94		
10	92		
6.3	89		
5	88		
3.35	86		
2	84		
1.18	77		
0.6	59		
0.425	47		
0.3	33		
0.212	26		
0.15	21		
0.063	16		

Sample Proportions	% dry mass
Cobbles	0
Gravel	16
Sand	68
Silt	7
Clay	9

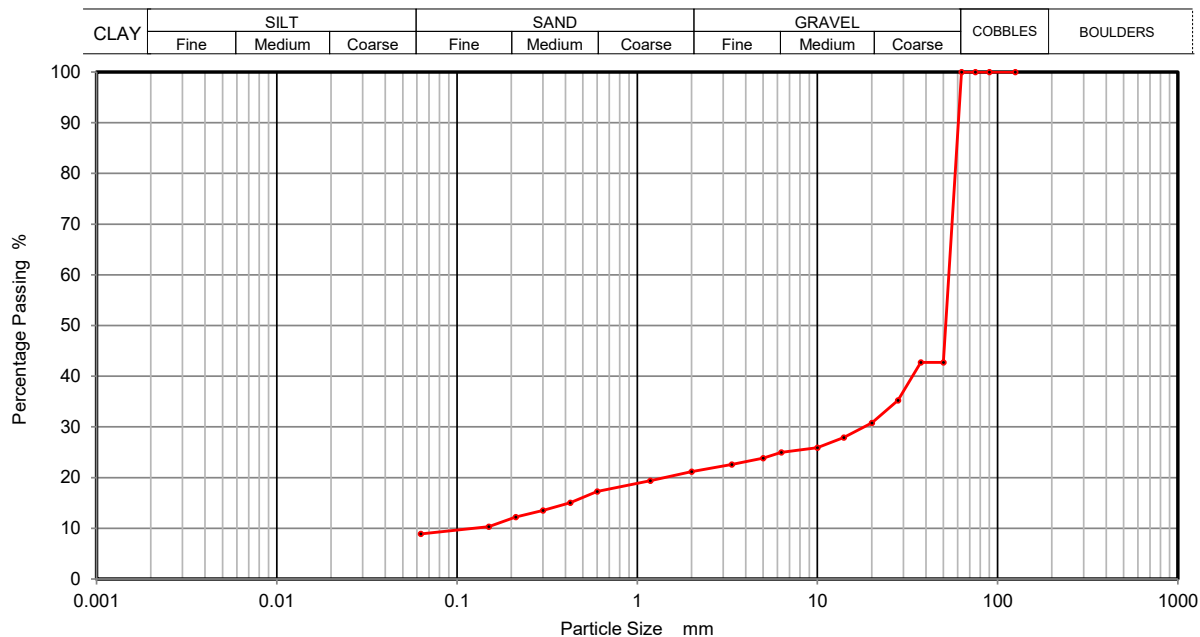
Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	69815	
	Borehole/Pit No.	
BH106		
Project Name	Trebanos WWTW	
Sample No.	2	
Soil Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	
Depth Top	0.50	
	Depth Base	
Date Tested	11/12/2023	
Sample Type	B	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	43		
37.5	43		
28	35		
20	31		
14	28		
10	26		
6.3	25		
5	24		
3.35	23		
2	21		
1.18	19		
0.6	17		
0.425	15		
0.3	14		
0.212	12		
0.15	10		
0.063	9		

Sample Proportions	% dry mass
Cobbles	0
Gravel	79
Sand	12
Silt and Clay	9

Remarks
Preparation and testing in accordance with BS1377 unless noted below

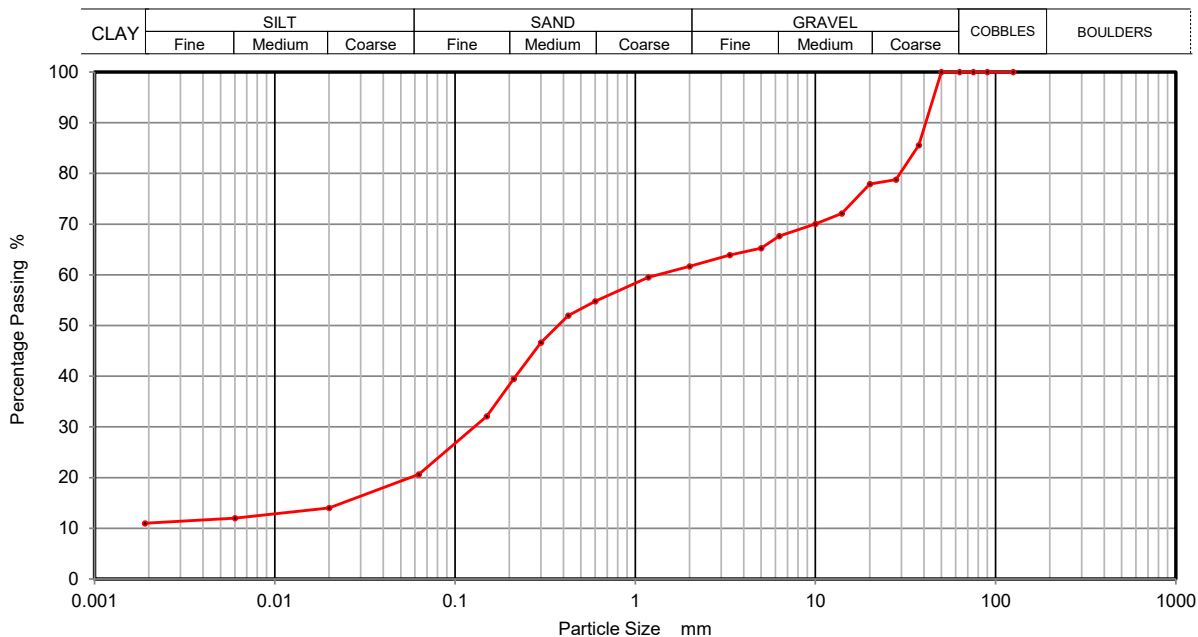
Operator
David Edwards



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	69815
Borehole/Pit No.	BH106
Sample No.	3
Depth Top	1.20
Depth Base	2.70
Sample Type	B

Project Name	Trebanos WWTW
Soil Description	Brown silty clayey fine to coarse gravelly fine to coarse SAND
Date Tested	11/12/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	14
90	100	0.0060	12
75	100	0.0020	11
63	100		
50	100		
37.5	86		
28	79		
20	78		
14	72		
10	70		
6.3	68		
5	65		
3.35	64		
2	62		
1.18	59		
0.6	55		
0.425	52		
0.3	47		
0.212	39		
0.15	32		
0.063	21		

Sample Proportions	% dry mass
Cobbles	0
Gravel	38
Sand	41
Silt	10
Clay	11

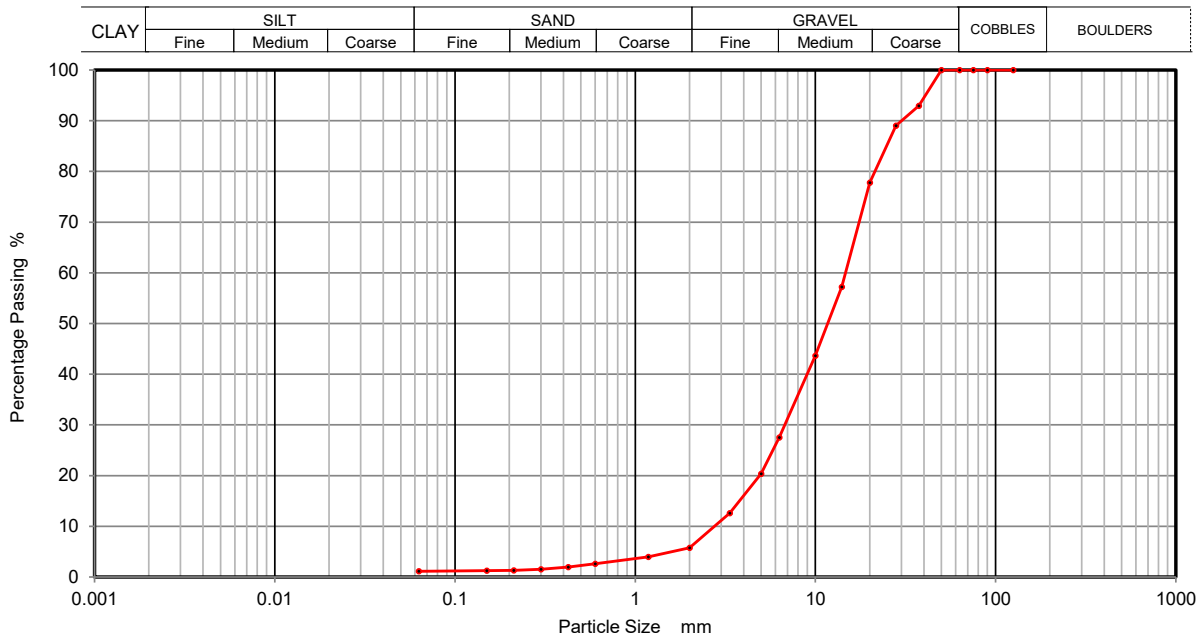
Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

 GEOTECHNICAL SITE & TESTING LABORATORIES	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	69815
		Borehole/Pit No.	BH106
Project Name	Trebanos WWTW	Sample No.	4
Soil Description	Brown slightly silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	2.70
		Depth Base	4.20
Date Tested	11/12/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	93		
28	89		
20	78		
14	57		
10	44		
6.3	28		
5	20		
3.35	13		
2	6		
1.18	4		
0.6	3		
0.425	2		
0.3	2		
0.212	1		
0.15	1		
0.063	1		

Sample Proportions	% dry mass
Cobbles	0
Gravel	94
Sand	5
Silt and Clay	1

Remarks
Preparation and testing in accordance with BS1377 unless noted below

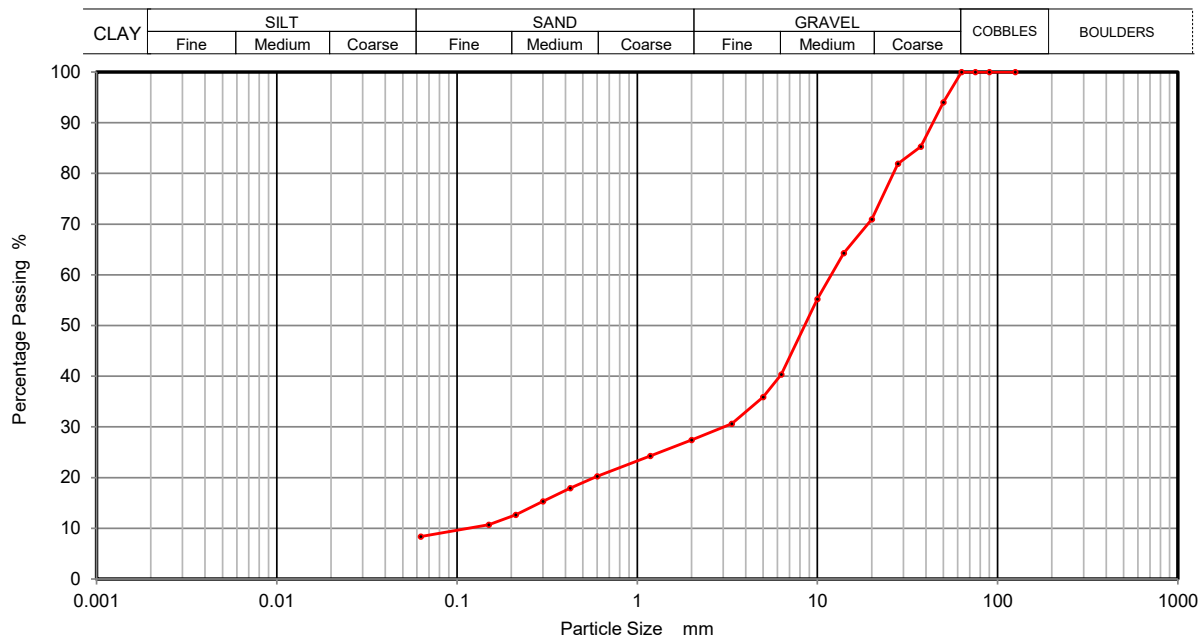
Operator
David Edwards





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

 GEOTECHNICAL SITE & TESTING LABORATORIES	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	69815
		Borehole/Pit No.	BH106
Project Name	Trebanos WWTW	Sample No.	6
Soil Description	Grey brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	5.70
		Depth Base	7.20
Date Tested	11/12/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	94		
37.5	85		
28	82		
20	71		
14	64		
10	55		
6.3	40		
5	36		
3.35	31		
2	27		
1.18	24		
0.6	20		
0.425	18		
0.3	15		
0.212	13		
0.15	11		
0.063	8		

Sample Proportions	% dry mass
Cobbles	0
Gravel	73
Sand	19
Silt and Clay	8

Remarks
Preparation and testing in accordance with BS1377 unless noted below

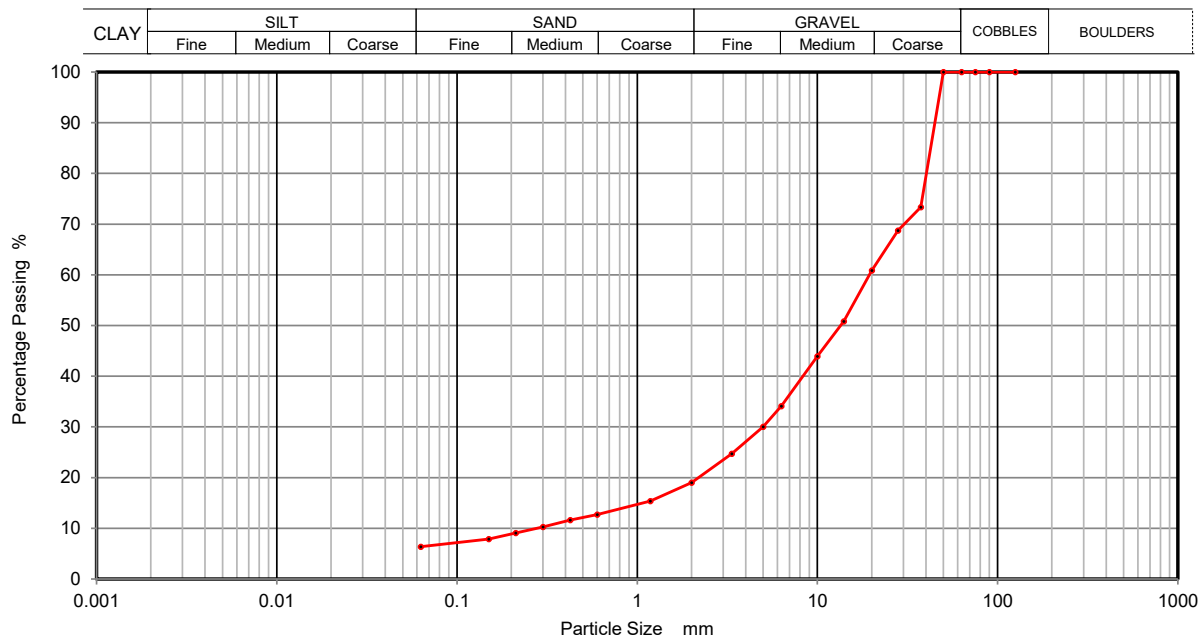
Operator
David Edwards





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	69815
		Borehole/Pit No.	BH106
Project Name	Trebanos WWTW	Sample No.	8
Soil Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	8.60
		Depth Base	10.20
Date Tested	11/12/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	73		
28	69		
20	61		
14	51		
10	44		
6.3	34		
5	30		
3.35	25		
2	19		
1.18	15		
0.6	13		
0.425	12		
0.3	10		
0.212	9		
0.15	8		
0.063	6		

Sample Proportions	% dry mass
Cobbles	0
Gravel	81
Sand	13
Silt and Clay	6

Remarks
Preparation and testing in accordance with BS1377 unless noted below

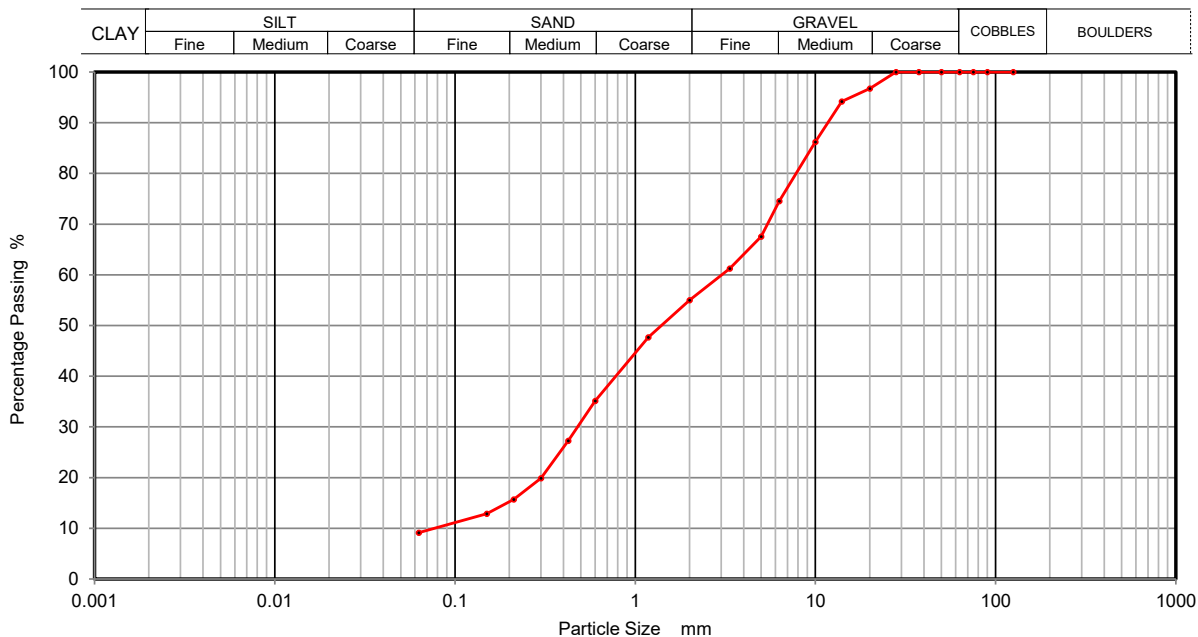
Operator
David Edwards





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	69815	
	Borehole/Pit No.	
BH106		
Project Name	Trebanos WWTW	Sample No.
Soil Description	Brown silty/clayey fine to coarse gravelly fine to coarse SAND	11
Depth Top		13.20
Depth Base		14.70
Date Tested	11/12/2023	Sample Type
		B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	94		
10	86		
6.3	75		
5	68		
3.35	61		
2	55		
1.18	48		
0.6	35		
0.425	27		
0.3	20		
0.212	16		
0.15	13		
0.063	9		

Sample Proportions	% dry mass
Cobbles	0
Gravel	45
Sand	46
Silt and Clay	9

Remarks
Preparation and testing in accordance with BS1377 unless noted below

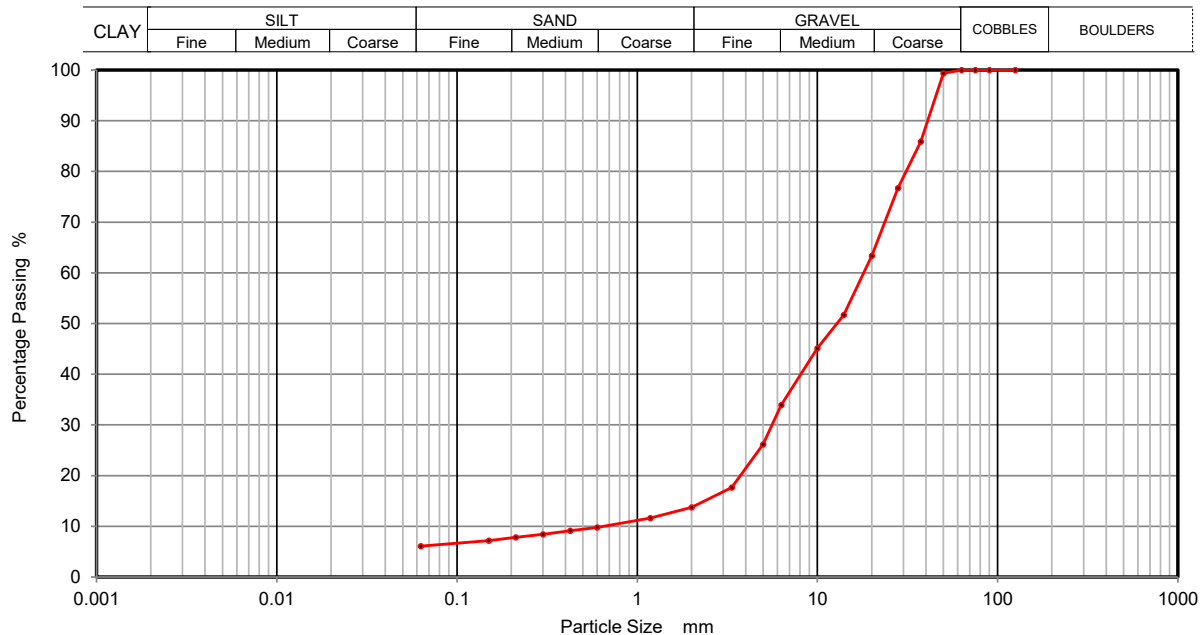
Operator
David Edwards





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

 PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	69815	
	Borehole/Pit No.	TP101	
Project Name	Trebanos WWTW	Sample No.	3
Soil Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.00
		Depth Base	
Date Tested	11/12/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	99		
37.5	86		
28	77		
20	63		
14	52		
10	45		
6.3	34		
5	26		
3.35	18		
2	14		
1.18	12		
0.6	10		
0.425	9		
0.3	8		
0.212	8		
0.15	7		
0.063	6		

Sample Proportions	% dry mass
Cobbles	0
Gravel	86
Sand	8
Silt and Clay	6

Remarks
Preparation and testing in accordance with BS1377 unless noted below

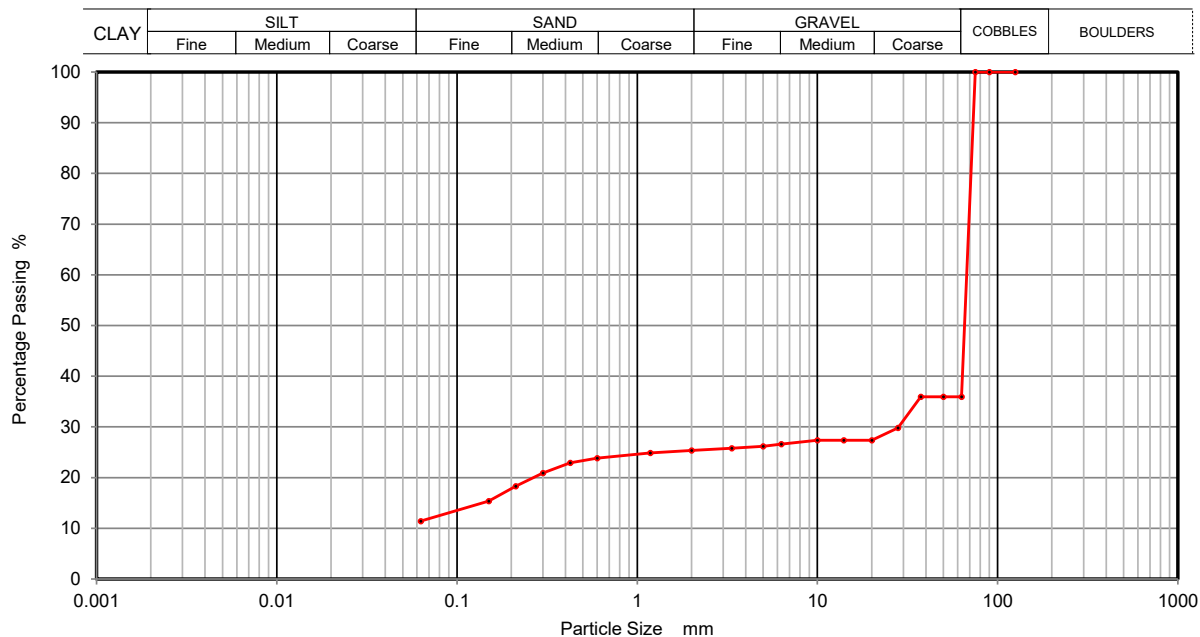
Operator
David Edwards





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	69815
	Borehole/Pit No. TP102
Project Name	Trebanos WWTW
Soil Description	Depth Top 0.50
	Depth Base
Date Tested	11/12/2023
Sample No.	2
Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	36		
50	36		
37.5	36		
28	30		
20	27		
14	27		
10	27		
6.3	27		
5	26		
3.35	26		
2	25		
1.18	25		
0.6	24		
0.425	23		
0.3	21		
0.212	18		
0.15	15		
0.063	11		

Sample Proportions	% dry mass
Cobbles	64
Gravel	11
Sand	14
Silt and Clay	11

Remarks
Preparation and testing in accordance with BS1377 unless noted below

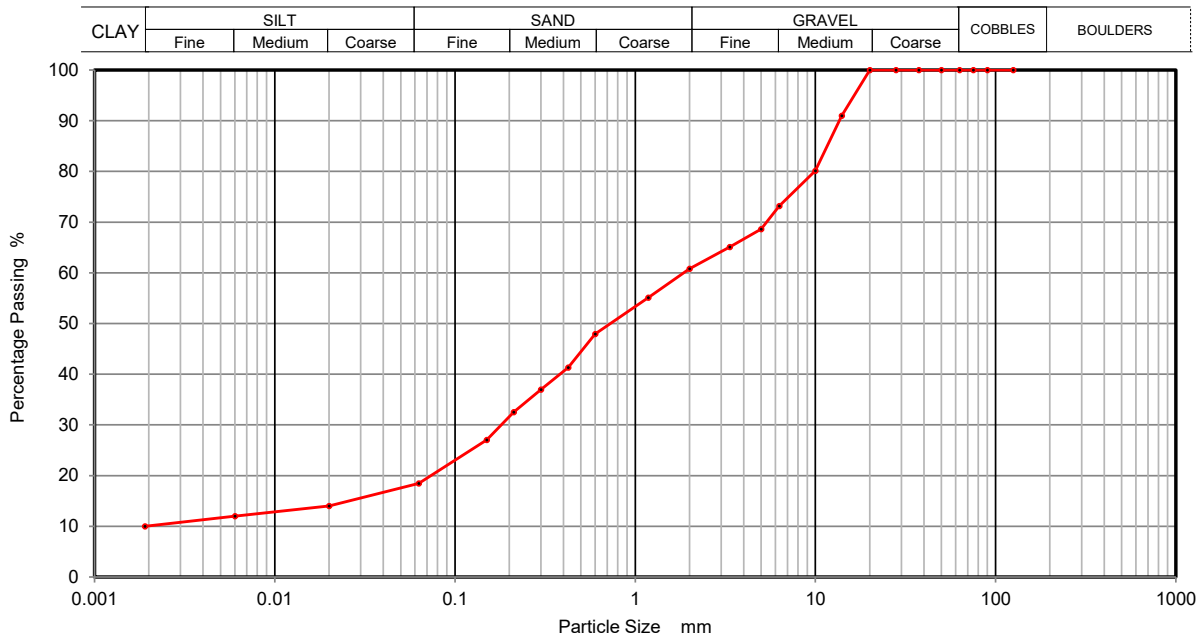
Operator
David Edwards





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	69815	
	TP103	
Borehole/Pit No.	TP103	
Sample No.	2	
Depth Top	1.00	
Depth Base		
Sample Type	B	
Date Tested	11/12/2023	
Project Name	Trebanos WWTW	
Soil Description	Brown silty clayey fine to medium gravelly fine to coarse SAND	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	14
90	100	0.0060	12
75	100	0.0020	10
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	91		
10	80		
6.3	73		
5	69		
3.35	65		
2	61		
1.18	55		
0.6	48		
0.425	41		
0.3	37		
0.212	33		
0.15	27		
0.063	18		

Sample Proportions	% dry mass
Cobbles	0
Gravel	39
Sand	43
Silt	8
Clay	10

Remarks
 Preparation and testing in accordance with BS1377 unless noted below

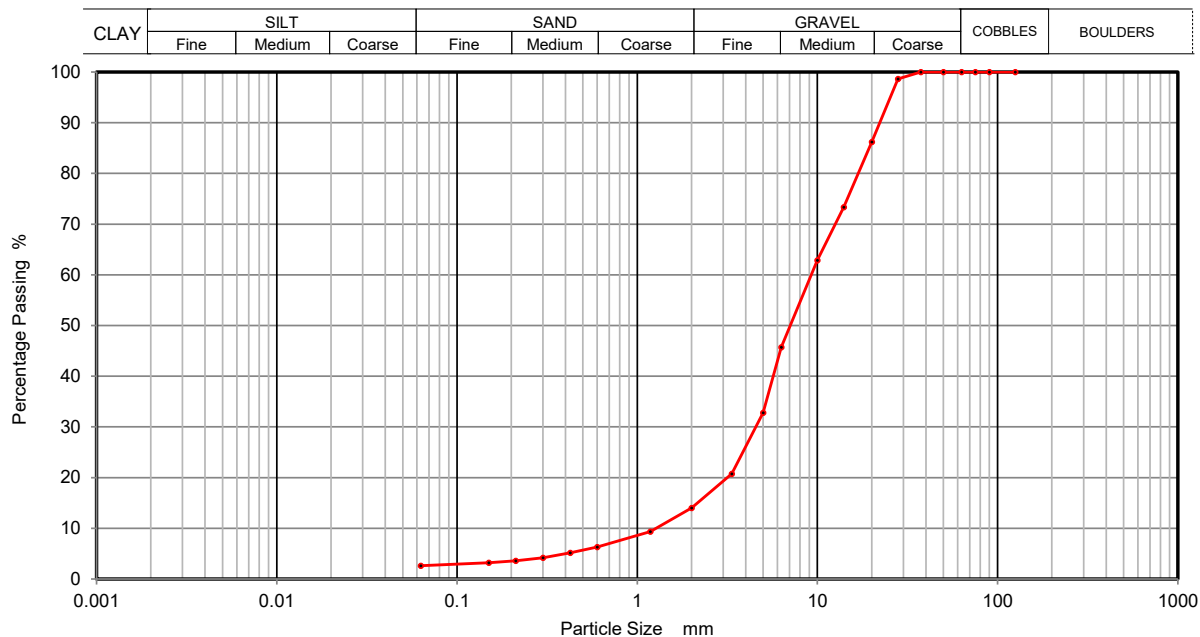
Operator
David Edwards





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

 GEOTECHNICAL SITE & TESTING LABORATORIES	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	69815
		Borehole/Pit No.	TP104
Project Name	Trebanos WWTW	Sample No.	3
Soil Description	Brown slightly silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.50
		Depth Base	
Date Tested	11/12/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	99		
20	86		
14	73		
10	63		
6.3	46		
5	33		
3.35	21		
2	14		
1.18	9		
0.6	6		
0.425	5		
0.3	4		
0.212	4		
0.15	3		
0.063	3		

Sample Proportions	% dry mass
Cobbles	0
Gravel	86
Sand	11
Silt and Clay	3

Remarks
Preparation and testing in accordance with BS1377 unless noted below

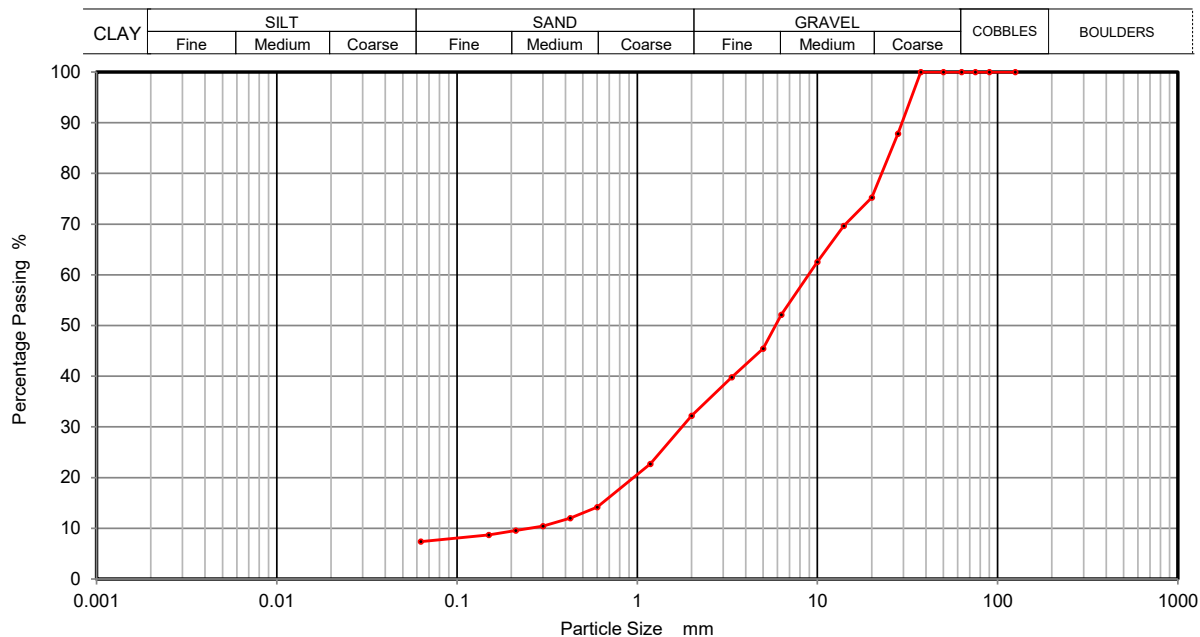
Operator
David Edwards





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

 GEOTECHNICAL SITE & TESTING LABORATORIES	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	69815
		Borehole/Pit No.	TP105
Project Name	Trebanos WWTW	Sample No.	2
Soil Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.50
		Depth Base	
Date Tested	11/12/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	88		
20	75		
14	70		
10	63		
6.3	52		
5	45		
3.35	40		
2	32		
1.18	23		
0.6	14		
0.425	12		
0.3	10		
0.212	10		
0.15	9		
0.063	7		

Sample Proportions	% dry mass
Cobbles	0
Gravel	68
Sand	25
Silt and Clay	7

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards



2788

Test Report: MS DIRECT SHEARBOX TEST.BS1377:Part 7:4.5 :1990.

Borehole Number:	BH101	Depth from (m):	2.70
Sample Number :	4	Depth to (m):	4.20
Sample Type:	B		
Particle Density - Mg/m3:	2.65 (Assumed)		
Specimen Tested:	Submerged, Remoulded (Light Tamping) Material above 2mm removed.		

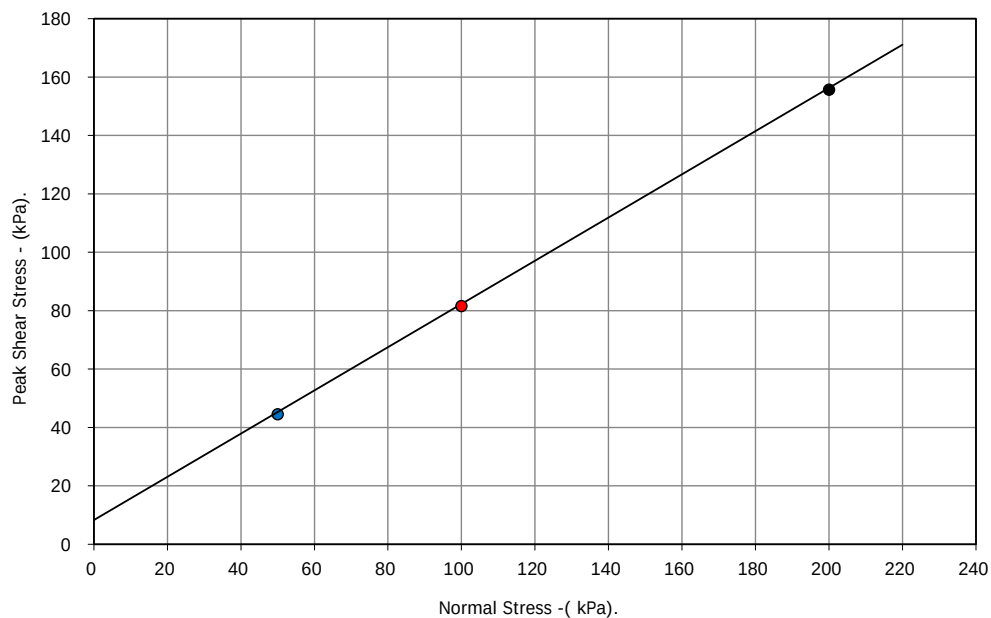
Sample Description:
Brown slightly silty/clayey slightly gravelly fine to coarse SAND

STAGE	1	2	3
Initial Conditions			
Height - mm:	24.80	24.80	24.80
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	19	19	19
Bulk Density - Mg/m3:	1.95	1.95	1.95
Dry Density - Mg/m3:	1.64	1.64	1.64
Voids Ratio:	0.6113	0.6147	0.6120
Degree of Saturation - %:	80.42	79.98	80.33
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	23.98	23.85	23.48
Shear			
Rate of Horizontal Displacement (mm/min)	0.500	0.500	0.500
Horizontal Displacement at Peak Shear Stress (mm)	2.88	3.61	4.78
Peak shear Stress - kPa:	45	82	156

PEAK

Angle of Shearing Resistance: (θ)	36.5
Effective Cohesion - kPa:	8.3

FAILURE CONDITIONS



Trebanos WWTW

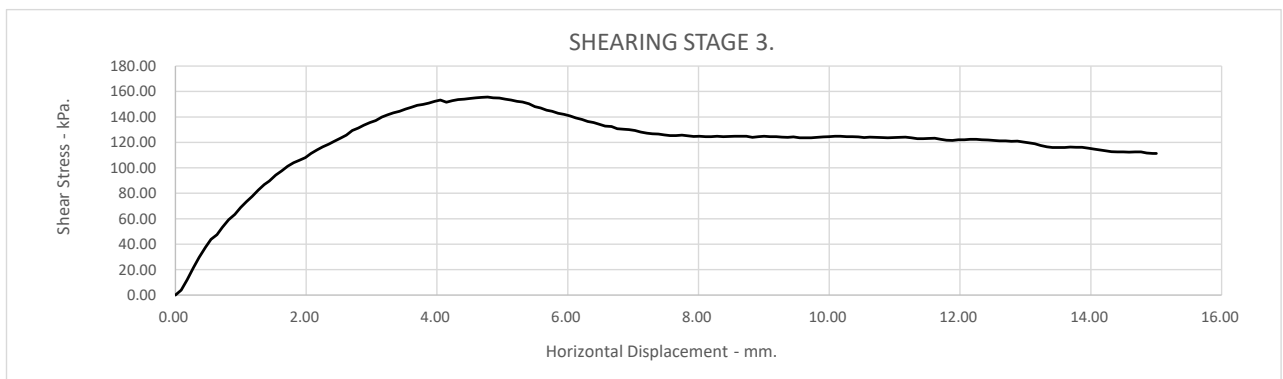
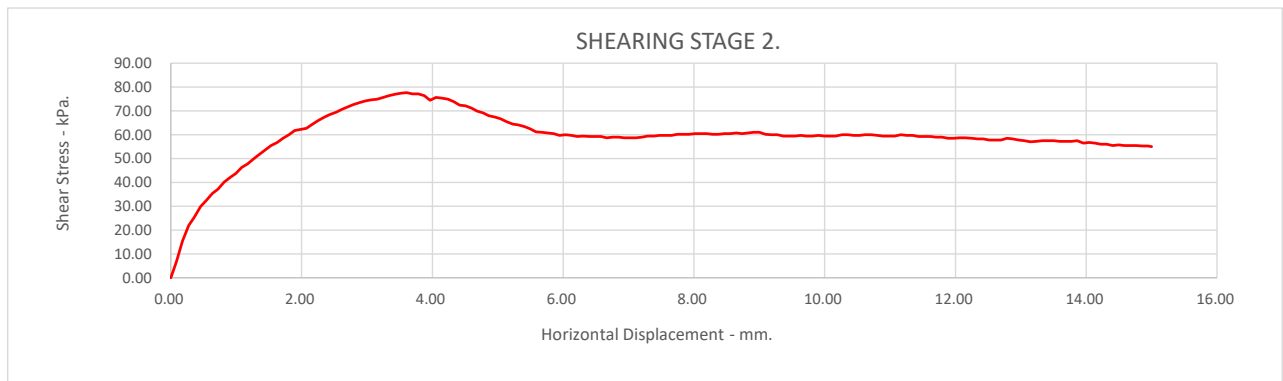
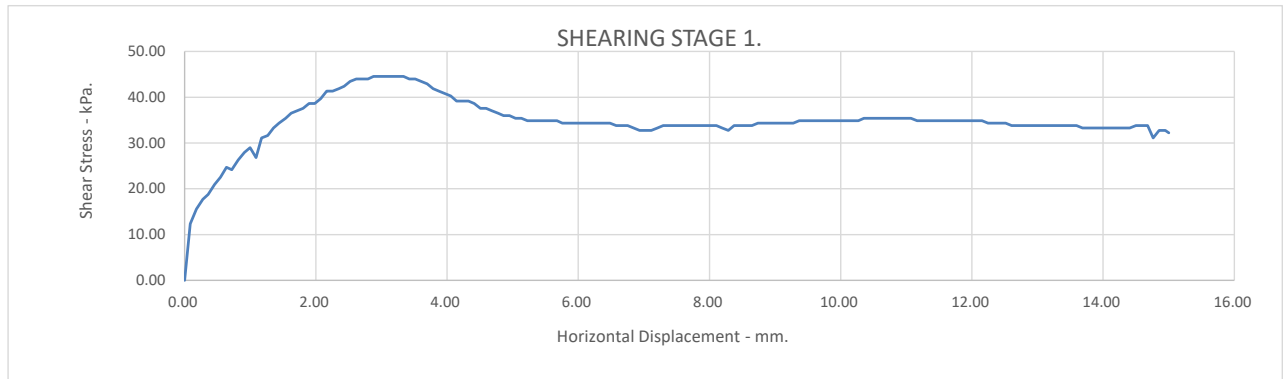
Contract No.:

69815
Client Ref Number:

Q1402

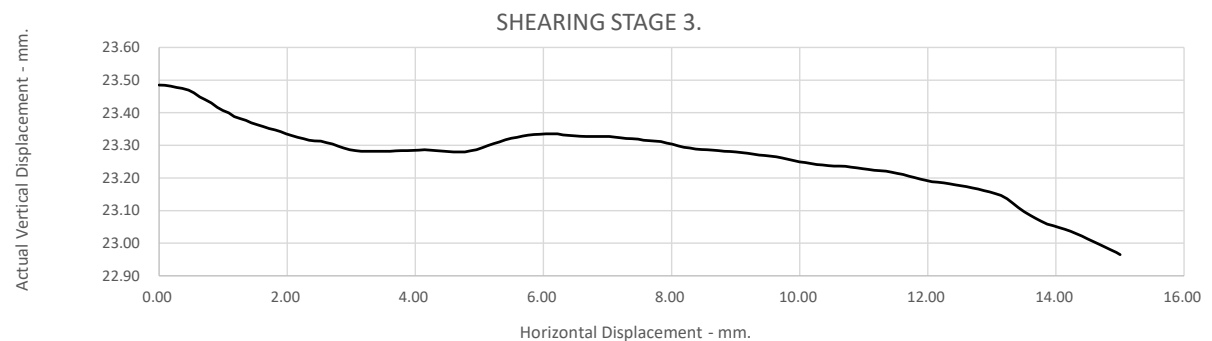
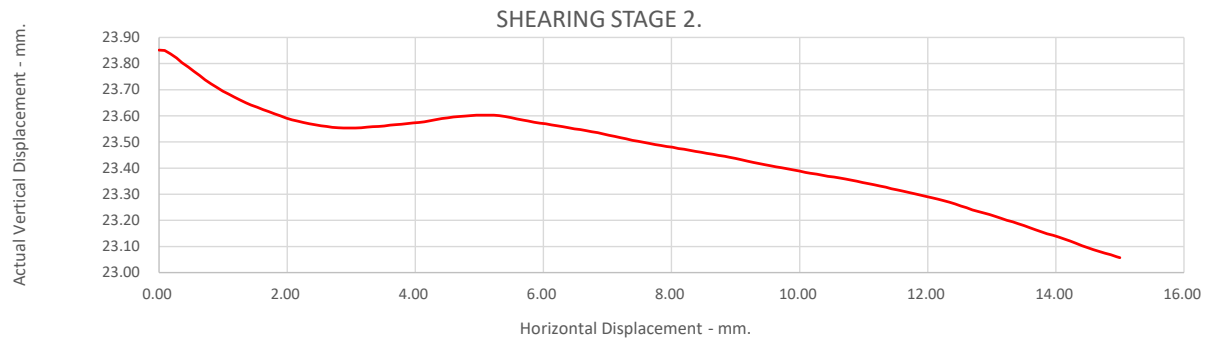
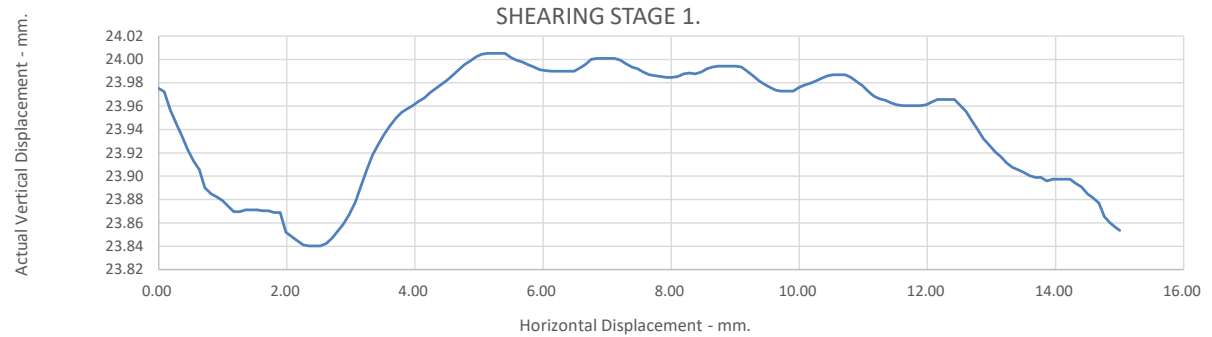
Borehole Number: BH101
Sample Number : 4

Depth from (m): 2.70
Depth to (m): 4.20



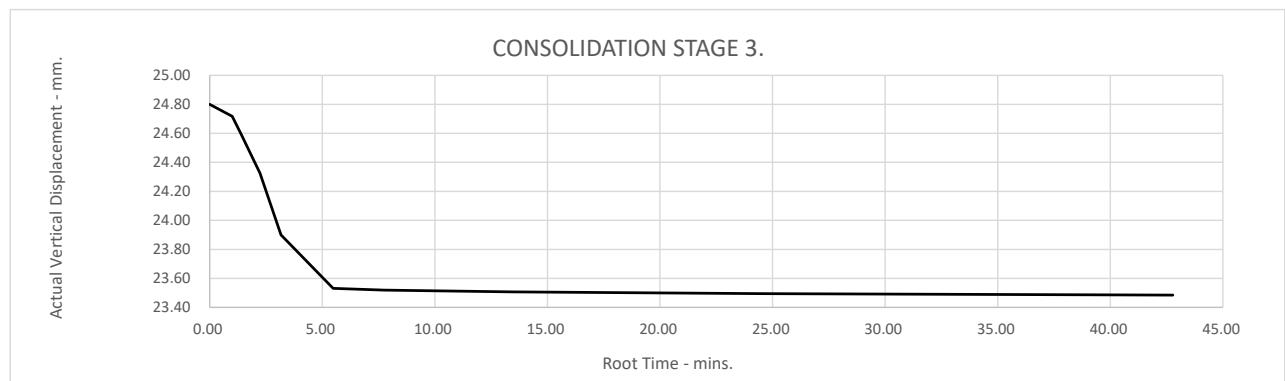
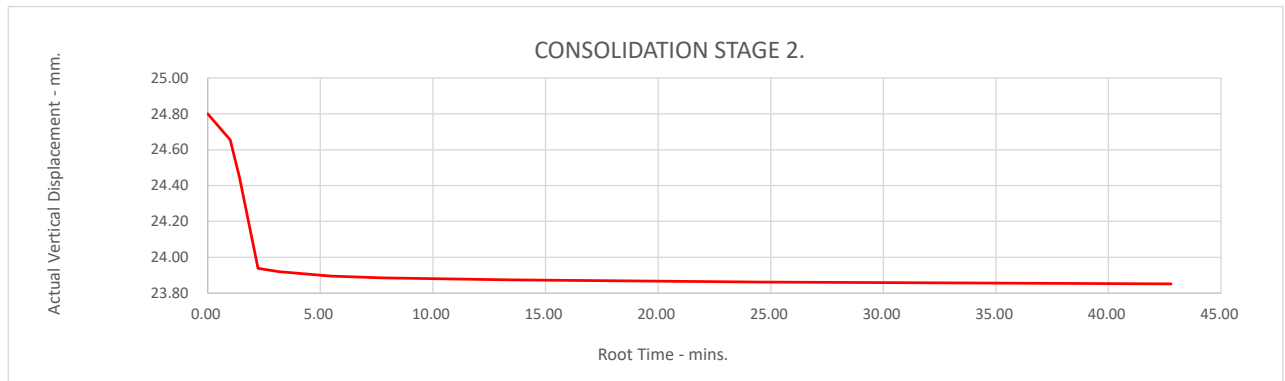
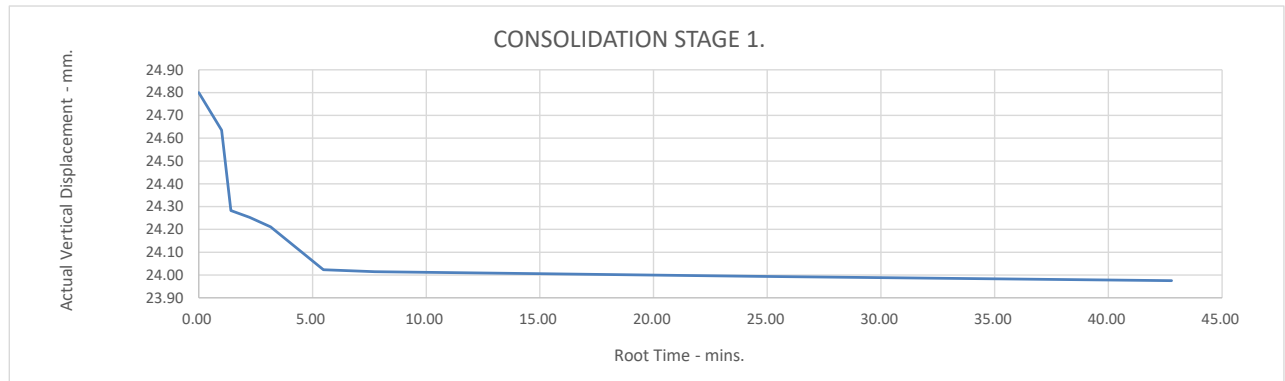
Borehole Number: BH101
Sample Number : 4

Depth from (m): 2.70
Depth to (m): 4.20



Borehole Number: BH101
Sample Number : 4

Depth from (m): 2.70
Depth to (m): 4.20



Test Report: MS DIRECT SHEARBOX TEST.BS1377:Part 7:4.5 :1990.

Borehole Number: BH101
 Sample Number : 6
 Depth from (m): 7.20
 Depth to (m): 8.70

Sample Type: B
 Particle Density - Mg/m3: 2.65 (Assumed)
 Specimen Tested: Submerged, Remoulded (Light Tamping) Material above 2mm removed.

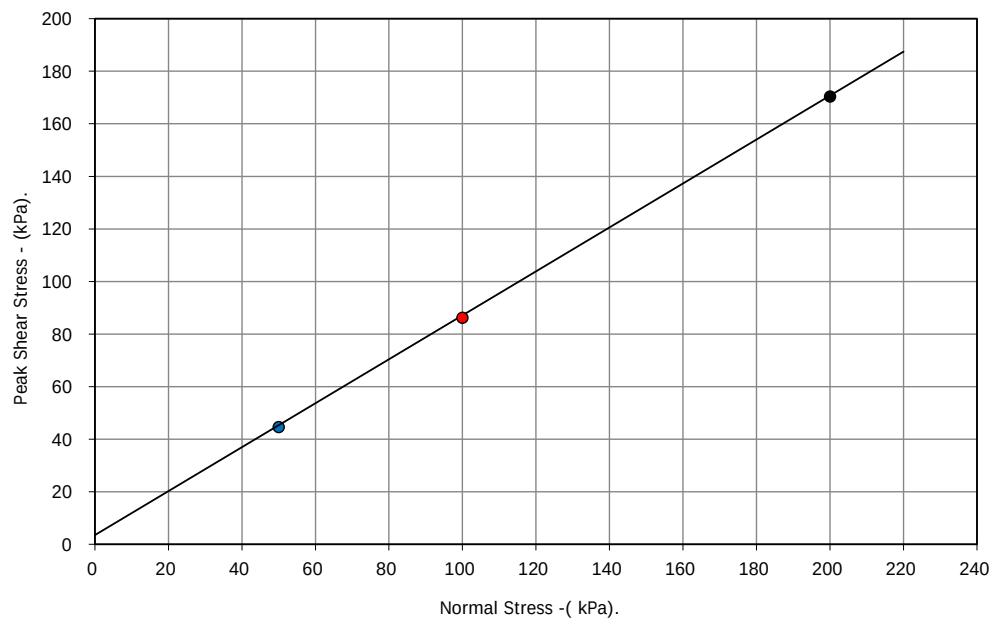
Sample Description:
 Brown clayey silty fine to coarse gravelly fine to coarse SAND

STAGE	1	2	3
Initial Conditions			
Height - mm:	24.80	24.80	24.80
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	20	20	20
Bulk Density - Mg/m3:	2.00	2.00	2.00
Dry Density - Mg/m3:	1.67	1.66	1.66
Voids Ratio:	0.5909	0.5941	0.5932
Degree of Saturation - %:	89.84	89.36	89.49
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	23.76	23.39	22.52
Shear			
Rate of Horizontal Displacement (mm/min)	0.500	0.500	0.500
Horizontal Displacement at Peak Shear Stress (mm)	4.24	3.16	5.41
Peak shear Stress - kPa:	45	86	170

PEAK

Angle of Shearing Resistance: (θ) 40.0
 Effective Cohesion - kPa: 3.5

FAILURE CONDITIONS



● Peak shear Stress - kPa: — Best Fit Line



Trebanos WWTW

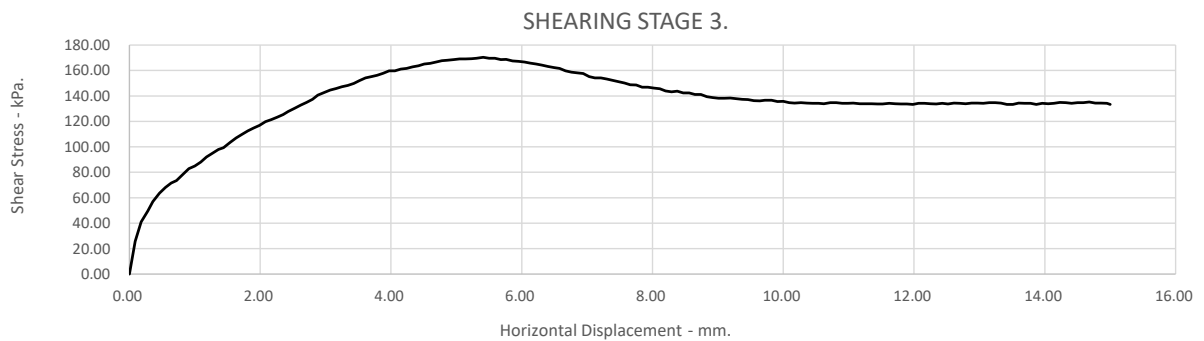
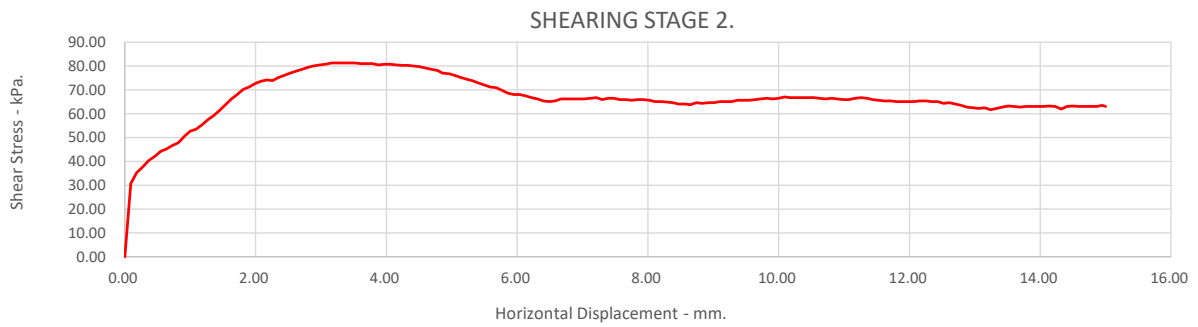
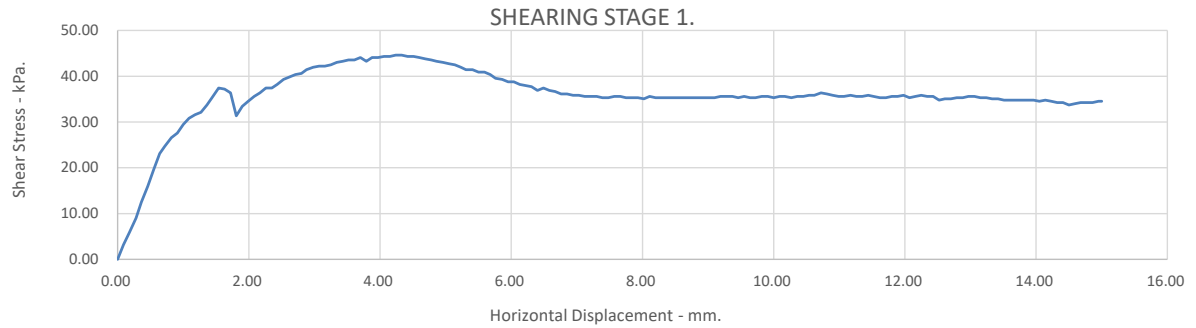
Contract No.:

69815
 Client Ref Number:

Q1402

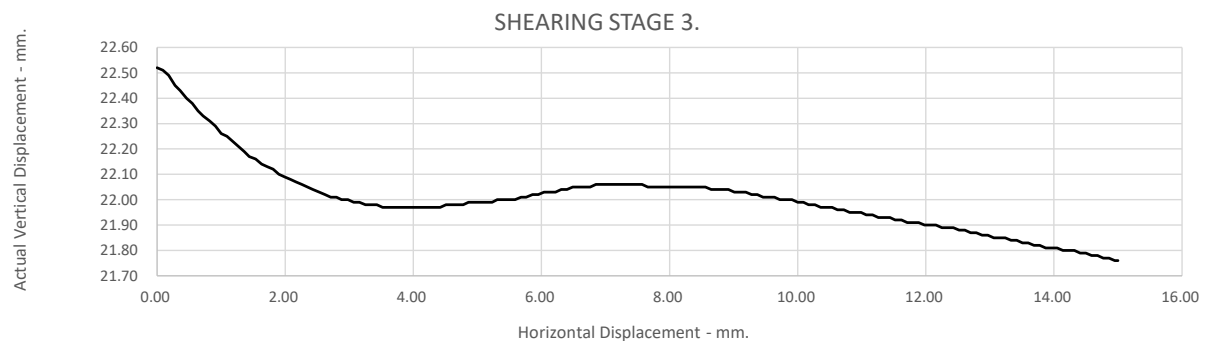
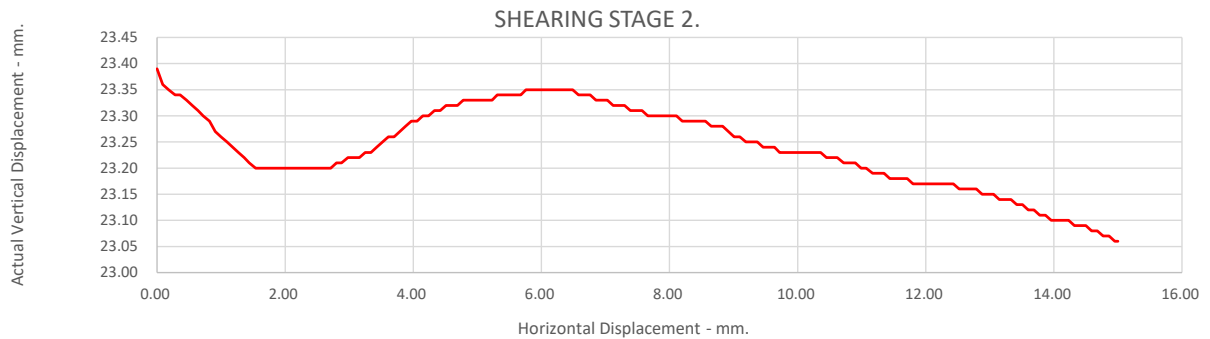
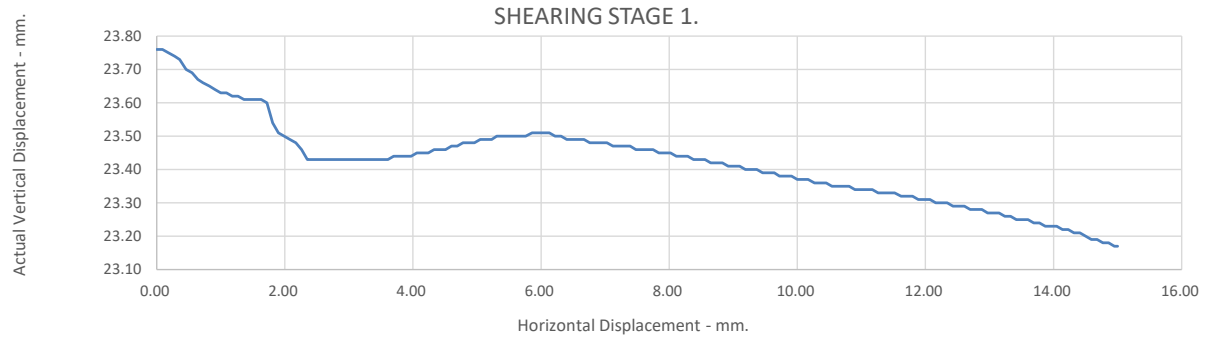
Borehole Number: BH101
Sample Number : 6

Depth from (m): 7.20
Depth to (m): 8.70



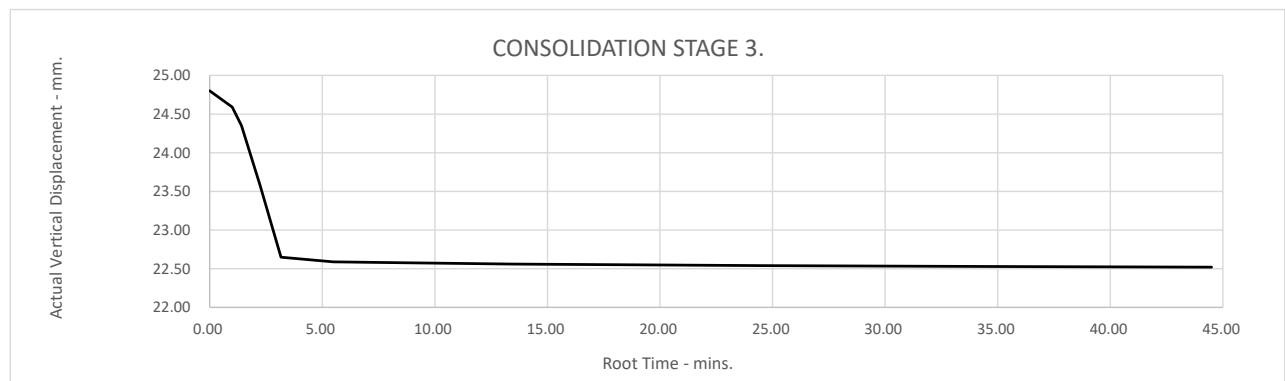
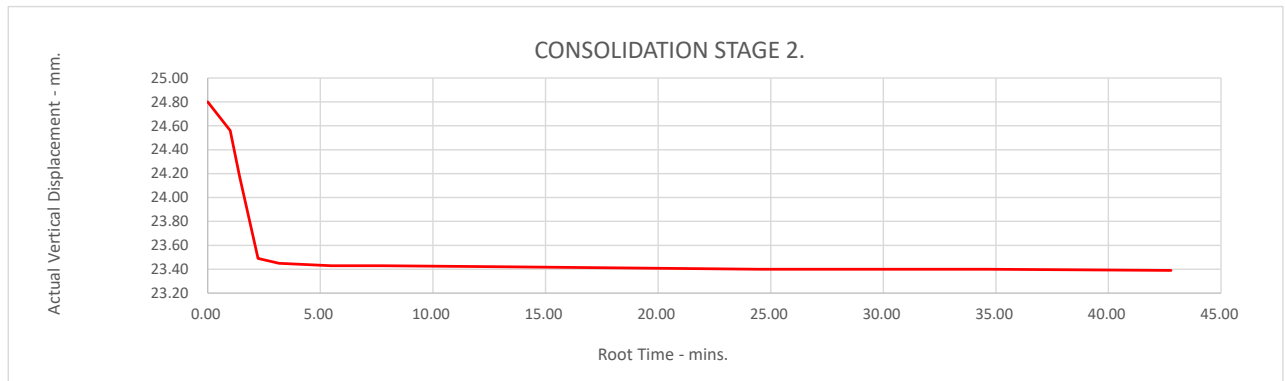
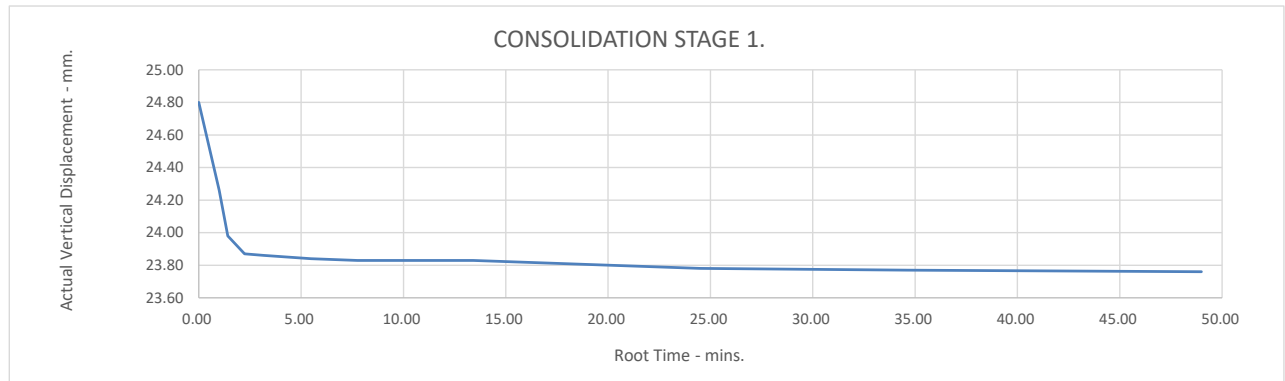
Borehole Number: BH101
Sample Number : 6

Depth from (m): 7.20
Depth to (m): 8.70



Borehole Number: BH101
Sample Number : 6

Depth from (m): 7.20
Depth to (m): 8.70



Test Report: MS DIRECT SHEARBOX TEST.BS1377:Part 7:4.5 :1990.

Borehole Number: BH102
 Sample Number : 4
 Depth from (m): 3.35
 Depth to (m): 4.00

Sample Type: B
 Particle Density - Mg/m³: 2.65 (Assumed)
 Specimen Tested: Submerged, Remoulded (Light Tamping) Material above 2mm removed.

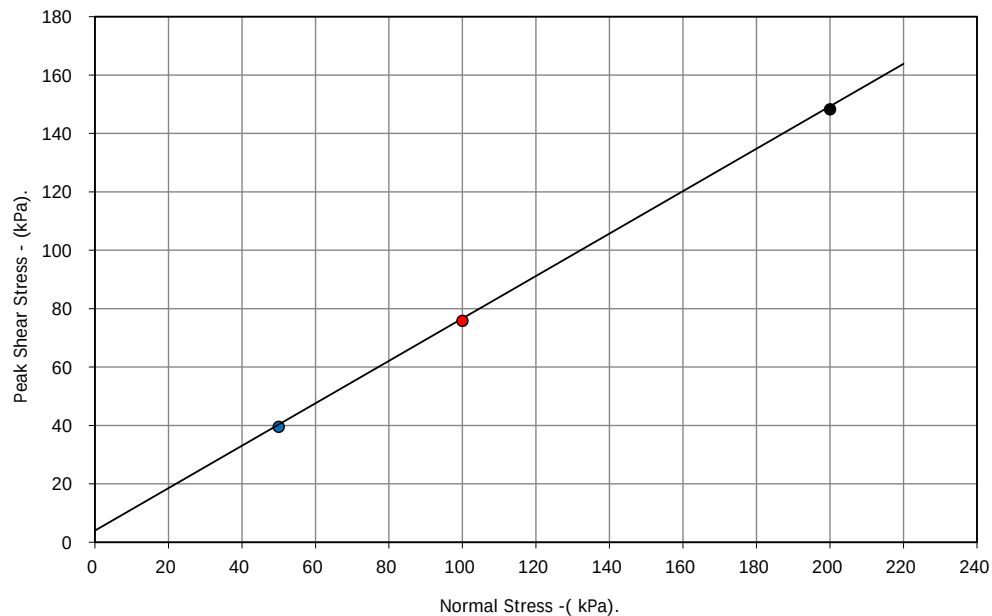
Sample Description:
 Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL

STAGE	1	2	3
Initial Conditions			
Height - mm:	24.80	24.80	24.80
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	21	21	21
Bulk Density - Mg/m ³ :	2.00	1.99	1.99
Dry Density - Mg/m ³ :	1.65	1.65	1.65
Voids Ratio:	0.6029	0.6060	0.6068
Degree of Saturation - %:	91.23	90.75	90.63
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	23.72	23.03	22.82
Shear			
Rate of Horizontal Displacement (mm/min)	0.500	0.500	0.500
Horizontal Displacement at Peak Shear Stress (mm)	3.61	5.41	6.22
Peak shear Stress - kPa:	40	76	148

PEAK

Angle of Shearing Resistance: (θ) 36.0
 Effective Cohesion - kPa: 4.0

FAILURE CONDITIONS



● Peak shear Stress - kPa: — Best Fit Line



Trebanos WWTW

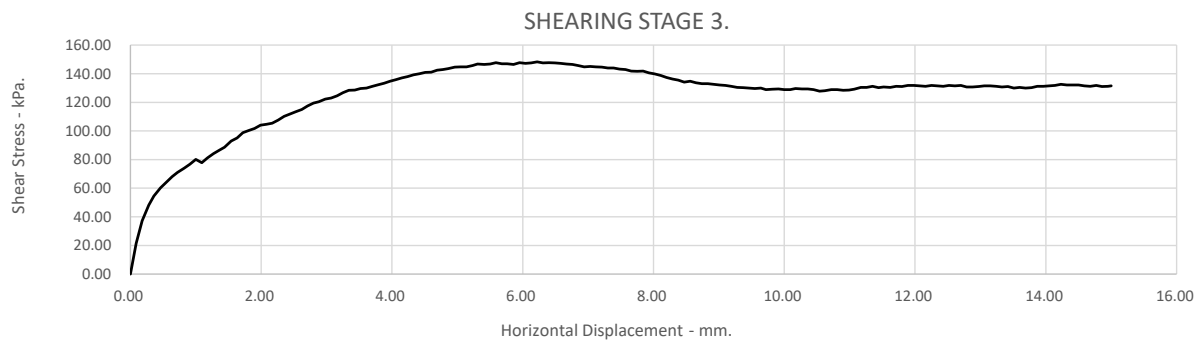
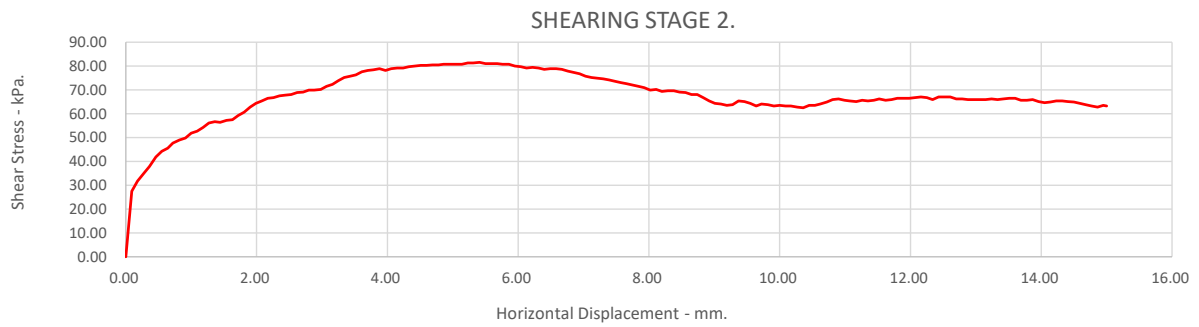
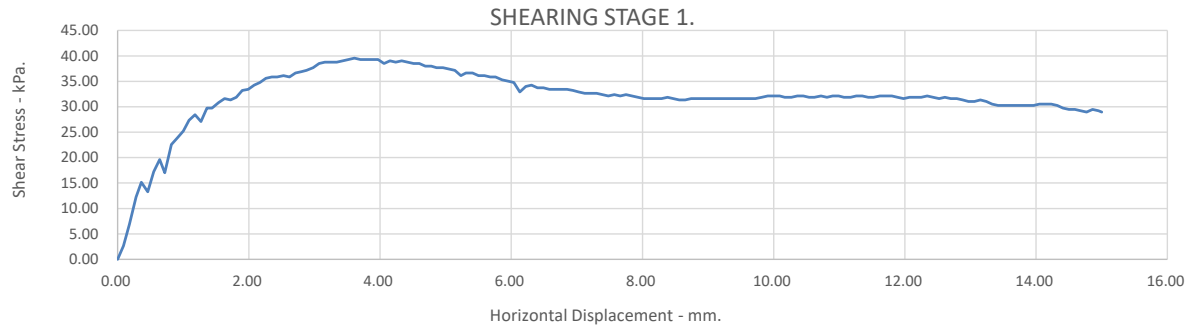
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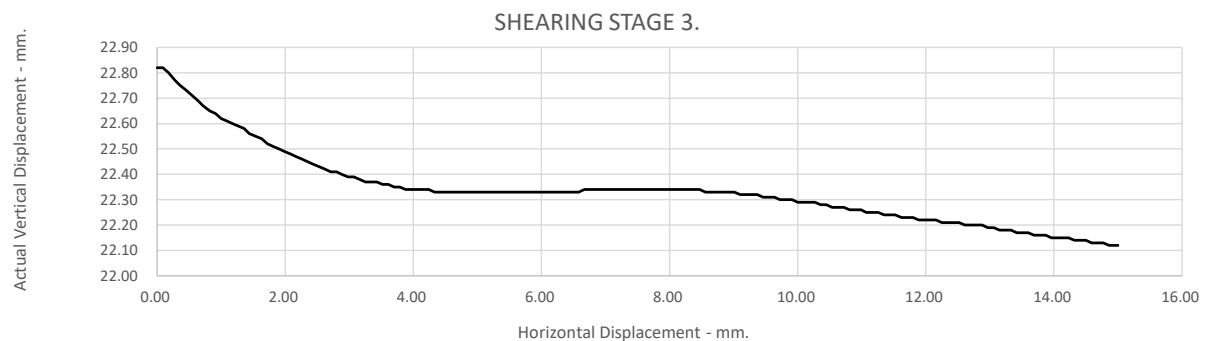
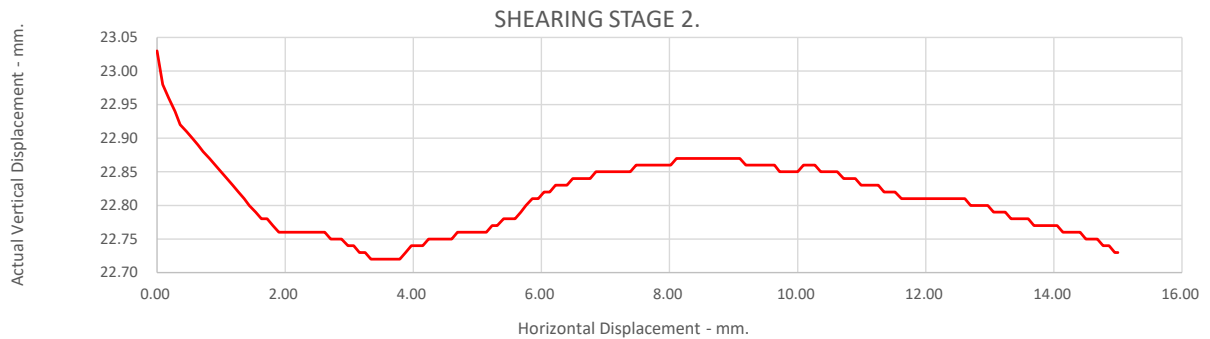
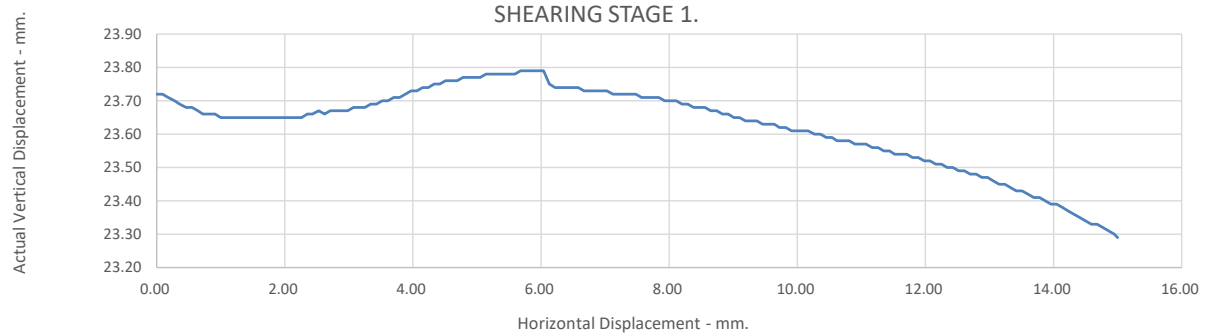
Borehole Number: BH102
Sample Number : 4

Depth from (m): 3.35
Depth to (m): 4.00



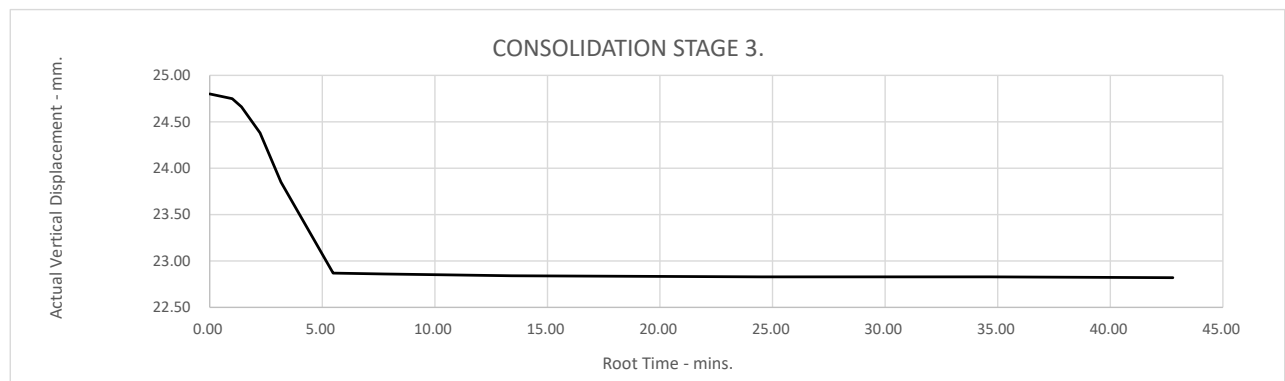
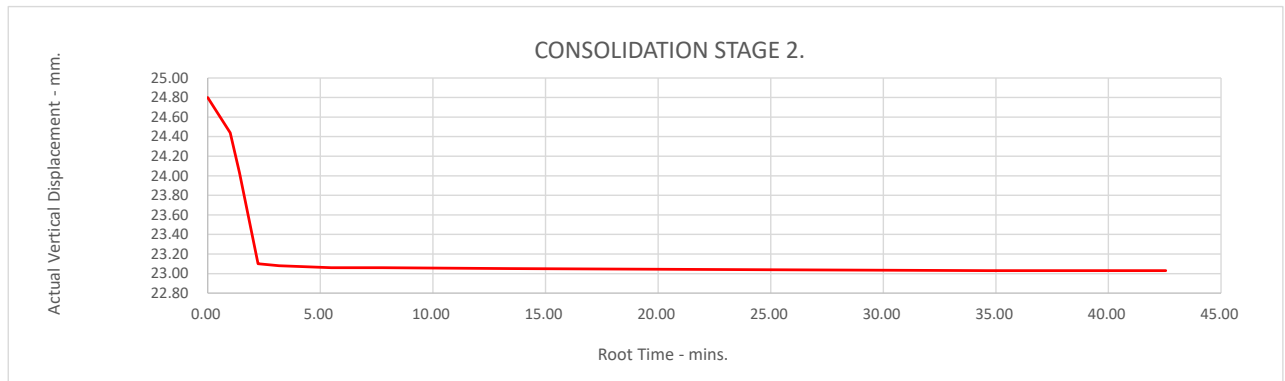
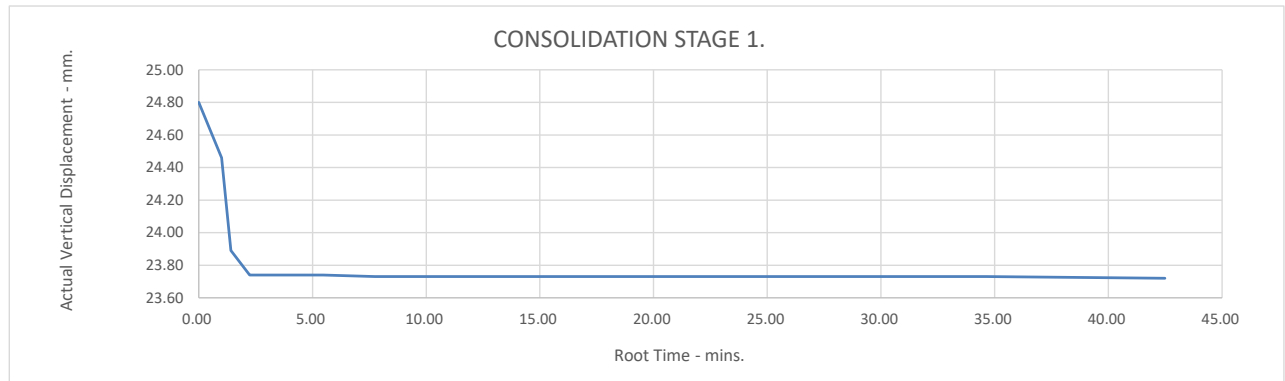
Borehole Number: BH102
Sample Number : 4

Depth from (m): 3.35
Depth to (m): 4.00



Borehole Number: BH102
Sample Number : 4

Depth from (m): 3.35
Depth to (m): 4.00



Test Report: MS DIRECT SHEARBOX TEST.BS1377:Part 7:4.5 :1990.

Borehole Number: BH102 Depth from (m): 7.00
Sample Number : 7 Depth to (m): 7.70

Sample Type: B
Particle Density - Mg/m³: 2.65 (Assumed)
Specimen Tested: Submerged, Remoulded (Light Tamping) Material above 2mm removed.

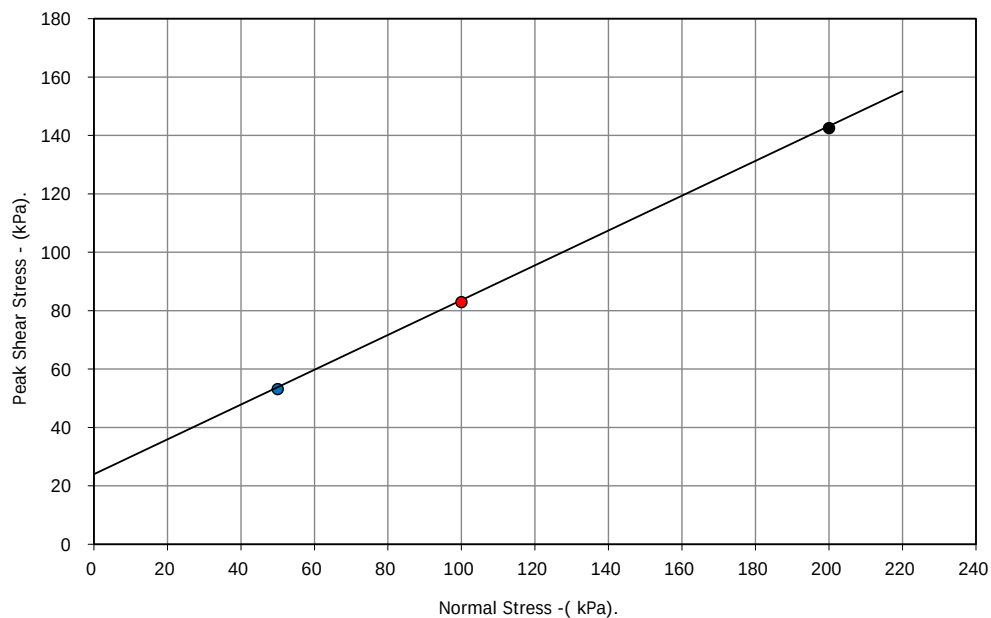
Sample Description:
Brown slightly silty/clayey fine to coarse sandy fine to coarse GRAVEL

STAGE	1	2	3
Initial Conditions			
Height - mm:	24.80	24.80	24.80
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	19	19	19
Bulk Density - Mg/m ³ :	2.07	2.07	2.06
Dry Density - Mg/m ³ :	1.74	1.74	1.74
Voids Ratio:	0.5250	0.5241	0.5272
Degree of Saturation - %:	95.84	96.01	95.45
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	23.62	23.29	23.16
Shear			
Rate of Horizontal Displacement (mm/min)	0.500	0.500	0.500
Horizontal Displacement at Peak Shear Stress (mm)	4.24	5.05	5.31
Peak shear Stress - kPa:	53	83	143

PEAK

Angle of Shearing Resistance: (θ) 31.0
Effective Cohesion - kPa: 24

FAILURE CONDITIONS



● Peak shear Stress - kPa: — Best Fit Line



Trebanos WWTW

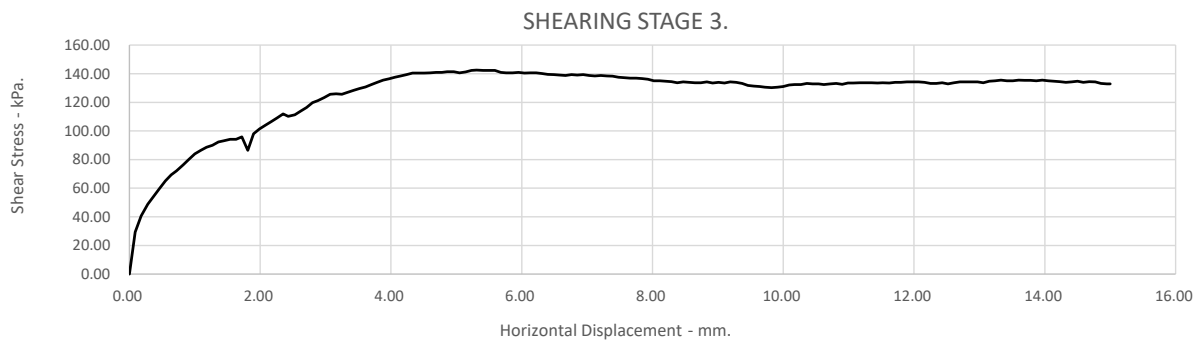
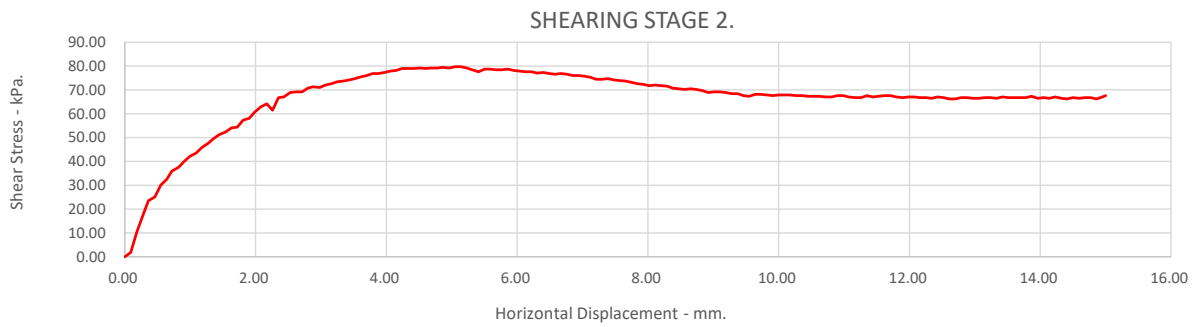
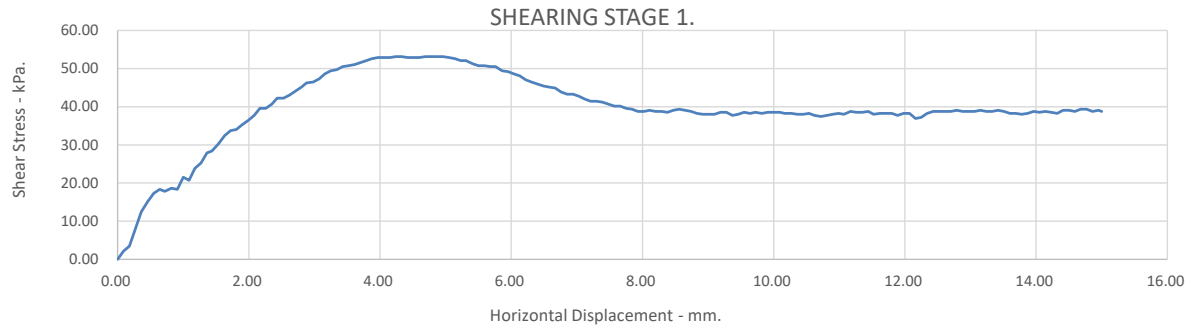
Contract No.:

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Client Ref Number:

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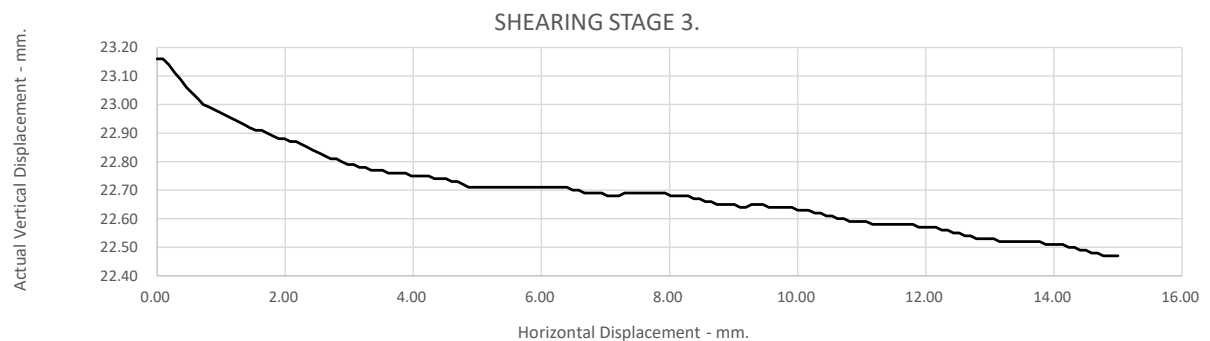
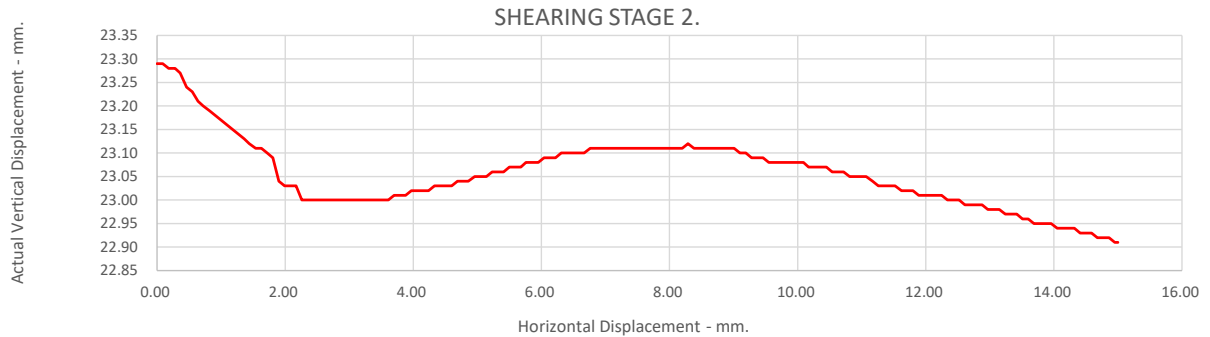
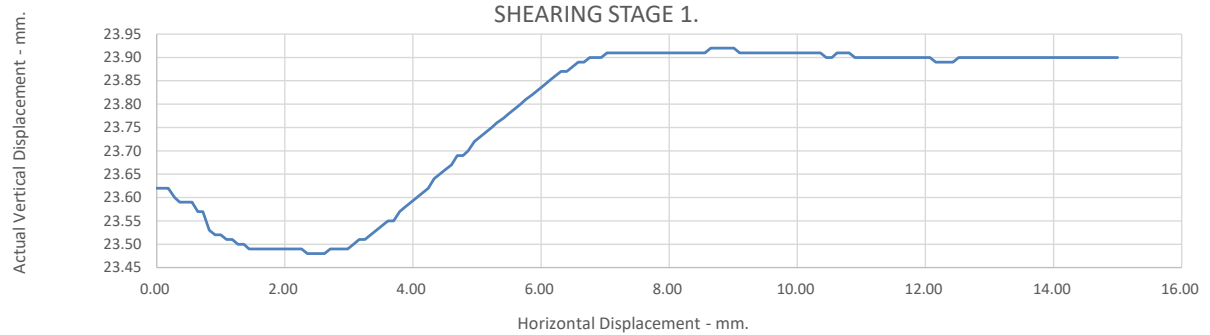
Borehole Number: BH102
Sample Number : 7

Depth from (m): 7.00
Depth to (m): 7.70



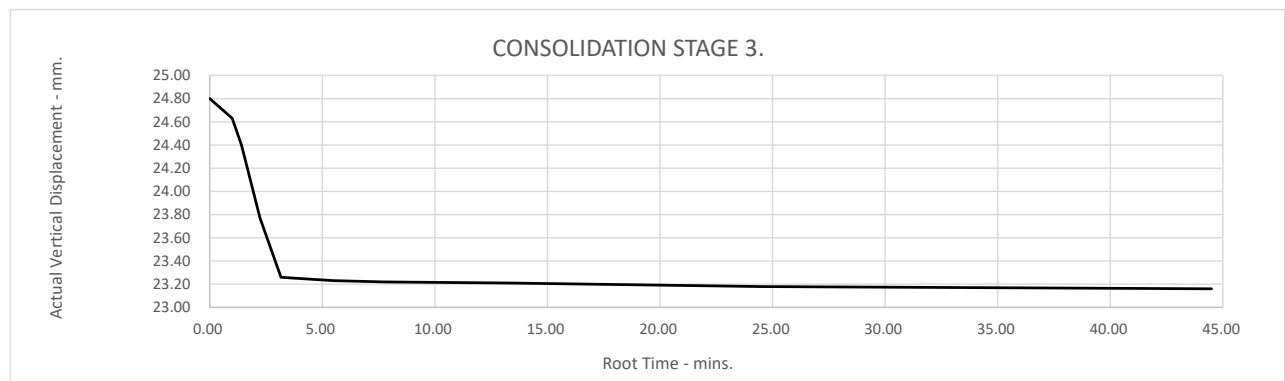
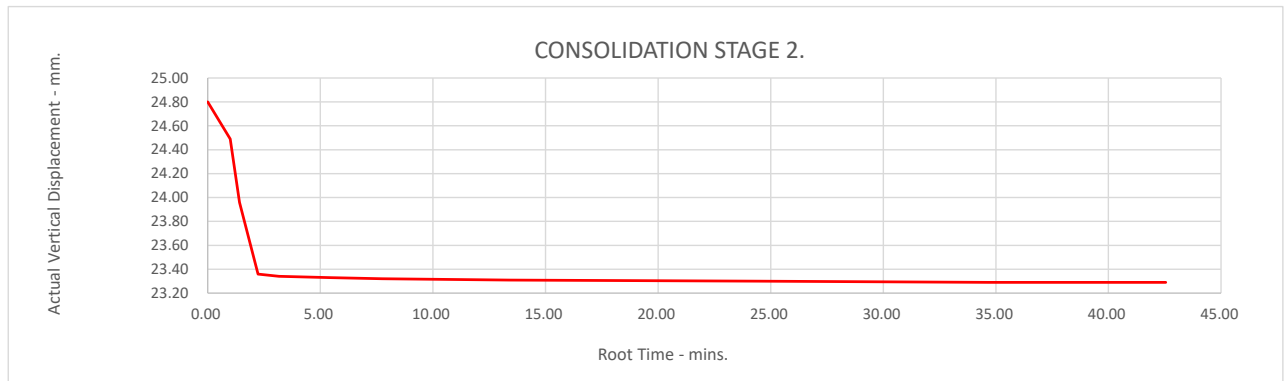
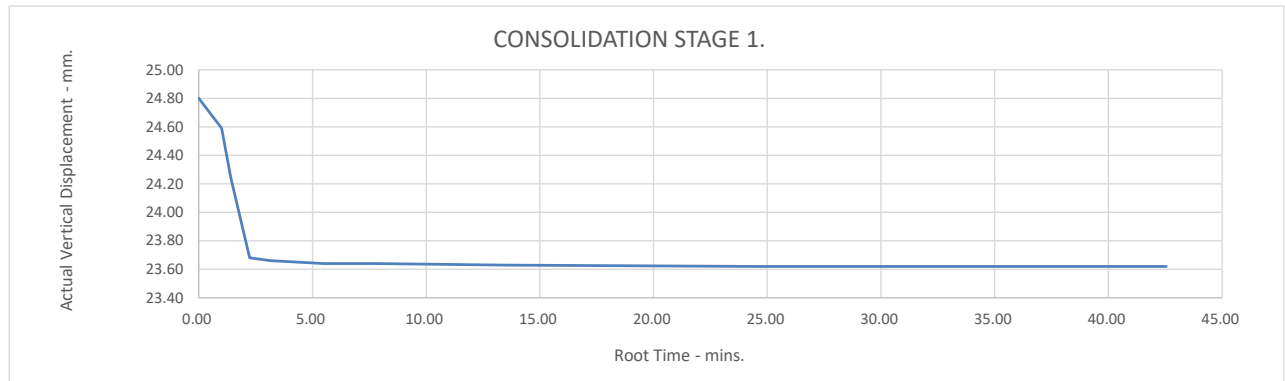
Borehole Number: BH102
Sample Number : 7

Depth from (m): 7.00
Depth to (m): 7.70



Borehole Number: BH102
Sample Number : 7

Depth from (m): 7.00
Depth to (m): 7.70



Test Report: MS DIRECT SHEARBOX TEST.BS1377:Part 7:4.5 :1990.

Borehole Number: BH103 Depth from (m): 2.20
Sample Number : 5 Depth to (m): 2.80

Sample Type: B
Particle Density - Mg/m³: 2.65 (Assumed)
Specimen Tested: Submerged, Remoulded (Light Tamping) Material above 2mm removed.

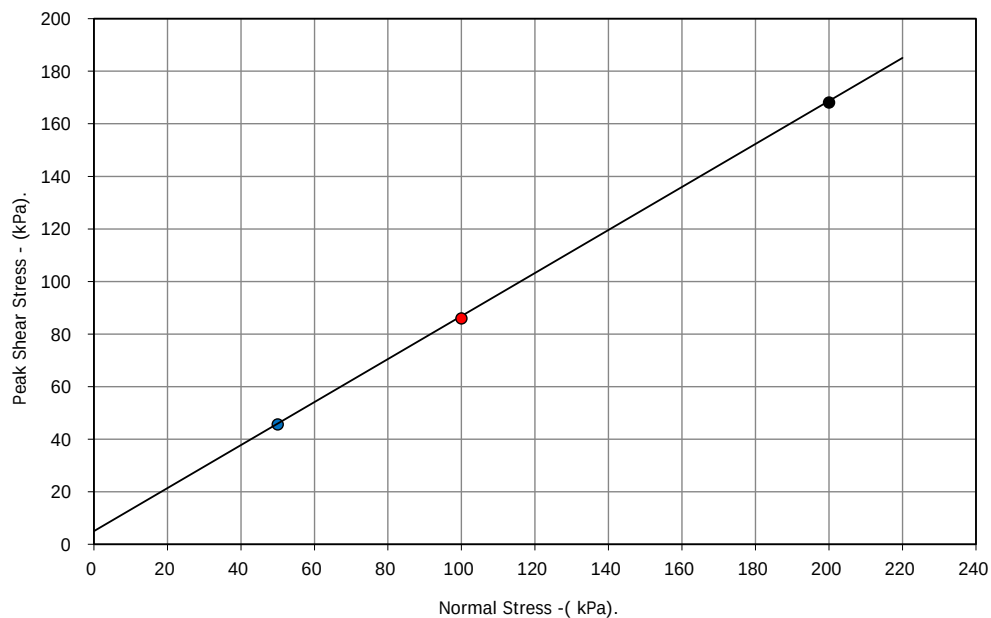
Sample Description:
Brown slightly silty/clayey fine to coarse sandy fine to coarse GRAVEL

STAGE	1	2	3
Initial Conditions			
Height - mm:	24.80	24.80	24.80
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	20	20	20
Bulk Density - Mg/m ³ :	1.85	1.85	1.85
Dry Density - Mg/m ³ :	1.54	1.54	1.54
Voids Ratio:	0.7228	0.7254	0.7222
Degree of Saturation - %:	75.10	74.83	75.17
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	24.26	23.86	23.27
Shear			
Rate of Horizontal Displacement (mm/min)	0.500	0.500	0.500
Horizontal Displacement at Peak Shear Stress (mm)	2.71	4.68	5.68
Peak shear Stress - kPa:	46	86	168

PEAK

Angle of Shearing Resistance: (θ) 39.5
Effective Cohesion - kPa: 5.0

FAILURE CONDITIONS



● Peak shear Stress - kPa: — Best Fit Line



Trebanos WWTW

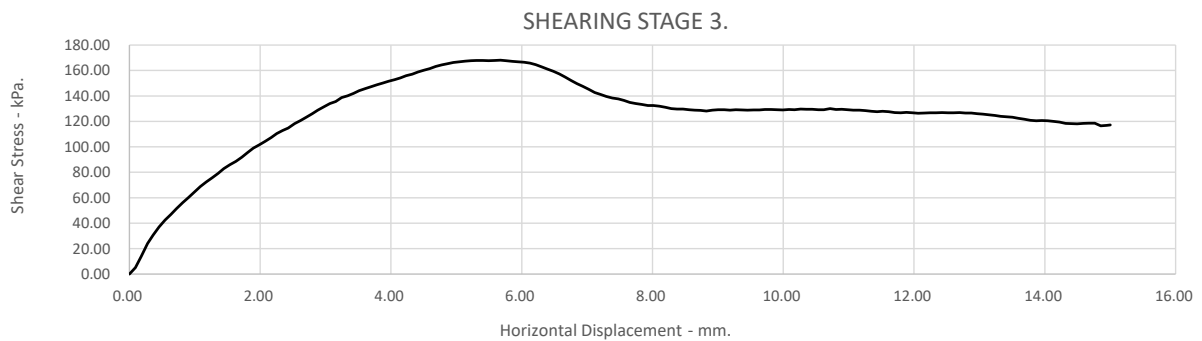
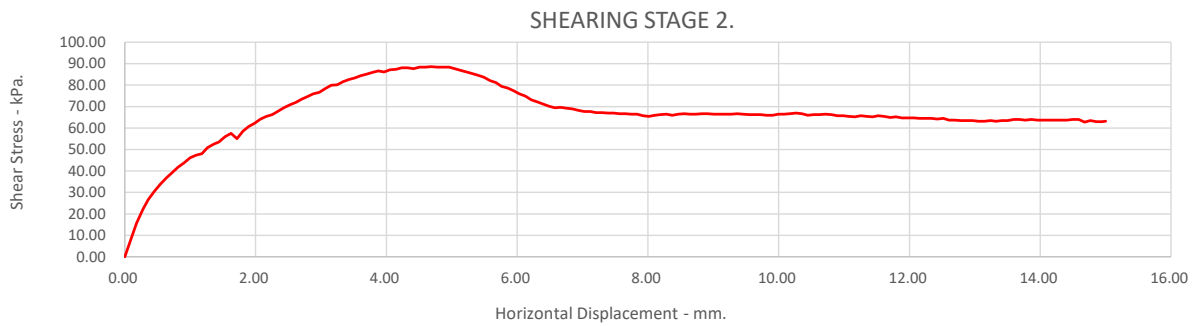
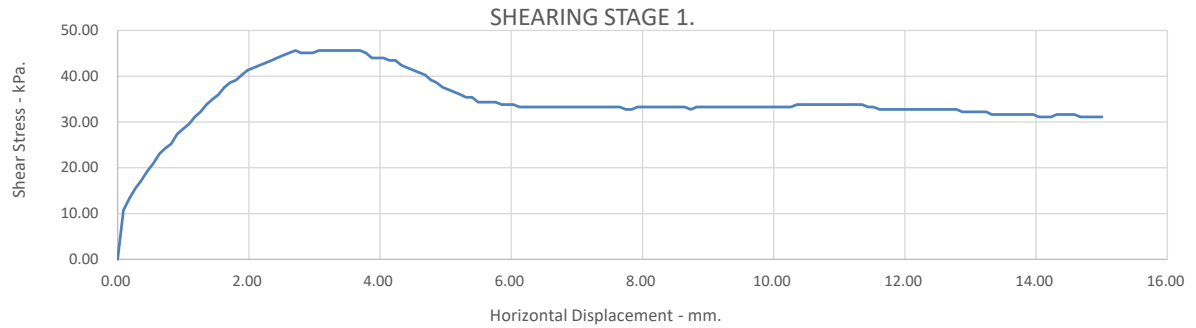
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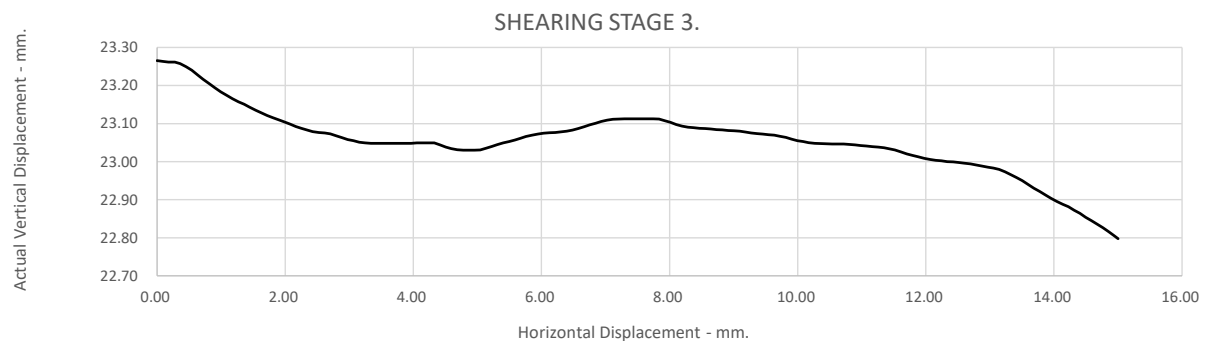
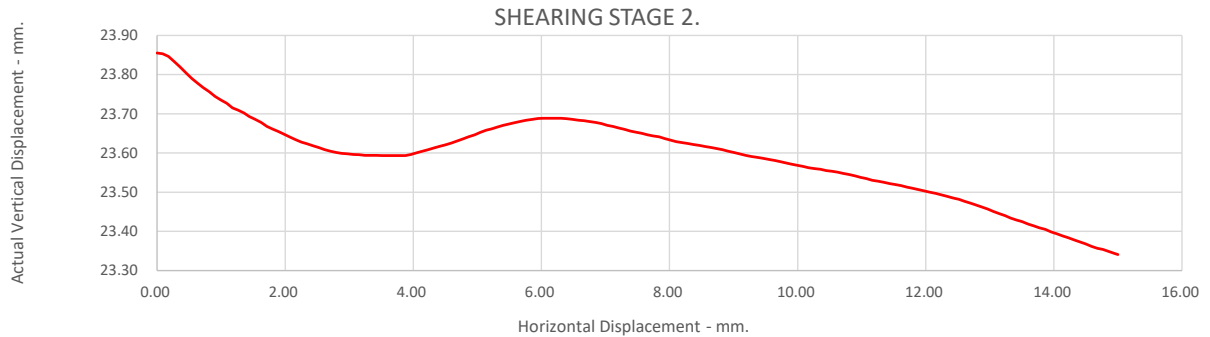
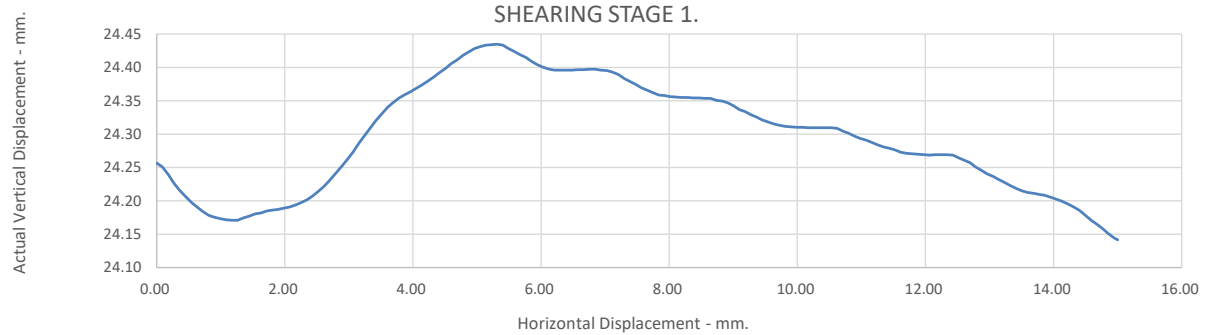
Borehole Number: BH103
Sample Number : 5

Depth from (m): 2.20
Depth to (m): 2.80



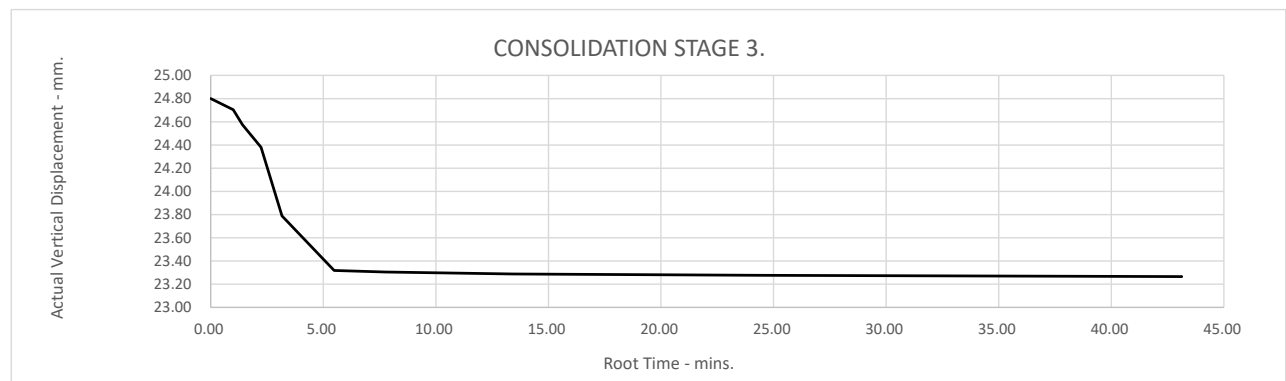
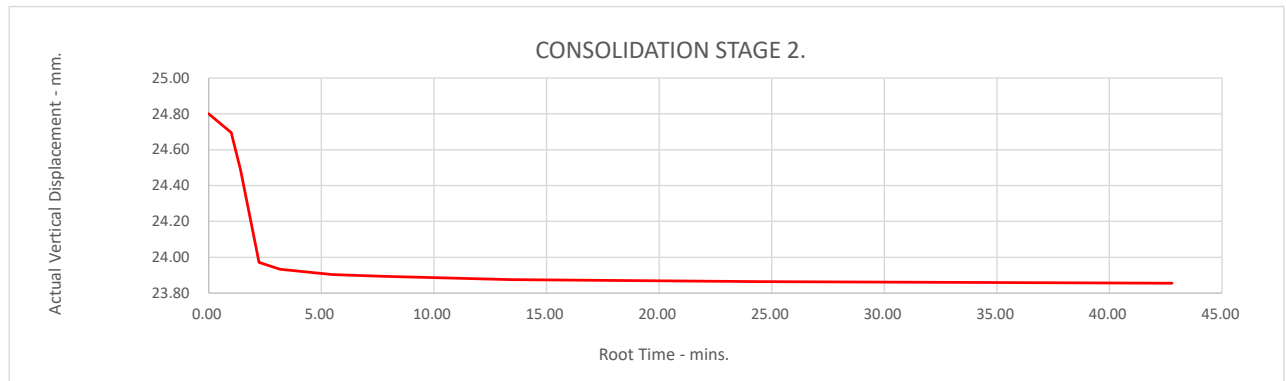
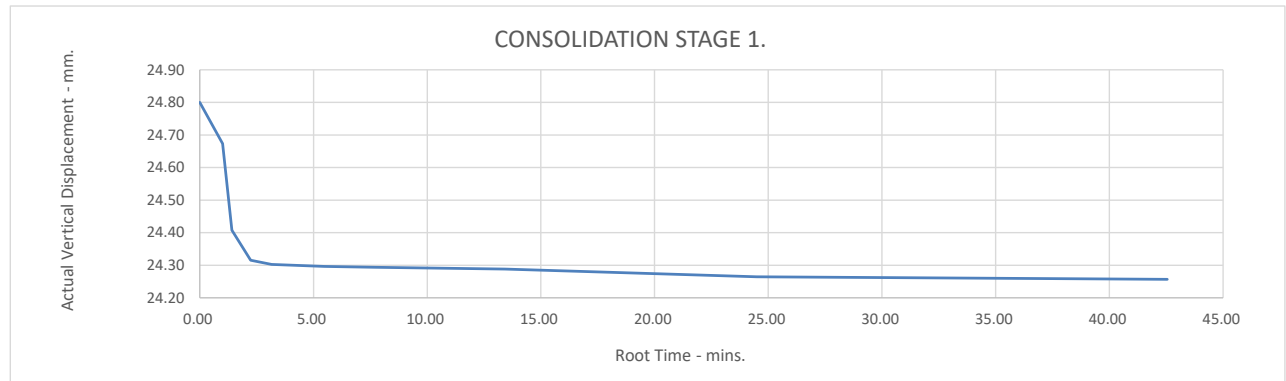
Borehole Number: BH103
Sample Number : 5

Depth from (m): 2.20
Depth to (m): 2.80



Borehole Number: BH103
Sample Number : 5

Depth from (m): 2.20
Depth to (m): 2.80



Test Report: MS DIRECT SHEARBOX TEST.BS1377:Part 7:4.5 :1990.

Borehole Number: BH105 Depth from (m): 4.70
Sample Number : 5 Depth to (m): 6.20

Sample Type: B
Particle Density - Mg/m3: 2.65 (Assumed)
Specimen Tested: Submerged, Remoulded (Light Tamping) Material above 2mm removed.

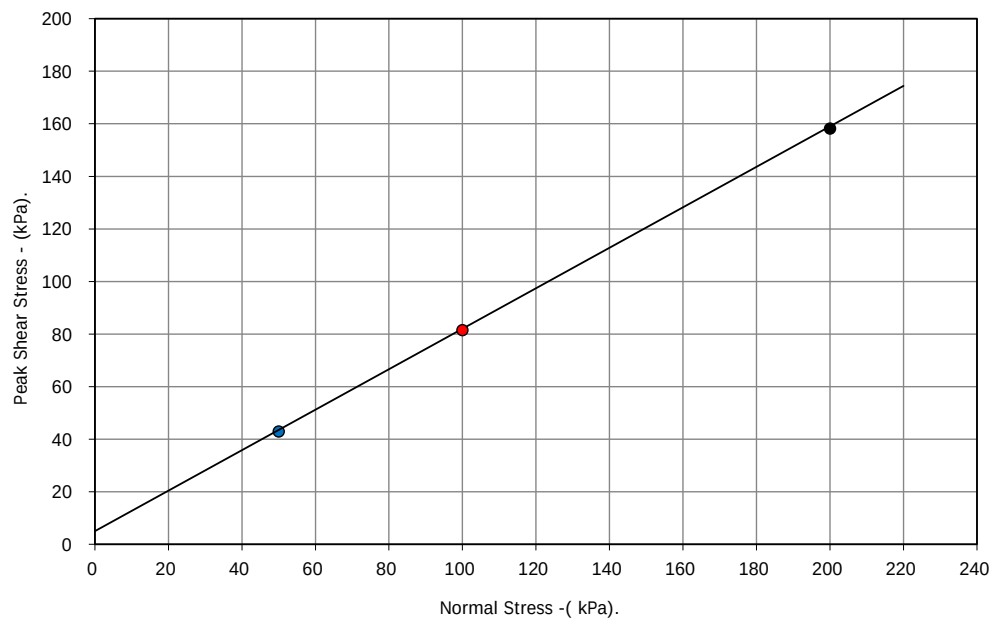
Sample Description:
Brown silty/clayey fine gravelly fine to coarse SAND

STAGE	1	2	3
Initial Conditions			
Height - mm:	24.80	24.80	24.80
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	20	20	20
Bulk Density - Mg/m3:	1.94	1.94	1.94
Dry Density - Mg/m3:	1.62	1.62	1.62
Voids Ratio:	0.6374	0.6331	0.6357
Degree of Saturation - %:	81.85	82.40	82.07
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	24.04	23.77	23.19
Shear			
Rate of Horizontal Displacement (mm/min)	0.500	0.500	0.500
Horizontal Displacement at Peak Shear Stress (mm)	3.52	3.88	5.41
Peak shear Stress - kPa:	43	81	158

PEAK

Angle of Shearing Resistance: (θ) 37.5
Effective Cohesion - kPa: 5.0

FAILURE CONDITIONS



● Peak shear Stress - kPa: — Best Fit Line



Trebanos WWTW

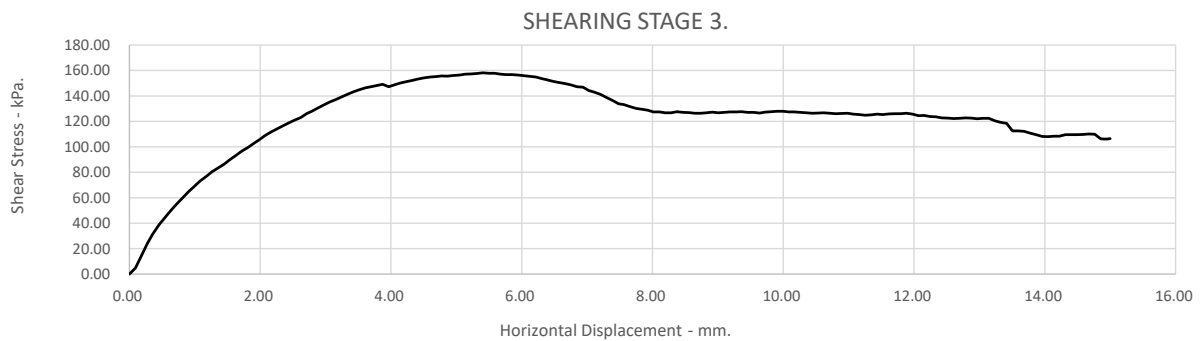
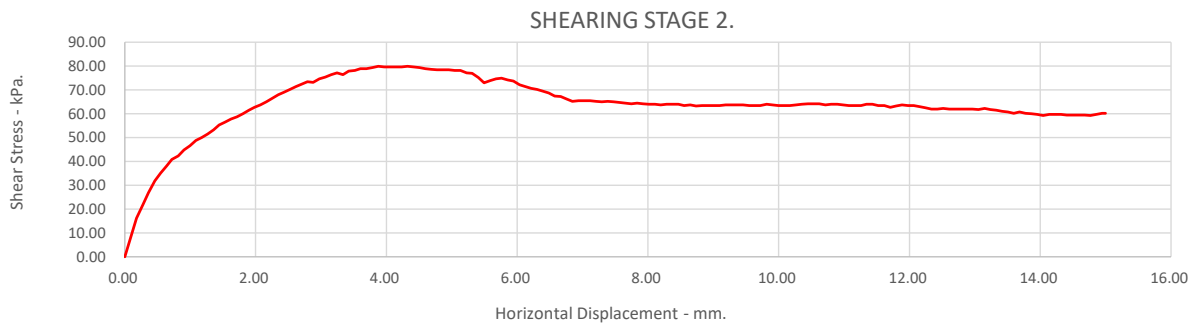
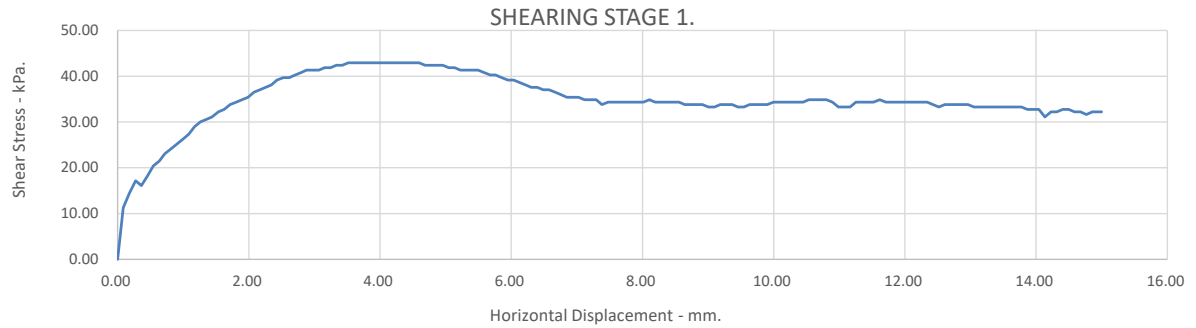
Contract No.:

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Client Ref Number:

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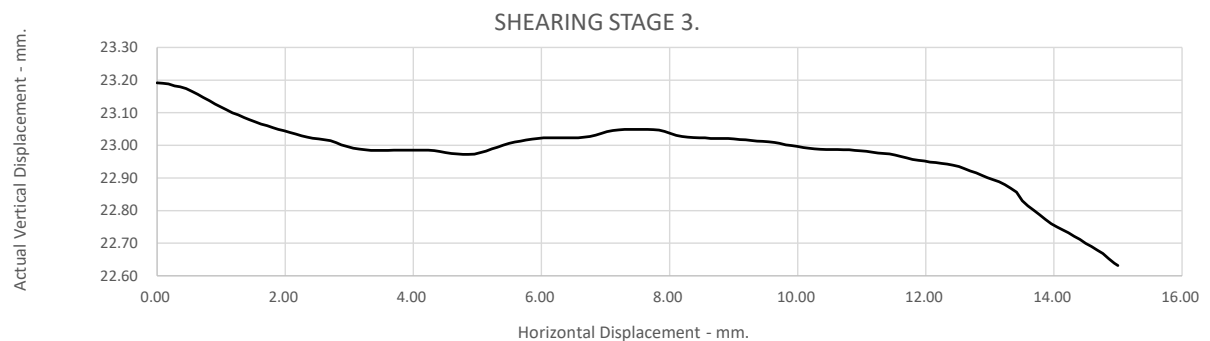
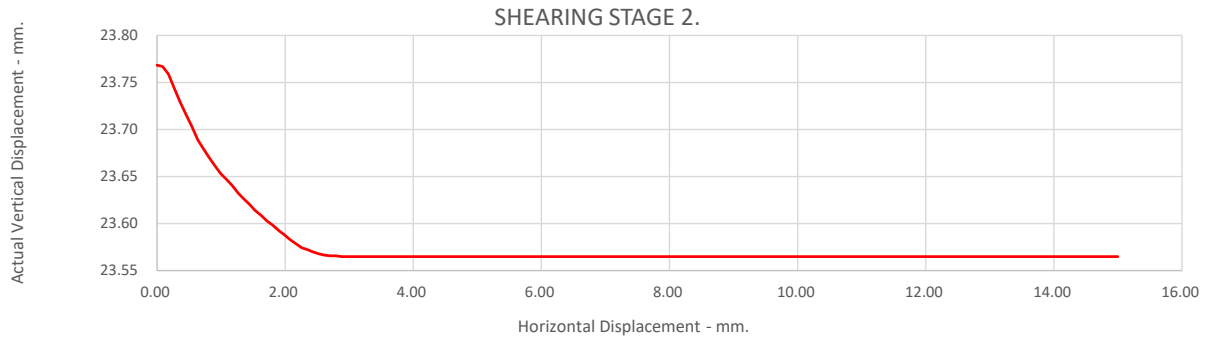
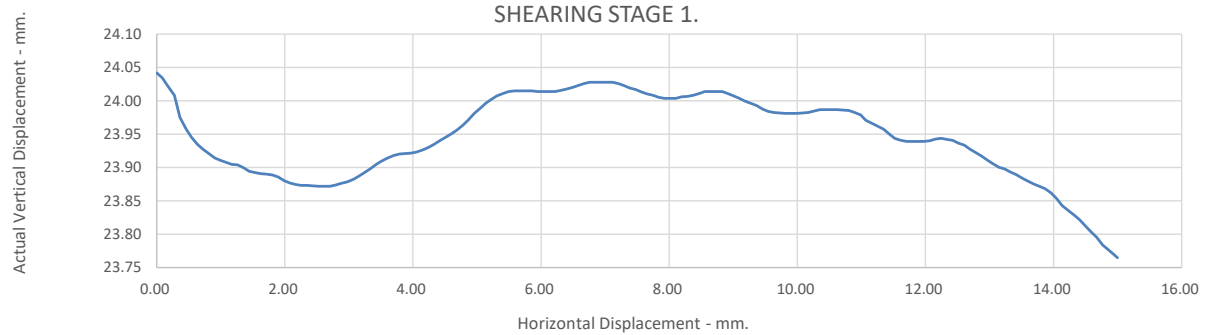
Borehole Number: BH105
Sample Number : 5

Depth from (m): 4.70
Depth to (m): 6.20



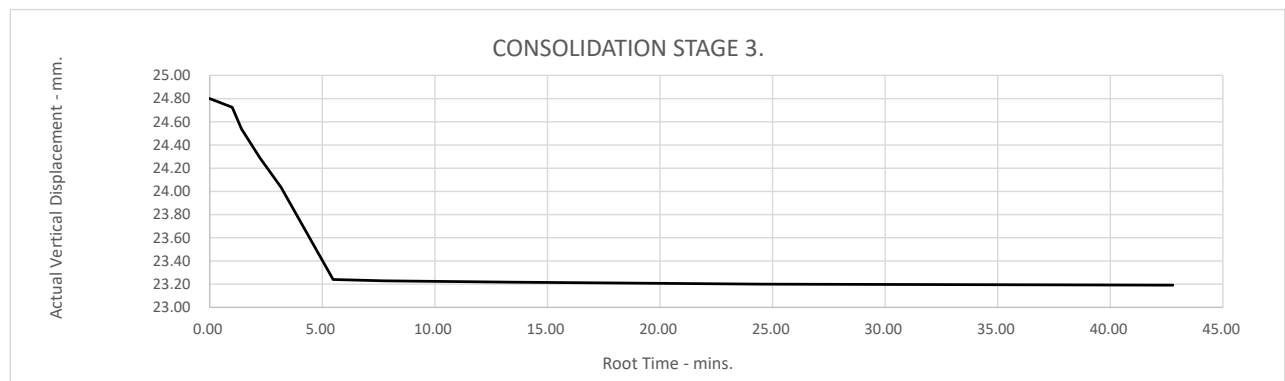
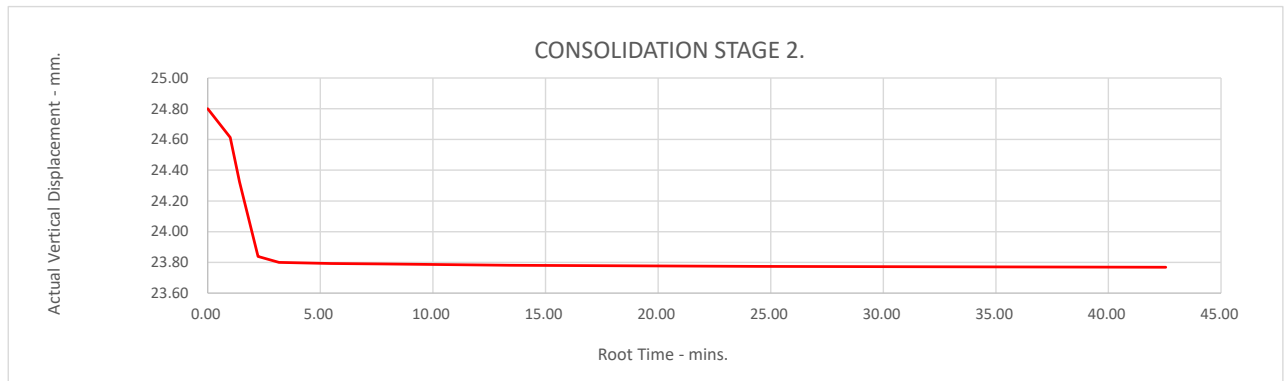
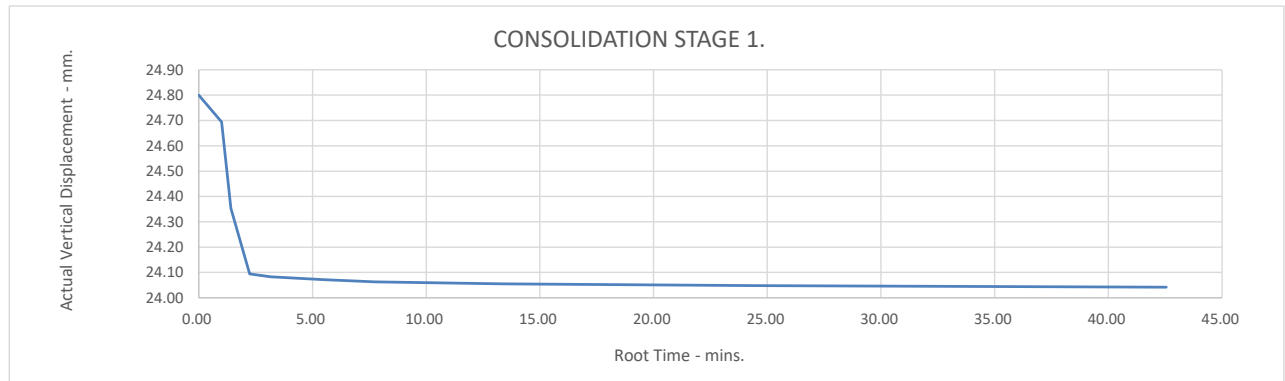
Borehole Number: BH105
Sample Number : 5

Depth from (m): 4.70
Depth to (m): 6.20



Borehole Number: BH105
Sample Number : 5

Depth from (m): 4.70
Depth to (m): 6.20



Test Report: MS DIRECT SHEARBOX TEST.BS1377:Part 7:4.5 :1990.

Borehole Number: BH106 Depth from (m): 2.70
Sample Number : 4 Depth to (m): 4.20

Sample Type: B
Particle Density - Mg/m³: 2.65 (Assumed)
Specimen Tested: Submerged, Remoulded (Light Tamping) Material above 2mm removed.

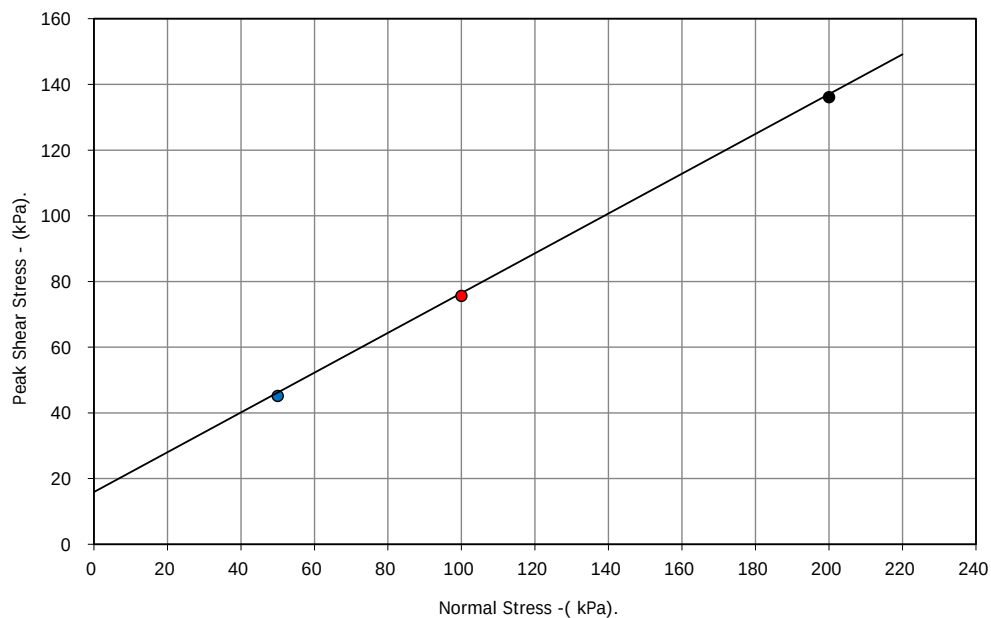
Sample Description:
Brown slightly silty/clayey fine to coarse sandy fine to coarse GRAVEL

STAGE	1	2	3
Initial Conditions			
Height - mm:	24.80	24.80	24.80
Length - mm:	60.00	60.00	60.00
Moisture Content - %:	20	20	20
Bulk Density - Mg/m ³ :	1.94	1.94	1.94
Dry Density - Mg/m ³ :	1.62	1.61	1.62
Voids Ratio:	0.6400	0.6436	0.6406
Degree of Saturation - %:	84.00	83.53	83.92
Normal Pressure- kPa	50	100	200
Consolidation			
Consolidated Height - mm:	23.83	22.69	22.79
Shear			
Rate of Horizontal Displacement (mm/min)	0.500	0.500	0.500
Horizontal Displacement at Peak Shear Stress (mm)	3.88	6.49	5.50
Peak shear Stress - kPa:	45	76	136

PEAK

Angle of Shearing Resistance: (θ) 31.0
Effective Cohesion - kPa: 16

FAILURE CONDITIONS



● Peak shear Stress - kPa: — Best Fit Line



Trebanos WWTW

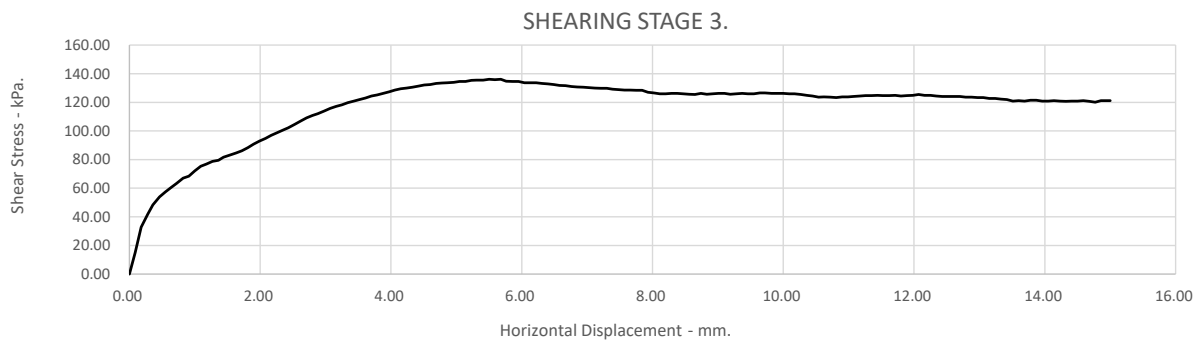
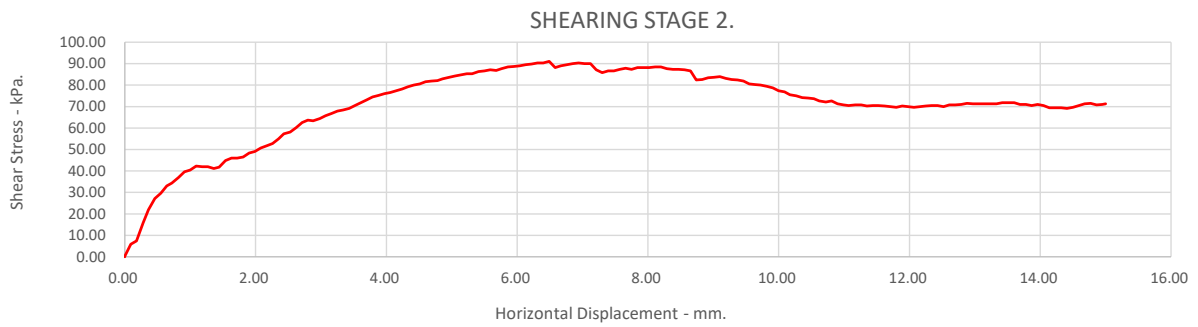
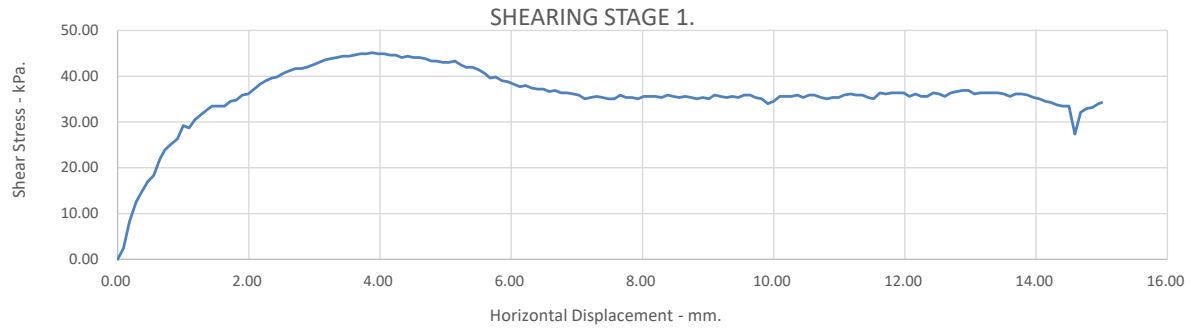
Contract No.:

69815
Client Ref Number:

Q1402

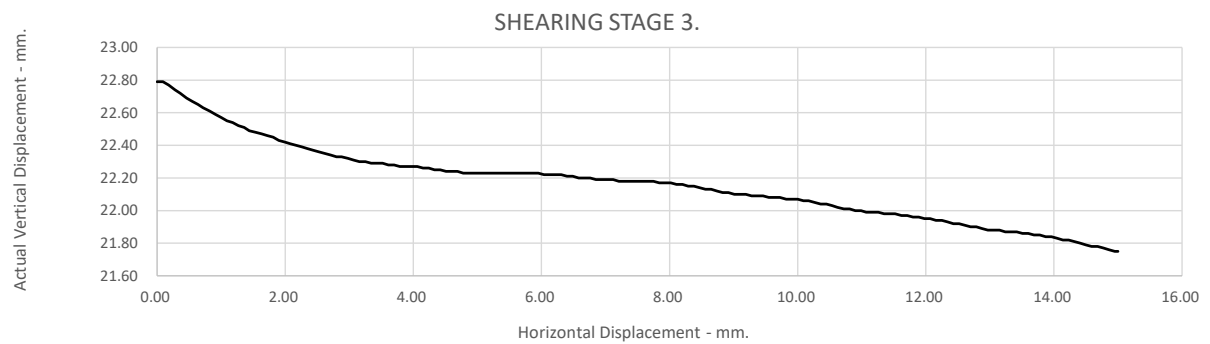
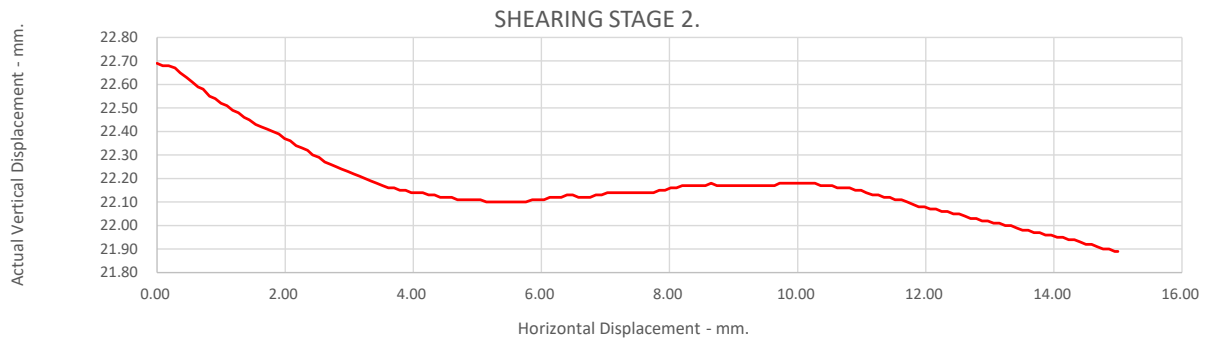
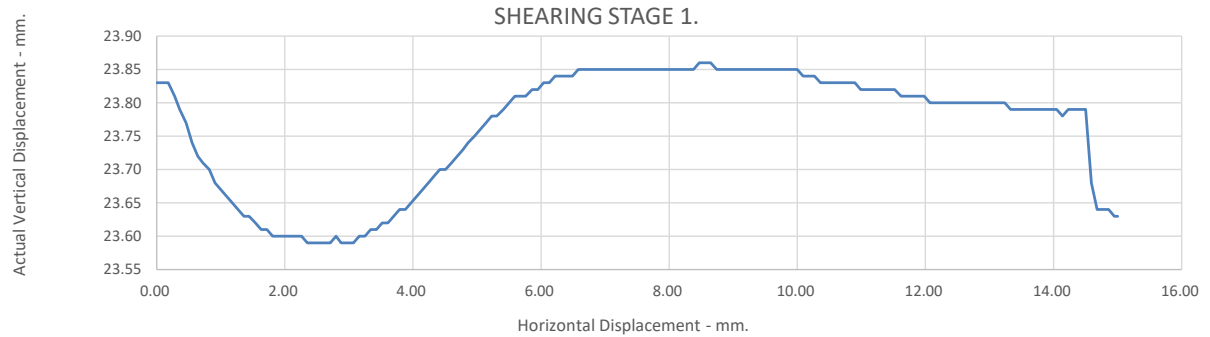
Borehole Number: BH106
Sample Number : 4

Depth from (m): 2.70
Depth to (m): 4.20



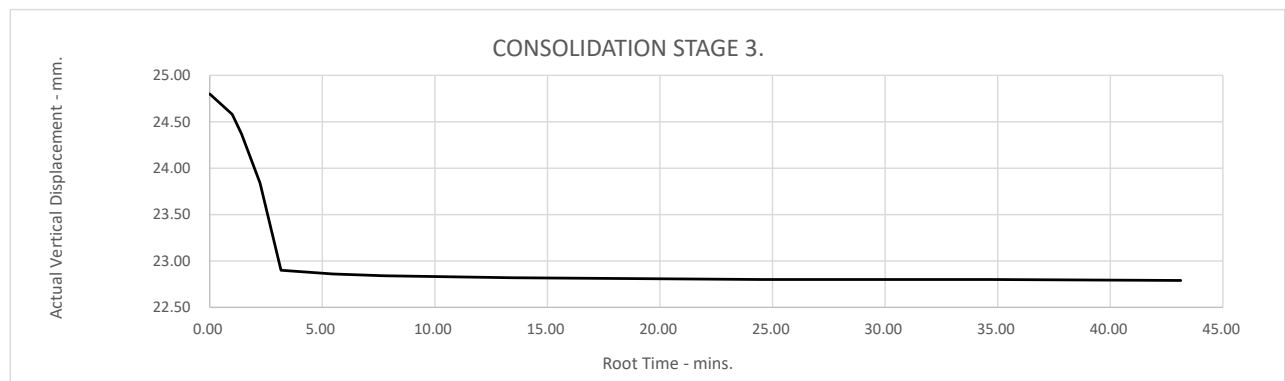
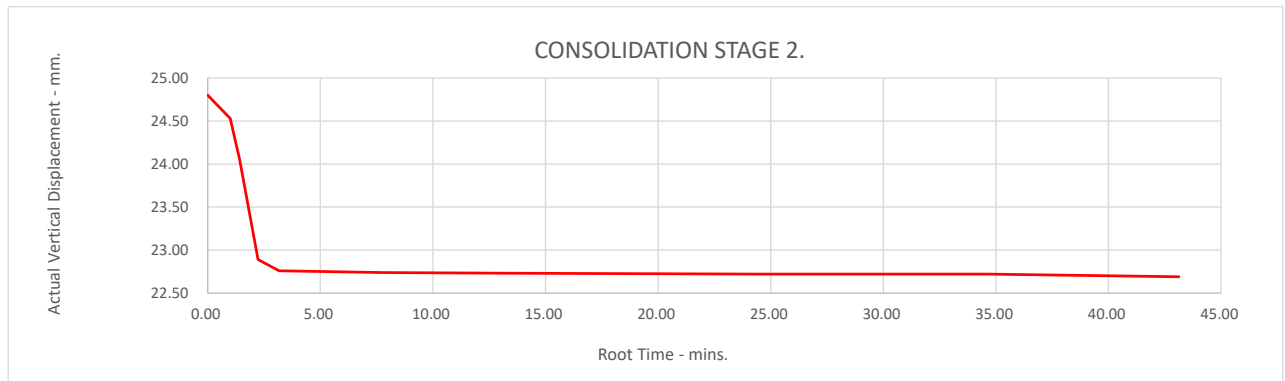
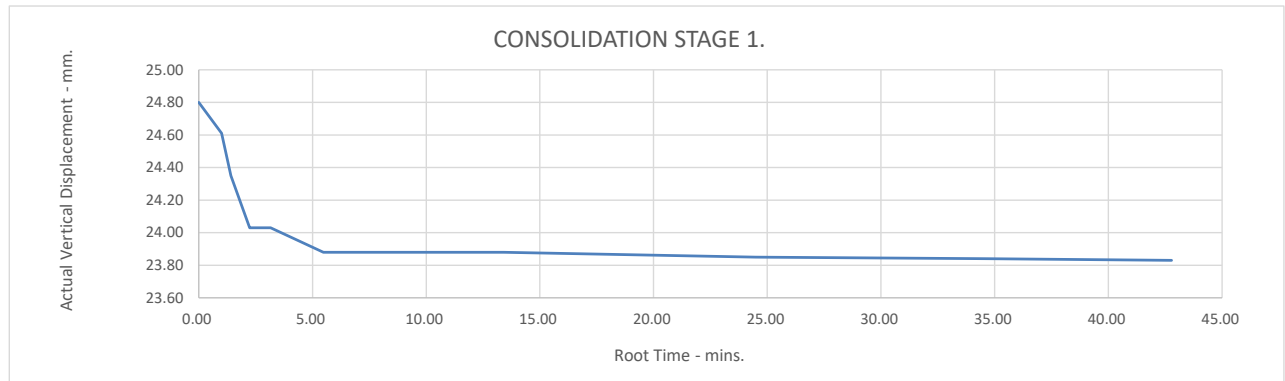
Borehole Number: BH106
Sample Number : 4

Depth from (m): 2.70
Depth to (m): 4.20



Borehole Number: BH106
Sample Number : 4

Depth from (m): 2.70
Depth to (m): 4.20





7 - 11 Harding Street
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LE1 4DH

GSTL
Unit 3-4 Heol Aur
Dafen Ind Estate
Dafen
SA14 8QN

Analytical Test Report: L23/07585/GSL - 23-39866

Your Project Reference:	TREBANOS WwTW Q1402		
Your Order Number:	69815	Samples Received / Instructed:	05/12/2023 / 05/12/2023
Report Issue Number:	1	Sample Tested:	05/12 to 12/12/2023
Samples Analysed:	18 soil samples	Report issued:	12/12/2023

Signed

James Gane
Analytical Services Manager
CTS Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 30.10.2023

Issued by: J. Gane

Issue No: 4

Rev No: 5

L23/07585/GSL - 23-39866

Project Reference - TREBANOS WwTW Q1402

Analytical Test Results - Chemical Analysis

Lab Reference			330760	330761	330762	330763	330764	330765	330766
Client Sample ID			3	6	3	4	6	2	6
Client Sample Location			BH102	BH102	BH101	BH101	BH101	BH103	BH103
Client Sample Type			D	D	D	D	D	D	D
Client Sample Number			-	-	-	-	-	-	-
Depth - Top (m)			1.00	4.10	1.00	2.70	7.20	0.50	2.20
Depth - Bottom (m)			1.00	4.25	1.00	2.70	7.20	0.50	2.20
Date of Sampling			-	-	-	-	-	-	-
Time of Sampling			-	-	-	-	-	-	-
Sample Matrix			Clay	Clay	Sand	Sand	Sand	Clay	Sand
Determinant	Units	Accreditation							
Water soluble sulphate (as SO ₄)	(mg/l)	u	110	100	78	79	58	< 10	35
pH Value	pH Units	MCERTS	9.9	6.8	10.5	10.6	10.5	8.3	8.7
Water Soluble Chloride	(mg/l)	u	6.0	9.7	4.4	4.9	4.2	6.1	7.3
Water Soluble Nitrate (As NO ₃)	(mg/l)	u	< 1.0	< 1.0	4.8	5.2	4.3	3.5	< 1.0
Water Soluble Magnesium	(mg/l)	u	1.5	7.7	1.5	1.5	1.5	3.0	1.5

L23/07585/GSL - 23-39866

Project Reference - TREBANOS WwTW Q1402

Analytical Test Results - Chemical Analysis

Lab Reference			330767	330768	330769	330770	330771	330772	330773
Client Sample ID			1	3	3	2	3	5	3
Client Sample Location			BH105	BH105	BH106	BH106	BH106	BH106	TP101
Client Sample Type			D	D	B	D	D	D	B
Client Sample Number			-	-	-	-	-	-	-
Depth - Top (m)			1.70	4.70	1.20	0.50	1.20	4.20	1.00
Depth - Bottom (m)			1.70	4.70	2.70	0.50	1.20	4.20	1.00
Date of Sampling			-	-	-	-	-	-	-
Time of Sampling			-	-	-	-	-	-	-
Sample Matrix			Other	Clay	Other	Clay	Clay	Other	Sand
Determinant	Units	Accreditation							
Water soluble sulphate (as SO ₄)	(mg/l)	u	33	18	12	20	< 10	11	49
pH Value	pH Units	MCERTS	8.1	7.8	7.9	8.0	7.9	8.9	11.7
Water Soluble Chloride	(mg/l)	u	4.6	3.8	3.9	4.0	0.8	3.3	36
Water Soluble Nitrate (As NO ₃)	(mg/l)	u	< 1.0	19	< 1.0	23	2.3	< 1.0	< 1.0
Water Soluble Magnesium	(mg/l)	u	2.1	5.8	2.1	5.1	1.5	2.5	1.5



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Leicester
LE1 4DH

L23/07585/GSL - 23-39866

Project Reference - TREBANOS WwTW Q1402

Analytical Test Results - Chemical Analysis

Lab Reference			330774	330775	330776	330777
Client Sample ID			2	2	3	2
Client Sample Location			TP102	TP103	TP104	TP104
Client Sample Type			B	B	B	B
Client Sample Number			-	-	-	-
Depth - Top (m)			0.50	1.00	1.50	0.50
Depth - Bottom (m)			0.50	1.00	1.50	0.50
Date of Sampling			-	-	-	-
Time of Sampling			-	-	-	-
Sample Matrix			Clay	Clay	Sand	Loam
Determinant	Units	Accreditation				
Water soluble sulphate (as SO ₄)	(mg/l)	u	21	< 10	19	45
pH Value	pH Units	MCERTS	8.5	8.4	9.5	6.7
Water Soluble Chloride	(mg/l)	u	3.0	1.3	4.6	13
Water Soluble Nitrate (As NO ₃)	(mg/l)	u	16	3.9	< 1.0	< 1.0
Water Soluble Magnesium	(mg/l)	u	4.3	1.8	1.7	2.3



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Project Reference - TREBANOS WwTW Q1402

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
330760	3	BH102	D	-	Greyish brown very gravelly sandy clay with rare rootlets	-	-	100
330761	6	BH102	D	-	Grey silty sandy clay	-	-	82
330762	3	BH101	D	-	Reddish brown very gravelly silty sand	-	-	42
330763	4	BH101	D	-	Reddish brown very gravelly silty sand	-	-	36
330764	6	BH101	D	-	Reddish brown very gravelly silty sand	-	-	30
330765	2	BH103	D	-	Brown gravelly sandy silty clay with frequent organic matter	-	-	70
330766	6	BH103	D	-	Brown gravelly silty sand	-	-	100
330767	1	BH105	D	-	Brown slightly clayey sandy gravel	-	-	100
330768	3	BH105	D	-	Dark brown sandy silty clay	-	-	58
330769	3	BH106	B	-	Brown slightly clayey silty gravel	-	-	100
330770	2	BH106	D	-	Dark brown sandy silty clay	-	-	61
330771	3	BH106	D	-	Brown silty sandy clay	-	-	57
330772	5	BH106	D	-	Greyish brown sandy crushed rock	-	-	100
330773	3	TP101	B	-	Dark brown very gravelly silty sand	-	-	100
330774	2	TP102	B	-	Dark brown gravelly sandy silty clay with rare organic matter	-	-	68
330775	2	TP103	B	-	Dark brown gravelly sandy silty clay	-	-	56
330776	3	TP104	B	-	Grey very gravelly sand	-	-	100
330777	2	TP104	B	-	Black slightly gravelly clayey loam with frequent organic matter	-	-	79



L23/07585/GSL - 23-39866

Project Reference - TREBANOS WwTW Q1402

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
330760	3	BH102	D	-	
330761	6	BH102	D	-	
330762	3	BH101	D	-	
330763	4	BH101	D	-	
330764	6	BH101	D	-	
330765	2	BH103	D	-	
330766	6	BH103	D	-	
330767	1	BH105	D	-	
330768	3	BH105	D	-	
330769	3	BH106	B	-	
330770	2	BH106	D	-	
330771	3	BH106	D	-	
330772	5	BH106	D	-	
330773	3	TP101	B	-	
330774	2	TP102	B	-	
330775	2	TP103	B	-	
330776	3	TP104	B	-	
330777	2	TP104	B	-	



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Project Reference - TREBANOS WwTW Q1402

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377MGICP	BS1377 WS Magnesium (ICP)	Oven dried	Passing 2mm test sieve	Water Soluble Magnesium testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 10.



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L23/07585/GSL - 23-39866

Project Reference - TREBANOS WwTW Q1402

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
330760	3	BH102	D	-		A
330761	6	BH102	D	-		A
330762	3	BH101	D	-		A
330763	4	BH101	D	-		A
330764	6	BH101	D	-		A
330765	2	BH103	D	-		A
330766	6	BH103	D	-		A
330767	1	BH105	D	-		A
330768	3	BH105	D	-		A
330769	3	BH106	B	-		A
330770	2	BH106	D	-		A
330771	3	BH106	D	-		A
330772	5	BH106	D	-		A
330773	3	TP101	B	-		A
330774	2	TP102	B	-		A
330775	2	TP103	B	-		A
330776	3	TP104	B	-		A
330777	2	TP104	B	-		A

APPENDIX VII – CHEMICAL LABORATORY TEST RESULTS



Final Report

Report No.: 23-36513-1

Initial Date of Issue: 06-Nov-2023

Re-Issue Details:

Client Spencer Quantum Ltd

Client Address: Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW

Contact(s): Lee Simlett
Phil Darby

Project Trebanos WWTW

Quotation No.: **Date Received:** 01-Nov-2023

Order No.: Q1402 **Date Instructed:** 01-Nov-2023

No. of Samples: 1

Turnaround (Wkdays): 5 **Results Due:** 07-Nov-2023

Date Approved: 06-Nov-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: Trebanos WWTW

Client: Spencer Quantum Ltd	Chemtest Job No.:				23-36513
Quotation No.:	Chemtest Sample ID.:				1725272
Order No.: Q1402	Client Sample Ref.:				ES2
	Sample Location:				BH102
	Sample Type:				SOIL
	Top Depth (m):				0.50
	Date Sampled:				30-Oct-2023
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	14
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	Stones
Soil Texture	N	2040		N/A	Loam
pH at 20C	M	2010		4.0	8.7
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.43
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50
Arsenic	M	2455	mg/kg	0.5	29
Cadmium	M	2455	mg/kg	0.10	2.1
Chromium	M	2455	mg/kg	0.5	57
Copper	M	2455	mg/kg	0.50	100
Mercury	M	2455	mg/kg	0.05	0.10
Nickel	M	2455	mg/kg	0.50	53
Lead	M	2455	mg/kg	0.50	160
Selenium	M	2455	mg/kg	0.25	1.2
Zinc	M	2455	mg/kg	0.50	330
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
LOI	M	2610	%	0.10	5.9
Total Organic Carbon	M	2625	%	0.20	3.6
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: Trebanos WWTW

Client: Spencer Quantum Ltd	Chemtest Job No.:		23-36513		
Quotation No.:	Chemtest Sample ID.:		1725272		
Order No.: Q1402	Client Sample Ref.:		ES2		
	Sample Location:		BH102		
	Sample Type:		SOIL		
	Top Depth (m):		0.50		
	Date Sampled:		30-Oct-2023		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	M	2760	mg/kg	0.0010	< 0.0010
Toluene	M	2760	mg/kg	0.0010	< 0.0010
Ethylbenzene	M	2760	mg/kg	0.0010	< 0.0010
m & p-Xylene	M	2760	mg/kg	0.0010	< 0.0010
o-Xylene	M	2760	mg/kg	0.0010	< 0.0010
Naphthalene	M	2800	mg/kg	0.10	0.31
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	0.23
Anthracene	M	2800	mg/kg	0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	0.53
Pyrene	M	2800	mg/kg	0.10	0.46
Benzo[a]anthracene	M	2800	mg/kg	0.10	0.23
Chrysene	M	2800	mg/kg	0.10	0.20
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	0.46
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	0.13
Benzo[a]pyrene	M	2800	mg/kg	0.10	0.33
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	0.29
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	0.28
Total Of 16 PAH's	N	2800	mg/kg	2.0	3.5
PCB 28	U	2815	mg/kg	0.010	< 0.010
PCB 52	U	2815	mg/kg	0.010	< 0.010
PCB 90+101	U	2815	mg/kg	0.010	< 0.010
PCB 118	U	2815	mg/kg	0.010	< 0.010
PCB 153	U	2815	mg/kg	0.010	< 0.010
PCB 138	U	2815	mg/kg	0.010	< 0.010
PCB 180	U	2815	mg/kg	0.010	< 0.010
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10	< 0.10
Total Phenols	M	2920	mg/kg	0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH at 20°C	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 23-36516-1

Initial Date of Issue: 09-Nov-2023

Re-Issue Details:

Client Spencer Quantum Ltd

Client Address: Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW

Contact(s): Lee Simlett

Project Terbanos WWTW

Quotation No.: **Date Received:** 01-Nov-2023

Order No.: Q1402 **Date Instructed:** 01-Nov-2023

No. of Samples: 1

Turnaround (Wkdays): 7 **Results Due:** 09-Nov-2023

Date Approved: 09-Nov-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: Terbanos WWTW

Chemtest Job No: 23-36516							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1725282							Limits			
Sample Ref: ES2							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: BH102										
Top Depth(m): 0.50										
Bottom Depth(m):										
Sampling Date: 30-Oct-2023										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				0.20	3	5	6
Loss On Ignition	2610	M	%				6.1	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				2.5	100	--	--
pH at 20C	2010	M					8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	4.0	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.013	0.0098	0.025	0.10	0.5	2	25	
Barium	1455	U	0.013	0.006	0.025	0.067	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0043	0.0028	0.0086	0.030	0.5	10	70	
Copper	1455	U	0.0013	0.0009	0.0025	0.0035	2	50	100	
Mercury	1455	U	0.00037	0.00024	0.00073	0.0025	0.01	0.2	2	
Molybdenum	1455	U	0.0098	0.0027	0.019	0.035	0.5	10	30	
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0012	< 0.0005	0.0023	0.0013	0.06	0.7	5	
Selenium	1455	U	0.0013	0.0007	0.0025	0.0073	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	4.7	1.9	9.3	22	10	150	500	
Sulphate	1220	U	8.6	2.1	17	28	1000	20000	50000	
Total Dissolved Solids	1020	N	220	72	430	880	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	3.3	3.2	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	14

Leachate Test Information	
Leachant volume 1st extract/l	0.321
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.196

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH at 20°C	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Amended Report

Report No.:	23-36902-2		
Initial Date of Issue:	21-Nov-2023	Date of Re-Issue:	03-Jan-2024
Re-Issue Details:	This report has been revised and directly supersedes 23-36902-1 in its entirety		
Client	Spencer Quantum Ltd		
Client Address:	Parcau Farm Penrhiwllan Llandysul Ceredigion SA44 5NW		
Contact(s):	Beth Thomas		
Project	Q1402 Trebanos WWTW		
Quotation No.:	Q23-33011	Date Received:	06-Nov-2023
Order No.:		Date Instructed:	10-Nov-2023
No. of Samples:	4		
Turnaround (Wkdays):	6	Results Due:	17-Nov-2023
Date Approved:	21-Nov-2023		
Approved By:			

Details: Stuart Henderson, Technical Manager

Results - Leachate

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd	Chemtest Job No.:					23-36902	23-36902
Quotation No.: Q23-33011	Chemtest Sample ID.:					1726800	1726805
Order No.:	Client Sample Ref.:					ES3	ES3
	Sample Location:					BH105	TP103
	Sample Type:					SOIL	SOIL
	Top Depth (m):					1	1.00
	Date Sampled:					01-Nov-2023	01-Nov-2023
Determinand	Accred.	SOP	Type	Units	LOD		
pH at 20C	U	1010	2:1		4.0	7.2	7.6
Chloride	U	1220	2:1	mg/l	1.0	1.4	< 1.0
Ammoniacal Nitrogen	U	1220	2:1	mg/l	0.050	0.42	0.062
Cyanide (Total)	U	1300	2:1	mg/l	0.050	< 0.050	< 0.050
Calcium	U	1455	2:1	mg/l	2.00	3.6	23
Arsenic (Dissolved)	U	1455	2:1	µg/l	0.20	5.8	4.7
Beryllium (Dissolved)	U	1455	2:1	µg/l	1.00	< 1.0	< 1.0
Cadmium (Dissolved)	U	1455	2:1	µg/l	0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	2:1	µg/l	0.50	1.6	1.7
Copper (Dissolved)	U	1455	2:1	µg/l	0.50	17	2.8
Mercury (Dissolved)	U	1455	2:1	µg/l	0.05	< 0.05	< 0.05
Manganese (Dissolved)	U	1455	2:1	µg/l	0.50	170	4.3
Nickel (Dissolved)	U	1455	2:1	µg/l	0.50	4.4	0.71
Lead (Dissolved)	U	1455	2:1	µg/l	0.50	6.0	0.87
Antimony (Dissolved)	U	1455	2:1	µg/l	0.50	0.70	0.69
Selenium (Dissolved)	U	1455	2:1	µg/l	0.50	0.74	0.62
Vanadium (Dissolved)	U	1455	2:1	µg/l	0.50	2.7	5.3
Zinc (Dissolved)	U	1455	2:1	µg/l	2.5	12	6.3
Benzene	U	1760	2:1	µg/l	1.0	< 1.0	< 1.0
Toluene	U	1760	2:1	µg/l	1.0	< 1.0	< 1.0
Ethylbenzene	U	1760	2:1	µg/l	1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	2:1	µg/l	1.0	< 1.0	< 1.0
o-Xylene	U	1760	2:1	µg/l	1.0	< 1.0	< 1.0
Naphthalene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Acenaphthene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Fluorene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Phenanthrene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Anthracene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Pyrene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Chrysene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	2:1	µg/l	0.10	< 0.10	< 0.10

Results - Leachate

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd	Chemtest Job No.:					23-36902	23-36902
Quotation No.: Q23-33011	Chemtest Sample ID.:					1726800	1726805
Order No.:	Client Sample Ref.:					ES3	ES3
	Sample Location:					BH105	TP103
	Sample Type:					SOIL	SOIL
	Top Depth (m):					1	1.0
	Date Sampled:					01-Nov-2023	01-Nov-2023
Determinand	Accred.	SOP	Type	Units	LOD		
Total Of 16 PAH's	U	1800	2:1	µg/l	2.0	< 2.0	< 2.0
PCB 28	N	1815	2:1	µg/l	0.010	< 0.010	< 0.010
PCB 52	N	1815	2:1	µg/l	0.010	< 0.010	< 0.010
PCB 101	N	1815	2:1	µg/l	0.010	< 0.010	< 0.010
PCB 118	N	1815	2:1	µg/l	0.010	< 0.010	< 0.010
PCB 153	N	1815	2:1	µg/l	0.010	< 0.010	< 0.010
PCB 138	N	1815	2:1	µg/l	0.010	< 0.010	< 0.010
PCB 180	N	1815	2:1	µg/l	0.010	< 0.010	< 0.010
Total PCBs (7 congeners)	N	1815	2:1	µg/l	0.010	< 0.010	< 0.010
Total Phenols	U	1920	2:1	mg/l	0.030	< 0.030	< 0.030

Results - Soil

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd		Chemtest Job No.:		23-36902	23-36902	23-36902	23-36902
Quotation No.: Q23-33011		Chemtest Sample ID.:		1726800	1726802	1726805	1726806
Order No.:		Client Sample Ref.:		ES3	ES2	ES3	ES4
		Sample Location:		BH105	BH105	TP103	TP103
		Sample Type:		SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		1	0.5	1.0	1.3
		Date Sampled:		01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023
		Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
ACM Type		U	2192		N/A	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Moisture		N	2030	%	0.020	20	18
Soil Colour		N	2040		N/A	Brown	Brown
Other Material		N	2040		N/A	Stones	Stones
Soil Texture		N	2040		N/A	Sand	Sand
pH at 20C		M	2010		4.0	8.4	8.6
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.020	< 0.010
Total Sulphur		U	2175	%	0.010		0.072
Chloride (Water Soluble)		M	2220	g/l	0.010		< 0.010
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50		7.6
Arsenic		M	2455	mg/kg	0.5	15	48
Barium		M	2455	mg/kg	0		110
Cadmium		M	2455	mg/kg	0.10	0.40	1.8
Chromium		M	2455	mg/kg	0.5	13	25
Molybdenum		M	2455	mg/kg	0.5		1.9
Copper		M	2455	mg/kg	0.50	30	150
Mercury		M	2455	mg/kg	0.05	< 0.05	0.08
Nickel		M	2455	mg/kg	0.50	30	60
Lead		M	2455	mg/kg	0.50	23	240
Selenium		M	2455	mg/kg	0.25	0.96	1.4
Zinc		M	2455	mg/kg	0.50	100	620
Chromium (Hexavalent)		N	2490	mg/kg	0.50		< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	2.2
Aliphatic EPH >C12-C16	EH_2D_AL_#1	M	2690	mg/kg	1.00	< 1.0	< 1.0
Aliphatic EPH >C16-C21	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0
Aliphatic EPH >C21-C35	EH_2D_AL_#1	M	2690	mg/kg	3.00	< 3.0	< 3.0
Aliphatic EPH >C35-C40	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10
Total Aliphatic EPH >C10-C35	EH_2D_AL_#1	M	2690	mg/kg	5.00	< 5.0	< 5.0
Total Aliphatic EPH >C10-C40	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10

Results - Soil

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd		Chemtest Job No.:		23-36902	23-36902	23-36902	23-36902
Quotation No.: Q23-33011		Chemtest Sample ID.:		1726800	1726802	1726805	1726806
Order No.:		Client Sample Ref.:		ES3	ES2	ES3	ES4
		Sample Location:		BH105	BH105	TP103	TP103
		Sample Type:		SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		1	0.5	1.0	1.3
		Date Sampled:		01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023
		Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	EH_2D_AR #1	U	2690	mg/kg	1.00	< 1.0	< 1.0
Aromatic EPH >C12-C16	EH_2D_AR #1	U	2690	mg/kg	1.00	< 1.0	< 1.0
Aromatic EPH >C16-C21	EH_2D_AR #1	U	2690	mg/kg	2.00	3.9	< 2.0
Aromatic EPH >C21-C35	EH_2D_AR #1	U	2690	mg/kg	2.00	4.9	6.3
Aromatic EPH >C35-C40	EH_2D_AR #1	N	2690	mg/kg	1.00	< 1.0	< 1.0
Total Aromatic EPH >C10-C35	EH_2D_AR #1	U	2690	mg/kg	5.00	8.8	10
Total Aromatic EPH >C10-C40	EH_2D_AR #1	N	2690	mg/kg	10.00	< 10	< 10
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50
Total EPH >C10-C35	EH_2D_Total_#1	U	2690	mg/kg	10.00	11	14
Total EPH >C10-C40	EH_2D_Total_#1	N	2690	mg/kg	10.00	11	14
LOI		M	2610	%	0.10		10
Total Organic Carbon		M	2625	%	0.20	0.87	8.4
Dichlorodifluoromethane		U	2760	µg/kg	1.0		< 1.0
Chloromethane		M	2760	µg/kg	1.0		< 1.0
Vinyl Chloride		M	2760	µg/kg	1.0		< 1.0
Bromomethane		M	2760	µg/kg	20		< 20
Chloroethane		U	2760	µg/kg	2.0		< 2.0
Trichlorofluoromethane		M	2760	µg/kg	1.0		< 1.0
1,1-Dichloroethene		M	2760	µg/kg	1.0		< 1.0
Dichloromethane		N	2760	µg/kg	50		< 50
Trans 1,2-Dichloroethene		M	2760	µg/kg	1.0		< 1.0
1,1-Dichloroethane		M	2760	µg/kg	1.0		< 1.0
cis 1,2-Dichloroethene		M	2760	µg/kg	1.0		< 1.0
Bromochloromethane		U	2760	µg/kg	5.0		< 5.0
Trichloromethane		M	2760	µg/kg	1.0		< 1.0
1,1,1-Trichloroethane		M	2760	µg/kg	1.0		< 1.0
Tetrachloromethane		M	2760	µg/kg	1.0		< 1.0
1,1-Dichloropropene		U	2760	µg/kg	1.0		< 1.0
Benzene		M	2760	µg/kg	1.0	< 1.0	< 1.0
1,2-Dichloroethane		M	2760	µg/kg	2.0		< 2.0
Trichloroethene		N	2760	µg/kg	1.0		< 1.0
1,2-Dichloropropane		M	2760	µg/kg	1.0		< 1.0

Results - Soil

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd		Chemtest Job No.:		23-36902	23-36902	23-36902	23-36902
Quotation No.: Q23-33011		Chemtest Sample ID.:		1726800	1726802	1726805	1726806
Order No.:		Client Sample Ref.:		ES3	ES2	ES3	ES4
		Sample Location:		BH105	BH105	TP103	TP103
		Sample Type:		SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		1	0.5	1.0	1.3
		Date Sampled:		01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023
		Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Dibromomethane		M	2760	µg/kg	1.0		< 1.0
Bromodichloromethane		M	2760	µg/kg	5.0		< 5.0
cis-1,3-Dichloropropene		N	2760	µg/kg	10		< 10
Toluene		M	2760	µg/kg	1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	2760	µg/kg	10		< 10
1,1,2-Trichloroethane		M	2760	µg/kg	10		< 10
Tetrachloroethene		M	2760	µg/kg	1.0		< 1.0
1,3-Dichloropropane		U	2760	µg/kg	2.0		< 2.0
Dibromochloromethane		U	2760	µg/kg	10		< 10
1,2-Dibromoethane		M	2760	µg/kg	5.0		< 5.0
Chlorobenzene		M	2760	µg/kg	1.0		< 1.0
1,1,1,2-Tetrachloroethane		M	2760	µg/kg	2.0		< 2.0
Ethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0
Styrene		M	2760	µg/kg	1.0		< 1.0
Tribromomethane		U	2760	µg/kg	1.0		< 1.0
Isopropylbenzene		M	2760	µg/kg	1.0		< 1.0
Bromobenzene		M	2760	µg/kg	1.0		< 1.0
1,2,3-Trichloropropane		N	2760	µg/kg	50		< 50
N-Propylbenzene		U	2760	µg/kg	1.0		< 1.0
2-Chlorotoluene		M	2760	µg/kg	1.0		< 1.0
1,3,5-Trimethylbenzene		M	2760	µg/kg	1.0		< 1.0
4-Chlorotoluene		U	2760	µg/kg	1.0		< 1.0
Tert-Butylbenzene		U	2760	µg/kg	1.0		< 1.0
1,2,4-Trimethylbenzene		M	2760	µg/kg	1.0		< 1.0
Sec-Butylbenzene		U	2760	µg/kg	1.0		< 1.0
1,3-Dichlorobenzene		M	2760	µg/kg	1.0		< 1.0
4-Isopropyltoluene		U	2760	µg/kg	1.0		< 1.0
1,4-Dichlorobenzene		M	2760	µg/kg	1.0		< 1.0
N-Butylbenzene		U	2760	µg/kg	1.0		< 1.0
1,2-Dichlorobenzene		M	2760	µg/kg	1.0		< 1.0
1,2-Dibromo-3-Chloropropane		U	2760	µg/kg	50		< 50
1,2,4-Trichlorobenzene		M	2760	µg/kg	1.0		< 1.0
Hexachlorobutadiene		N	2760	µg/kg	1.0		< 1.0
1,2,3-Trichlorobenzene		U	2760	µg/kg	2.0		< 2.0
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0		< 1.0
N-Nitrosodimethylamine		M	2790	mg/kg	0.50		< 0.50

Results - Soil

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd		Chemtest Job No.:		23-36902	23-36902	23-36902	23-36902
Quotation No.: Q23-33011		Chemtest Sample ID.:		1726800	1726802	1726805	1726806
Order No.:		Client Sample Ref.:		ES3	ES2	ES3	ES4
		Sample Location:		BH105	BH105	TP103	TP103
		Sample Type:		SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		1	0.5	1.0	1.3
		Date Sampled:		01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023
		Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Phenol		M	2790	mg/kg	0.50		< 0.50
2-Chlorophenol		N	2790	mg/kg	0.50		< 0.50
Bis-(2-Chloroethyl)Ether		M	2790	mg/kg	0.50		< 0.50
1,3-Dichlorobenzene		M	2790	mg/kg	0.50		< 0.50
1,4-Dichlorobenzene		N	2790	mg/kg	0.50		< 0.50
1,2-Dichlorobenzene		M	2790	mg/kg	0.50		< 0.50
2-Methylphenol		M	2790	mg/kg	0.50		< 0.50
Bis(2-Chloroisopropyl)Ether		M	2790	mg/kg	0.50		< 0.50
Hexachloroethane		M	2790	mg/kg	0.50		< 0.50
N-Nitrosodi-n-propylamine		M	2790	mg/kg	0.50		< 0.50
4-Methylphenol		M	2790	mg/kg	0.50		< 0.50
Nitrobenzene		N	2790	mg/kg	0.50		< 0.50
Isophorone		M	2790	mg/kg	0.50		< 0.50
2-Nitrophenol		N	2790	mg/kg	0.50		< 0.50
2,4-Dimethylphenol		M	2790	mg/kg	0.50		< 0.50
Bis(2-Chloroethoxy)Methane		M	2790	mg/kg	0.50		< 0.50
2,4-Dichlorophenol		N	2790	mg/kg	0.50		< 0.50
1,2,4-Trichlorobenzene		M	2790	mg/kg	0.50		< 0.50
Naphthalene		M	2790	mg/kg	0.50		< 0.50
4-Chloroaniline		N	2790	mg/kg	0.50		< 0.50
Hexachlorobutadiene		M	2790	mg/kg	0.50		< 0.50
4-Chloro-3-Methylphenol		N	2790	mg/kg	0.50		< 0.50
2-Methylnaphthalene		M	2790	mg/kg	0.50		< 0.50
4-Nitrophenol		N	2790	mg/kg	0.50		< 0.50
Hexachlorocyclopentadiene		N	2790	mg/kg	0.50		< 0.50
2,4,6-Trichlorophenol		N	2790	mg/kg	0.50		< 0.50
2,4,5-Trichlorophenol		N	2790	mg/kg	0.50		< 0.50
2-Chloronaphthalene		M	2790	mg/kg	0.50		< 0.50
2-Nitroaniline		N	2790	mg/kg	0.50		< 0.50
Acenaphthylene		M	2790	mg/kg	0.50		< 0.50
Dimethylphthalate		M	2790	mg/kg	0.50		< 0.50
2,6-Dinitrotoluene		N	2790	mg/kg	0.50		< 0.50
Acenaphthene		M	2790	mg/kg	0.50		< 0.50
3-Nitroaniline		N	2790	mg/kg	0.50		< 0.50
Dibenzofuran		M	2790	mg/kg	0.50		< 0.50
4-Chlorophenylphenylether		M	2790	mg/kg	0.50		< 0.50
2,4-Dinitrotoluene		N	2790	mg/kg	0.50		< 0.50
Fluorene		M	2790	mg/kg	0.50		< 0.50

Results - Soil

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd		Chemtest Job No.:		23-36902	23-36902	23-36902	23-36902
Quotation No.: Q23-33011		Chemtest Sample ID.:		1726800	1726802	1726805	1726806
Order No.:		Client Sample Ref.:		ES3	ES2	ES3	ES4
		Sample Location:		BH105	BH105	TP103	TP103
		Sample Type:		SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		1	0.5	1.0	1.3
		Date Sampled:		01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023
		Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Diethyl Phthalate		M	2790	mg/kg	0.50		< 0.50
4-Nitroaniline		N	2790	mg/kg	0.50		< 0.50
Azobenzene		M	2790	mg/kg	0.50		< 0.50
4-Bromophenylphenyl Ether		M	2790	mg/kg	0.50		< 0.50
Hexachlorobenzene		M	2790	mg/kg	0.50		< 0.50
Phenanthrene		M	2790	mg/kg	0.50		< 0.50
Anthracene		M	2790	mg/kg	0.50		< 0.50
Carbazole		M	2790	mg/kg	0.50		< 0.50
Di-N-Butyl Phthalate		N	2790	mg/kg	0.50		< 0.50
Fluoranthene		M	2790	mg/kg	0.50		< 0.50
Pyrene		M	2790	mg/kg	0.50		< 0.50
Butylbenzyl Phthalate		N	2790	mg/kg	0.50		< 0.50
Benzo[a]anthracene		M	2790	mg/kg	0.50		< 0.50
Chrysene		M	2790	mg/kg	0.50		< 0.50
Bis(2-Ethylhexyl)Phthalate		N	2790	mg/kg	0.50		< 0.50
Di-N-Octyl Phthalate		N	2790	mg/kg	0.50		< 0.50
Benzo[b]fluoranthene		M	2790	mg/kg	0.50		< 0.50
Benzo[k]fluoranthene		M	2790	mg/kg	0.50		< 0.50
Benzo[a]pyrene		M	2790	mg/kg	0.50		< 0.50
Indeno(1,2,3-c,d)Pyrene		N	2790	mg/kg	0.50		< 0.50
Dibenz(a,h)Anthracene		N	2790	mg/kg	0.50		< 0.50
Benzo[g,h,i]perylene		M	2790	mg/kg	0.50		< 0.50
Naphthalene		M	2800	mg/kg	0.10	< 0.10	0.79
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	0.17
Fluorene		M	2800	mg/kg	0.10	< 0.10	0.12
Phenanthrene		M	2800	mg/kg	0.10	< 0.10	0.59
Anthracene		M	2800	mg/kg	0.10	< 0.10	0.13
Fluoranthene		M	2800	mg/kg	0.10	< 0.10	1.0
Pyrene		M	2800	mg/kg	0.10	< 0.10	0.75
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10	0.47
Chrysene		M	2800	mg/kg	0.10	< 0.10	0.47
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	0.68
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	0.21
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10	0.47
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10	0.37
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	0.39

Results - Soil

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd		Chemtest Job No.:				23-36902	23-36902	23-36902	23-36902
Quotation No.: Q23-33011		Chemtest Sample ID.:				1726800	1726802	1726805	1726806
Order No.:		Client Sample Ref.:				ES3	ES2	ES3	ES4
		Sample Location:				BH105	BH105	TP103	TP103
		Sample Type:				SOIL	SOIL	SOIL	SOIL
		Top Depth (m):				1	0.5	1.0	1.3
		Date Sampled:				01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023
		Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	
Determinand	HWOL Code	Accred.	SOP	Units	LOD				
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0	6.6		< 2.0
PCB 81		N	2815	mg/kg	0.010		< 0.010	< 0.010	
PCB 77		U	2815	mg/kg	0.010		< 0.010	< 0.010	
PCB 105		N	2815	mg/kg	0.010		< 0.010	< 0.010	
PCB 114		N	2815	mg/kg	0.010		< 0.010	< 0.010	
PCB 118		N	2815	mg/kg	0.010		< 0.010	< 0.010	
PCB 123		N	2815	mg/kg	0.010		< 0.010	< 0.010	
PCB 126		N	2815	mg/kg	0.010		< 0.010	< 0.010	
PCB 156		N	2815	mg/kg	0.010		< 0.010	< 0.010	
PCB 157		N	2815	mg/kg	0.010		< 0.010	< 0.010	
PCB 167		N	2815	mg/kg	0.010		< 0.010	< 0.010	
PCB 169		N	2815	mg/kg	0.010		< 0.010	< 0.010	
PCB 189		N	2815	mg/kg	0.010		< 0.010	< 0.010	
Total PCBs (12 Congeners)		N	2815	mg/kg	0.12		< 0.12	< 0.12	
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: Q1402 Trebanos WWTW

Chemtest Job No: 23-36902							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1726802							Limits			
Sample Ref: ES2							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: BH105										
Top Depth(m): 0.5										
Bottom Depth(m):										
Sampling Date: 01-Nov-2023										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				8.4	3	5	6
Loss On Ignition	2610	M	%				10	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				7.8	100	--	--
pH at 20C	2010	M					8.5	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0070	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0053	0.0069	0.010	0.064	0.5	2	25	
Barium	1455	U	0.029	0.008	0.055	0.13	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0026	0.0010	0.0050	0.014	0.5	10	70	
Copper	1455	U	0.019	0.0079	0.036	0.045	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0068	0.0031	0.013	0.040	0.5	10	30	
Nickel	1455	U	0.0051	0.0020	0.0098	0.028	0.4	10	40	
Lead	1455	U	< 0.0005	0.0029	< 0.0005	0.022	0.5	10	50	
Antimony	1455	U	0.0014	0.0005	0.0027	0.0074	0.06	0.7	5	
Selenium	1455	U	0.0014	< 0.0005	0.0026	0.0033	0.1	0.5	7	
Zinc	1455	U	0.007	0.008	0.013	0.072	4	50	200	
Chloride	1220	U	2.2	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	1.2	0.62	2.3	7.6	10	150	500	
Sulphate	1220	U	13	< 1.0	25	32	1000	20000	50000	
Total Dissolved Solids	1020	N	210	59	410	960	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	9.7	4.5	< 50	57	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	25

Leachate Test Information	
Leachant volume 1st extract/l	0.150
Leachant volume 2nd extract/l	0.720
Eluant recovered from 1st extract/l	0.219

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: Q1402 Trebanos WWTW

Chemtest Job No: 23-36902							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1726806							Limits			
Sample Ref: ES4							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: TP103										
Top Depth(m): 1.3										
Bottom Depth(m):										
Sampling Date: 01-Nov-2023										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				0.43	3	5	6
Loss On Ignition	2610	M	%				6.4	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH at 20C	2010	M					8.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0090	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0005	0.0003	0.0010	0.0034	0.5	2	25	
Barium	1455	U	0.013	< 0.005	0.025	0.031	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0018	0.0006	0.0036	0.0091	0.5	10	70	
Copper	1455	U	0.0008	0.0006	0.0016	0.0020	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0017	0.0009	0.0034	0.011	0.5	10	30	
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0006	< 0.0005	0.0011	0.0014	0.06	0.7	5	
Selenium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7	
Zinc	1455	U	0.003	0.004	0.006	0.035	4	50	200	
Chloride	1220	U	1.1	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	1.8	0.55	3.6	8.5	10	150	500	
Sulphate	1220	U	2.1	< 1.0	< 10	< 10	1000	20000	50000	
Total Dissolved Solids	1020	N	110	27	210	460	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	2.9	2.5	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	9.0

Leachate Test Information	
Leachant volume 1st extract/l	0.171
Leachant volume 2nd extract/l	0.720
Eluant recovered from 1st extract/l	0.218

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH at 20°C	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1815	Polychlorinated Biphenyls (PCB) ICES7 Congeners in Waters by GC-MS	ICES7 PCB congeners	Solvent extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH at 20°C	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurement by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.

Test Methods

SOP	Title	Parameters included	Method summary
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2810	Polychlorinated Biphenyls (PCB) as Aroclors in Soils by GC-ECD	Polychlorinated Biphenyls expressed as an Aroclor (normally reported as *Aroclor 1242)	Extraction of a soil sample, as received, into hexane/acetone (50:50) followed by gas chromatography (GC) using mass spectrometric (MS) detection for identification of polychlorinated biphenyls and electron capture detection (ECD) for quantitation if present.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Final Report

Report No.: 23-36904-1

Initial Date of Issue: 21-Nov-2023

Re-Issue Details:

Client Spencer Quantum Ltd

Client Address: Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW

Contact(s): Beth Thomas

Project Q1402 Trebanos WWTW

Quotation No.: Q23-33011

Date Received: 06-Nov-2023

Order No.:

Date Instructed: 10-Nov-2023

No. of Samples: 4

Turnaround (Wkdays): 6

Results Due: 17-Nov-2023

Date Approved: 21-Nov-2023

Approved By:



Details: Stuart Henderson, Technical
Manager

Results - Leachate

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd	Chemtest Job No.:					23-36904
Quotation No.: Q23-33011	Chemtest Sample ID.:					1726810
Order No.:	Client Sample Ref.:					ES1
	Sample Location:					TP105
	Sample Type:					SOIL
	Top Depth (m):					0.2
	Date Sampled:					01-Nov-2023
Determinand	Accred.	SOP	Type	Units	LOD	
pH at 20C	U	1010	2:1		4.0	7.7
Chloride	U	1220	2:1	mg/l	1.0	1.1
Ammoniacal Nitrogen	U	1220	2:1	mg/l	0.050	< 0.050
Cyanide (Total)	U	1300	2:1	mg/l	0.050	< 0.050
Calcium	U	1455	2:1	mg/l	2.00	5.6
Arsenic (Dissolved)	U	1455	2:1	µg/l	0.20	15
Beryllium (Dissolved)	U	1455	2:1	µg/l	1.00	< 1.0
Cadmium (Dissolved)	U	1455	2:1	µg/l	0.11	0.28
Chromium (Dissolved)	U	1455	2:1	µg/l	0.50	3.4
Copper (Dissolved)	U	1455	2:1	µg/l	0.50	32
Mercury (Dissolved)	U	1455	2:1	µg/l	0.05	< 0.05
Manganese (Dissolved)	U	1455	2:1	µg/l	0.50	65
Nickel (Dissolved)	U	1455	2:1	µg/l	0.50	4.3
Lead (Dissolved)	U	1455	2:1	µg/l	0.50	98
Antimony (Dissolved)	U	1455	2:1	µg/l	0.50	1.7
Selenium (Dissolved)	U	1455	2:1	µg/l	0.50	1.2
Vanadium (Dissolved)	U	1455	2:1	µg/l	0.50	7.6
Zinc (Dissolved)	U	1455	2:1	µg/l	2.5	100
Benzene	U	1760	2:1	µg/l	1.0	< 1.0
Toluene	U	1760	2:1	µg/l	1.0	< 1.0
Ethylbenzene	U	1760	2:1	µg/l	1.0	< 1.0
m & p-Xylene	U	1760	2:1	µg/l	1.0	< 1.0
o-Xylene	U	1760	2:1	µg/l	1.0	< 1.0
Naphthalene	U	1800	2:1	µg/l	0.10	< 0.10
Acenaphthylene	U	1800	2:1	µg/l	0.10	< 0.10
Acenaphthene	U	1800	2:1	µg/l	0.10	< 0.10
Fluorene	U	1800	2:1	µg/l	0.10	< 0.10
Phenanthrene	U	1800	2:1	µg/l	0.10	< 0.10
Anthracene	U	1800	2:1	µg/l	0.10	< 0.10
Fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10
Pyrene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[a]anthracene	U	1800	2:1	µg/l	0.10	< 0.10
Chrysene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[b]fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[k]fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[a]pyrene	U	1800	2:1	µg/l	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	2:1	µg/l	0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	2:1	µg/l	0.10	< 0.10

Results - Leachate

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd	Chemtest Job No.:					23-36904
Quotation No.: Q23-33011	Chemtest Sample ID.:					1726810
Order No.:	Client Sample Ref.:					ES1
	Sample Location:					TP105
	Sample Type:					SOIL
	Top Depth (m):					0.2
	Date Sampled:					01-Nov-2023
Determinand	Accred.	SOP	Type	Units	LOD	
Total Of 16 PAH's	U	1800	2:1	µg/l	2.0	< 2.0
PCB 28	N	1815	2:1	µg/l	0.010	< 0.010
PCB 52	N	1815	2:1	µg/l	0.010	< 0.010
PCB 101	N	1815	2:1	µg/l	0.010	< 0.010
PCB 118	N	1815	2:1	µg/l	0.010	< 0.010
PCB 153	N	1815	2:1	µg/l	0.010	< 0.010
PCB 138	N	1815	2:1	µg/l	0.010	< 0.010
PCB 180	N	1815	2:1	µg/l	0.010	< 0.010
Total PCBs (7 congeners)	N	1815	2:1	µg/l	0.010	< 0.010
Total Phenols	U	1920	2:1	mg/l	0.030	< 0.030

Results - Soil

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd	Chemtest Job No.:				23-36904	23-36904	23-36904	23-36904
Quotation No.: Q23-33011	Chemtest Sample ID.:				1726808	1726810	1726811	1726813
Order No.:	Client Sample Ref.:				ES2	ES1	ES1	ES3
	Sample Location:				TP105	TP105	TP102	TP102
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.5	0.2	0.2	1.0
	Date Sampled:				01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023
	Asbestos Lab:					NEW-ASB	NEW-ASB	
Determinand	Accred.	SOP	Units	LOD				
ACM Type	U	2192		N/A		-	-	
Asbestos Identification	U	2192		N/A		No Asbestos Detected	No Asbestos Detected	
Moisture	N	2030	%	0.020	25	13	23	11
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones and Roots	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand
pH at 20C	U	2010		4.0	8.9	7.9	7.7	8.2
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.014	< 0.010	< 0.010	< 0.010
Total Sulphur	U	2175	%	0.010			0.15	
Chloride (Water Soluble)	U	2220	g/l	0.010			< 0.010	
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50			3.9	
Arsenic	U	2455	mg/kg	0.5	59	73	30	11
Barium	U	2455	mg/kg	0			70	
Cadmium	U	2455	mg/kg	0.10	1.4	3.9	1.8	0.32
Chromium	U	2455	mg/kg	0.5	10	29	22	14
Molybdenum	U	2455	mg/kg	0.5			1.2	
Copper	U	2455	mg/kg	0.50	52	290	120	30
Mercury	U	2455	mg/kg	0.05	0.05	0.12	0.07	< 0.05
Nickel	U	2455	mg/kg	0.50	30	68	64	35
Lead	U	2455	mg/kg	0.50	53	840	260	31
Selenium	U	2455	mg/kg	0.25	1.5	1.4	0.95	0.89
Zinc	U	2455	mg/kg	0.50	150	2400	750	120
Chromium (Hexavalent)	N	2490	mg/kg	0.50			< 0.50	
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	U	2690	mg/kg	2.00	2.1	2.2	2.3	< 2.0
Aliphatic EPH >C12-C16	U	2690	mg/kg	1.00	1.0	< 1.0	< 1.0	< 1.0
Aliphatic EPH >C16-C21	U	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35	U	2690	mg/kg	3.00	< 3.0	< 3.0	< 3.0	< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35	U	2690	mg/kg	5.00	< 5.0	5.3	5.0	< 5.0

Results - Soil

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd	Chemtest Job No.:				23-36904	23-36904	23-36904	23-36904
Quotation No.: Q23-33011	Chemtest Sample ID.:				1726808	1726810	1726811	1726813
Order No.:	Client Sample Ref.:				ES2	ES1	ES1	ES3
	Sample Location:				TP105	TP105	TP102	TP102
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.5	0.2	0.2	1.0
	Date Sampled:				01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023
	Asbestos Lab:					NEW-ASB	NEW-ASB	
Determinand	Accred.	SOP	Units	LOD				
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	4.1	3.3	8.4	< 2.0
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0	< 1.0	1.1	< 1.0
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	6.1	5.1	10	< 5.0
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10	11	< 10
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	11	10	15	< 10
Total EPH >C10-C40	N	2690	mg/kg	10.00	11	10	16	< 10
LOI	U	2610	%	0.10			14	
Total Organic Carbon	U	2625	%	0.20	2.1	6.7	11	0.85
Dichlorodifluoromethane	U	2760	µg/kg	1.0	< 1.0			
Chloromethane	U	2760	µg/kg	1.0	< 1.0			
Vinyl Chloride	U	2760	µg/kg	1.0	< 1.0			
Bromomethane	U	2760	µg/kg	20	< 20			
Chloroethane	U	2760	µg/kg	2.0	< 2.0			
Trichlorofluoromethane	U	2760	µg/kg	1.0	< 1.0			
1,1-Dichloroethene	U	2760	µg/kg	1.0	< 1.0			
Dichloromethane	N	2760	µg/kg	50	< 50			
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0			
1,1-Dichloroethane	U	2760	µg/kg	1.0	< 1.0			
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0			
Bromochloromethane	U	2760	µg/kg	5.0	< 5.0			
Trichloromethane	U	2760	µg/kg	1.0	< 1.0			
1,1,1-Trichloroethane	U	2760	µg/kg	1.0	< 1.0			
Tetrachloromethane	U	2760	µg/kg	1.0	< 1.0			
1,1-Dichloropropene	U	2760	µg/kg	1.0	< 1.0			
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	2760	µg/kg	2.0	< 2.0			
Trichloroethene	N	2760	µg/kg	1.0	< 1.0			
1,2-Dichloropropane	U	2760	µg/kg	1.0	< 1.0			
Dibromomethane	U	2760	µg/kg	1.0	< 1.0			

Results - Soil

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd	Chemtest Job No.:					23-36904	23-36904	23-36904	23-36904
Quotation No.: Q23-33011	Chemtest Sample ID.:					1726808	1726810	1726811	1726813
Order No.:	Client Sample Ref.:					ES2	ES1	ES1	ES3
	Sample Location:					TP105	TP105	TP102	TP102
	Sample Type:					SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					0.5	0.2	0.2	1.0
	Date Sampled:					01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023
	Asbestos Lab:						NEW-ASB	NEW-ASB	
Determinand	Accred.	SOP	Units	LOD					
Bromodichloromethane	U	2760	µg/kg	5.0	< 5.0				
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10				
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10				
1,1,2-Trichloroethane	U	2760	µg/kg	10	< 10				
Tetrachloroethene	U	2760	µg/kg	1.0	< 1.0				
1,3-Dichloropropane	U	2760	µg/kg	2.0	< 2.0				
Dibromochloromethane	U	2760	µg/kg	10	< 10				
1,2-Dibromoethane	U	2760	µg/kg	5.0	< 5.0				
Chlorobenzene	U	2760	µg/kg	1.0	< 1.0				
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0	< 2.0				
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	U	2760	µg/kg	1.0	< 1.0				
Tribromomethane	U	2760	µg/kg	1.0	< 1.0				
Isopropylbenzene	U	2760	µg/kg	1.0	< 1.0				
Bromobenzene	U	2760	µg/kg	1.0	< 1.0				
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50				
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0				
2-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0				
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0				
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0				
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0				
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0				
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0				
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0				
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0				
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0				
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0				
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0				
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50				
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	< 1.0				
Hexachlorobutadiene	N	2760	µg/kg	1.0	< 1.0				
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0				
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0				
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	< 0.50				
Phenol	U	2790	mg/kg	0.50	< 0.50				

Results - Soil

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd	Chemtest Job No.:					23-36904	23-36904	23-36904	23-36904
Quotation No.: Q23-33011	Chemtest Sample ID.:					1726808	1726810	1726811	1726813
Order No.:	Client Sample Ref.:					ES2	ES1	ES1	ES3
	Sample Location:					TP105	TP105	TP102	TP102
	Sample Type:					SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					0.5	0.2	0.2	1.0
	Date Sampled:					01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023
	Asbestos Lab:						NEW-ASB	NEW-ASB	
Determinand	Accred.	SOP	Units	LOD					
2-Chlorophenol	N	2790	mg/kg	0.50	< 0.50				
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	< 0.50				
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50				
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50				
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50				
2-Methylphenol	U	2790	mg/kg	0.50	< 0.50				
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	< 0.50				
Hexachloroethane	U	2790	mg/kg	0.50	< 0.50				
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50	< 0.50				
4-Methylphenol	U	2790	mg/kg	0.50	< 0.50				
Nitrobenzene	N	2790	mg/kg	0.50	< 0.50				
Isophorone	U	2790	mg/kg	0.50	< 0.50				
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50				
2,4-Dimethylphenol	U	2790	mg/kg	0.50	< 0.50				
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	< 0.50				
2,4-Dichlorophenol	N	2790	mg/kg	0.50	< 0.50				
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	< 0.50				
Naphthalene	U	2790	mg/kg	0.50	< 0.50				
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50				
Hexachlorobutadiene	U	2790	mg/kg	0.50	< 0.50				
4-Chloro-3-Methylphenol	N	2790	mg/kg	0.50	< 0.50				
2-Methylnaphthalene	U	2790	mg/kg	0.50	< 0.50				
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50				
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50				
2,4,6-Trichlorophenol	N	2790	mg/kg	0.50	< 0.50				
2,4,5-Trichlorophenol	N	2790	mg/kg	0.50	< 0.50				
2-Chloronaphthalene	U	2790	mg/kg	0.50	< 0.50				
2-Nitroaniline	N	2790	mg/kg	0.50	< 0.50				
Acenaphthylene	U	2790	mg/kg	0.50	< 0.50				
Dimethylphthalate	U	2790	mg/kg	0.50	< 0.50				
2,6-Dinitrotoluene	N	2790	mg/kg	0.50	< 0.50				
Acenaphthene	U	2790	mg/kg	0.50	< 0.50				
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50				
Dibenzofuran	U	2790	mg/kg	0.50	< 0.50				
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	< 0.50				
2,4-Dinitrotoluene	N	2790	mg/kg	0.50	< 0.50				
Fluorene	U	2790	mg/kg	0.50	< 0.50				
Diethyl Phthalate	U	2790	mg/kg	0.50	< 0.50				

Results - Soil

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd	Chemtest Job No.:				23-36904	23-36904	23-36904	23-36904
Quotation No.: Q23-33011	Chemtest Sample ID.:				1726808	1726810	1726811	1726813
Order No.:	Client Sample Ref.:				ES2	ES1	ES1	ES3
	Sample Location:				TP105	TP105	TP102	TP102
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.5	0.2	0.2	1.0
	Date Sampled:				01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023
	Asbestos Lab:					NEW-ASB	NEW-ASB	
Determinand	Accred.	SOP	Units	LOD				
4-Nitroaniline	N	2790	mg/kg	0.50	< 0.50			
Azobenzene	U	2790	mg/kg	0.50	< 0.50			
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50	< 0.50			
Hexachlorobenzene	U	2790	mg/kg	0.50	< 0.50			
Phenanthrene	U	2790	mg/kg	0.50	< 0.50			
Anthracene	U	2790	mg/kg	0.50	< 0.50			
Carbazole	U	2790	mg/kg	0.50	< 0.50			
Di-N-Butyl Phthalate	N	2790	mg/kg	0.50	< 0.50			
Fluoranthene	U	2790	mg/kg	0.50	< 0.50			
Pyrene	U	2790	mg/kg	0.50	< 0.50			
Butylbenzyl Phthalate	N	2790	mg/kg	0.50	< 0.50			
Benzo[a]anthracene	U	2790	mg/kg	0.50	< 0.50			
Chrysene	U	2790	mg/kg	0.50	< 0.50			
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50			
Di-N-Octyl Phthalate	N	2790	mg/kg	0.50	< 0.50			
Benzo[b]fluoranthene	U	2790	mg/kg	0.50	< 0.50			
Benzo[k]fluoranthene	U	2790	mg/kg	0.50	< 0.50			
Benzo[a]pyrene	U	2790	mg/kg	0.50	< 0.50			
Indeno(1,2,3-c,d)Pyrene	N	2790	mg/kg	0.50	< 0.50			
Dibenz(a,h)Anthracene	N	2790	mg/kg	0.50	< 0.50			
Benzo[g,h,i]perylene	U	2790	mg/kg	0.50	< 0.50			
Naphthalene	U	2800	mg/kg	0.10		1.8	1.7	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10		0.53	0.90	< 0.10
Anthracene	U	2800	mg/kg	0.10		< 0.10	0.25	< 0.10
Fluoranthene	U	2800	mg/kg	0.10		0.80	0.89	< 0.10
Pyrene	U	2800	mg/kg	0.10		0.72	0.67	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10		0.50	0.50	< 0.10
Chrysene	U	2800	mg/kg	0.10		0.50	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10		< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0		4.9	4.9	< 2.0

Results - Soil

Project: Q1402 Trebanos WWTW

Client: Spencer Quantum Ltd	Chemtest Job No.:				23-36904	23-36904	23-36904	23-36904
Quotation No.: Q23-33011	Chemtest Sample ID.:				1726808	1726810	1726811	1726813
Order No.:	Client Sample Ref.:				ES2	ES1	ES1	ES3
	Sample Location:				TP105	TP105	TP102	TP102
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.5	0.2	0.2	1.0
	Date Sampled:				01-Nov-2023	01-Nov-2023	01-Nov-2023	01-Nov-2023
	Asbestos Lab:					NEW-ASB	NEW-ASB	
Determinand	Accred.	SOP	Units	LOD				
PCB 81	N	2815	mg/kg	0.010			< 0.010	
PCB 77	U	2815	mg/kg	0.010			< 0.010	
PCB 105	N	2815	mg/kg	0.010			< 0.010	
PCB 114	N	2815	mg/kg	0.010			< 0.010	
PCB 118	N	2815	mg/kg	0.010			< 0.010	
PCB 123	N	2815	mg/kg	0.010			< 0.010	
PCB 126	N	2815	mg/kg	0.010			< 0.010	
PCB 156	N	2815	mg/kg	0.010			< 0.010	
PCB 157	N	2815	mg/kg	0.010			< 0.010	
PCB 167	N	2815	mg/kg	0.010			< 0.010	
PCB 169	N	2815	mg/kg	0.010			< 0.010	
PCB 189	N	2815	mg/kg	0.010			< 0.010	
Total PCBs (12 Congeners)	N	2815	mg/kg	0.12			< 0.12	
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: Q1402 Trebanos WWTW

Chemtest Job No: 23-36904 Chemtest Sample ID: 1726808 Sample Ref: ES2 Sample ID: Sample Location: TP105 Top Depth(m): 0.5 Bottom Depth(m): Sampling Date: 01-Nov-2023							Landfill Waste Acceptance Criteria				
			Limits								
			Inert Waste Landfill				Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill			
Determinand									SOP	Accred.	Units
Total Organic Carbon									2625	U	%
Loss On Ignition									2610	U	%
Total BTEX									2760	U	mg/kg
Total PCBs (7 Congeners)									2815	U	mg/kg
TPH Total WAC									2670	U	mg/kg
Total (Of 17) PAH's			2700	N	mg/kg						
pH at 20C			2010	U							
Acid Neutralisation Capacity			2015	N	mol/kg						
Eluate Analysis					2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic			1455	U	0.0013	0.0006	0.0026	0.0075	0.5	2	25
Barium			1455	U	0.014	0.007	0.027	0.082	20	100	300
Cadmium			1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium			1455	U	< 0.0005	0.0006	< 0.0005	0.0047	0.5	10	70
Copper			1455	U	0.0034	0.0018	0.0065	0.0072	2	50	100
Mercury			1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum			1455	U	0.0005	0.0003	0.0009	0.0030	0.5	10	30
Nickel			1455	U	0.0007	0.0008	0.0014	0.0077	0.4	10	40
Lead			1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony			1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5
Selenium			1455	U	0.0005	< 0.0005	0.0010	0.0011	0.1	0.5	7
Zinc			1455	U	< 0.003	0.005	< 0.003	0.042	4	50	200
Chloride			1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride			1220	U	2.3	0.12	4.4	5.8	10	150	500
Sulphate			1220	U	4.9	< 1.0	< 10	10	1000	20000	50000
Total Dissolved Solids			1020	N	89	28	170	400	4000	60000	100000
Phenol Index			1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon			1610	U	5.5	5.6	< 50	56	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	25

Leachate Test Information	
Leachant volume 1st extract/l	0.150
Leachant volume 2nd extract/l	0.720
Eluant recovered from 1st extract/l	0.190

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: Q1402 Trebanos WWTW

Chemtest Job No: 23-36904							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1726811							Limits			
Sample Ref: ES1							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: TP102										
Top Depth(m): 0.2										
Bottom Depth(m):										
Sampling Date: 01-Nov-2023										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				11	3	5	6
Loss On Ignition	2610	U	%				14	--	--	10
Total BTEX	2760	U	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				9.4	100	--	--
pH at 20C	2010	U					7.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.0040	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0036	0.010	0.0070	0.082	0.5	2	25	
Barium	1455	U	0.020	0.010	0.039	0.13	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	0.0006	< 0.0005	0.0042	0.5	10	70	
Copper	1455	U	0.0037	0.0038	0.0072	0.012	2	50	100	
Mercury	1455	U	< 0.00005	0.00011	< 0.00005	0.00078	0.01	0.2	2	
Molybdenum	1455	U	0.0031	0.0021	0.0060	0.024	0.5	10	30	
Nickel	1455	U	0.0017	0.0013	0.0034	0.014	0.4	10	40	
Lead	1455	U	< 0.0005	0.0015	< 0.0005	0.010	0.5	10	50	
Antimony	1455	U	0.0006	< 0.0005	0.0011	0.0018	0.06	0.7	5	
Selenium	1455	U	0.0009	0.0007	0.0018	0.0075	0.1	0.5	7	
Zinc	1455	U	0.003	0.006	0.006	0.052	4	50	200	
Chloride	1220	U	1.2	2.8	< 10	23	800	15000	25000	
Fluoride	1220	U	0.74	0.17	1.4	3.5	10	150	500	
Sulphate	1220	U	2.7	4.7	< 10	40	1000	20000	50000	
Total Dissolved Solids	1020	N	120	52	240	730	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	5.1	4.4	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	23

Leachate Test Information	
Leachant volume 1st extract/l	0.153
Leachant volume 2nd extract/l	0.720
Eluant recovered from 1st extract/l	0.280

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: Q1402 Trebanos WWTW

Chemtest Job No: 23-36904 Chemtest Sample ID: 1726813 Sample Ref: ES3 Sample ID: Sample Location: TP102 Top Depth(m): 1.0 Bottom Depth(m): Sampling Date: 01-Nov-2023							Landfill Waste Acceptance Criteria			
							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				0.85	3	5	6
Loss On Ignition	2610	U	%				4.3	--	--	10
Total BTEX	2760	U	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH at 20C	2010	U					8.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.0060	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0006	0.0045	0.0012	0.035	0.5	2	25	
Barium	1455	U	0.015	0.006	0.030	0.079	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	0.0005	< 0.0005	0.0038	0.5	10	70	
Copper	1455	U	0.0027	0.0040	0.0054	0.0068	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0008	0.0005	0.0015	0.0055	0.5	10	30	
Nickel	1455	U	0.0017	0.0008	0.0033	0.010	0.4	10	40	
Lead	1455	U	< 0.0005	0.0016	< 0.0005	0.012	0.5	10	50	
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5	
Selenium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7	
Zinc	1455	U	< 0.003	0.007	< 0.003	0.053	4	50	200	
Chloride	1220	U	3.2	1.9	< 10	22	800	15000	25000	
Fluoride	1220	U	0.17	0.20	< 1.0	1.9	10	150	500	
Sulphate	1220	U	4.8	1.3	< 10	22	1000	20000	50000	
Total Dissolved Solids	1020	N	120	36	250	580	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	9.1	5.1	< 50	61	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	11

Leachate Test Information	
Leachant volume 1st extract/l	0.169
Leachant volume 2nd extract/l	0.720
Eluant recovered from 1st extract/l	0.225

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH at 20°C	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1815	Polychlorinated Biphenyls (PCB) ICES7 Congeners in Waters by GC-MS	ICES7 PCB congeners	Solvent extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH at 20°C	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurement by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.

Test Methods

SOP	Title	Parameters included	Method summary
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2810	Polychlorinated Biphenyls (PCB) as Aroclors in Soils by GC-ECD	Polychlorinated Biphenyls expressed as an Aroclor (normally reported as *Aroclor 1242)	Extraction of a soil sample, as received, into hexane/acetone (50:50) followed by gas chromatography (GC) using mass spectrometric (MS) detection for identification of polychlorinated biphenyls and electron capture detection (ECD) for quantitation if present.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 23-37272-1

Initial Date of Issue: 20-Nov-2023

Re-Issue Details:

Client Spencer Quantum Ltd

Client Address: Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW

Contact(s): Bethan Thomas
Lee Simlett

Project Q1402 TREBANOS

Quotation No.: Q23-33011

Date Received: 08-Nov-2023

Order No.:

Date Instructed: 15-Nov-2023

No. of Samples: 3

Turnaround (Wkdays): 5

Results Due: 21-Nov-2023

Date Approved: 20-Nov-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Leachate

Project: Q1402 TREBANOS

Client: Spencer Quantum Ltd	Chemtest Job No.:					23-37272
Quotation No.: Q23-33011	Chemtest Sample ID.:					1728228
Order No.:	Client Sample Ref.:					ES1
	Sample Location:					TP101
	Sample Type:					SOIL
	Top Depth (m):					0.2
	Date Sampled:					03-Nov-2023
	Time Sampled:					12:00
Determinand	Accred.	SOP	Type	Units	LOD	
pH at 20C	U	1010	2:1		4.0	11.0
Chloride	U	1220	2:1	mg/l	1.0	2.6
Ammoniacal Nitrogen	U	1220	2:1	mg/l	0.050	0.12
Cyanide (Total)	U	1300	2:1	mg/l	0.050	< 0.050
Calcium	U	1455	2:1	mg/l	2.00	55
Arsenic (Dissolved)	U	1455	2:1	µg/l	0.20	3.0
Beryllium (Dissolved)	U	1455	2:1	µg/l	1.00	< 1.0
Cadmium (Dissolved)	U	1455	2:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	2:1	µg/l	0.50	24
Copper (Dissolved)	U	1455	2:1	µg/l	0.50	11
Mercury (Dissolved)	U	1455	2:1	µg/l	0.05	0.17
Manganese (Dissolved)	U	1455	2:1	µg/l	0.50	< 0.50
Nickel (Dissolved)	U	1455	2:1	µg/l	0.50	0.75
Lead (Dissolved)	U	1455	2:1	µg/l	0.50	< 0.50
Antimony (Dissolved)	U	1455	2:1	µg/l	0.50	1.4
Selenium (Dissolved)	U	1455	2:1	µg/l	0.50	4.2
Vanadium (Dissolved)	U	1455	2:1	µg/l	0.50	110
Zinc (Dissolved)	U	1455	2:1	µg/l	2.5	< 2.5
Benzene	U	1760	2:1	µg/l	1.0	< 1.0
Toluene	U	1760	2:1	µg/l	1.0	< 1.0
Ethylbenzene	U	1760	2:1	µg/l	1.0	< 1.0
m & p-Xylene	U	1760	2:1	µg/l	1.0	< 1.0
o-Xylene	U	1760	2:1	µg/l	1.0	< 1.0
Naphthalene	U	1800	2:1	µg/l	0.10	< 0.10
Acenaphthylene	U	1800	2:1	µg/l	0.10	< 0.10
Acenaphthene	U	1800	2:1	µg/l	0.10	< 0.10
Fluorene	U	1800	2:1	µg/l	0.10	< 0.10
Phenanthrene	U	1800	2:1	µg/l	0.10	< 0.10
Anthracene	U	1800	2:1	µg/l	0.10	< 0.10
Fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10
Pyrene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[a]anthracene	U	1800	2:1	µg/l	0.10	< 0.10
Chrysene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[b]fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[k]fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[a]pyrene	U	1800	2:1	µg/l	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	2:1	µg/l	0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	2:1	µg/l	0.10	< 0.10

Results - Leachate

Project: Q1402 TREBANOS

Client: Spencer Quantum Ltd	Chemtest Job No.:					23-37272
Quotation No.: Q23-33011	Chemtest Sample ID.:					1728228
Order No.:	Client Sample Ref.:					ES1
	Sample Location:					TP101
	Sample Type:					SOIL
	Top Depth (m):					0.2
	Date Sampled:					03-Nov-2023
	Time Sampled:					12:00
Determinand	Accred.	SOP	Type	Units	LOD	
Benzo[g,h,i]perylene	U	1800	2:1	µg/l	0.10	< 0.10
Total Of 16 PAH's	U	1800	2:1	µg/l	2.0	< 2.0
PCB 28	N	1815	2:1	µg/l	0.010	< 0.010
PCB 52	N	1815	2:1	µg/l	0.010	< 0.010
PCB 101	N	1815	2:1	µg/l	0.010	< 0.010
PCB 118	N	1815	2:1	µg/l	0.010	< 0.010
PCB 153	N	1815	2:1	µg/l	0.010	< 0.010
PCB 138	N	1815	2:1	µg/l	0.010	< 0.010
PCB 180	N	1815	2:1	µg/l	0.010	< 0.010
Total PCBs (7 congeners)	N	1815	2:1	µg/l	0.010	< 0.010
Total Phenols	U	1920	2:1	mg/l	0.030	< 0.030

Results - Soil

Project: Q1402 TREBANOS

Client: Spencer Quantum Ltd	Chemtest Job No.:				23-37272	23-37272	23-37272
Quotation No.: Q23-33011	Chemtest Sample ID.:				1728225	1728227	1728228
Order No.:	Client Sample Ref.:				ES3	ES2	ES1
	Sample Location:				BH103	TP101	TP101
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.7	0.5	0.2
	Bottom Depth (m):				1.9		
	Date Sampled:				03-Nov-2023	03-Nov-2023	03-Nov-2023
	Time Sampled:				12:00	12:00	12:00
	Asbestos Lab:					COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
ACM Type	U	2192		N/A		-	-
Asbestos Identification	U	2192		N/A		No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	15	14	17
Soil Colour	N	2040		N/A	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand
pH at 20C	M	2010		4.0	10.9	10.8	9.9
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.61	0.56	0.17
Total Sulphur	U	2175	%	0.010		0.20	0.080
Chloride (Water Soluble)	M	2220	g/l	0.010		0.010	< 0.010
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50		15	6.8
Arsenic	M	2455	mg/kg	0.5	52	51	40
Barium	M	2455	mg/kg	0		580	1100
Cadmium	M	2455	mg/kg	0.10	2.8	3.5	2.3
Chromium	M	2455	mg/kg	0.5	2000	290	1100
Molybdenum	M	2455	mg/kg	0.5		8.7	15
Copper	M	2455	mg/kg	0.50	380	300	160
Mercury	M	2455	mg/kg	0.05	0.13	0.10	0.11
Nickel	M	2455	mg/kg	0.50	80	86	61
Lead	M	2455	mg/kg	0.50	260	420	250
Selenium	M	2455	mg/kg	0.25	3.2	2.0	2.1
Zinc	M	2455	mg/kg	0.50	490	640	410
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	< 1.0	1.1	< 1.0
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	< 2.0	3.6	< 2.0
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	< 3.0	< 3.0	< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10

Results - Soil

Project: Q1402 TREBANOS

Client: Spencer Quantum Ltd	Chemtest Job No.:				23-37272	23-37272	23-37272
Quotation No.: Q23-33011	Chemtest Sample ID.:				1728225	1728227	1728228
Order No.:	Client Sample Ref.:				ES3	ES2	ES1
	Sample Location:				BH103	TP101	TP101
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.7	0.5	0.2
	Bottom Depth (m):				1.9		
	Date Sampled:				03-Nov-2023	03-Nov-2023	03-Nov-2023
	Time Sampled:				12:00	12:00	12:00
	Asbestos Lab:					COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	< 5.0	5.3	< 5.0
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	< 2.0	2.3	3.7
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	3.1	< 2.0	7.3
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	4.4	< 1.0	120
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	< 5.0	< 5.0	11
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10	130
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	< 10	< 10	11
Total EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10	130
LOI	M	2610	%	0.10		3.6	5.0
Total Organic Carbon	M	2625	%	0.20	2.2	2.7	2.9
Dichlorodifluoromethane	U	2760	µg/kg	1.0		< 1.0	< 1.0
Chloromethane	M	2760	µg/kg	1.0		< 1.0	< 1.0
Vinyl Chloride	M	2760	µg/kg	1.0		< 1.0	< 1.0
Bromomethane	M	2760	µg/kg	20		< 20	< 20
Chloroethane	U	2760	µg/kg	2.0		< 2.0	< 2.0
Trichlorofluoromethane	M	2760	µg/kg	1.0		< 1.0	< 1.0
1,1-Dichloroethene	M	2760	µg/kg	1.0		< 1.0	< 1.0
Dichloromethane	N	2760	µg/kg	50		< 50	< 50
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0		< 1.0	< 1.0
1,1-Dichloroethane	M	2760	µg/kg	1.0		< 1.0	< 1.0
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0		< 1.0	< 1.0
Bromochloromethane	U	2760	µg/kg	5.0		< 5.0	< 5.0
Trichloromethane	M	2760	µg/kg	1.0		< 1.0	< 1.0
1,1,1-Trichloroethane	M	2760	µg/kg	1.0		< 1.0	< 1.0
Tetrachloromethane	M	2760	µg/kg	1.0		< 1.0	< 1.0
1,1-Dichloropropene	U	2760	µg/kg	1.0		< 1.0	< 1.0
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	M	2760	µg/kg	2.0		< 2.0	< 2.0

Results - Soil

Project: Q1402 TREBANOS

Client: Spencer Quantum Ltd	Chemtest Job No.:				23-37272	23-37272	23-37272
Quotation No.: Q23-33011	Chemtest Sample ID.:				1728225	1728227	1728228
Order No.:	Client Sample Ref.:				ES3	ES2	ES1
	Sample Location:				BH103	TP101	TP101
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.7	0.5	0.2
	Bottom Depth (m):				1.9		
	Date Sampled:				03-Nov-2023	03-Nov-2023	03-Nov-2023
	Time Sampled:				12:00	12:00	12:00
	Asbestos Lab:					COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
Trichloroethene	N	2760	µg/kg	1.0		< 1.0	< 1.0
1,2-Dichloropropane	M	2760	µg/kg	1.0		< 1.0	< 1.0
Dibromomethane	M	2760	µg/kg	1.0		< 1.0	< 1.0
Bromodichloromethane	M	2760	µg/kg	5.0		< 5.0	< 5.0
cis-1,3-Dichloropropene	N	2760	µg/kg	10		< 10	< 10
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10		< 10	< 10
1,1,2-Trichloroethane	M	2760	µg/kg	10		< 10	< 10
Tetrachloroethene	M	2760	µg/kg	1.0		< 1.0	< 1.0
1,3-Dichloropropane	U	2760	µg/kg	2.0		< 2.0	< 2.0
Dibromochloromethane	U	2760	µg/kg	10		< 10	< 10
1,2-Dibromoethane	M	2760	µg/kg	5.0		< 5.0	< 5.0
Chlorobenzene	M	2760	µg/kg	1.0		< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0		< 2.0	< 2.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Styrene	M	2760	µg/kg	1.0		< 1.0	< 1.0
Tribromomethane	U	2760	µg/kg	1.0		< 1.0	< 1.0
Isopropylbenzene	M	2760	µg/kg	1.0		< 1.0	< 1.0
Bromobenzene	M	2760	µg/kg	1.0		< 1.0	< 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50		< 50	< 50
N-Propylbenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0
2-Chlorotoluene	M	2760	µg/kg	1.0		< 1.0	< 1.0
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0		< 1.0	< 1.0
4-Chlorotoluene	U	2760	µg/kg	1.0		< 1.0	< 1.0
Tert-Butylbenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0		< 1.0	< 1.0
Sec-Butylbenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0
1,3-Dichlorobenzene	M	2760	µg/kg	1.0		< 1.0	< 1.0
4-Isopropyltoluene	U	2760	µg/kg	1.0		< 1.0	< 1.0
1,4-Dichlorobenzene	M	2760	µg/kg	1.0		< 1.0	< 1.0
N-Butylbenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0
1,2-Dichlorobenzene	M	2760	µg/kg	1.0		< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50		< 50	< 50
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0		< 1.0	< 1.0

Results - Soil

Project: Q1402 TREBANOS

Client: Spencer Quantum Ltd	Chemtest Job No.:		23-37272	23-37272	23-37272
Quotation No.: Q23-33011	Chemtest Sample ID.:		1728225	1728227	1728228
Order No.:	Client Sample Ref.:		ES3	ES2	ES1
	Sample Location:		BH103	TP101	TP101
	Sample Type:		SOIL	SOIL	SOIL
	Top Depth (m):		1.7	0.5	0.2
	Bottom Depth (m):		1.9		
	Date Sampled:		03-Nov-2023	03-Nov-2023	03-Nov-2023
	Time Sampled:		12:00	12:00	12:00
	Asbestos Lab:			COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD	
Hexachlorobutadiene	N	2760	µg/kg	1.0	< 1.0
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0
N-Nitrosodimethylamine	M	2790	mg/kg	0.50	< 0.50
Phenol	M	2790	mg/kg	0.50	< 0.50
2-Chlorophenol	N	2790	mg/kg	0.50	< 0.50
Bis-(2-Chloroethyl)Ether	M	2790	mg/kg	0.50	< 0.50
1,3-Dichlorobenzene	M	2790	mg/kg	0.50	< 0.50
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50
1,2-Dichlorobenzene	M	2790	mg/kg	0.50	< 0.50
2-Methylphenol	M	2790	mg/kg	0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	M	2790	mg/kg	0.50	< 0.50
Hexachloroethane	M	2790	mg/kg	0.50	< 0.50
N-Nitrosodi-n-propylamine	M	2790	mg/kg	0.50	< 0.50
4-Methylphenol	M	2790	mg/kg	0.50	< 0.50
Nitrobenzene	N	2790	mg/kg	0.50	< 0.50
Isophorone	M	2790	mg/kg	0.50	< 0.50
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50
2,4-Dimethylphenol	M	2790	mg/kg	0.50	< 0.50
Bis(2-Chloroethoxy)Methane	M	2790	mg/kg	0.50	< 0.50
2,4-Dichlorophenol	N	2790	mg/kg	0.50	< 0.50
1,2,4-Trichlorobenzene	M	2790	mg/kg	0.50	< 0.50
Naphthalene	M	2790	mg/kg	0.50	< 0.50
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50
Hexachlorobutadiene	M	2790	mg/kg	0.50	< 0.50
4-Chloro-3-Methylphenol	N	2790	mg/kg	0.50	< 0.50
2-Methylnaphthalene	M	2790	mg/kg	0.50	< 0.50
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50
2,4,6-Trichlorophenol	N	2790	mg/kg	0.50	< 0.50
2,4,5-Trichlorophenol	N	2790	mg/kg	0.50	< 0.50
2-Chloronaphthalene	M	2790	mg/kg	0.50	< 0.50
2-Nitroaniline	N	2790	mg/kg	0.50	< 0.50
Acenaphthylene	M	2790	mg/kg	0.50	< 0.50
Dimethylphthalate	M	2790	mg/kg	0.50	< 0.50
2,6-Dinitrotoluene	N	2790	mg/kg	0.50	< 0.50

Results - Soil

Project: Q1402 TREBANOS

Client: Spencer Quantum Ltd	Chemtest Job No.:		23-37272	23-37272	23-37272
Quotation No.: Q23-33011	Chemtest Sample ID.:		1728225	1728227	1728228
Order No.:	Client Sample Ref.:		ES3	ES2	ES1
	Sample Location:		BH103	TP101	TP101
	Sample Type:		SOIL	SOIL	SOIL
	Top Depth (m):		1.7	0.5	0.2
	Bottom Depth (m):		1.9		
	Date Sampled:		03-Nov-2023	03-Nov-2023	03-Nov-2023
	Time Sampled:		12:00	12:00	12:00
	Asbestos Lab:			COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD	
Acenaphthene	M	2790	mg/kg	0.50	< 0.50
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50
Dibenzofuran	M	2790	mg/kg	0.50	< 0.50
4-Chlorophenylphenylether	M	2790	mg/kg	0.50	< 0.50
2,4-Dinitrotoluene	N	2790	mg/kg	0.50	< 0.50
Fluorene	M	2790	mg/kg	0.50	< 0.50
Diethyl Phthalate	M	2790	mg/kg	0.50	< 0.50
4-Nitroaniline	N	2790	mg/kg	0.50	< 0.50
Azobenzene	M	2790	mg/kg	0.50	< 0.50
4-Bromophenylphenyl Ether	M	2790	mg/kg	0.50	< 0.50
Hexachlorobenzene	M	2790	mg/kg	0.50	< 0.50
Phenanthrene	M	2790	mg/kg	0.50	< 0.50
Anthracene	M	2790	mg/kg	0.50	< 0.50
Carbazole	M	2790	mg/kg	0.50	< 0.50
Di-N-Butyl Phthalate	N	2790	mg/kg	0.50	< 0.50
Fluoranthene	M	2790	mg/kg	0.50	< 0.50
Pyrene	M	2790	mg/kg	0.50	< 0.50
Butylbenzyl Phthalate	N	2790	mg/kg	0.50	< 0.50
Benzo[a]anthracene	M	2790	mg/kg	0.50	< 0.50
Chrysene	M	2790	mg/kg	0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50
Di-N-Octyl Phthalate	N	2790	mg/kg	0.50	< 0.50
Benzo[b]fluoranthene	M	2790	mg/kg	0.50	< 0.50
Benzo[k]fluoranthene	M	2790	mg/kg	0.50	< 0.50
Benzo[a]pyrene	M	2790	mg/kg	0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	N	2790	mg/kg	0.50	< 0.50
Dibenz(a,h)Anthracene	N	2790	mg/kg	0.50	< 0.50
Benzo[g,h,i]perylene	M	2790	mg/kg	0.50	< 0.50
Naphthalene	M	2800	mg/kg	0.10	0.48
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	0.41
Anthracene	M	2800	mg/kg	0.10	0.11
Fluoranthene	M	2800	mg/kg	0.10	0.58
Pyrene	M	2800	mg/kg	0.10	0.84

Results - Soil

Project: Q1402 TREBANOS

Client: Spencer Quantum Ltd	Chemtest Job No.:				23-37272	23-37272	23-37272
Quotation No.: Q23-33011	Chemtest Sample ID.:				1728225	1728227	1728228
Order No.:	Client Sample Ref.:				ES3	ES2	ES1
	Sample Location:				BH103	TP101	TP101
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				1.7	0.5	0.2
	Bottom Depth (m):				1.9		
	Date Sampled:				03-Nov-2023	03-Nov-2023	03-Nov-2023
	Time Sampled:				12:00	12:00	12:00
	Asbestos Lab:					COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD			
Benzo[a]anthracene	M	2800	mg/kg	0.10	0.43		
Chrysene	M	2800	mg/kg	0.10	0.70		
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	0.56		
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	0.18		
Benzo[a]pyrene	M	2800	mg/kg	0.10	0.29		
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	< 0.10		
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10		
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	< 0.10		
Total Of 16 PAH's	N	2800	mg/kg	2.0	4.6		
PCB 81	N	2815	mg/kg	0.010		< 0.010	
PCB 77	U	2815	mg/kg	0.010		< 0.010	
PCB 105	N	2815	mg/kg	0.010		< 0.010	
PCB 114	N	2815	mg/kg	0.010		< 0.010	
PCB 118	N	2815	mg/kg	0.010		< 0.010	
PCB 123	N	2815	mg/kg	0.010		< 0.010	
PCB 126	N	2815	mg/kg	0.010		< 0.010	
PCB 156	N	2815	mg/kg	0.010		< 0.010	
PCB 157	N	2815	mg/kg	0.010		< 0.010	
PCB 167	N	2815	mg/kg	0.010		< 0.010	
PCB 169	N	2815	mg/kg	0.010		< 0.010	
PCB 189	N	2815	mg/kg	0.010		< 0.010	
Total PCBs (12 Congeners)	N	2815	mg/kg	0.12		< 0.12	
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH at 20°C	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1815	Polychlorinated Biphenyls (PCB) ICES7 Congeners in Waters by GC-MS	ICES7 PCB congeners	Solvent extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH at 20°C	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurement by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.

Test Methods

SOP	Title	Parameters included	Method summary
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2810	Polychlorinated Biphenyls (PCB) as Aroclors in Soils by GC-ECD	Polychlorinated Biphenyls expressed as an Aroclor (normally reported as *Aroclor 1242)	Extraction of a soil sample, as received, into hexane/acetone (50:50) followed by gas chromatography (GC) using mass spectrometric (MS) detection for identification of polychlorinated biphenyls and electron capture detection (ECD) for quantitation if present.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 23-37570-1

Initial Date of Issue: 17-Nov-2023

Re-Issue Details:

Client Spencer Quantum Ltd

Client Address: Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW

Contact(s): Beth Thomas

Project Q1042 Trebanos

Quotation No.: Q23-33011

Date Received: 10-Nov-2023

Order No.:

Date Instructed: 10-Nov-2023

No. of Samples: 1

Turnaround (Wkdays): 6

Results Due: 17-Nov-2023

Date Approved: 17-Nov-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: Q1042 Trebanos

Chemtest Job No: 23-37570							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1729662							Limits			
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: TP103										
Top Depth(m): 1.00										
Bottom Depth(m):										
Sampling Date: 01-Nov-2023										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				13	3	5	6
Loss On Ignition	2610	M	%				7.0	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				3.2	100	--	--
pH at 20C	2010	M					8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.0090	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0021	0.0037	0.0041	0.033	0.5	2	25	
Barium	1455	U	0.024	0.037	0.048	0.34	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0062	0.011	0.012	0.095	0.5	10	70	
Copper	1455	U	0.023	0.0020	0.045	0.053	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0040	0.0021	0.0078	0.026	0.5	10	30	
Nickel	1455	U	0.0014	< 0.0005	0.0028	0.0034	0.4	10	40	
Lead	1455	U	< 0.0005	0.0012	< 0.0005	0.0088	0.5	10	50	
Antimony	1455	U	0.010	0.0027	0.020	0.044	0.06	0.7	5	
Selenium	1455	U	0.0017	< 0.0005	0.0033	0.0039	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	2.0	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	4.1	0.11	8.0	10	10	150	500	
Sulphate	1220	U	7.8	< 1.0	15	18	1000	20000	50000	
Total Dissolved Solids	1020	N	130	87	250	970	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	6.0	5.3	< 50	54	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	17

Leachate Test Information	
Leachant volume 1st extract/l	0.161
Leachant volume 2nd extract/l	0.720
Eluant recovered from 1st extract/l	0.210

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH at 20°C	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

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- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

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customerservices@chemtest.com

Final Report

Report No.: 23-37645-1

Initial Date of Issue: 20-Nov-2023

Re-Issue Details:

Client Spencer Quantum Ltd

Client Address: Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW

Contact(s): Beth Thomas

Project Q1402 Trebanos

Quotation No.: Q23-33011

Date Received: 13-Nov-2023

Order No.:

Date Instructed: 15-Nov-2023

No. of Samples: 1

Turnaround (Wkdays): 5

Results Due: 21-Nov-2023

Date Approved: 20-Nov-2023

Approved By:



Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: Q1402 Trebanos

Client: Spencer Quantum Ltd	Chemtest Job No.:		23-37645		
Quotation No.: Q23-33011	Chemtest Sample ID.:		1729972		
Order No.:	Client Sample Ref.:		ES2		
	Sample Location:		BH103		
	Sample Type:		SOIL		
	Top Depth (m):		0.5		
	Date Sampled:		03-Nov-2023		
	Time Sampled:		12:00		
Determinand	Accred.	SOP	Units	LOD	
Moisture	N	2030	%	0.020	24
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	Stones
Soil Texture	N	2040		N/A	Sand
pH at 20C	U	2010		4.0	8.7
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.014
Total Sulphur	U	2175	%	0.010	0.032
Chloride (Water Soluble)	U	2220	g/l	0.010	< 0.010
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	4.7
Arsenic	U	2455	mg/kg	0.5	8.7
Barium	U	2455	mg/kg	0	45
Cadmium	U	2455	mg/kg	0.10	0.20
Chromium	U	2455	mg/kg	0.5	12
Molybdenum	U	2455	mg/kg	0.5	0.5
Copper	U	2455	mg/kg	0.50	18
Mercury	U	2455	mg/kg	0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	20
Lead	U	2455	mg/kg	0.50	16
Selenium	U	2455	mg/kg	0.25	0.58
Zinc	U	2455	mg/kg	0.50	51
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25
Aliphatic EPH >C10-C12	U	2690	mg/kg	2.00	< 2.0
Aliphatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0
Aliphatic EPH >C16-C21	U	2690	mg/kg	2.00	< 2.0
Aliphatic EPH >C21-C35	U	2690	mg/kg	3.00	< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10
Total Aliphatic EPH >C10-C35	U	2690	mg/kg	5.00	< 5.0
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05

Results - Soil

Project: Q1402 Trebanos

Client: Spencer Quantum Ltd	Chemtest Job No.:		23-37645		
Quotation No.: Q23-33011	Chemtest Sample ID.:		1729972		
Order No.:	Client Sample Ref.:		ES2		
	Sample Location:		BH103		
	Sample Type:		SOIL		
	Top Depth (m):		0.5		
	Date Sampled:		03-Nov-2023		
	Time Sampled:		12:00		
Determinand	Accred.	SOP	Units	LOD	
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	4.1
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	< 2.0
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	2.0
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	< 5.0
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	< 10
Total EPH >C10-C40	N	2690	mg/kg	10.00	< 10
LOI	U	2610	%	0.10	5.8
Total Organic Carbon	U	2625	%	0.20	1.6
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH at 20°C	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurement by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easily liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 23-37649-1

Initial Date of Issue: 20-Nov-2023

Re-Issue Details:

Client Spencer Quantum Ltd

Client Address: Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW

Contact(s): Beth Thomas

Project Q1402 Trebanos

Quotation No.: Q23-33011

Date Received: 13-Nov-2023

Order No.:

Date Instructed: 13-Nov-2023

No. of Samples: 2

Turnaround (Wkdays): 5

Results Due: 17-Nov-2023

Date Approved: 20-Nov-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Leachate

Project: Q1402 Trebanos

Client: Spencer Quantum Ltd	Chemtest Job No.:					23-37649
Quotation No.: Q23-33011	Chemtest Sample ID.:					1729989
Order No.:	Client Sample Ref.:					ES4
	Sample Location:					BH106
	Sample Type:					SOIL
	Top Depth (m):					2.5
	Date Sampled:					08-Nov-2023
	Time Sampled:					12:00
Determinand	Accred.	SOP	Type	Units	LOD	
pH at 20C	U	1010	2:1		4.0	8.7
Chloride	U	1220	2:1	mg/l	1.0	1.1
Ammoniacal Nitrogen	U	1220	2:1	mg/l	0.050	0.078
Cyanide (Total)	U	1300	2:1	mg/l	0.050	0.20
Calcium	U	1455	2:1	mg/l	2.00	4.2
Arsenic (Dissolved)	U	1455	2:1	µg/l	0.20	0.66
Beryllium (Dissolved)	U	1455	2:1	µg/l	1.00	< 1.0
Cadmium (Dissolved)	U	1455	2:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	2:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	2:1	µg/l	0.50	1.2
Mercury (Dissolved)	U	1455	2:1	µg/l	0.05	< 0.05
Manganese (Dissolved)	U	1455	2:1	µg/l	0.50	8.9
Nickel (Dissolved)	U	1455	2:1	µg/l	0.50	0.92
Lead (Dissolved)	U	1455	2:1	µg/l	0.50	0.86
Antimony (Dissolved)	U	1455	2:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	2:1	µg/l	0.50	0.52
Vanadium (Dissolved)	U	1455	2:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	2:1	µg/l	2.5	4.5
Benzene	U	1760	2:1	µg/l	1.0	< 1.0
Toluene	U	1760	2:1	µg/l	1.0	< 1.0
Ethylbenzene	U	1760	2:1	µg/l	1.0	< 1.0
m & p-Xylene	U	1760	2:1	µg/l	1.0	< 1.0
o-Xylene	U	1760	2:1	µg/l	1.0	< 1.0
Naphthalene	U	1800	2:1	µg/l	0.10	< 0.10
Acenaphthylene	U	1800	2:1	µg/l	0.10	< 0.10
Acenaphthene	U	1800	2:1	µg/l	0.10	< 0.10
Fluorene	U	1800	2:1	µg/l	0.10	< 0.10
Phenanthrene	U	1800	2:1	µg/l	0.10	1.1
Anthracene	U	1800	2:1	µg/l	0.10	0.32
Fluoranthene	U	1800	2:1	µg/l	0.10	1.5
Pyrene	U	1800	2:1	µg/l	0.10	2.2
Benzo[a]anthracene	U	1800	2:1	µg/l	0.10	< 0.10
Chrysene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[b]fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[k]fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[a]pyrene	U	1800	2:1	µg/l	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	2:1	µg/l	0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	2:1	µg/l	0.10	< 0.10

Results - Leachate

Project: Q1402 Trebanos

Client: Spencer Quantum Ltd	Chemtest Job No.:					23-37649
Quotation No.: Q23-33011	Chemtest Sample ID.:					1729989
Order No.:	Client Sample Ref.:					ES4
	Sample Location:					BH106
	Sample Type:					SOIL
	Top Depth (m):					2.5
	Date Sampled:					08-Nov-2023
	Time Sampled:					12:00
Determinand	Accred.	SOP	Type	Units	LOD	
Benzo[g,h,i]perylene	U	1800	2:1	µg/l	0.10	< 0.10
Total Of 16 PAH's	U	1800	2:1	µg/l	2.0	5.1
Total Phenols	U	1920	2:1	mg/l	0.030	< 0.030

Results - Soil

Project: Q1402 Trebanos

Client: Spencer Quantum Ltd	Chemtest Job No.:				23-37649	23-37649
Quotation No.: Q23-33011	Chemtest Sample ID.:				1729989	1729991
Order No.:	Client Sample Ref.:				ES4	ES5
	Sample Location:				BH106	BH106
	Sample Type:				SOIL	SOIL
	Top Depth (m):				2.5	5.8
	Date Sampled:				08-Nov-2023	08-Nov-2023
	Time Sampled:				12:00	12:00
Determinand	Accred.	SOP	Units	LOD		
Moisture	N	2030	%	0.020	6.7	9.7
Soil Colour	N	2040		N/A	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones
Soil Texture	N	2040		N/A	Loam	Sand
pH at 20C	M	2010		4.0	8.6	8.4
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.060	0.014
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Arsenic	M	2455	mg/kg	0.5	6.4	9.7
Cadmium	M	2455	mg/kg	0.10	0.18	0.20
Chromium	M	2455	mg/kg	0.5	15	14
Copper	M	2455	mg/kg	0.50	29	22
Mercury	M	2455	mg/kg	0.05	0.09	0.06
Nickel	M	2455	mg/kg	0.50	35	30
Lead	M	2455	mg/kg	0.50	35	47
Selenium	M	2455	mg/kg	0.25	0.98	0.84
Zinc	M	2455	mg/kg	0.50	110	74
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	< 2.0	< 2.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	< 1.0	1.4
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	< 2.0	< 2.0
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	< 3.0	< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	< 5.0	< 5.0
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	5.3	2.9
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	2.0	3.1

Results - Soil

Project: Q1402 Trebanos

Client: Spencer Quantum Ltd	Chemtest Job No.:				23-37649	23-37649
Quotation No.: Q23-33011	Chemtest Sample ID.:				1729989	1729991
Order No.:	Client Sample Ref.:				ES4	ES5
	Sample Location:				BH106	BH106
	Sample Type:				SOIL	SOIL
	Top Depth (m):				2.5	5.8
	Date Sampled:				08-Nov-2023	08-Nov-2023
	Time Sampled:				12:00	12:00
Determinand	Accred.	SOP	Units	LOD		
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0	< 1.0
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	7.3	6.0
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	< 10	< 10
Total EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10
Total Organic Carbon	M	2625	%	0.20	0.93	0.48
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Naphthalene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Chrysene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH at 20°C	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH at 20°C	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 23-37905-1

Initial Date of Issue: 21-Nov-2023

Re-Issue Details:

Client Spencer Quantum Ltd

Client Address: Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW

Contact(s): Beth Thomas

Project Q1402 Trebanos

Quotation No.: **Date Received:** 13-Nov-2023

Order No.: **Date Instructed:** 13-Nov-2023

No. of Samples: 1

Turnaround (Wkdays): 7 **Results Due:** 21-Nov-2023

Date Approved: 21-Nov-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: Q1402 Trebanos

Chemtest Job No: 23-37905							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1731079							Limits			
Sample Ref: ES5							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: BH106										
Top Depth(m): 5.8										
Bottom Depth(m):										
Sampling Date: 08-Nov-2023										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				0.68	3	5	6
Loss On Ignition	2610	M	%				2.5	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH at 20C	2010	M					8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.0080	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0005	0.0008	0.0009	0.0073	0.5	2	25	
Barium	1455	U	0.007	< 0.005	0.014	0.0058	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	< 0.0005	0.0010	< 0.0005	< 0.0005	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0007	0.0016	0.0013	0.015	0.5	10	30	
Nickel	1455	U	0.0007	0.0008	0.0014	0.0079	0.4	10	40	
Lead	1455	U	< 0.0005	0.0005	< 0.0005	0.0048	0.5	10	50	
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5	
Selenium	1455	U	0.0007	0.0006	0.0014	0.0059	0.1	0.5	7	
Zinc	1455	U	0.004	0.005	0.007	0.048	4	50	200	
Chloride	1220	U	1.8	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.37	0.33	< 1.0	3.3	10	150	500	
Sulphate	1220	U	6.2	2.0	12	23	1000	20000	50000	
Total Dissolved Solids	1020	N	52	27	99	280	4000	60000	100000	
Phenol Index	1920	U	0.10	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	4.1	4.0	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	25

Leachate Test Information	
Leachant volume 1st extract/l	0.290
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.144

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH at 20°C	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 23-37976-1

Initial Date of Issue: 27-Nov-2023

Re-Issue Details:

Client Spencer Quantum Ltd

Client Address: Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW

Contact(s): Lee Simlett

Project Q1402 Trebanos

Quotation No.: Q23-33011

Date Received: 15-Nov-2023

Order No.:

Date Instructed: 15-Nov-2023

No. of Samples: 2

Turnaround (Wkdays): 7

Results Due: 23-Nov-2023

Date Approved: 27-Nov-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: Q1402 Trebanos

Chemtest Job No: 23-37976							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1731332							Limits			
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: BH103										
Top Depth(m): 1.70										
Bottom Depth(m):										
Sampling Date: 02-Nov-2023										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				2.1	3	5	6
Loss On Ignition	2610	M	%				4.2	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH at 20C	2010	M					10.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0060	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0007	0.0007	0.0014	0.0068	0.5	2	25	
Barium	1455	U	0.22	0.11	0.44	1.2	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.057	0.025	0.11	0.28	0.5	10	70	
Copper	1455	U	0.0086	0.0020	0.017	0.015	2	50	100	
Mercury	1455	U	0.0024	0.00074	0.0047	0.0089	0.01	0.2	2	
Molybdenum	1455	U	0.085	0.018	0.17	0.24	0.5	10	30	
Nickel	1455	U	0.0015	< 0.0005	0.0030	0.0014	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0056	0.0009	0.011	0.014	0.06	0.7	5	
Selenium	1455	U	0.0092	0.0034	0.018	0.039	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	15	4.0	30	50	800	15000	25000	
Fluoride	1220	U	2.2	1.7	4.3	17	10	150	500	
Sulphate	1220	U	22	13	43	140	1000	20000	50000	
Total Dissolved Solids	1020	N	100	690	200	6300	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	14	< 2.5	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	15

Leachate Test Information	
Leachant volume 1st extract/l	0.319
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.159

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: Q1402 Trebanos

Chemtest Job No: 23-37976							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1731333							Limits			
Sample Ref:							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: TP101										
Top Depth(m): 0.50										
Bottom Depth(m):										
Sampling Date: 02-Nov-2023										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				3.2	3	5	6
Loss On Ignition	2610	M	%				4.1	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH at 20C	2010	M					10.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.0070	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0005	0.0003	0.0010	0.0034	0.5	2	25	
Barium	1455	U	0.33	0.22	0.66	2.3	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.039	0.022	0.078	0.24	0.5	10	70	
Copper	1455	U	0.0079	0.0041	0.016	0.018	2	50	100	
Mercury	1455	U	0.0016	0.00087	0.0032	0.0096	0.01	0.2	2	
Molybdenum	1455	U	0.068	0.023	0.14	0.29	0.5	10	30	
Nickel	1455	U	0.0007	< 0.0005	0.0014	0.0009	0.4	10	40	
Lead	1455	U	0.0005	< 0.0005	0.0010	0.0007	0.5	10	50	
Antimony	1455	U	0.0007	< 0.0005	0.0014	0.0009	0.06	0.7	5	
Selenium	1455	U	0.0063	0.0026	0.012	0.031	0.1	0.5	7	
Zinc	1455	U	< 0.003	0.003	< 0.003	0.025	4	50	200	
Chloride	1220	U	14	16	28	160	800	15000	25000	
Fluoride	1220	U	2.1	2.2	4.2	22	10	150	500	
Sulphate	1220	U	9.4	14	19	130	1000	20000	50000	
Total Dissolved Solids	1020	N	1300	960	2600	10000	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	3.7	< 2.5	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	14

Leachate Test Information	
Leachant volume 1st extract/l	0.321
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.225

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH at 20°C	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

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U	UKAS accredited
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I/S	Insufficient Sample
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N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

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customerservices@chemtest.com



Final Report

Report No.: 23-37984-1

Initial Date of Issue: 27-Nov-2023

Re-Issue Details:

Client Spencer Quantum Ltd

Client Address: Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW

Contact(s): Lee Simlett

Project Q1402 Trebanos

Quotation No.: Q23-33011

Date Received: 15-Nov-2023

Order No.:

Date Instructed: 15-Nov-2023

No. of Samples: 1

Turnaround (Wkdays): 7

Results Due: 23-Nov-2023

Date Approved: 27-Nov-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: Q1402 Trebanos

Chemtest Job No: 23-37984 Chemtest Sample ID: 1731355 Sample Ref: ES2 Sample ID: Sample Location: BH103 Top Depth(m): 0.50 Bottom Depth(m): Sampling Date: 02-Nov-2023							Landfill Waste Acceptance Criteria			
			Limits							
			Inert Waste Landfill				Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill		
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				2.0	3	5	6
Loss On Ignition	2610	M	%				5.1	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH at 20C	2010	M					8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.0090	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0075	0.0038	0.015	0.041	0.5	2	25	
Barium	1455	U	0.021	0.009	0.040	0.096	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0012	0.0047	0.0024	0.044	0.5	10	70	
Copper	1455	U	0.014	0.0053	0.026	0.0097	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0028	0.0016	0.0053	0.017	0.5	10	30	
Nickel	1455	U	0.0064	0.0025	0.012	0.028	0.4	10	40	
Lead	1455	U	0.0085	0.0030	0.016	0.034	0.5	10	50	
Antimony	1455	U	0.0011	0.0014	0.0021	0.014	0.06	0.7	5	
Selenium	1455	U	0.0010	0.0005	0.0020	0.0058	0.1	0.5	7	
Zinc	1455	U	0.015	0.007	0.029	0.078	4	50	200	
Chloride	1220	U	3.4	2.4	< 10	25	800	15000	25000	
Fluoride	1220	U	1.3	0.63	2.5	6.7	10	150	500	
Sulphate	1220	U	7.3	< 1.0	14	< 10	1000	20000	50000	
Total Dissolved Solids	1020	N	130	70	260	740	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	13	6.5	< 50	69	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	24

Leachate Test Information	
Leachant volume 1st extract/l	0.295
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.125

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH at 20°C	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



2183

Final Report

Report No.: 23-39676-1

Initial Date of Issue: 07-Dec-2023

Re-Issue Details:

Client Spencer Quantum Ltd

Client Address: Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW

Contact(s): Lee Simlett

Project Q1402 Trebanos Storm Outfall

Quotation No.: Q23-33011

Date Received: 30-Nov-2023

Order No.:

Date Instructed: 30-Nov-2023

No. of Samples: 7

Turnaround (Wkdays): 5

Results Due: 06-Dec-2023

Date Approved: 07-Dec-2023

Approved By:



Details: Stuart Henderson, Technical
Manager

Results - Water

Project: Q1402 Trebanos Storm Outfall

Client: Spencer Quantum Ltd	Chemtest Job No.:				23-39676	23-39676	23-39676	23-39676	23-39676	23-39676	23-39676
Quotation No.: Q23-33011	Chemtest Sample ID.:				1738630	1738631	1738632	1738633	1738634	1738635	1738636
Order No.:	Client Sample Ref.:				EW1	EW1	EW1	EW1	EW1	EW1	EW1
	Sample Location:				BH102	BH103	BH105	BH106	SW1	SW2	Culvert
	Sample Type:				WATER	WATER	WATER	WATER	WATER	WATER	WATER
	Top Depth (m):				2.20	1.06	1.97	1.17			
	Bottom Depth (m):				3.18	1.95	6.95	4.82			
	Date Sampled:				28-Nov-2023	28-Nov-2023	28-Nov-2023	28-Nov-2023	28-Nov-2023	28-Nov-2023	28-Nov-2023
	Time Sampled:				10:00	10:20	10:30	10:45	11:00	11:10	11:25
Determinand	Accred.	SOP	Units	LOD							
pH at 20C	U	1010		4.0	7.6	8.2	8.3	8.3	8.4	8.2	8.0
Chloride	U	1220	mg/l	1.0	15	30	15	17	9.5	8.9	23
Ammoniacal Nitrogen	U	1220	mg/l	0.050	0.31	0.19	0.22	0.28	0.29	0.086	1.3
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium (Total)	N	1455	mg/l	5.0	310	79	66	54	20	20	31
Total Hardness as CaCO3	U	1270	mg/l	15	210	170	190	160	77	76	94
Arsenic (Dissolved)	U	1455	µg/l	0.20	0.47	0.51	< 0.20	< 0.20	0.88	0.92	0.53
Beryllium (Dissolved)	U	1455	µg/l	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	µg/l	0.50	0.57	6.5	1.5	1.2	0.74	0.92	0.74
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Manganese (Dissolved)	U	1455	µg/l	0.50	260	820	260	450	18	17	4.5
Nickel (Dissolved)	U	1455	µg/l	0.50	2.3	8.8	2.9	3.2	1.4	1.3	3.1
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Antimony (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	3.2	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.88
Zinc (Dissolved)	U	1455	µg/l	2.5	9.7	19	69	58	15	16	24
Dissolved Organic Carbon	U	1610	mg/l	2.0	2.8	8.2	2.7	2.3	3.6	3.2	4.2
TPH >C6-C10	N	1670	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH >C10-C21	N	1670	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH >C21-C40	N	1670	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total TPH >C6-C40	U	1670	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: Q1402 Trebanos Storm Outfall

Client: Spencer Quantum Ltd	Chemtest Job No.:				23-39676	23-39676	23-39676	23-39676	23-39676	23-39676	23-39676
Quotation No.: Q23-33011	Chemtest Sample ID.:				1738630	1738631	1738632	1738633	1738634	1738635	1738636
Order No.:	Client Sample Ref.:				EW1	EW1	EW1	EW1	EW1	EW1	EW1
	Sample Location:				BH102	BH103	BH105	BH106	SW1	SW2	Culvert
	Sample Type:				WATER	WATER	WATER	WATER	WATER	WATER	WATER
	Top Depth (m):				2.20	1.06	1.97	1.17			
	Bottom Depth (m):				3.18	1.95	6.95	4.82			
	Date Sampled:				28-Nov-2023	28-Nov-2023	28-Nov-2023	28-Nov-2023	28-Nov-2023	28-Nov-2023	28-Nov-2023
	Time Sampled:				10:00	10:20	10:30	10:45	11:00	11:10	11:25
Determinand	Accred.	SOP	Units	LOD							
Benzo[a]anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	1800	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
PCB 81	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 77	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 105	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 114	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 118	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 123	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 126	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 156	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 157	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 167	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 169	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 189	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total PCBs (12 Congeners)	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH at 20°C	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO ₃ equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1815	Polychlorinated Biphenyls (PCB) ICES7 Congeners in Waters by GC-MS	ICES7 PCB congeners	Solvent extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

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<	"less than"
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Uncertainty of measurement for the determinands tested are available upon request

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All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

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- A - Date of sampling not supplied
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- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

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All water samples will be retained for 14 days from the date of receipt

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customerservices@chemtest.com



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Final Report

Report No.: 23-41461-1**Initial Date of Issue:** 27-Dec-2023**Re-Issue Details:****Client** Spencer Quantum Ltd**Client Address:** Parcau Farm
Penrhiwllan
Llandysul
Ceredigion
SA44 5NW**Contact(s):** Lee Simlett**Project** Q1402 Trebonos WWTW**Quotation No.:** Q23-33011**Date Received:** 15-Dec-2023**Order No.:****Date Instructed:** 15-Dec-2023**No. of Samples:** 8**Turnaround (Wkdays):** 5**Results Due:** 21-Dec-2023**Date Approved:** 27-Dec-2023**Approved By:****Details:** Stuart Henderson, Technical
Manager

Results - Water

Project: Q1402 Trebonos WWTW

Client: Spencer Quantum Ltd		Chemtest Job No.:		23-41461	23-41461	23-41461	23-41461	23-41461	23-41461	23-41461	23-41461	23-41461	23-41461
Quotation No.: Q23-33011		Chemtest Sample ID.:		1745861	1745862	1745863	1745864	1745865	1745866	1745867	1745868		
		Client Sample ID.:		EW2	EW2	EW2	EW2	EW2	EW2	EW2	EW2	EW2	EW2
		Sample Location:		BH101	BH102	BH103	BH105	BH106	SW1	SW2	SW03		
		Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER		
		Top Depth (m):		1.96	1.73	0.50	1.40	0.70					
		Date Sampled:		13-Dec-2023	13-Dec-2023	13-Dec-2023	13-Dec-2023	13-Dec-2023	13-Dec-2023	13-Dec-2023	13-Dec-2023	13-Dec-2023	13-Dec-2023
Determinand	HWOL Code	Accred.	SOP	Units	LOD								
pH at 20C		U	1010		4.0	8.0	8.2	7.8	7.8	7.9	7.9	7.9	8.0
Chloride		U	1220	mg/l	1.0	13	14	28	15	15	10	10	21
Ammoniacal Nitrogen		U	1220	mg/l	0.050	0.064	< 0.050	< 0.050	0.060	0.086	0.12	0.32	8.6
Cyanide (Total)		U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium (Total)		N	1455	mg/l	5.0	92	27	5.4	72	57	22	18	46
Total Hardness as CaCO3		U	1270	mg/l	15	230	260	160	200	150	57	57	99
Arsenic (Dissolved)		U	1455	µg/l	0.20	< 0.20	< 0.20	0.25	< 0.20	< 0.20	0.84	0.81	0.95
Beryllium (Dissolved)		U	1455	µg/l	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium (Dissolved)		U	1455	µg/l	0.11	0.12	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)		U	1455	µg/l	0.50	2.4	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.2	< 0.50
Copper (Dissolved)		U	1455	µg/l	0.50	12	0.73	5.5	1.1	< 0.50	0.87	1.5	< 0.50
Mercury (Dissolved)		U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Manganese (Dissolved)		U	1455	µg/l	0.50	7.2	1.5	240	190	360	10	11	92
Nickel (Dissolved)		U	1455	µg/l	0.50	2.1	0.76	6.9	2.2	1.8	0.83	1.3	5.2
Lead (Dissolved)		U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Antimony (Dissolved)		U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)		U	1455	µg/l	0.50	0.56	0.71	< 0.50	< 0.50	< 0.50	0.62	< 0.50	0.60
Vanadium (Dissolved)		U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Zinc (Dissolved)		U	1455	µg/l	2.5	28	22	14	18	29	16	18	31
Dissolved Organic Carbon		U	1610	mg/l	2.0	3.1	2.2	7.3	2.1	< 2.0	3.1	3.2	14
TPH >C6-C10	EH_1D_Total	N	1670	µg/l	0.10	< 0.10		< 0.10			< 0.10	< 0.10	< 0.10
TPH >C10-C21	EH_1D_Total	N	1670	µg/l	0.10	< 0.10		< 0.10			< 0.10	< 0.10	< 0.10
TPH >C21-C40	EH_1D_Total	N	1670	µg/l	0.10	< 0.10		< 0.10			< 0.10	< 0.10	< 0.10
Total TPH >C6-C40		U	1670	µg/l	10	< 10		< 10			< 10	< 10	< 10
Benzene		U	1760	µg/l	1.0	< 1.0		< 1.0			< 1.0	< 1.0	< 1.0
Toluene		U	1760	µg/l	1.0	< 1.0		< 1.0			< 1.0	< 1.0	< 1.0
Ethylbenzene		U	1760	µg/l	1.0	< 1.0		< 1.0			< 1.0	< 1.0	< 1.0
m & p-Xylene		U	1760	µg/l	1.0	< 1.0		< 1.0			< 1.0	< 1.0	< 1.0
o-Xylene		U	1760	µg/l	1.0	< 1.0		< 1.0			< 1.0	< 1.0	< 1.0
Naphthalene		U	1800	µg/l	0.10	< 0.10		< 0.10			< 0.10	< 0.10	< 0.10
Acenaphthylene		U	1800	µg/l	0.10	< 0.10		< 0.10			< 0.10	< 0.10	< 0.10
Acenaphthene		U	1800	µg/l	0.10	< 0.10		< 0.10			< 0.10	< 0.10	< 0.10
Fluorene		U	1800	µg/l	0.10	< 0.10		< 0.10			< 0.10	< 0.10	< 0.10
Phenanthrene		U	1800	µg/l	0.10	< 0.10		< 0.10			< 0.10	< 0.10	< 0.10
Anthracene		U	1800	µg/l	0.10	< 0.10		< 0.10			< 0.10	< 0.10	< 0.10
Fluoranthene		U	1800	µg/l	0.10	< 0.10		< 0.10			< 0.10	< 0.10	< 0.10
Pyrene		U	1800	µg/l	0.10	< 0.10		< 0.10			< 0.10	< 0.10	< 0.10
Benzo[a]anthracene		U	1800	µg/l	0.10	< 0.10		< 0.10			< 0.10	< 0.10	< 0.10
Chrysene		U	1800	µg/l	0.10	< 0.10		< 0.10			< 0.10	< 0.10	< 0.10

Results - Water

Project: Q1402 Trebonos WWTW

Client: Spencer Quantum Ltd		Chemtest Job No.:						23-41461	23-41461	23-41461	23-41461	23-41461	23-41461	23-41461
Quotation No.: Q23-33011		Chemtest Sample ID.:						1745861	1745862	1745863	1745864	1745865	1745866	1745868
		Client Sample ID.:						EW2	EW2	EW2	EW2	EW2	EW2	EW2
		Sample Location:						BH101	BH102	BH103	BH105	BH106	SW1	SW2
		Sample Type:						WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Top Depth (m):						1.96	1.73	0.50	1.40	0.70		
		Date Sampled:						13-Dec-2023	13-Dec-2023	13-Dec-2023	13-Dec-2023	13-Dec-2023	13-Dec-2023	13-Dec-2023
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
Benzo[b]fluoranthene		U	1800	µg/l	0.10	< 0.10		< 0.10				< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene		U	1800	µg/l	0.10	< 0.10		< 0.10				< 0.10	< 0.10	< 0.10
Benzo[a]pyrene		U	1800	µg/l	0.10	< 0.10		< 0.10				< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		U	1800	µg/l	0.10	< 0.10		< 0.10				< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene		U	1800	µg/l	0.10	< 0.10		< 0.10				< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		U	1800	µg/l	0.10	< 0.10		< 0.10				< 0.10	< 0.10	< 0.10
Total Of 16 PAH's		U	1800	µg/l	2.0	< 2.0		< 2.0				< 2.0	< 2.0	< 2.0
Total Phenols		U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH at 20°C	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO ₃ equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com