



Additional Ground Investigation Report

Site 2, Image Business Park, Acornfield Road, Knowsley L33 7UF

Presented to Knowsley (Image Business Park) Ltd

Issued: June 2021

Delta-Simons Project No. 19-0654.07



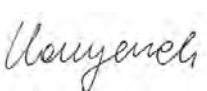
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Report Details

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Report Title	Additional Ground Investigation Report
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Quality Assurance

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Executive Summary

Brief	Delta-Simons was instructed by Knowsley (Image Business Park) Ltd to undertake Additional Ground Investigation for a parcel of land known as Site 2, Image Business Park, Acornfield Road, Knowsley, L33 7UF (hereafter referred to as the "Site"). The Site is proposed for commercial development.
Site Setting	The Site is located off Acornfield Road within Image Business Park in Knowsley, approximately 9 miles east of Liverpool. The Site is bordered by commercial/industrial development to the north and south. Acornfield Road and commercial development lie to the east and an undeveloped plot of land (known as Plot B) lies to the east. The Site appeared to have been in agricultural use from as early as 1850. By the early 1970's, a building was recorded in the southern area of the Site that was later extended by 1994 with the addition of an electrical substation in the north-western corner. The Site remained approximately in that configuration until circa 2019 when the buildings were demolished.
Ground Conditions	Made Ground was encountered between 0.6 to 1.5 m depth across the Site underlain by a thin layer of the Shirdley Hill Sand Formation, which in turn was underlain by Glacial Till to depths of between 3.20 and 8.0 m bgl. Weathered horizons of the Chester Formation were encountered underlying the Glacial Till grading into weak becoming medium strong sandstone rock at an approximate depth of 9.0 m bgl and extending to at least 15.0 m bgl. Two groundwater bodies have been identified within the Shirdley Hill Sand Formation and Chester Formation.
Land Contamination Assessment	<i>Human Health</i> Widespread significant contamination was not identified. However, asbestos was identified in Made Ground. Given the presence of Made Ground, clean imported topsoil will be required in proposed landscaped areas, to act as an appropriate cover layer. The risks to ground and construction workers will be mitigated through the adoption of robust health and safety practices and the use of PPE. <i>Controlled Waters</i> No widespread contamination of groundwater was encountered during this investigation. <i>Ground Gas</i> Ground gas monitoring indicates the Site can be classified as CS2 and that basic ground gas protection measures are required.
Recommendations	Based on the findings of this report, the following recommendations for supplementary works are made. Specific recommendations relating to the proposed development plan may also be appropriate, once the design has been finalised. ▲ Preparation of a Remediation Strategy, to set out the proposed capping layer, ground gas protection measures and subsequent verification which will be required. Classification of the ground gas regime should be agreed with the Local Authority, who may request additional monitoring or additional protection to mitigate the risk of elevated ground gases and depleted oxygen. ▲ Provision of analytical data associated with the ground investigation to the appropriate Statutory Undertakers to agree and adopt an appropriate barrier pipe/design for the proposed development.

	▲ Given the reported results some excavation arisings are likely to meet the requirements for disposal at a facility licensed to receive inert waste, however, soils that contain elevated sulphates and total dissolved solids are unlikely to be acceptable at such a facility. Waste disposal classifications and costs should be confirmed with the receiving landfill operator before final decisions are taken to dispose of any excess materials off site. Additional testing may be required in this regard. Appropriate assessment and management/processing of small piles of demolition rubble will be required prior to reuse or off-site disposal. ▲ Although not encountered during the investigation, hotspots of localised contamination associated with Made Ground cannot be discounted. As with all brownfield sites, groundworkers and sub-surface maintenance workers should be made aware of the possibility of encountering contaminated soils through toolbox talks. Safe working procedures should be implemented, good standards of personal hygiene should be observed and appropriate levels of personal protective equipment (PPE) provided and utilised. This recommendation should be captured in Site health and safety documentation and in maintenance plans. ▲ Provision of analytical data associated with the ground investigation to the appropriate Statutory Undertakers to agree and adopt an appropriate barrier pipe/design for the proposed development. ▲ Detailed foundation and road/pavement design by suitably qualified Structural and Civil Engineers.
This is intended as a summary only. Further detail and the limitations of the assessment are provided within the main body of the Report.	

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1.0 Introduction

1.1 Appointment

Delta-Simons Environmental Consultants Limited ("Delta-Simons") was instructed by Knowsley (Image Business Park) Ltd (the "Client") to undertake Additional Ground Investigation for a parcel of land known as Site 2, Image Business Park, Acornfield Road, Knowsley, L33 7UF (the "Site"). A Site Location Map is included as Figure 1.

1.2 Context & Purpose

The following Reports have been produced for the Site, in order to support submission of a planning application and design of a proposed warehouse:

- ▲ 'Preliminary Geo-Environmental Risk Assessment, Plots A, B and C, Image Business Park, Acornfield Road, Knowsley', reference 19-0654.01, dated 8th August 2019; and
- ▲ 'Geo-Environmental Risk Assessment: Plot A, Image Business Park, Acornfield Road, Knowsley', reference 19-0654.01/Plot A Rev 1, dated 8th November 2019.

Reference should be made to the above reports for full Site details. It should be noted that the Site was formerly referred to as 'Plot A' and is now known as 'Site 2'.

Since the issue of the reports, the Site is known to have been in use as a site compound for the construction of the adjacent commercial unit known as Plot B. Borehole installations that had been previously installed for ground gas and groundwater monitoring and sampling appear to have been lost or destroyed. The ground gas regime has not been confirmed with the Local Authority and; therefore, it was recommended that these boreholes were replaced to facilitate additional monitoring beneath the proposed building footprint.

The aim of the study was to complete an updated geo-environmental assessment of the proposed development area. The investigation has obtained information regarding ground conditions, from which risks to end-users, the environment and structures have been assessed, with mitigation measures suggested where necessary.

The Site is proposed for commercial development.

1.3 Scope of Works

The scope of the investigation and layout of this report has been designed with consideration of guidance on Land Contamination: Risk Management pages of the [GOV.UK](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf) web pages, the relevant requirements of the National Planning Policy Framework 2019 (NPPF) (paragraphs 170 & 178-180)¹ and the Planning Practice Guidance (Land Affected by Contamination)².

The project was carried out to an agreed brief as set out in Delta-Simons' proposal dated 16th March 2021 (reference 19-0654.07). The scope of works is outlined in Section 3.2.1.

1.4 Limitations

The assessment is limited to the issues agreed within the proposal for the works. Notes on limitations associated with this assessment are provided in Appendix A. In addition, there are the following specific limitations that apply to this assessment:

- ▲ It was not possible to investigate the north-eastern and western parts of the Site due to the presence of site contractors utilising the areas as a compound whilst development works on the adjacent plot to the north continued;

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf

² <https://www.gov.uk/guidance/land-affected-by-contamination>

- ▲ Additional geotechnical investigation, testing and assessment was outside the scope of this report. Further comment on the findings of this investigation are provided in Section 4.7. Reference should be made to the report listed in Section 1.2 for full geotechnical conclusions;
- ▲ Monitoring well DS102 remained dry throughout the monitoring period and therefore it was not possible to obtain a groundwater sample for laboratory analysis; and
- ▲ Unrecorded buried cables were identified within DS103 at 0.3 m bgl. This location was abandoned and reattempted as DS103A approximately 2 m to the south-west.

2.0 Site Details

2.1 Site Setting

A summary of the current Site status, environmental setting and key historical features is presented below. This has been summarised from the existing report(s) listed in Section 1.2 which should be consulted for further detail.

Co-ordinates	Centred approximately at National Grid Reference 343791, 398911.	Elevation	Approx. 44-47 m AOD
		Area	Approx. 0.95 Ha
Site Location	The Site is located off Acornfield Road within Image Business Park in Knowsley, approximately 9 miles east of Liverpool. A Site Location Map is included as Figure 1. The Site is bordered by commercial/industrial development to the north and south. Acornfield Road and commercial development lie to the east and an undeveloped plot of land (known as Plot B) lies to the east.		
Current Site Use and Description	The Site (known as Site 2) is accessed via an estate road, known as North Street, which runs along the southern boundary. The former building (Offices and Research Facility) in the central and southern part of the Site was demolished to slab level in 2019. The building formerly housed offices and a small-scale laboratory where small quantities of chemical were reportedly stored/used. Much of the central and southern part of the Site remains covered with the former building slab and associated hardstanding (concrete and tarmac). The western and northern parts of Site 2 are grass-covered. The Site slopes down gently from a topographic high of approximately 44.0 m AOD in the east to a topographic low of 41.5 m AOD in the west towards Acornfield Road. The western boundary slopes down by approximately 1.5 m along the western and north-western boundary which is adjacent to an off-site electrical sub-station.		
Proposed Development	The Site is to be developed for commercial end use and a proposed development plan is included as Drawing 1.		
Environmental Setting	The Site is likely to be underlain by a sequence of Topsoil and/or Made Ground (in locations of former buildings) underlain by Shirdley Hill Sand Formation (Secondary A Aquifer), Glacial Till (Secondary Undifferentiated Aquifer) and bedrock of the Chester Formation (Principal Aquifer). The Site is located within a designated groundwater Source Protection Zone (Zone III – Total Catchment) and there are fifteen licensed abstraction records from groundwater located within 1 km of the Site. The nearest surface water feature is a drain located approximately 20 m to the south of the Site.		
Key Historical Features	The Site appeared to have been in agricultural use from as early as 1850. By the early 1970's, a building was recorded in the southern area of the Site that was later extended by 1994 with the addition of an electrical substation in the north-western corner. The Site remained approximately in that configuration until circa 2019 when the buildings were demolished. The Facilities Manager indicated that during WWII, part of the wider Site (Plot B) was associated with Royal Ordnance Factory (ROF) Kirkby – and that munitions were discarded and possibly buried.		

Summary of Previous Reports	Delta-Simons has obtained previous reports prepared by others relating to the Site and wider Image Business Park; a full list is provided in the Preliminary Geo-Environmental Risk Assessment (report ref. 19-0654.01, dated August 2019). Copies of the reports are also included within the aforementioned document.
Previous Report – Preliminary Geo-Environmental Assessment – Delta-Simons, August 2019	Delta-Simons was instructed by Knowsley (Image Business Park) Limited to prepare a Preliminary Geo-Environmental Risk Assessment for industrial property at Image Business Park, Knowsley which included Site 2 (then known as Plot A). On the basis of the findings of the preliminary geo-environmental risk assessment and the proposed commercial development, it was recommended that an intrusive Site investigation was undertaken to assess the potential for contamination and ground gases to impact on the proposed development.
Previous Report – Geo-Environmental Assessment - Delta-Simons, November 2019	Delta-Simons was instructed by Knowsley (Image Business Park) Limited to prepare a Geo-Environmental Assessment for Site 2 (then known as Plot A). The intrusive investigation was undertaken in June 2019 concurrently with the investigation at Plot B (reported separately) and comprised the following: ▲ Excavation of four trial pits (TP9, TP10A, TP11 and TP12) to a maximum depth of 3.50 m bgl; ▲ Drilling of two rotary cored boreholes (BH5 to BH6) to a maximum depth of 15.0 m bgl and installation of gas and groundwater monitoring standpipes; ▲ Undertaking of two in-situ California Bearing Ratio (CBR) Tests (CBR Test 6 and CBR Test 7); ▲ Collection of soil and groundwater samples for subsequent laboratory testing; and ▲ Preliminary post-ground investigation gas and groundwater monitoring programme undertaken over four weeks. At the time of the intrusive investigation in 2019, the Site was vacant and the former building had been recently demolished. <i>Ground Conditions</i> Made Ground was encountered to depths of between 1.0 to 1.5 m across the Site. A thin layer of the Shirdley Hill Sand Formation was found to directly underlie the Made Ground which in turn was underlain by Glacial Till to depths between 3.2 and 8.0 m bgl. Weathered horizons of the Chester Formation were encountered underlying the Glacial Till grading into weak becoming medium strong sandstone rock at an approximate depth of 9.0 m bgl and extending to at least 15.0 m bgl (maximum depth of investigation). Two groundwater bodies were identified within the Shirdley Hill Sand Formation and Chester Formation. <i>Land Contamination Assessment - Human Health</i> Widespread significant contamination was not identified. However, given the presence of Made Ground clean imported topsoil was recommended in proposed landscaped areas, to act as an appropriate cover layer. It was considered that risks to ground and construction workers should be mitigated through the adoption of robust health and safety practices and the use of PPE. <i>Land Contamination Assessment - Controlled Waters</i> No widespread contamination of groundwater was encountered and no further assessment was considered necessary.

	Land Contamination Assessment - Ground Gas Preliminary ground gas monitoring indicated the Site could be provisionally classified as CS2 for which ground gas protection measures would be required. Geotechnical Assessment Traditional spread foundations were considered to be suitable for the Site, founded at a minimum depth of 1.5 m bgl within the medium dense sand (Shirdley Hill Sand Formation) or firm clay (Glacial Till). An allowable bearing capacity of 100 kN/m² was recommended (limited to less than 25 mm settlement) for a lightly loaded structure. Where foundations straddle different strata types, suitable reinforcement was recommended be added to the foundation to minimise potential movement and also flexible service connections may be required. Suspended floor slabs were recommended where untreated Made Ground is greater than 600mm thick. Given that significant thicknesses of Made Ground have been identified at the Site, it was considered that if soakaway drainage was to be considered, this would only be suitable in certain areas and subject to confirmatory testing. Buried concrete may be designed in accordance with Design Sulphate Class DS-1 and ACEC Class AC-1. Recommendations The following recommendations for supplementary works were made: ▲ Preparation of a Remediation Strategy, to set out the proposed capping layer, ground gas protection measures and subsequent verification which will be required. Classification of the ground gas regime was recommended to be agreed with the Local Authority. Additional monitoring or additional protection may be required. ▲ Waste classification was not undertaken as part of the scope of works. Should off-Site disposal of materials be proposed, then specific additional investigations may be needed to classify the materials in accordance with current regulatory requirements. The on-Site Made Ground was likely to be classed as non-hazardous as a minimum. ▲ Although not encountered during the investigation, hotspots of localised contamination associated with Made Ground cannot be discounted. As with all brownfield sites, groundworkers and sub-surface maintenance workers should be made aware of the possibility of encountering contaminated soils through toolbox talks. Safe working procedures should be implemented, good standards of personal hygiene should be observed and appropriate levels of personal protective equipment (PPE) provided and utilised. This recommendation should be captured in Site health and safety documentation and in maintenance plans. ▲ Provision of analytical data associated with the ground investigation to the appropriate Statutory Undertakers to agree and adopt an appropriate barrier pipe/design for the proposed development.
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2.2 Conceptual Site Model

A summary of the Conceptual Site Model is presented below.

Revised Conceptual Site Model				
Source	Pathways	Receptors	Risk Rating	Mitigation
Potential contamination in areas not directly investigated	Ingestion and/or inhalation of soil/dust	Future site workers and patrons. Construction and Maintenance workers, General public during the construction phase.	Low to Moderate Risk	Low to moderate risk – clean cover capping layer placed in all soft landscaped areas will break pollutant linkage between future end users of the site and the impacted Made Ground. The use of suitable dust prevention measures during the construction phase should mitigate the generation of airborne fibres, furthermore, suitable levels of PPE (as determined by the asbestos risk assessment to be completed by the contractor) would mitigate the risk to construction and maintenance workers in close contact with the impacted Made Ground.
	Direct contact between aggressive ground conditions and new infrastructure.	The Built Environment (new buildings and infrastructure)	Low Risk	The Local Water Authority should be contacted to understand their requirements for upgraded water pipes.
	Leaching of contamination into groundwater followed by migration of groundwater to the wider groundwater environment or surface waters.	The underlying Principal Aquifers / Controlled waters.	Very Low Risk	Significant contamination has not been identified at the Site within shallow soils. Hardstanding within the development will further mitigate the risk by restricting any infiltration and subsequent mobilisation of any soil contaminants, as such the risk is considered low.
Ground Gas (Methane and Carbon Dioxide)	Migration of ground gas into on-site buildings causing asphyxiation or risk of explosion.	The Built Environment (new buildings and infrastructure) Future users.	Low to Moderate	Elevated concentrations of methane and carbon dioxide have been recorded. The Site can provisionally be classified as a CS2 for which low level gas protection measures are required. Further monitoring is likely to be required to confirm this classification.

Risk Definitions are provided in Appendix B.

Since the issue of the initial reports and formulation of the conceptual site model, the Site is known to have been in use as a site compound for the construction of the adjacent commercial unit known as Plot B. Borehole installations that had been previously installed for ground gas and groundwater monitoring and sampling appear to have been lost or destroyed. The ground gas regime has not been confirmed with the Local Authority and therefore it was recommended that these boreholes were replaced to facilitate additional monitoring beneath the proposed building footprint.

The aim of the study was to complete an updated geo-environmental assessment for the proposed redevelopment.

3.0 Site Investigation

3.1 Additional Intrusive Investigation

Delta-Simons carried out additional intrusive investigation work on 27th and 28th April 2021 to assess the potential linkages identified in the conceptual model (see Section 2.2 above).

3.1.1 Health & Safety Considerations

Service plans were provided by the Client and a utilities clearance specialist attended the site on 27th April 2021 to trace services on and around the site prior to excavation of exploratory hole locations. As a further precaution for the avoidance of buried services, each borehole position was hand excavated to a minimum 1.20 m bgl (metres below ground level) and each trial pit excavation was scanned with a Cable Avoidance Tool (CAT) and Genny at regular intervals as excavation progressed.

An initial assessment of the Site identified a low risk in relation to Unexploded Ordnance (UXO). However, during Site reconnaissance the Site Facilities Manager indicated that Plot B, located to the north of Site 2, was formerly associated with munitions preparation during WWII. Further enquiries were made with First Line Defence, a UXO specialist, who provided additional information/advice as summarised below:

- ▲ Plot B was reportedly located within the Royal Ordnance Factory (ROF Kirkby) during the war, which was a large factory filling munitions from 1940-1946. Unused/faulty ammunition would often be buried within the ROF factories themselves, and it is not possible to rule out the risk of Allied Military Ordnance remaining on Site within most former Royal Ordnance Factories; and
- ▲ Given this use of the wider Site during the war, a risk from Allied Military Ordnance is considered to be present.

The enquiries identified the following precautionary measures which were applied for the works:

- ▲ Specialist staff induction; and
- ▲ Site attendance from a UXO specialist during the ground investigation.

Future Contractors should undertake their own assessment of UXO risk in relation to their specific proposed scope of works.

3.2 Scope of Ground Investigation and Rationale

3.2.1 Scope

The ground investigation comprised the following items:

- ▲ Initial service avoidance exercise;
- ▲ Full time UXO supervision by third party specialist using a magnetometer for all investigation locations;
- ▲ Hand pitting of borehole locations to 1.2 m depth, where possible;
- ▲ Supervision of all works by a Delta-Simons Geo-Environmental engineer. All intrusive locations were logged to BS 5930:2015+A1:2020 Code of Practice for Site Investigations;
- ▲ Excavation of four trial pits (TP101 to TP104) to a maximum depth of 3.60 m bgl;
- ▲ Drilling of four windowless sampler boreholes (DS101 to DS104 including DS103A to a maximum depth of 5.45 m bgl. An unrecorded buried cable was identified in DS103 at 0.3 m bgl and the location was relocated as DS103A ;
- ▲ Installation of standpipes in all boreholes (4 No.) to allow future ground gas and groundwater level monitoring and sampling;
- ▲ Collection of soil and groundwater samples for subsequent laboratory testing; and
- ▲ Post ground investigation gas and groundwater monitoring programme over a period of approximately four weeks.

3.2.2 Rationale

Location	Rationale	Key Contaminants of Concern
TP101 to TP104 and DS101 to DS104	General Site Coverage.	Suite of contaminants listed in Section 3.5.

3.3 Ground Investigation Factual Data

The investigation locations were surveyed in by the appointed surveying contractor to an accuracy of approximately +/- 0.1m. An intrusive exploratory hole location plan is presented as Figure 2.

Delta-Simons engineer verified borehole logs are presented as Appendix C, the SPT Calibration Certificates, in accordance with *BS EN ISO 22476-3:2005 (incorporating corrigendum No. 1 2007), Geotechnical investigation and testing - Field testing - Part 3: Standard penetration test for SPT trip hammers* are provided in Appendix C.

3.4 In-Situ Testing and Sampling

SPT tests were undertaken in all boreholes at 1.00 m intervals. The results of these tests are presented in the borehole logs included as Appendix C. Uncorrected and Corrected SPT values are shown in Figures 3 and 4 respectively.

Hand vane shear tests were undertaken on cohesive soils encountered within trial pits. Test results are shown on the borehole and trial pit logs presented in Appendix C and on Figure 5.

Sampling comprised disturbed tub and jar samples as detailed on the borehole and trial pit logs.

3.5 Geotechnical Laboratory Testing

Geotechnical sampling and laboratory testing was outside the scope of this assessment.

The existing report(s) listed in Section 1.2 should be consulted for further geotechnical detail. Further comment is provided in Section 4.7.

3.6 Environmental Sampling, In-Situ Testing and Laboratory Analysis

Soils collected for laboratory analysis were placed in a variety of containers appropriate to the anticipated testing suite. Samples were stored in accordance with Delta-Simons' quality procedures to maintain sample integrity and preservation and to minimise the chance of cross contamination. Records of the samples taken as part of the site investigation works, including their depths and location, are included within the exploratory hole records in Appendix C.

Three groundwater sample were collected from three boreholes on 6th May 2021. Monitoring well DS102 remained dry throughout the monitoring period and therefore it was not possible to obtain a groundwater sample for laboratory analysis. The groundwater samples were collected using a dedicated disposable bailer and dedicated suitable tubing.

Samples analysed for environmental purposes were placed in chilled cool boxes on Site and transported to the laboratory for analysis on completion of the site investigation works/groundwater sampling visit.

The rationale for chemical analysis is presented in the table below and the results of the chemical laboratory testing are included in Appendix D (soil) and E (groundwater).

Analytes	No. of Samples Tested		Rationale
	Soil	Ground-water	
Asbestos	6	-	Common potential contaminant - Analysed in all samples of Made Ground.
pH, As, Cd, Cu, Cr, Hg, Pb, Ni, Zn, speciated Polycyclic Aromatic Hydrocarbons (PAH)	6	3	Potential contaminants of concern, common to many sites.
Leachable metals	3	-	
Total Petroleum Hydrocarbons, Criteria Working Group Method (TPHCWG), Benzene, Toluene, Ethylbenzene and Xylene (BTEX)	6	3	
Volatile and Semi-Volatile Organic Compounds (VOC and SVOC)	3	3	
Polychlorinated Biphenyls (PCB)	2	-	To assess the presence of PCB associated with the on-Site electrical equipment.
pH, sulphate	6	3	To assess potential for chemical attack on buried concrete.
Soil Organic Matter (SOM)	3	-	To allow comparison of potentially elevated contaminants against their relevant assessment criteria.
Waste Acceptance Criteria (WAC)	2	-	To inform off-site waste disposal.

3.7 Monitoring Programme

Since the issue of the ground investigation report in August 2019, the Site is known to have been in use as a site compound for the construction of the adjacent commercial unit known as Plot B. Borehole installations that had been previously installed for ground gas and groundwater monitoring and sampling appear to have been lost or destroyed. The ground gas regime has not been confirmed with the Local Authority and therefore it was recommended that these boreholes were replaced to facilitate additional monitoring beneath the proposed building footprint.

Four rounds of groundwater level and ground gas monitoring were undertaken on newly installed wells (DS101 to DS104) between 6th May and 27th May 2021. Measurements of the depth to groundwater within the monitoring wells were taken using an electronic dip meter. The groundwater level monitoring sheets are included as Appendix F.

To characterise the ground gas regime at the site, an infrared gas meter was used to measure gas flow, concentrations of carbon dioxide (CO₂), methane (CH₄) and oxygen (O₂) in percentage by volume. Initial and steady state concentrations were recorded. The atmospheric pressure before and during monitoring, together with the weather conditions, was recorded. All monitoring results obtained to date together with the temporal conditions are contained within Appendix F.

4.0 Ground Summary

4.1 Introduction

The sections below summarise the ground and groundwater conditions encountered during both phases of site investigation.

4.2 Ground Model

A summary of the observed ground conditions at the Site is provided below.

Summary of Observed Ground Conditions				
Stratum	Typical Stratum Description	Depth Range of Stratum Base (m)	Maximum Proven Thickness (m)	Comments
Topsoil	Grass overlying dark brown slightly gravelly sand with abundant roots. Gravel is fine to medium angular to rounded brick and quartzite.	0.25 - 0.50	0.5	Recorded in BH5, TP9, TP11, TP12, DS102, DS103 and DS103A.
Made Ground	Dark blackish brown slightly clayey slightly gravelly sand with occasional pockets of orangish brown/black soft clay. Gravel is fine to coarse angular to subrounded brick, concrete, wood, slag, clinker, sandstone, glass and quartzite. Frequent broken bricks.	0.60 – 1.5	1.5	Deepest Made Ground identified within TP10A and DS103A. Concrete slab/hard standing in centre of Site is between 0.15 and 0.4 m thick as identified in BH6 and TP102. Full extent of Made Ground unproven in DS103.
Shirdley Hill Sand Formation	Loose becoming medium dense orangish brown slightly silty fine to coarse (locally gravelly) SAND.	1.4 - 3.1	1.4	-
Glacial Till	Typically firm becoming stiff light grey mottled orangish brown slightly sandy gravelly CLAY. Gravel is fine to coarse rounded quartzite. Thin horizons of soft clay and/or initially soft becoming firm clay.	3.2 – 8.0	5.2	Thin horizons of locally soft clay and/or initially soft becoming firm clay: TP9 at 1.4 – 1.7 m, TP12 at 1.8 - 2.5 m, DS101 at 2.0 – 2.3 m, DS102 at 1.95 – 4.45 m, DS104 at 2.25 – 2.75 m, TP101 at 2.1 – 3.6 m, TP103 at 2.3 – 3.5 m and TP104 at 2.1 – 3.5 m.
Weathered Chester Formation*	Medium dense becoming very dense dark reddish brown slightly gravelly SAND. Gravel is fine to medium angular to subrounded sandstone.	9.1 - 10.5	4.4	-
Chester Formation*	Weak becoming medium strong dark reddish-brown medium to coarse grained thinly laminated SANDSTONE.	>15.0 (unproven)	>8.9 (unproven)	15.0 m maximum depth of investigation.
*Encountered during previous investigation only – maximum depth of recent investigation was 5.45 m bgl.				

The findings of the recent investigation generally corroborated the findings of the initial phase of intrusive investigation. Delta-Simons comments as follows:

- ▲ This investigation confirmed the presence of soft upper horizons within the Glacial Till.
- ▲ SPTs generally showed an increase in strength with depth (Figure 3 – Uncorrected SPT, Depth and Strata and Figure 4 – Corrected SPT, Depth and Strata) and geotechnical refusal (> 50) was typically recorded at a depth of 9.0 m bgl within the Chester Formation.
- ▲ Hand shear vane test results obtained from various depths within Glacial Till in trial pit excavations and dynamic sampler boreholes were variable and ranged between 11 and 181 kPa (Figure 5 – Hand Shear Vane Results), although average results were typically around 57 kPa. On the basis of these findings, the underlying clay strata can be classified as typically medium strength although some horizons can be classified as very low strength in accordance with Table 9 of BS5930:2015.
- ▲ Lower SPT and HSV test results within the Glacial Till appear to be coincident with water strikes and disturbance of clay during the drilling/excavation process.

The existing report(s) listed in Section 1.2 should be consulted for further geotechnical detail. Further comment is provided in Section 4.7.

4.3 Visual and Olfactory Evidence of Contamination - Soils

No visual or olfactory evidence of potential gross contamination was observed during the additional investigation. Made Ground materials were noted to contain fragments of ash across much of the Site.

All environmental samples were screened using the photoionisation detector and the results are included on the exploratory hole logs in Appendix C. All results were below the detection limit. Results recorded above the instrument detection limit from previous phase of investigation are summarised in the table below.

Location	Depth	Stratum	VOC (ppm)
TP9	0.40	Made Ground	0.1
TP10A	0.20	Made Ground	0.2
TP11	0.50	Made Ground	0.1
BH5	0.60	Made Ground	0.2
BH6	0.60	Made Ground	0.1

4.4 Groundwater

4.4.1 Strikes During Investigations

Groundwater strikes recorded as drilling/excavation progressed during the recent site investigation ranged from 1.50 to 3.00 m bgl. The groundwater strikes during drilling from both phases of investigations are summarised below.

Exploratory Hole	Water strike during drilling (m bgl)	Water strike during drilling (m AOD)	Stratum	Comment
DS102	2.00	41.51	Shirdley Hill Sand Formation/Glacial Till	Slight seepage
DS103A	3.00	40.44	Glacial Till	Slight seepage
TP102	1.50	41.23	Shirdley Hill Sand Formation	Slight seepage

BH5	7.95	35.03	Chester Formation	-
BH6	8.70	34.21	Chester Formation	-
TP9	1.20	41.77	Shirdley Hill Sand Formation	Slight seepage
TP12	2.40	41.51	Glacial Till	Slight seepage

4.4.2 Levels During Monitoring Programme

Groundwater levels were monitored in recently installed wells on a total of four occasions between 6th May and 27th May 2021. Monitoring data is provided in Appendix F and summarised in the table below.

Exploratory Hole	Response Zone		Water level during monitoring Max to Min Range		LNAPL Y/N	Stratum
	m bgl	m AOD	m bgl	m AOD.		
DS101	1.00 – 5.00	41.97 – 37.97	1.25 – 2.28	41.72 – 40.69	N	SHSF/GT
DS102	0.50 – 1.00	43.01 – 42.51	0.73 - 1.09	42.78 - 42.42	N	MG
DS103A	1.50 – 3.00	41.94 – 40.44	1.00 - 1.67	42.44 - 41.77	N	SHSF/GT
DS104	2.00 – 5.00	40.84 – 37.84	2.96 - 3.95	39.89 - 38.90	N	SHSF/GT
BH5	8.00 -15.00	34.98 - 27.98	7.62 - 7.89	35.36 - 35.09	N	CF
BH6	1.00 - 5.00	41.91 – 36.91	1.50 - 1.95	41.41 - 40.96	N	SHSF

MG = Made Ground, SHSF = Shirdley Hill Sand Formation, GT = Glacial Till, CF = Chester Formation

Light Non-Aqueous Phase Liquid (LNAPL) was not detected in any of the monitoring wells.

Groundwater monitoring during both phases of investigation have identified two groundwater bodies; one within the Shirdley Hill Sand Formation at depths of between approximately 1.00 and 1.95 m bgl (42.4 and 40.9 m AOD) and one within the Chester Formation at depths of between approximately 7.62 and 7.89m bgl (35.36 and 35.09 m AOD).

4.5 Visual and Olfactory Evidence of Contamination - Groundwater

No visual or olfactory evidence of potential gross contamination was observed during both phases of investigation.

4.6 Material Properties

Geotechnical sampling and analysis was outside the scope of this assessment. Reference should be made to the reports in Section 1.2 for full details. Further comment is provided in Section 4.7.

4.7 Geochemical Testing

Geochemical analysis was undertaken on selected soil samples of Made Ground, Shirdley Hill Sand Formation, Glacial Till and Chester Formation, tested for selective contaminants (BRE Special Digest 1:2005 (3rd Edition)), Concrete in Aggressive Ground, the results of both phases of investigation which are summarised in the table below.

Tests	Made Ground	Shirdley Hill Sand Formation	Glacial Till	Chester Formation
No. of Tests	14	1	2	2
Soil - pH	6.9 – 10.8	7.7	6.8 – 7.8	8.6 – 8.7
Soil - Water Soluble Sulphate	19.6 – 552 mg/L	6.0 mg/L	8.4 - 18.5 mg/L	5.8 – 6.1 mg/L
Total sulphur	-	0.008	0.010 - 0.011	<0.005

4.8 Ground Gas Data

Gas monitoring results are presented in Appendix F and are summarised in the table below.

A total of 4 rounds of gas monitoring was undertaken over a period of 4 weeks within the recently installed wells (DS101 to DS104). Barometric pressures ranged from 999 mB (visit 1) to 1013 mB (visit 3).

Borehole	Steady Gas Concentration (%v/v)						Steady Flow Rate (l/hr)		Response Zone (m bgl)		Stratum	Flooded ?
	Methane		Carbon Dioxide		Oxygen							
	Min	Max	Min	Max	Min	Max	Min	Max	From	To		
DS101	<0.1	<0.1	0.4	1.1	18.7	20.1	<0.1	<0.1	1.0	5.0	SHSF/GT	N
DS102	<0.1	<0.1	0.6	7.6	7.0	20.2	<0.1	<0.1	0.5	1.0	MG	N
DS103A	<0.1	<0.1	0.5	3.6	16.6	20.7	<0.1	<0.1	1.5	3.0	SHSF/GT	Y
DS104	<0.1	<0.1	3.1	9.1	1.0	14.2	<0.1	<0.1	2.0	5.0	SHSF/GT	N
BH5	<0.1	<0.1	3.4	13.0	5.0	17.1	<0.1	1.6	8.0	15.0	CF	Y
BH6	<0.1	2.1	1.5	6.8	0.1	7.6	<0.1	1.9	1.00	5.0	SHSF	N
MG = Made Ground, SHSF = Shirdley Hill Sand Formation, GT = Glacial Till, CF = Chester Formation												

The ground gas monitoring visits can be summarised as follows:

- ▲ Methane concentrations were below the instrument lower limit of detection (< 0.1 % by volume (% v/v)) at all locations, although were previously elevated up to 2.1 % v/v at one location (BH6);
- ▲ Elevated concentrations of carbon dioxide were recorded ranging between 0.4 and 13.0 % v/v;
- ▲ Depleted oxygen concentrations were recorded in DS102 (7.0 % v/v), DS104 (1.0 % v/v), BH5 (5.0 % v/v) and BH6 (0.1 % v/v);
- ▲ Concentrations of VOC were typically below the instrument lower limit of detection (< 0.1 ppm);
- ▲ Carbon monoxide concentrations ranged between < 0.1 and 10 ppm;
- ▲ Hydrogen sulphide concentrations were below the instrument lower limit of detection (< 0.1 ppm); and
- ▲ Steady flow rates were typically below the instrument lower limit of detection (< 0.1 l/hr) but previously recorded up to 1.9 l/hr within BH6.

4.9 Geotechnical Considerations

Proposed Development

It is understood that the Site is to be developed for a commercial end use however at the time of writing, structural and floor loadings and final levels for any proposed development were also unknown.

Consequently, the information provided below should be treated as preliminary and will be subject to review once a scheme and levels have been finalised.

Ground Model

The findings of the recent investigation generally corroborated the findings of the initial phase of intrusive investigation which identified the following sequence:

- ▲ Topsoil - beneath grassed areas to depths of between 0.25 and 0.5 m bgl;
- ▲ Made Ground - between 1.0 and 1.5 m in depth across the majority of the Site comprising gravelly sand with occasional pockets of soft clay. The remnant slab thickness was recorded as 0.4 m thick;

- ▲ Shirdley Hill Sand Formation – relatively thin horizon of medium dense (locally loose) sand was found to directly underlie the Made Ground to a maximum proven depth of 3.1 m bgl;
- ▲ Glacial Till - firm/stiff clay, typically soft in the upper horizons which extended to depths of between 3.2 and 8.0 m bgl;
- ▲ Weathered Chester Formation - medium dense becoming very dense dark reddish-brown sand, was encountered to a maximum depth of 9.1 m bgl, grading into weak sandstone rock at becoming medium strong between 10.5 and 12.0 m bgl and extends to at least 15.0 m bgl (maximum depth of investigation); and
- ▲ Two groundwater bodies have been identified; one within the Shirdley Hill Sand Formation at depths of between approximately 1.0 and 1.95 m bgl approximately (42 and 41 m AOD) and one within the Chester Formation at depths of between approximately 7.6 and 7.9m bgl (approximately 35 m AOD).

Spread Foundations

The Made Ground is not considered suitable as a founding horizon and therefore foundations should extend below Made Ground and any soft/loose horizons, and into competent Shirdley Hill Sand Formation which are generally encountered between 1.5 and 2.5 m bgl.

Based on the ground investigation undertaken, strip/trench fill/pad foundations are considered to be suitable for the proposed development (assumed lightly loaded commercial warehouse type building), founded within the medium dense sand (Shirdley Hill Sand Formation). For a strip/trench fill foundation in this part of the site, an allowable bearing pressure of 100 kN/m² is considered appropriate with total settlements not anticipated to exceed 25 mm.

All foundation excavations should be inspected by a suitably qualified geotechnical engineer prior to casting to ensure the appropriate depth, founding medium and strength characteristics have been achieved and to confirm the absence of any localised cohesive soils. Relatively shallow groundwater has been identified and it is recommended that foundations are cast in dry ground.

Should the required loads exceed the allowable bearing capacity then an alternative foundation solution should be considered such as piling. Ground improvement (e.g. vibro-stone columns) would not be considered as an appropriate foundation solution given that gas protection measures are required.

Piling

Piles should extend into competent sandstone (Chester Formation) encountered at depths of approximately 9.0 m bgl. The precise method of pile installation and applicability of proprietary systems, diameters and depths required would need to be informed based on the results of this investigation, by discussions with a piling contractor with suitable experience.

Individual pile/pile group loads will be a function of the surface area of the piles to be employed at the Site and their method of construction.

Normal static and dynamic load testing (including uplift tests) should be considered to achieve satisfactory quality control/assurance in accordance with good practice.

There will be a requirement for the placement of a suitably engineered piling mat, which should be designed and validated by a suitably qualified and experienced engineer.

Reference should be made to the reports in Section 1.2 for full details.

5.0 Generic Quantitative Risk Assessment

5.1 Introduction

The presence of hazardous substances in or on a site is generally only of concern if an actual or potential unacceptable risk exists. Legislation and guidance on the assessment of contaminated sites, consistent with UK best practice, acknowledges the need for a tiered risk-based approach. A Preliminary Risk Assessment is presented in Section 2.2. This section represents a Generic Quantitative Risk Assessment (GQRA) being a comparison of site contaminant levels against Generic Assessment Criteria.

5.2 Human Health GQRA

The assessment of risks in relation to human health has been undertaken using Generic Assessment Criteria (GAC) as detailed within the appropriate tables. Risks from soil, groundwater and Non-Aqueous Phase Liquids (NAPL) have been considered. The GAC are predominantly based on long term (chronic) risk to health. However, in the limited circumstances where short-term (acute) risks are more pronounced, these GAC have been utilised to ensure a thorough and conservative initial assessment is undertaken.

The end use scenario adopted for the assessment is a Commercial/Industrial end use, considered appropriate based on the proposed commercial development.

5.2.1 Risks from Soil Sources

Based on the proposed use of the Site for light industrial use, the soil and groundwater chemical data has been compared against a commercial/industrial end use GAC for 1% soil organic matter (SOM) content.

The laboratory results for contaminants exceeding detection limit compared to their respective GAC (from both phases of investigation) are presented in the table below. Recent laboratory analysis results are provided in Appendix D.

The primary exposure pathways considered in the risk assessment are as follows:

- ▲ Ingestion of soil and indoor dust and/or oral background exposure;
- ▲ Consumption of home-grown produce and attached soil;
- ▲ Inhalation of dust (background and indoor);
- ▲ Direct dermal contact; and
- ▲ Inhalation of vapour (background and indoor).

Contaminant	No. Samples	Max Conc. (mg/kg)	GAC (mg/kg)	GAC Source	No. Exceed GAC	Volatile	Location of Exceedances (depth) = Concentration (mg/kg)	Area of Site of Exceedance
Asbestos	14	0.005	Detected	DS	1	N	TP104 at 0.7 m bgl - Chrysotile Loose Fibrous Debris	South-east
Metals and metalloids								
Arsenic	14	96	640	LQM	0	N	-	-
Cadmium	14	0.7	190	LQM	0	N	-	-
Chromium	14	1.5	33	LQM	0	N	-	-
Chromium VI	14	33	8,600	LQM	0	N	-	-
Copper	14	270	68,000	LQM	0	N	-	-
Lead	14	130	2300	C4SL	0	N	-	-
Mercury	14	0.6	1100	LQM	0	N	-	-
Nickel	14	84	980	LQM	0	N	-	-
Zinc	14	130	730,000	LQM	0	N	-	-
Polyaromatic Hydrocarbons								
Phenanthrene	14	0.8	22,000	LQM	0	N	-	-
Anthracene	14	0.13	520,000	LQM	0	N	-	-
Fluoranthene	14	1.8	23,000	LQM	0	N	-	-
Pyrene	14	2.0	54,000	LQM	0	N	-	-
Benzo[a]anthracene	14	1.1	170	LQM	0	N	-	-
Chrysene	14	1.1	350	LQM	0	N	-	-
Benzo[b]fluoranthene	14	1.4	44	LQM	0	N	-	-
Benzo[k]fluoranthene	14	0.49	1,200	LQM	0	N	-	-
Benzo[a]pyrene	14	1.2	35	LQM	0	N	-	-
Indeno(1,2,3-c,d)pyrene	14	0.55	500	LQM	0	N	-	-
Benzo[g,h,i]perylene	14	0.73	3,900	LQM	0	N	-	-
Petroleum Hydrocarbons								

Contaminant	No. Samples	Max Conc. (mg/kg)	GAC (mg/kg)	GAC Source	No. Exceed GAC	Volatile	Location of Exceedances (depth) = Concentration (mg/kg)	Area of Site of Exceedance
Aromatic TPH >C10-C12	14	3.7	16,000	LQM	0	Y	-	-
Aromatic TPH >C12-C16	14	5.7	36,000	LQM	0	Y	-	-
Aromatic TPH >C16-C21	14	12	28,000	LQM	0	N	-	-
Aromatic TPH >C21-C35	14	47	28,000	LQM	0	N	-	-
Aromatic TPH >C35-C44	14	17	N/A	N/A	0	N	-	-
Total Petroleum Hydrocarbons	14	58	5000	DS	0	Y	-	-
Notes: Shaded = Maximum concentration exceeds GAC C4SL = Category 4 Screening Levels (C4SLs) published by DEFRA. DS = In-house GAC derived by Delta-Simons Environmental Consultants Ltd, 2018. EIC = Guidance values produced by the Environmental Industries Commission (EIC), the Associated of Geotechnical and Geoenvironmental Specialists (AGS) and Contaminated Land: Application in Real Environments (CL:AIRE) in December 2009. LQM = Land Quality Management/CIEH S4UIs for Human Health Risk Assessment, 2014. AGAC = Acute Generic Assessment Criteria published by the Society of Brownfield Risk Assessment (SoBRA) 2019 No GAC = No Generic Assessment Criteria value available for compound.								

Widespread significant contamination of the soils has not been identified at the Site. None of the site-specific contaminants of concern were recorded at concentrations in excess of their respective GAC.

One sample of Made Ground (TP104 at 0.70 m) tested positive for the presence of chrysotile type asbestos (loose fibrous debris, quantification analysis indicated 0.005 % by weight); and the presence of additional asbestos within soils cannot be discounted at this stage.

The majority of the proposed development will be covered with building footprint and/or hardstanding which will break the pollutant linkage between asbestos contaminated soils and future end users. However, a potential linkage exists between asbestos impacted soils and construction/maintenance workers.

Any workers performing below ground works should be made aware of the potential for encountering contaminated soils, including asbestos containing materials. Appropriate levels of PPE should be utilised. Clean imported topsoil will be required in proposed landscaped areas, to act as an appropriate cover layer.

In the event that unforeseen contamination may be present groundworkers should use appropriate PPE and maintain good standards of hygiene to be protected from any soil contamination which may be present.

A 'hotspot' protocol should be in place for groundworkers to act upon should potential contamination be identified.

The soil analysis results are considered further in the Conceptual Site Model (CSM) presented in Section 7.0 with regard to potential pollutant linkages.

5.2.2 Risks from Groundwater Sources

Based on the proposed end use of the Site, the soil and groundwater chemical data has been compared against a commercial/industrial end use GAC to assess risks from groundwater sources to indoor air and subsequent vapour inhalation indoors.

None of the site-specific contaminants of concern were recorded at concentrations in excess of their detection limits/respective GAC.

The water analysis results are considered further in the Conceptual Site Model (CSM) presented in Section 7.0 with regard to potential pollutant linkages.

Seven samples of Made Ground were obtained during both phases of investigation and were analysed for the presence of leachable metals and the results are included in Appendix D and summarised in the table overleaf.



Contaminant	No. Samples	Max Conc. (µg/l)	GAC (µg/l)	GAC Source	No. Exceed GAC	Location of Exceedances	Area of Site of Exceedance
Metals and Metalloids							
Arsenic	7	7.9	10	DWQS	0	-	-
Chromium	7	12	4.7	WFD	1	TP10A at 0.2 m	Centre
Copper	7	25	2	WFD	7	TP10A at 0.2 m, TP11 at 0.5 m, TP12 at 0.7 m, BH5 at 0.6 m, DS101 at 0.4 m, DS104 at 0.5 m, TP103 at 0.2 m	Site-wide
Lead	7	15	10	DWQS	1	BH5 at 0.6 m	East
Nickel	7	3.8	8.48	WFD	0	-	-
Zinc	7	19	23.1	WFD	0	-	-
Notes: Shaded = Maximum concentration exceeds GAC. DWQS 2016 = The Water Supply (Water Quality) Regulations 2016 [UK Drinking Water Standards] WFD 2003 = Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.							

Elevated concentrations of copper were recorded in all samples together with locally elevated lead and chromium. However, given that the majority of the Site is anticipated to be covered with building footprint and/or hardstanding, the risks of infiltration and subsequent migration of contaminants is considered to be low. Furthermore, laboratory analysis on groundwater samples obtained by Delta-Simons as part of this investigation did not reveal the presence of any significantly elevated contaminants of concern and indicated general groundwater quality beneath the Site to be good.

The water analysis results are considered further in the Conceptual Site Model (CSM) presented in Section 7.0 with regard to potential pollutant linkages.

5.2.3 Risks from Non-Aqueous Phase Liquids (NAPL)

Soil and groundwater exposure models used in generating Generic Assessment Criteria do not account for the potential for NAPL to represent a source of risk to human health, principally due to the production of vapours. Whilst it is possible to calculate theoretical soil saturation limits, in reality, due to co-solubility effects, these are not an appropriate indicator of the presence of NAPL. In order to assess the presence of NAPL, for petroleum hydrocarbons, an assessment criterion of 5,000 mg/kg has been applied based on professional experience.

The following has been identified in relation to NAPL at the Site:

- ▲ No observations of NAPL were made within the soils observed during drilling;
- ▲ No concentrations of Total Petroleum Hydrocarbons in excess of 5,000 mg/kg were recorded;
- ▲ No NAPL was measured during groundwater monitoring works.

On this basis, there is no evidence of NAPL being present on the Site.

5.3 Controlled Waters/Water Environment GQRA

5.3.1 Groundwater Results

The approach adopted to assessing risks to Controlled Waters/Water Environment is based principally on considering the concentrations of contaminants identified within the groundwater samples obtained in comparison to relevant GAC.

Given the 'prevent and limit' approach of the Water Framework Directive (2000/60/EC) and the identified receptors, a range of Water Quality Standards (WQS) have been applied as Generic Assessment Criteria (GAC), these include Water Framework Directive standards and thresholds (WFD), the Freshwater Environmental Quality Standards (EQS), the UK Drinking Water Quality Standards (DWQS), WHO Guidelines for Drinking Water Quality or SEPA resource protection values which have been used as initial conservative GAC to assess whether groundwater contamination requires further assessment or discussion in terms of the risks to controlled waters. Where specific water quality standards are not available, Delta-Simons has adopted surrogate values based on professional judgement (DS GAC).

Groundwater contaminant concentrations that exceed the applied GAC are then considered in the context of the Site's environmental setting as to whether further qualitative or quantitative assessment is required as described in subsequent sections. Laboratory results above relevant detection limits from both phases of investigation are summarised in the table below with a comparison to the GAC applied.

Contaminant	No. Samples	Max Conc. (µg/l)	GAC (µg/l)	GAC Source	No. Exceed GAC	Location of Exceedances	Area of Site of Exceedance
Metals and Metalloids							
Arsenic	5	5.25	10	DWQS 2016	0	-	-
Cadmium	5	0.06	5	DWQS 2016	0	-	-
Chromium III	5	9.3	50	DWQS 2016	0	-	-
Chromium VI	5	7.2	50	DWQS 2016	0	-	-
Copper	5	6.4	2000	DWQS 2016	0	-	-
Lead	5	12	10	DWQS 2016	1	BH6	West
Nickel	5	8.4	20	DWQS 2016	1	-	-
Zinc	5	17	3000	WHO 2003	0	-	-
Notes: Shaded = Maximum concentration exceeds GAC. DWQS 2016 = The Water Supply (Water Quality) Regulations 2016 [UK Drinking Water Standards] WFD 2003 = Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.							

Generally, water quality was noted to be good with only one localised slight exceedance of lead observed. This exceedance is not considered to represent unacceptable risks to controlled waters receptors. Therefore, there is no significant source that it is considered that significant migration of any contaminants to the underlying aquifers / off-Site is unlikely.

Hardstanding within the development will further mitigate the risk by restricting any infiltration and subsequent mobilisation of any soil contaminants, as such the risk is considered low.

The groundwater analysis results are considered further in the CSM presented in Section 7.0 with regard to potential pollutant linkages.

5.4 Built Environment

5.4.1 Potable Water Supply Pipes

The investigation requirements for the selection of potable water pipe material are set out in UKWIR Report 10/WM/03/21. Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites (UKWIR, 2010). This report has very specific and onerous investigation requirements and as such the detailed investigation of each utility route was not within the scope of this investigation.

A preliminary review of the results indicates that a relevant linkage is unlikely to exist associated with organic contaminants and therefore contaminant polyethylene (PE) and/or polyvinyl chloride (PVC) water supply pipes may be suitable for use on the development.

It should be noted that at the time of this investigation the future routes of water supply pipes had not been established, hence the investigation and sampling strategy is not likely to be considered fully compliant with UKWIR recommendations. Consequently, a targeted investigation and specific sampling/analytical strategy may be required at a later date once the route(s) of the supply pipe(s) are known. In addition, it is recommended that the relevant water supply company be contacted at an early stage to confirm its requirements for assessment, which may not necessarily be the same as those recommended by UKWIR.

5.4.2 Building Materials

Water soluble sulphate concentrations and soil pH values can be summarised as follows for the various material types:

- ▲ Made Ground: water soluble sulphate concentrations varied from 19.6 to 552 mg/L with soil pH values ranging from 6.9 to 10.8;
- ▲ Shirdley Hill Sand Formation: water soluble sulphate concentrations were found to be 6.0 mg/L with a soil pH value of 7.0;
- ▲ Glacial Till: water soluble sulphate concentrations varied from 8.4 to 18.5 mg/L with soil pH values ranging from 6.8 to 7.8; and
- ▲ Chester Formation: water soluble sulphate concentrations varied from 5.8 to 6.1 mg/L with soil pH values ranging from 8.6 to 8.7.

In accordance with the recommendations of BRE Special Digest 1, 'Concrete in Aggressive Ground' (2005), the conditions of the Made Ground and natural soils (Shirdley Hill Sand Formation, Glacial Till and Chester Formation) would be classified as Design Sulphate Class DS-1 and ACEC Class AC-1, when considering the most appropriate type of concrete to be used at the site in order to resist chemical attack from elevated sulphate present in the soils (assuming non pyritic soils and mobile groundwater).

5.5 Waste Classification

It is understood that excavation arisings generated from the development area may require disposal off-Site. While a full waste classification sampling and analysis exercise (compliant with relevant guidance – WM3) was outside the scope of this report, we have reviewed the available laboratory soil analysis (collected for the purposes of assessing risks to human health).

The assessment has identified that arisings from excavations requiring disposal off Site are likely to be classified as non-hazardous waste.

Two samples of Made Ground soils were subject to WAC analysis. The results are presented in Appendix D and are summarised below.

- ▲ DS101, 0.40 m bgl – Passes inert WAC; and
- ▲ TP103, 0.20 m bgl - Passes inert WAC.

Made Ground should be classified as non-hazardous as a minimum and arisings are likely to meet the requirements for disposal at a facility licensed to receive inert waste. The chemical results and the results of WAC analysis will need to be presented to the receiving waste facility in order for them to confirm whether they agree with the classification and will accept the waste. Additional testing may be required in this regard, particularly in respect of asbestos.

Appropriate controls should be in place to ensure separation of potentially hazardous excavated materials (such as potentially bituminous macadam) from natural soils more likely to be acceptable as inert or transferred to a receiving Site under the Definition of Waste: Code of Practice (DoWCoP) and to ensure disposal of excavation arisings under duty of care.

This investigation was not undertaken to classify materials in terms of waste disposal. Where waste disposal then a specific and detailed investigation in accordance with Environment Agency Guidance WM3 would typically be required.

Should soils be required to be disposed of from Site, the results of the chemical analysis should be forwarded to the proposed receiving facility who will determine what criteria they will accept the waste from Site as. Further investigation in addition to specific WAC analysis may be required.

Considering the nature of the materials encountered, more cost efficient and sustainable methods of removing the material i.e. recovery/re-use should be considered prior to disposal at landfill (e.g. registering with the CL:AIRE Register of Materials) in an attempt to find a site with a requirement for import of materials.

6.0 Bulk Ground Gas Risk Assessment

6.1 Ground Gas Conceptual Site Model

6.1.1 Sources

Made Ground was encountered at all exploratory locations across the Site to depths of between 0.6 and 1.5 m bgl and therefore represents a potential source of ground gases. Surrounding historical land uses, which include many former industrial facilities and an infilled marl pit within Plot B, may represent localised off-site sources of ground gases.

6.1.2 Receptors

The principal receptors under consideration are future Site users. Other receptors include adjacent site occupiers and future maintenance/construction workers.

6.1.3 Pathways

The underlying geology is likely to be relatively permeable and may provide a viable pathway for ground gases to migrate.

The most significant pathways with respect to Site users relate to the potential for ground gas to enter the proposed building.

Future maintenance/construction workers may come into contact with hazardous ground gases via entry into below ground confined spaces such as excavations or service entries/inspection points.

6.2 Duration & Extent of Monitoring

Since the issue of the ground investigation report in August 2019, the Site is known to have been in use as a site compound for the construction of the adjacent commercial unit known as Plot B. Borehole installations that had been previously installed (BH5 and BH6) for ground gas and groundwater monitoring and sampling appear to have been lost or destroyed. The ground gas regime has not been confirmed with the Local Authority and therefore it was recommended that these boreholes were replaced to facilitate additional monitoring beneath the proposed building footprint.

Tables 5.5a and 5.5b within CIRIA C665 detail current recommended monitoring duration and frequency for sites in the UK. Based on the identification of potential sources in the preceding section, the gas generation potential is considered to be low, whilst the sensitivity of the proposed development is low. On this basis, CIRIA C665 recommends between 4 visits over a minimum period of 1 month.

Gas monitoring has been carried out on newly installed wells on four occasions over a period of four weeks and therefore the assessment is considered to be preliminary.

During the recent monitoring periods, gas concentrations have been recorded in a total of 4 monitoring positions. The locations of the monitoring wells are highlighted on Figure 2 and indicate representative coverage across the whole study area.

Barometric pressures during the recent gas monitoring period ranged from 999 mBar to 1013 mBar.

6.3 Ground Gas Risk Assessment

6.3.1 Background

Based on the proposed commercial end use, the following documents have been consulted when assessing the gas regime at the site:

- ▲ NHBC/RSK Group PLC (2007), Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present, Report Edition No. 4.

- ▲ British Standards Institute (BSI, 2015): Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings, BS:8485.

The presence of a source of hazardous gas within the ground does not necessarily indicate a risk will be present. Consideration of recorded gas flows together with source concentrations can allow an initial assessment to be made of the potential both for generation and subsequent migration of gas. A Characteristic Situation (CS) is derived from an assessment of the ground gas data and forms the basis of determining mitigation measures.

6.3.2 Gas Screening Value (GSV)

The Gas Screening Value (gas concentration as a fraction x maximum recorded flow) is used to provide an initial assessment of risks to future site users. The GSVs calculated for the monitoring wells are presented in the following table.

Location	Maximum Methane (%v/v)	Maximum Carbon Dioxide (%v/v)	Maximum Flow Rate (l/hr)	GSV/Characteristic Situation				Flooded well (Frequency)
				Methane		Carbon Dioxide		
				GSV	CS	GSV	CS	
DS101	<0.1	1.1	<0.1	0.0001	CS1	0.0011	CS1	N
DS102	<0.1	7.6	<0.1	0.0001	CS1	0.0076	CS1+	N
DS103	<0.1	3.6	<0.1	0.0001	CS1	0.0036	CS1	Y (3/4)
DS104	<0.1	9.4	<0.1	0.0001	CS1	0.0094	CS1+	N
BH5	<0.1	13.4	1.6	0.001	CS1	0.2144	CS2	Y
BH6	2.1	6.8	1.9	0.039	CS1+	0.1292	CS2	N
Notes: CS1+ = Calculated GSV is CS1; however, peak methane exceeds 1%v/v and/or peak carbon dioxide exceeds 5%v/v, therefore, consider increase in CS value.								

The gas monitoring results over the two monitoring periods recorded elevated concentrations of ground gases (carbon dioxide and methane) and flow rates together with depleted oxygen levels. A maximum Gas Screening Value (GSV) of 0.039 l/hr for methane and 0.2144 l/hr has been calculated for carbon dioxide, which equate to a Characteristic Situation 2 (CS2).

A Characteristic Situation 2 classification is indicative of low risk conditions that would require basic gas protection to buildings and is considered appropriate.

These recommendations should be agreed with the Local Authority in advance of development works starting on site. Further monitoring may also be required.

6.4 Ground Gas Risk Mitigation

BS:8485 provides a scoring system to determine the appropriate protection measures for a proposed development in accordance with the identified ground gas regime. Table 3 of BS:8485 summarises typical UK building types, which for this development will comprise Type D (industrial style building); however, small rooms within these style buildings should be separately categorized as Type B. For the purposes of this assessment, the most conservative building type has been considered (Building Type B). Table 4 details the points required for the Characteristic Situation the proposed development, which for CS2 is 3.5 points. This can be achieved by a combination of the following:

- ▲ Structural barriers (Table 5)
- ▲ Ventilation (Table 6)
- ▲ Gas Membrane (Table 7)

The above should be considered in conjunction with the proposed foundation/floorslab design to achieve the minimum score required within BS:8485+A1:2019.

The above assessment relates solely to future residential occupiers. Given the nature of the ground gas regime at the site, no further works are considered necessary to protect 3rd parties/surrounding occupiers. Entry to

excavations/confined spaces should be restricted to personnel with relevant Confined Spaces training and with prior confirmation of atmospheric conditions.

6.5 Radon

The Site is located within an area where radon protective measures are not required.

6.6 Organic Vapours

No significant visual or olfactory evidence of volatile contamination has been identified during the works.

7.0 Revised Conceptual Site Model

A revised CSM is presented in the table below and has been formulated taking into account all of the available data from the Delta-Simons intrusive investigation, suitable for a Site with a proposed commercial end-use.

Revised Conceptual Site Model				
Source	Pathways	Receptors	Risk Rating	Mitigation
Potential contamination in areas not directly investigated	Ingestion and/or inhalation of soil/dust	Future site workers and patrons. Construction and Maintenance workers. General public during the construction phase.	Low Risk	Low to moderate risk – clean cover capping layer placed in all soft landscaped areas will break pollutant linkage between future end users of the site and the impacted Made Ground. Asbestos has been identified in Made Ground during the additional phase of investigation, therefore it is prudent to assume that more asbestos can be present on-Site. The use of suitable dust prevention measures during the construction phase should mitigate the generation of airborne fibres, furthermore, suitable levels of PPE (as determined by the asbestos risk assessment to be completed by the contractor) would mitigate the risk to construction and maintenance workers in close contact with the impacted Made Ground.
	Direct contact between aggressive ground conditions and new infrastructure.	The Built Environment (new buildings and infrastructure)	Low Risk	The Local Water Authority should be contacted to understand their requirements for upgraded water pipes.
	Leaching of contamination into groundwater followed by migration of groundwater to the wider groundwater environment or surface waters.	The underlying Principal Aquifers / Controlled waters.	Very Low Risk	Significant contamination has not been identified at the Site within shallow soils. Hardstanding within the development will further mitigate the risk by restricting any infiltration and subsequent mobilisation of any soil contaminants, as such the risk is considered low.
Ground Gas (Methane and Carbon Dioxide)	Migration of ground gas into on-site buildings causing asphyxiation or risk of explosion.	The Built Environment (new buildings and infrastructure) Future users.	Low to Moderate	Elevated concentrations of methane and carbon dioxide have been recorded. The Site can provisionally be classified as a CS2 for which low level gas protection measures are required. Further monitoring is likely to be required to confirm this classification. Radon protection measures are not required.

8.0 Conclusions & Recommendations

8.1 Contamination Issues

The investigation has been carried out in order to provide information on the quality of the soil and groundwater beneath the Site in the context of land contamination and provide information on the ground gas regime beneath the Site for a commercial end use. The assessment is being completed prior to the proposed redevelopment of the Site.

8.2.1 Human Health

Widespread significant contamination of the soils has not been identified at the Site. Asbestos has been identified locally and the possibility of additional asbestos cannot be entirely discounted.

The proposed development comprises building footprint and hardstanding which will break the pollutant linkage between potentially contaminated soils and future end users. However, a potential linkage exists between potentially impacted Made Ground and construction/maintenance workers.

Any workers performing below ground works should be made aware of the potential for encountering contaminated soils, including asbestos containing materials. Appropriate levels of PPE should be utilised. Clean imported topsoil will be required in proposed landscaped areas, to act as an appropriate cover layer.

In the event that unforeseen contamination may be present groundworkers should use appropriate PPE and maintain good standards of hygiene to be protected from any soil contamination which may be present.

A 'hotspot' protocol should be in place for groundworkers to act upon should potential contamination be identified.

On the basis of the gas monitoring undertaken at the Site to date, a Characteristic Situation 2 (CS2) has been assigned and gas protection measures would be required for the proposed development. These recommendations should be agreed with the Local Authority in advance of development works starting on site. Further monitoring may also be required.

WAC testing has been undertaken as part of this investigation. Given the reported results some excavation arisings are likely to meet the requirements for disposal at a facility licensed to receive inert waste. Waste disposal classifications and costs should be confirmed with the receiving landfill operator before final decisions are taken to dispose of any excess materials off site. Additional testing may be required in this regard. Appropriate assessment and management/processing of the stockpiled demolition rubble will be required prior to reuse or off-site disposal.

No suspected hydrocarbons have been identified or recorded at the Site and hence no specific protection measures are considered necessary for water supply pipes. However, it is recommended that this report be submitted to the relevant Water Supply Authority to confirm this assessment.

8.2.2 Controlled Waters

Elevated concentrations of leachable metals (copper, lead and chromium) were recorded in samples of Made Ground. However, given that the majority of the Site is anticipated to be covered with building footprint and/or hardstanding, the risks of infiltration and subsequent migration of contaminants is considered to be low.

No widespread contamination of groundwater was encountered during this investigation. Slightly elevated concentrations of lead was recorded within one of the boreholes. However, these exceedances are not considered to pose an unacceptable risk to controlled waters receptors. Therefore, it is considered that no further action is required.

8.2 Geotechnical Considerations

The Made Ground is not considered suitable as a founding horizon and therefore foundations should extend below Made Ground and any soft/loose horizons, and into competent Shirdley Hill Sand Formation which are generally encountered between 1.5 and 2.5 m bgl.

Based on the ground investigation undertaken, strip/trench fill/pad foundations are considered to be suitable for the proposed development (assumed lightly loaded commercial warehouse type building), founded within the medium dense sand (Shirdley Hill Sand Formation). For a strip/trench fill foundation in this part of the site, an allowable bearing pressure of 100 kN/m² is considered appropriate with total settlements not anticipated to exceed 25 mm.

All foundation excavations should be inspected by a suitably qualified geotechnical engineer prior to casting to ensure the appropriate depth, founding medium and strength characteristics have been achieved and to confirm the absence of any localised cohesive soils. Relatively shallow groundwater has been identified and it is recommended that foundations are cast in dry ground.

Should the required loads exceed the allowable bearing capacity then an alternative foundation solution should be considered such as piling. Ground improvement (e.g. vibro-stone columns) would not be considered as an appropriate foundation solution given that gas protection measures are required.

Reference should be made to the reports in Section 1.2 for full details.

8.3 Recommendations for Supplementary Work

Based on the findings of this report, the following recommendations for supplementary works are made;

- ▲ Preparation of a Remediation Strategy, to set out the proposed capping layer, ground gas protection measures and subsequent verification which will be required. Classification of the ground gas regime should be agreed with the Local Authority, who may request additional monitoring or additional protection to mitigate the risk of elevated ground gases and depleted oxygen.
- ▲ Provision of analytical data associated with the ground investigation to the appropriate Statutory Undertakers to agree and adopt an appropriate barrier pipe/design for the proposed development.
- ▲ Given the reported results some excavation arisings are likely to meet the requirements for disposal at a facility licensed to receive inert waste, however, soils that contain elevated sulphates and total dissolved solids are unlikely to be acceptable at such a facility. Waste disposal classifications and costs should be confirmed with the receiving landfill operator before final decisions are taken to dispose of any excess materials off site. Additional testing may be required in this regard. Appropriate assessment and management/processing of small piles of demolition rubble will be required prior to reuse or off-site disposal.
- ▲ Although not encountered during the investigation, hotspots of localised contamination associated with Made Ground cannot be discounted. As with all brownfield sites, groundworkers and sub-surface maintenance workers should be made aware of the possibility of encountering contaminated soils through toolbox talks. Safe working procedures should be implemented, good standards of personal hygiene should be observed and appropriate levels of personal protective equipment (PPE) provided and utilised. This recommendation should be captured in Site health and safety documentation and in maintenance plans.
- ▲ Provision of analytical data associated with the ground investigation to the appropriate Statutory Undertakers to agree and adopt an appropriate barrier pipe/design for the proposed development.
- ▲ Detailed foundation and road/pavement design by suitably qualified Structural and Civil Engineers.

Drawing 1 – Proposed Development Plan

Disclaimer:
Subject to survey.

Notes:

KEY

- Image Business Park
- Site 2
- Site 3
- Sites to be cleared
- CGI Approx View Points

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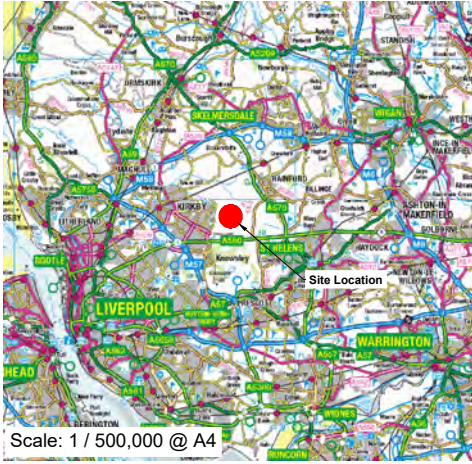
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198a Providence Square, Jacob Street, London, SE1 2DZ
Project:

Drawing Title:
Masterplan
Proposed Site Plan

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Drawing No: SK4000 Revision:
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Figure 1 – Site Location Map



LEGEND

Site Boundary



Scale: 1 / 10,000 @ A4

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Figure 2 – Exploratory Hole Location Plan

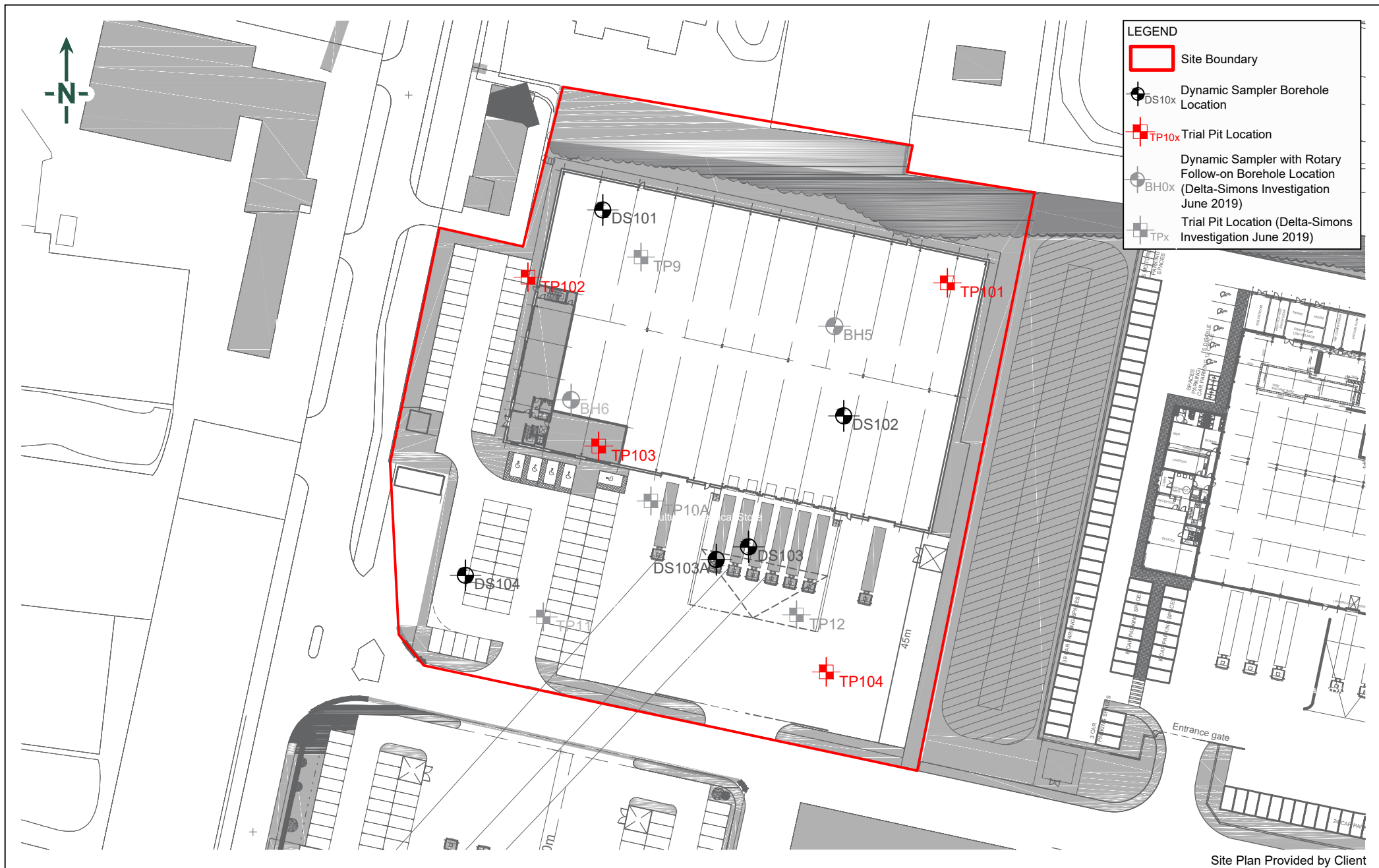


Figure 3 – Uncorrected SPT Results, Depth and Strata Type

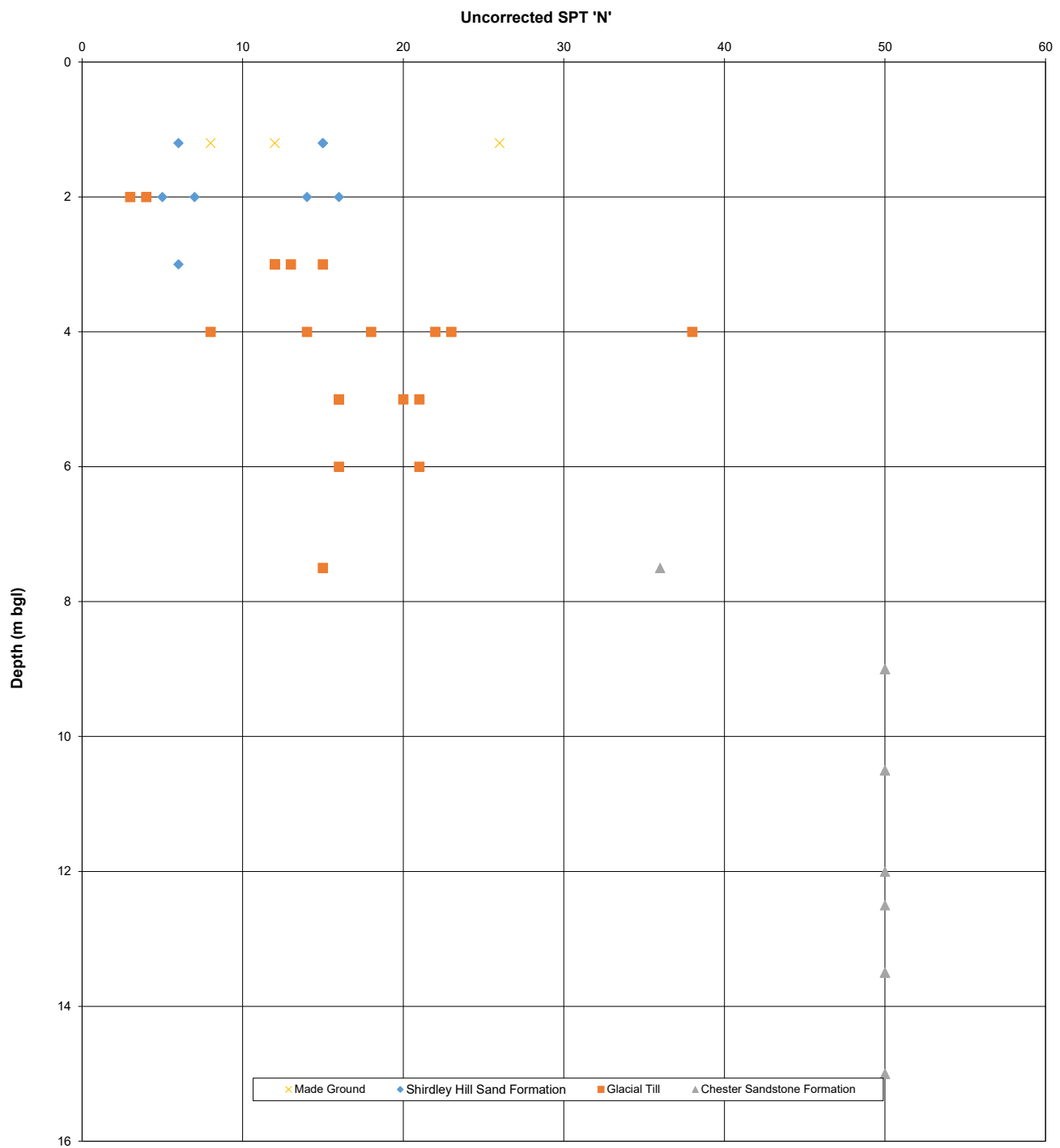


Figure 4 –Corrected SPT Results, Depth and Strata Type

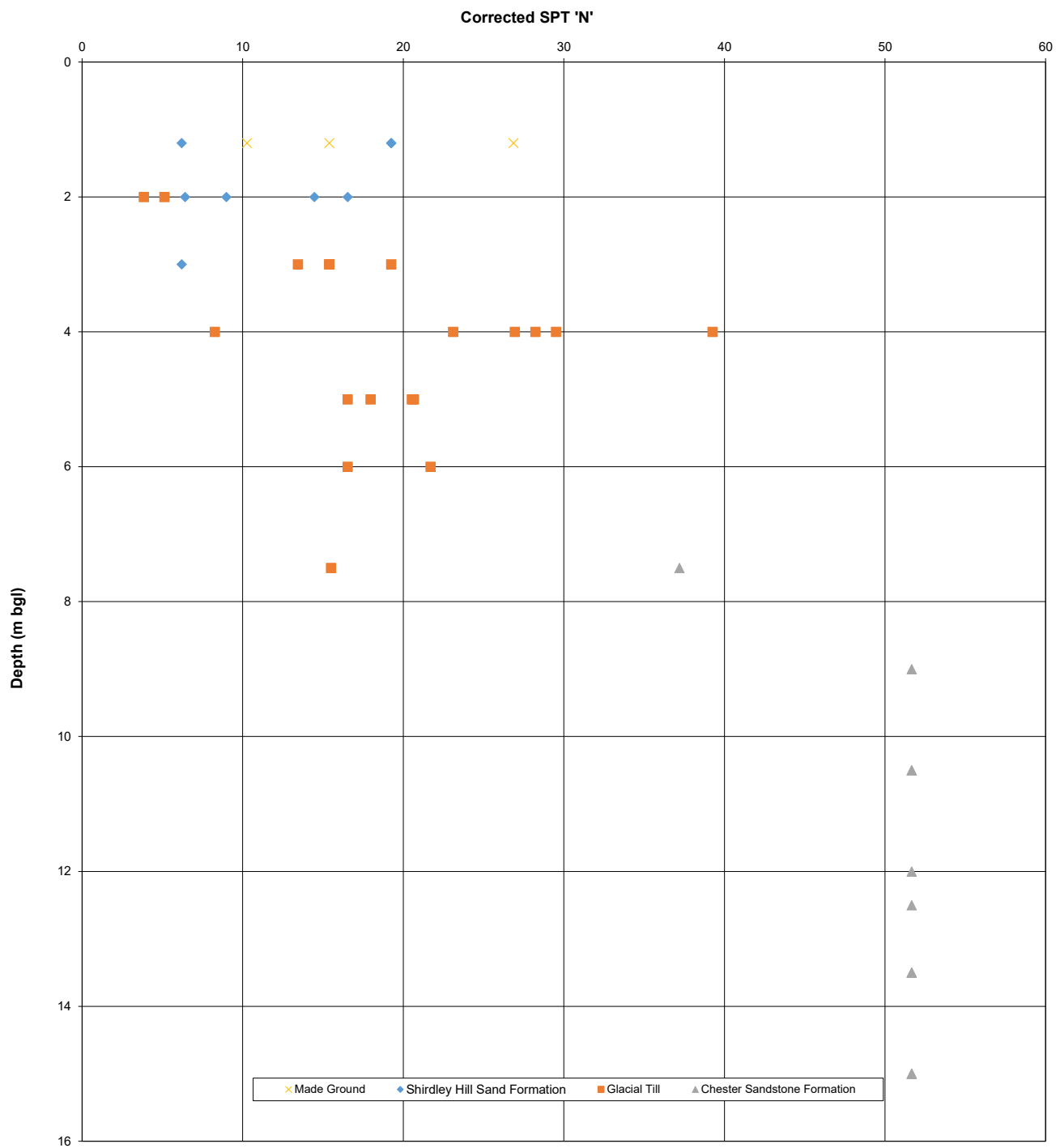
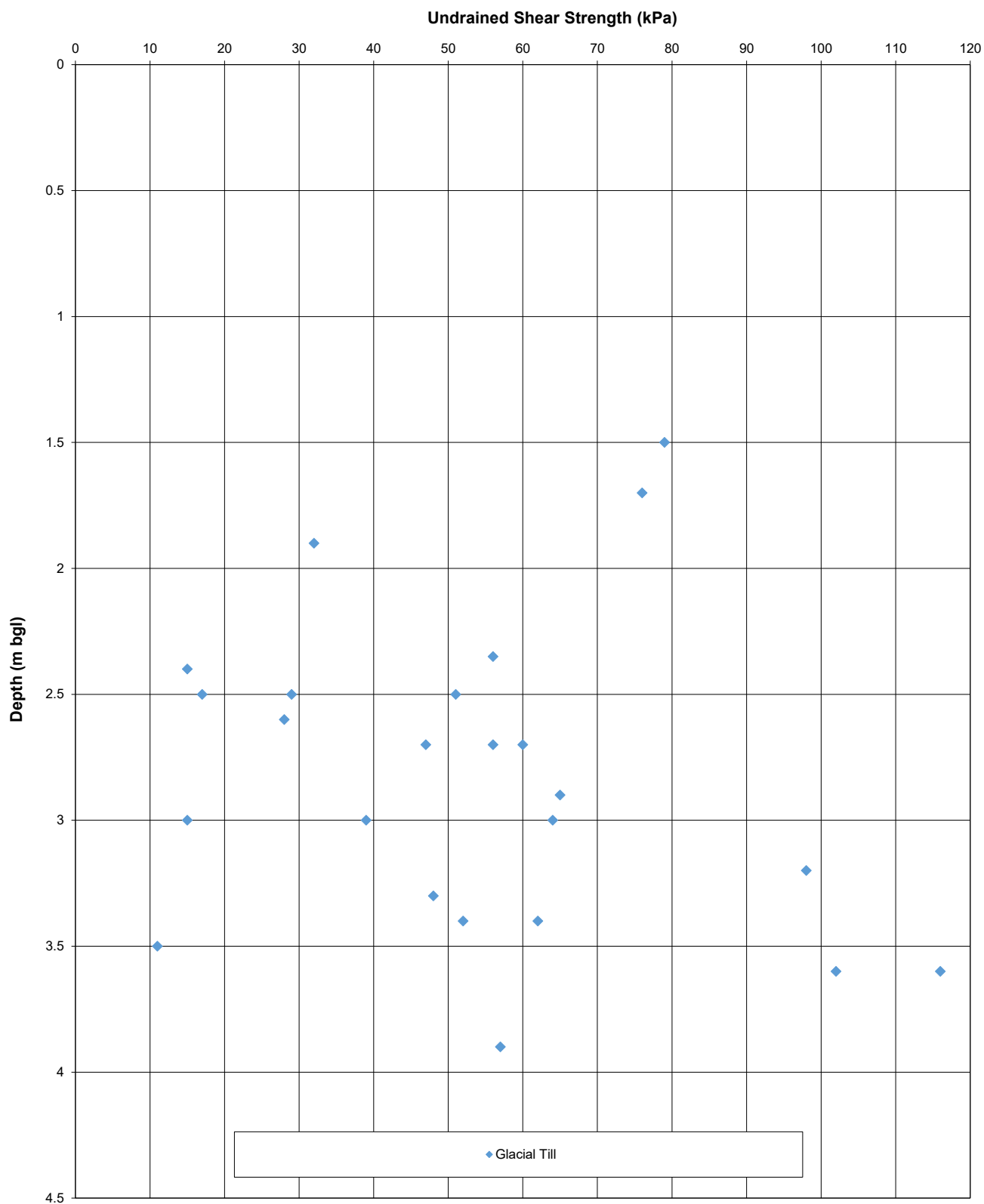


Figure 5 – Hand Shear Vane Results, Depth and Strata Type



TITLE:

Hand Shear Vane Results, Depth and Strata Type
Site 2 Knowsley

DWN:

AK

PROJECT NO:

19-0654.07

DATE:

25/05/2021

FIGURE NO:

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Appendix A – Limitations

Limitations

The recommendations contained in this Report represent Delta-Simons professional opinions, based upon the information listed in the Report, exercising the duty of care required of an experienced Environmental Consultant. Delta-Simons does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions.

Due to the evolving regulatory climate specific to Per Fluoro Alkyl Substances (PFAS), the scope of works is not intended to be conclusive as it relates to the identification of any PFAS related issues. While Delta-Simons may advise its Client if Delta-Simons becomes aware of the use of PFAS at the subject property, Delta-Simons makes no representation nor accepts any liability that any or all PFAS issues have been identified and/or revealed to its client through its scope of work, as presented herein.

Delta-Simons obtained, reviewed and evaluated information in preparing this Report from the Client and others. Delta-Simons conclusions, opinions and recommendations has been determined using this information. Delta-Simons does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which Delta-Simons has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

This Report was prepared by Delta-Simons for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Delta-Simons does not intend, without its written consent, for this Report to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the Report by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.

Appendix B – Risk Definitions

Contaminated Land Risk Definitions

The following methodology is based on the methodology presented in CIRIA C552 Contaminated Land Risk Assessment: A Guide to Good Practice 2001. It requires the classification of the:

- ▲ Magnitude of the potential consequence (severity) of the Risk occurring: and
- ▲ Magnitude of the Probability (likelihood) of the Risk occurring.

The classifications are then compared to indicate the risk presented by each pollutant linkage.

Consequence to Receptor Definition Matrix

	Human Health	Controlled Waters	Buildings/Services
Severe Consequence	Acute or chronic permanent impact on human health.	Sensitive controlled water pollution ongoing, or just about to occur.	Catastrophic collapse
Medium Consequence	Chronic permanent impact on human health	Gradual pollution of sensitive controlled water	Degradation of materials
Mild Consequence	Chronic temporary impact on human health	Gradual pollution of non-sensitive controlled water	Damage to building rendering it unsafe to occupy (eg foundation damage resulting in instability).
Minor Consequence	Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc).	Slight discoloration of water	Easily repairable effects of damage to buildings, structures and services, i.e discoloration of concrete

Probability Definitions

Probability	Definition in Context
Higher	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution. Positive evidence of source, pathway and receptor.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term. Suspect source, pathway, and receptor
Low Likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term No evidence of hazard, pathway, and receptor

Standard Risk Matrix

		Consequence/Magnitude of impact			
		Severe	Medium	Mild	Minor
Probability	High	Very High	High	Moderate	Moderate/Low
	Likely	High	Moderate	Moderate/low	Low
	Low Likelihood	Moderate	Moderate/low	Low	Very Low
	Unlikely	Moderate/low	Low	Very Low	Very Low

Classified risks and likely action

Significance Level	Definition/Comments
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required. Demonstrable contaminated land situation, highest threat & liability level, urgent action recommended.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term. Likely contaminated land situation, risk assessment and action recommended.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, if it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term. Plausible contaminated land situation, risk assessment and possible action recommended.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. Unlikely contaminated land situation, possible risk assessment and possible action.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe. Negligible risk, no action recommended except vigilance for changes in conditions.

Geotechnical Risk Classification

The geohazards listed in the report within Section 4 follow guidance presented in Clayton, C.R.I. (2001) *Managing Geotechnical Risk*, Thomas Telford and the Highways Agency document CD622 '*Managing Geotechnical Risk*' (2008) which aims to identify and manage the geotechnical risks associated with a scheme throughout its lifespan, from planning to construction to maintenance.

For each geohazard the probability of the hazard occurring (P) has been considered together with the impact it would have (I) if it were to happen to calculate the risk rating between 1 and 25.

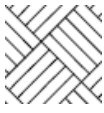
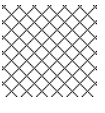
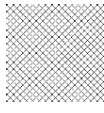
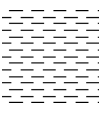
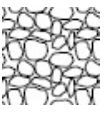
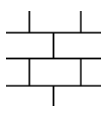
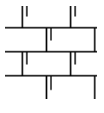
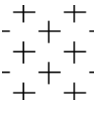
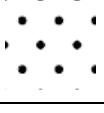
Risks that fall within Moderate, Significant and Severe categories below are considered to be **substantial** and are therefore listed within the report.

Probability	(P)		Impact	(I)		(R)	Risk
Very Likely (VLk)	5	X	Very High (VH)	5	=	20 – 25	Severe
Likely (Lk)	4		High (H)	4		15 – 19	Substantial
Plausible (P)	3		Medium (M)	3		10 – 14	Moderate
Unlikely (U)	2		Low (L)	2		5 – 9	Minor
Very Unlikely (VU)	1		Very Low (VL)	1		1 – 4	Negligible

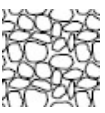
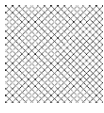
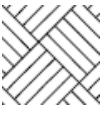
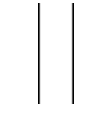
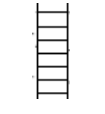
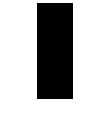
Appendix C – Photographic Record, Exploratory Logs and SPT Calibration Certificate

KEY TO BOREHOLE AND TRIAL PIT LOGS

MATERIAL LEGENDS

	Topsoil		Made Ground		Made Ground 2
	Concrete		Clay		Silt
	Sand		Gravel		Peat
	Cobbles		Boulders		Mudstone
	Siltstone		Sandstone		Limestone
	Chalk		Coal		Breccia
	Conglomerate		Igneous		Metamorphic
	Volcanoclastic		Gypsum		Shale
	Ironstone		Bedrock (Unidentified)		Void

INSTALLATION / BACKFILL LEGENDS

	Sand		Gravel		Bentonite
	Cement/Grout		Arisings		Concrete
	Plain Pipe		Slotted Pipe		Piezometer Tip

Legend symbols in general accordance with BS 5930 (1999) and AGS.

KEY TO BOREHOLE AND TRIAL PIT LOGS

SAMPLE TYPES

ACM	Asbestos Containing Material Sample
B	Bulk Disturbed Sample
BLK	Block Sample
C	Core Sample
CBR	Undisturbed Sample for California Bearing Ratio Test – 154mm diameter
D	Disturbed Sample - Tub
ES	Soil Sample for Environmental Testing
EW	Water Sample for Environmental Testing
J	Disturbed Sample - Jar
U	Undisturbed Driven Tube Sample – 70/102mm diameter, 450mm long
U(P)	Undisturbed Pushed Piston Sample – 102mm diameter, 450mm long
U(TW)	Undisturbed Thin Walled Push In Sample – 100mm diameter, 450mm long
V	Disturbed Sample - Vial

TEST TYPES

CPT	Cone Penetrometer Test (kN/m ²)
FID	Flame Ionisation Detector Test (ppm)
HSV	In-Situ Hand Sheer Vane Test (kN/m ²)
PID	Photoionisation Detector Test (ppm)
SPT (S)	Standard Penetration Test – Split Spoon Sampler
SPT (C)	Standard Penetration Test – Solid 60 Degree Cone

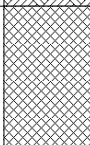
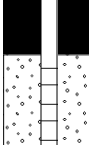
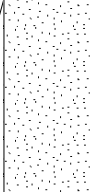
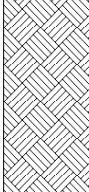
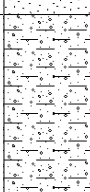
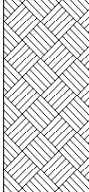
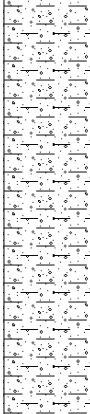
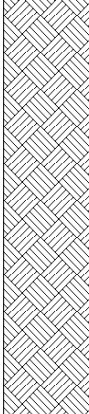
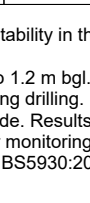
CORE DETAILS

If	Fracture Spacing (mm) – Minimum, Average, Maximum
NI	Non-Intact where >25 fracture spacings per metre
TCR	Total Core Recovery (%)
SCR	Solid Core Recovery (%)
RQD	Rock Quality Designation (%)
AF	Air Flush Return (%)
WF	Water Flush Return (%)

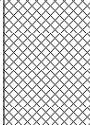
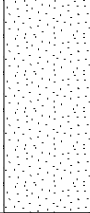
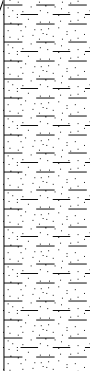
WATER COLUMN DETAILS

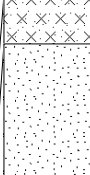
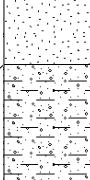
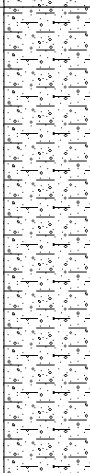
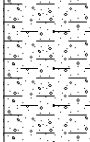
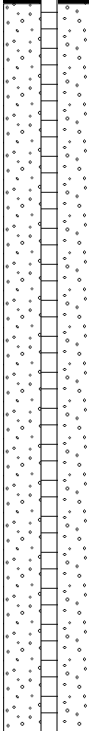
	First Water Strike, Second Water Strike etc.
	Standing Water Level – First Strike, Second Strike etc.
	Seepage

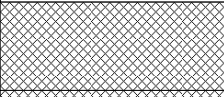
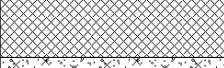
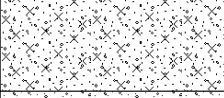
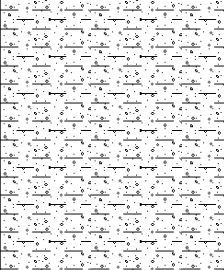
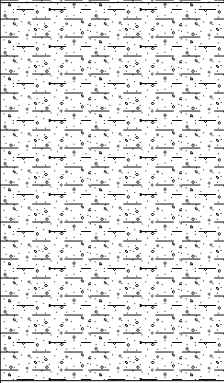
 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 19-0654.07		Hole ID: DS101		Page: 1 of 1		
					Project: Site 2 Knowsley						
Dynamic Sampler Log					Date: 28/04/2021		Client: Hale on behalf of Seybourne Estates				
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill
							Depth (m)	Type & Ref	Depth (m)	Results	
Vegetation over MADE GROUND: Dark brown slightly silty gravelly sand. Gravel is angular to subrounded fine to coarse brick, concrete, sandstone and quartzite. Frequent roots.		0.30	(0.30)	42.67			0.40	ES1	0.40	PID=0.0ppmv	
MADE GROUND: Red sandy gravel. Gravel is angular to subrounded fine to coarse brick and quartzite.		0.50	(0.20)	42.47							
MADE GROUND: Blackish brown sandy gravel. Gravel is angular to subrounded fine to coarse clinker, brick and quartzite.		0.70	(0.20)	42.27							
Light brown and black fine to coarse SAND. (SHIRDLEY HILL SAND FORMATION)		1.10	(0.40)	41.87			1.20	SPT(C) N=15 (2,3/4,4,4,3)			
Dark brown fine to medium SAND. (SHIRDLEY HILL SAND FORMATION)		1.25	(0.15)	41.72							
Yellowish brown medium to coarse SAND. (SHIRDLEY HILL SAND FORMATION)		1.55	(0.30)	41.42							
Firm bluish grey mottled light brown slightly gravelly CLAY. Gravel is angular to subrounded fine quartzite. (GLACIAL TILL)		2.00	(0.45)	40.97			1.70	HV= 76 kPa			
Becoming stiff below 1.8 m bgl.											
Soft becoming firm light brown slightly sandy slightly gravelly CLAY. Gravel is angular fine to coarse quartzite and sandstone. (GLACIAL TILL)									2.30	(0.30)	
Firm light brown slightly sandy slightly gravelly CLAY. Gravel is angular fine to coarse quartzite and sandstone. (GLACIAL TILL)											
Becoming stiff below 3.4 m bgl.											
Pocket of yellow coarse sand.			(3.15)		2.70	HV= 56 kPa					
Rare pockets of sandstone gravel below 5 m bgl.					3.00	SPT(S) N=15 (2,2/2,4,4,5)					
Borehole complete at 5.45 m bgl.					3.60	HV= 102 kPa					
					3.90	HV= 181 kPa SPT(S) N=18 (3,3/3,4,5,6)					
					4.00	PID=0.0ppmv					
					4.50	D1					
					5.00	SPT(S) N=16 (2,3/3,4,4,5)					
											
Remarks: 1. Borehole terminated at 5.45 m bgl. 2. Hand dug service avoidance pit excavated to 1.2 m bgl. 3. Groundwater not encountered during drilling. 4. Hand Shear Vane obtained using 19 mm blade. Results have been corrected and averaged. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.					Water Strike Date Depth (m) Remarks		Water Level Duration (min) Depth		Borehole Diameter Depth Base Diameter		
Coordinates: E343785.02 N398938.62		Elevation (mAOD): 42.97		Drilled By: Geospek Ltd		Plant Used: Premier 110		Logged: AK		Checked: MY	
							Approved: PB		Scale: 1:32		

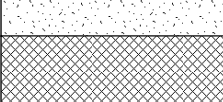
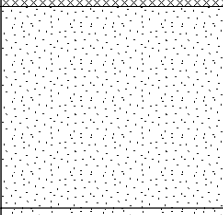
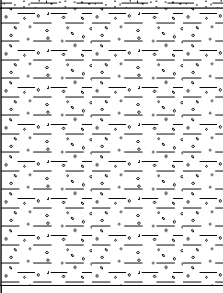
 deltasimons Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 19-0654.07		Hole ID: DS102		Page: 1 of 1		
					Project: Site 2 Knowsley						
Dynamic Sampler Log					Date: 28/04/2021		Client: Hale on behalf of Seybourne Estates				
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill
							Depth (m)	Type & Ref	Depth (m)	Results	
Vegetation over TOPSOIL: Dark brown slightly clayey fine to medium sand. Frequent roots.		0.30	(0.30)	43.21							
MADE GROUND: Dark brown slightly clayey gravelly ashly sand with occasional fine cobbles. Gravel is angular to subrounded fine to coarse brick, concrete and clinker.		0.90	(0.60)	42.61			0.50	ES1	0.50	PID=0.0ppmv	
MADE GROUND: Blackish brown sandy gravel. Gravel is angular to subrounded fine to coarse slag, clinker, sandstone and quartzite.		1.10	(0.20)	42.41					1.20	SPT(C) N=15 (1,2/2,3,4,6)	
Medium dense orangish brown fine to coarse SAND. (SHIRDLEY HILL SAND FORMATION)		1.95	(0.85)	41.56			1.70	D1	1.70	PID=0.0ppmv	
Firm locally soft light grey slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse quartzite and sandstone. (GLACIAL TILL)						2.00 ▼			2.00	SPT(S) N=3 (1,1/0,1,1,1)	
Becoming soft below 2.7 m bgl.			(2.50)						2.50	HV= 51 kPa	
									3.00	SPT(S) N=12 (2,2/2,3,3,4)	
									3.50	HV= 11 kPa	
									4.00	SPT(S) N=23 (4,4/5,5,6,7)	
Borehole complete at 4.45 m bgl.		4.45		39.06							
Remarks: 1. Borehole terminated at 4.45 m bgl due to instability in the borehole causing borehole to collapse. 2. Hand dug service avoidance pit excavated to 1.2 m bgl. 3. Groundwater encountered at 2.00 m bgl during drilling. 4. Hand Shear Vane obtained using 19 mm blade. Results have been corrected and averaged. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.					Water Strike			Water Level		Borehole Diameter	
					Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter
					28/04/2021	2.00					
Coordinates: E343812.92 N398884.46		Elevation (mAOD): 43.51		Drilled By: Geospek Ltd		Plant Used: Premier 110		Logged: AK	Checked: MY	Approved: PB	Scale: 1:32

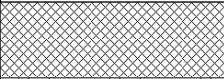
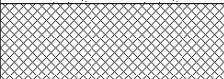
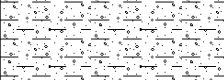
Coordinates: E343796.54 N398863.94	Elevation (mAOD): 43.44	Drilled By: Geospek Ltd	Plant Used: Premier 110	Logged: AK	Checked: MY	Approved: PB	Scale: 1:32
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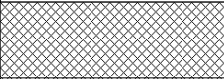
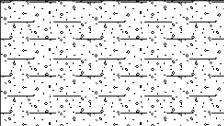
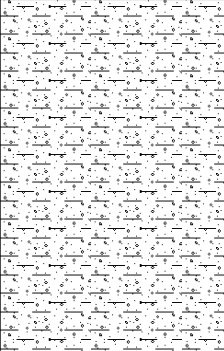
 deltasimons Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 19-0654.07		Hole ID: DS103A		Page: 1 of 1		
					Project: Site 2 Knowsley						
Dynamic Sampler Log					Date: 28/04/2021		Client: Hale on behalf of Seybourne Estates				
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill
							Depth (m)	Type & Ref	Depth (m)	Results	
Vegetation over TOPSOIL: Dark brown gravelly sand. Gravel is angular to subrounded fine to coarse brick and quartzite. Frequent roots.		0.30	(0.30)	43.14							
MADE GROUND: Dark brown slightly clayey gravelly sand with occasional fine cobbles. Gravel is angular to subrounded fine to coarse brick, concrete, clinker, sandstone and quartzite.		0.85	(0.55)	42.59							
MADE GROUND: Reddish brown sandy gravel. Gravel is angular to subrounded fine to coarse brick, clinker and quartzite.		1.20	(0.35)	42.24				0.90	ES1	0.90	PID=0.0ppmv
MADE GROUND: Firm becoming stiff blackish brown slightly sandy slightly gravelly silt. Gravel is angular to subrounded brick and quartzite.		1.50	(0.30)	41.94						1.20	SPT(C) N=8 (1,1/1,2,2,3)
Loose orangish brown fine to coarse SAND. (SHIRDLIE HILL SAND FORMATION)		2.40	(0.90)	41.04						2.00	SPT(C) N=5 (1,2/2,1,1,1)
Firm locally soft blueish light grey slightly gravelly sandy SILT. Gravel is angular to subrounded fine to coarse quartzite and sandstone.		2.80	(0.40)	40.64						2.50	HV= 29 kPa
(GLACIAL TILL)		2.90	(0.10)	40.54							
Light blue clayey coarse SAND. (GLACIAL TILL)			(1.55)			3.00		3.00	D1	3.00 3.00 3.00	SPT(S) N=12 (2,2/2,3,3,4) PID=0.0ppmv HV= 39 kPa
Firm light brown sandy CLAY with rare gravel and lenses of light brown coarse sand. Gravel is angular to subrounded fine to medium quartzite. (GLACIAL TILL)										3.90 4.00	HV= 57 kPa SPT(S) N=21 (2,3/4,4,6,7)
4.45				38.99							
Borehole complete at 4.45 m bgl.											
Remarks: 1. Borehole terminated at 4.45 m bgl due to instability in the borehole causing borehole to collapse back to 3 m bgl. 2. Hand dug service avoidance pit excavated to 1.2 m bgl. 3. Groundwater encountered at 3.00 m bgl during drilling. 4. Hand Shear Vane obtained using 19 mm blade. Results have been corrected and averaged. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.					Water Strike			Water Level		Borehole Diameter	
					Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter
					28/04/2021	3.00					
Coordinates: E343796.54 N398863.94		Elevation (mAOD): 43.44		Drilled By: Geospek Ltd		Plant Used: Premier 110		Logged: AK	Checked: MY	Approved: PB	Scale: 1:32

 Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com					Project No: 19-0654.07		Hole ID: DS104		Page: 1 of 1		
					Project: Site 2 Knowsley						
Dynamic Sampler Log					Date: 28/04/2021		Client: Hale on behalf of Seybourne Estates				
Description of Strata	Legend	Strata Depth (m bgl)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Sample Details		Test Details		Backfill
							Depth (m)	Type & Ref	Depth (m)	Results	
MADE GROUND: Dark greyish brown slightly clayey gravelly sand with occasional cobbles. Gravel is angular to subrounded fine to coarse brick, concrete and clinker. Cobbles are angular fine to coarse brick and concrete. Rare glass and wood. Occasional roots. MADE GROUND: Dark blackish brown very sandy gravel. Gravel is angular to subrounded fine to coarse brick, clinker and quartzite. MADE GROUND: Reddish and greyish brown sandy cobbly gravel. Gravel is angular fine to coarse brick. Cobbles are angular fine to medium bricks. MADE GROUND: Blackish brown gravelly sand with rare brick cobble. Gravel is angular to subrounded fine to coarse brick, concrete, mortar, clinker, quartzite and sandstone. Rare glass. Blackish brown sandy SILT. Sand is medium to fine. (SHIRDLEY HILL SAND FORMATION) Yellowish brown locally dark brown fine to coarse SAND. (SHIRDLEY HILL SAND FORMATION) Firm locally soft blueish grey mottled brown sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to medium quartzite. Rare wood. (GLACIAL TILL) Stiff light pinkish brown slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse quartzite. (GLACIAL TILL)		0.40	(0.40)	42.44			0.50	ES1	0.50	PID=0.0ppmv	
		0.65	(0.25)	42.20							
		0.85	(0.20)	42.00							
		1.25	(0.40)	41.60							
		1.45	(0.20)	41.40							
		2.25	(0.80)	40.60							
		2.75	(0.50)	40.10							
			(2.70)								
											
											
Band of clayey sand between 4.7 and 4.8 m bgl. Gravelly sand between 5.25 and 5.45. Borehole complete at 5.45 m bgl.											
Remarks: 1. Borehole terminated at 5.45 m bgl. 2. Hand dug service avoidance pit excavated to 1.2 m bgl. 3. Groundwater not encountered during drilling. 4. Hand Shear Vane obtained using 19 mm blade. Results have been corrected and averaged. 5. Borehole installed with gas and groundwater monitoring standpipe as detailed above. 6. Borehole logged in general accordance with BS5930:2015+A1:2020.					Water Strike		Water Level		Borehole Diameter		
					Date	Depth (m)	Remarks	Duration (min)	Depth	Depth Base	Diameter
Coordinates: E343756.01 N398870.18		Elevation (mAOD): 42.84		Drilled By: Geospek Ltd		Plant Used: Premier 110		Logged: AK	Checked: MY	Approved: PB	Scale: 1:32

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.07		Hole ID: TP101		Page: 1 of 1		
		Project: Site 2 Knowsley						
Trial Pit Log		Date: 27/04/2021		Client: Hale on behalf of Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
Vegetation over MADE GROUND: Dark brown slightly clayey gravelly fine sand with pockets of light grey soft to firm sandy clay with cobbles. Gravel and cobbles are angular to subrounded fine to coarse concrete, ceramics and brick. Rare metal and plastics. Frequent roots.		0.35	42.42		0.20	ES1	0.20	PID=0.00ppmv
MADE GROUND: Reddish brown slightly clayey gravelly sand with pockets of dark brown clay. Gravel is angular to subrounded fine to coarse bricks. Rare roots.		0.60	42.17					
Light brown slightly silty slightly gravelly fine to coarse SAND with locally compacted pockets of dark brown fine to coarse sand. Gravel is fine to coarse quartzite with rare quartzite cobbles.		1.00	41.77					
(SHIRDLEY HILL SAND FORMATION)								
Firm blueish grey mottled dark brown slightly sandy gravelly CLAY with occasional cobbles of quartzite and pockets of light yellowish fine to coarse sand. Gravel is angular to subrounded fine to coarse quartzite. Rare decomposed wood. (GLACIAL TILL)		2.10	40.67		1.50	D2	1.50 1.50	PID=0.00ppmv HV=79 kPa
Firm locally soft pinkish grey mottled blue grey sandy gravelly CLAY with lenses of coarse dark brown sand. Gravel is subangular to subrounded fine to coarse quartzite. (GLACIAL TILL)		3.60	39.17				2.40 3.20	HV=15 kPa HV=98 kPa
Trial pit complete at 3.60 m bgl.								
Dimensions and Orientation: Length = 3.00 m Width = 0.70 m 		Orientation: Inclination:		Remarks: 1. Trial pit terminated at 3.6 m bgl. 2. Groundwater not encountered during excavation. 3. Trial pit stable during excavation. 4. Hand Shear Vane obtained using 19 mm blade. Results have been corrected and averaged. 5. Trial pit backfilled with arisings upon completion. 6. Trial pit logged in general accordance with BS5930:2015+A1:2020.				
Coordinates: E343819.63 N398939.48	Elevation (mAOD): 42.77	Excavated By: Boundary Plant		Plant Used: 13T track excavator	Logged: AK	Checked: MY	Approved: PB	Scale: 1:30

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.07		Hole ID: TP102		Page: 1 of 1		
		Project: Site 2 Knowsley						
Trial Pit Log		Date: 27/04/2021		Client: Hale on behalf of Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
MADE GROUND: Reinforced concrete.		0.15	42.58		0.50	ES1	0.50	PID=0.00ppmv
MADE GROUND: Blackish brown sandy gravel with occasional cobbles. Gravel is angular to subrounded fine to coarse concrete, brick and various lithologies.		0.60	42.13					
MADE GROUND: Dark brown slightly clayey gravelly sand with pockets of black fine to coarse sand. Gravel is angular to subrounded quartzite.		1.10	41.63					
Light brown medium to coarse SAND. Rare quartzite cobbles. (SHIRDLEY HILL SAND FORMATION)		1.90	40.83		1.60	D1	1.60	PID=0.00ppmv
Blueish grey very clayey fine to coarse SAND. (SHIRDLEY HILL SAND FORMATION)		2.40	40.33		2.20	D2	2.20	PID=0.00ppmv
Firm blueish grey mottled dark brown and pinkish brown slightly gravelly CLAY. Gravel is angular to subrounded fine to medium quartzite. (GLACIAL TILL)		3.50	39.23				2.70	HV=47 kPa
							3.00	HV=64 kPa
						3.40	HV=62 kPa	
Trial pit complete at 3.50 m bgl.								
Dimensions and Orientation: Length = 3.50 m Width = 0.70 m 				Orientation: Inclination:				
				Remarks: 1. Trial pit terminated at 3.5 m bgl. 2. Groundwater encountered at 1.5 m bgl during excavation. 3. Instability in upper 1.5 m bgl in the northern wall. 4. Hand Shear Vane obtained using 19 mm blade. Results have been corrected and averaged. 5. Trial pit backfilled with arisings upon completion. 6. Trial pit logged in general accordance with BS5930:2015+A1:2020.				
Coordinates: E343777.07 N398926.57		Elevation (mAOD): 42.73		Excavated By: Boundary Plant		Plant Used: 13T track excavator		Logged: AK Checked: MY Approved: PB Scale: 1:30

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.07		Hole ID: TP103		Page: 1 of 1		
		Project: Site 2 Knowsley						
Trial Pit Log		Date: 27/04/2021		Client: Hale on behalf of Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
MADE GROUND: Light brown sandy cobbly gravel. Gravel and cobbles are angular to subrounded fine to coarse concrete, brick and paving stones. Occasional wood and metal. Rare plastic, glass, chip wood board and electrical wires.		0.30	42.56		0.20	ES1	0.20	PID=0.00ppmv
MADE GROUND: Reinforced concrete.		0.45	42.41					
MADE GROUND: Blackish dark brown gravelly cobbly fine to coarse sand. Gravel and cobbles are angular fine to coarse bricks.								
A brick duct running East-West with concrete at either side encountered on northern face of excavation, extending between 0.65 and 0.9 m bgl.		1.30	41.56					
Orangish brown slightly silty fine to coarse SAND with locally compacted pockets of dark sand. (SHIRDLEY HILL SAND FORMATION)		2.10	40.76					
Blueish grey mottled brown and pinkish brown sandy CLAY with pockets of light brown orangish fine to coarse sand. (GLACIAL TILL)		2.30	40.56					
Firm locally soft light grey slightly sandy slightly gravelly CLAY with lenses of mottled brown to grey coarse sand. Gravel is subangular to subrounded fine to medium quartzite. (GLACIAL TILL)				2.80	D1	2.50	HV=17 kPa	
						2.80	PID=0.00ppmv	
		3.50	39.36					3.40
Trial pit complete at 3.50 m bgl.								
Dimensions and Orientation: Length = 5.00 m Width = 1.00 m 		Orientation: Inclination:		Remarks: 1. Trial pit terminated at 3.5 m bgl. 2. Groundwater not encountered during excavation. 3. Trial pit stable during excavation. 4. Hand Shear Vane obtained using 19 mm blade. Results have been corrected and averaged. 5. Trial pit backfilled with arisings upon completion. 6. Trial pit logged in general accordance with BS5930:2015+A1:2020.				
Coordinates: E343775.69 N398888.70	Elevation (mAOD): 42.86	Excavated By: Boundary Plant		Plant Used: 13T track excavator	Logged: AK	Checked: MY	Approved: PB	Scale: 1:30

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.07		Hole ID: TP104		Page: 1 of 1		
		Project: Site 2 Knowsley						
Trial Pit Log		Date: 27/04/2021		Client: Hale on behalf of Seybourne Estates				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type & Ref	Depth (m)	Results
Vegetation over MADE GROUND: Dark brown gravelly cobbly medium to coarse sand with pockets of firm to stiff reddish sandy clay. Gravel and cobbles are angular to subrounded quartzite, brick, granite, slag and cable wire. Occasional roots.		0.30	43.35		0.70	ES1		
MADE GROUND: Brown gravelly slightly clayey fine to medium sand with pockets of firm light grey slightly sandy gravelly clay. Gravel is angular to subrounded fine to coarse quartzite, sandstone, brick.		0.65	43.00					
MADE GROUND: Blackish brown sandy gravel. Gravel is angular to subrounded fine to coarse slag, clinker, brick. Frequent roots.		1.20	42.45					
Dark greyish brown slightly clayey slightly gravelly SAND with brown pockets of sandy clay. (SHIRDLEY HILL SAND FORMATION)		1.70	41.95		1.50	D1		
Orangish brown slightly silty fine to coarse SAND with localised pockets of dark brown sand. (SHIRDLEY HILL SAND FORMATION)		2.10	41.55					
Firm locally soft bluish light grey mottled pinkish brown slightly sandy slightly gravelly CLAY with lenses of light brown fine to medium sand sand. Gravel is subangular to subrounded fine to medium quartzite. (GLACIAL TILL)		3.50	40.15				2.70	HV=60 kPa
							3.00	HV=15 kPa
							3.30	HV=48 kPa
Trial pit complete at 3.50 m bgl.								
Dimensions and Orientation: Length = 3.00 m Width = 0.60 m 		Orientation: Inclination:		Remarks: 1. Trial pit terminated at 3.5 m bgl. 2. Groundwater not encountered during excavation. 3. Trial pit unstable within the upper 0.3 m bgl. 4. Hand Shear Vane obtained using 19 mm blade. Results have been corrected and averaged. 5. Trial pit backfilled with arisings upon completion. 6. Trial pit logged in general accordance with BS5930:2015+A1:2020.				
Coordinates: E343808.88 N398851.90	Elevation (mAOD): 43.65	Excavated By: Boundary Plant		Plant Used: 13T track excavator	Logged: AK	Checked: MY	Approved: PB	Scale: 1:30

19-0654.07 – Site Works Photographic Record



Photograph 1 – TP101 Trial Pit 0.0 to 3.6 m.



Photograph 2 – TP101 Trial Pit spoil.



Photograph 3 – TP101 Trial Pit spoil.



Photograph 4 – TP102 Trial Pit 0.0 to 3.5 m.



Photograph 5 – TP102 Trial pit spoil.



Photograph 6 – TP103 Trial Pit 0.0 to 3.5 m.



Photograph 7 – TP103 Trial Pit spoil.



Photograph 8 – TP103 Trial Pit spoil.



Photograph 9 – Brick and concrete obstruction in TP103 at 0.65 m bgl.



Photograph 10 – TP104 0.0 to 3.5 m.



Photograph 11 – TP104 Trial Pit spoil.



Photograph 12 - TP104 Trial Pit spoil.



Photograph 13 – DS101 hand dug pit.



Photograph 14 – DS101 0.0 to 1.2 m.



Photograph 15 – DS101 1.2 to 5.0 m.



Photograph 16 – DS102 hand dug pit.



Photograph 17 – DS102 0.0 to 1.2 m.



Photograph 18 – DS103 hand dig hole with services. Location was abandoned.



Photograph 19 – DS103A hand dug pit.



Photograph 20 – DS103A 0.0 to 1.2 m.



Photograph 21– DS103A 1.2 to 4.0 m.



Photograph 22 – DS104 hand dug pit.



Photograph 23 – DS104 0.0 to 1.2 m.



Photograph 24 – DS104 1.2 to 5.0 m.

SPT Hammer Energy Test Report

in accordance with BS EN ISO 22476-3:2005

ARCHWAY ENGINEERING (UK LTD)
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP
UNITED KINGDOM

SPT Hammer Ref: GEO 004
Test Date: 28/08/2020
Report Date: 05/08/2020
File Name: Geo 004.spt
Test Operator: MG

Instrumented Rod Data

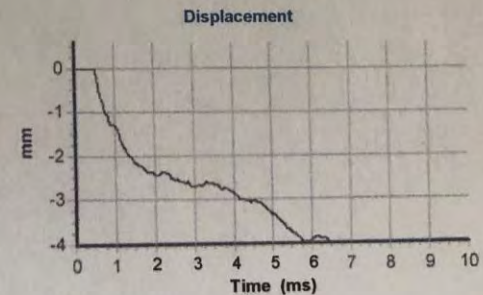
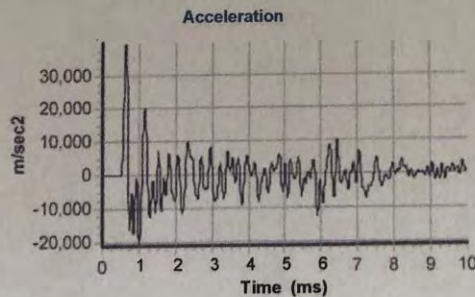
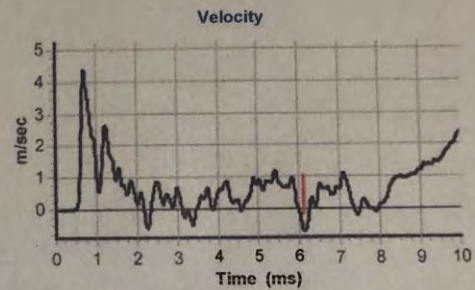
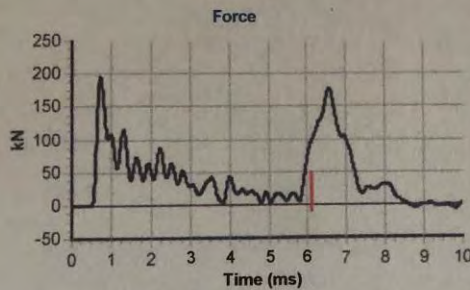
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.1
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 7082
Accelerometer No.2: 7077

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 13.0

Comments / Location

CALIBRATION CERTIFICATE FOR GEOSPEK
LIMITED TRIP HAMMER



Calculations

Area of Rod A (mm^2): 918
Theoretical Energy E^A (J): 473
Measured Energy E_{meas} (J): 364

Energy Ratio E_r (%): **77**

Signed: KMCDONALD

Title: SALES ENGINEER

The recommended calibration interval is 12 months

Appendix D – Soil Chemical Analysis Results and Screening

Appendix D - Chemical Screening - Soils																												
19-0654.07 Site Two, Image Business Park, Knowsley																												
Key	Below GAC	Above GAC	Below LoD	Exploratory Hole ID																								
				Depth	DS101	DS102	DS104	TP101	TP103	TP104	TP9	TP10A	TP10A	TP11	TP12	TP12	BH5	BH6										
																			Consultant	DS	DS	DS	DS	DS	DS	DS	DS	DS
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Acceptable Status	No. tests	Minimum (mg/kg)	Maximum (mg/kg)	Commercial screening criteria (mg/kg)	GAC Source	Date Sampled	28/04/2021	28/04/2021	28/04/2021	27/04/2021	27/04/2021	27/04/2021	26/06/2019	26/06/2019	26/06/2019	26/06/2019	26/06/2019	26/06/2019	27/06/2019	28/06/2019					
										MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG
Stone Content	%	0.1	NONE	14	<0.1	<0.1	N/A	N/A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					
Moisture Content	%	N/A	NONE	14	4.7	18	N/A	N/A	7.9	9	11	14	4.7	13	9.4	6.4	17	13	15	18	16	18	18					
Total mass of sample received	kg	0.001	NONE	14	0.9	2	N/A	N/A	1.5	1	1	1	1.7	0.9	1.7	2	2	1.5	1.9	1.5	1.5	1.8	1.8					
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	1	-	-	Detected	N/A	-	-	-	-	-	-	-	Chrysotile- Loose Fibrous Debris	-	-	-	-	-	-	-					
Asbestos Quantification	% wt	N/A	ISO 17025	1	0.005	0.005	Detected	N/A	-	-	-	-	-	-	-	0.005	-	-	-	-	-	-	-					
Asbestos in Soil	Type	N/A	ISO 17025	14	N/A	N/A	Detected	N/A	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected					
General Inorganics																												
pH - Automated	pH Units	N/A	MCERTS	14	6.9	10.8	N/A	N/A	7.1	8.4	7.4	7.1	10.8	6.9	8.6	10.2	8.5	8.1	8	7.2	8	8	8					
Water Soluble Sulphate as SO ₄ , 16hr extraction (2:1)	mg/kg	2.5	MCERTS	14	39	1100	N/A	N/A	180	110	100	240	740	1100	39	380	560	310	100	390	49	420	420					
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	14	0.02	0.55	N/A	N/A	0.09	0.096	0.061	0.12	0.37	0.55	0.02	0.19	0.28	0.16	0.051	0.2	0.024	0.21	0.21					
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	14	19.6	552	N/A	N/A	90.4	55.7	50.8	118	371	552	19.6	189	281	157	50.5	196	24.3	209	209					
Organic Matter	%	0.2	MCERTS	7	0.6	9.4	N/A	N/A	-	3	-	4.4	-	2.3	-	0.6	-	5.5	-	9.4	3.3	-	-					
Speciated PAHs																												
Naphthalene	mg/kg	0.05	NCERTS	14	<0.05	<0.05	190	LQM	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05					
Acenaphthylene	mg/kg	0.05	MCERTS	14	<0.05	<0.05	83,000	LQM	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05					
Acenaphthene	mg/kg	0.05	MCERTS	14	<0.05	<0.05	84,000	LQM	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05					
Fluorene	mg/kg	0.05	MCERTS	14	<0.05	<0.05	63,000	LQM	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05					
Phenanthrene	mg/kg	0.05	NCERTS	14	0.23	0.8	22,000	LQM	0.28	<0.05	0.55	<0.05	0.48	<0.05	<0.05	0.38	<0.05	<0.05	<0.05	0.23	0.8	0.33	0.33					
Anthracene	mg/kg	0.05	MCERTS	14	0.06	0.13	520,000	LQM	0.06	<0.05	0.13	<0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05					
Fluoranthene	mg/kg	0.05	NCERTS	14	0.26	1.8	23,000	LQM	0.51	0.29	1.1	<0.05	1.2	<0.05	<0.05	0.58	0.26	0.29	0.27	0.37	1.8	0.47	0.47					
Pyrene	mg/kg	0.05	MCERTS	14	0.26	2	54,000	LQM	0.47	0.3	1.1	<0.05	1.1	<0.05	<0.05	0.4	0.26	0.32	0.27	0.38	2	0.51	0.51					
Benzo(a)anthracene	mg/kg	0.05	MCERTS	14	0.21	1.1	170	LQM	0.3	<0.05	0.6	<0.05	0.88	<0.05	<0.05	0.24	<0.05	<0.05	<0.05	0.21	1.1	0.34	0.34					
Chrysene	mg/kg	0.05	MCERTS	14	0.24	1.1	350	LQM	0.27	<0.05	0.54	<0.05	0.83	<0.05	<0.05	0.28	<0.05	<0.05	<0.05	0.24	1.1	0.32	0.32					
Benzo(b)fluoranthene	mg/kg	0.05	NCERTS	14	0.35	1.4	44	LQM	0.35	<0.05	0.8	<0.05	1.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1.4	0.44	0.44					
Benzo(k)fluoranthene	mg/kg	0.05	NCERTS	14	0.15	0.49	1,200	LQM	0.15	<0.05	0.16	<0.05	0.49	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.46	0.19					
Benzo(a)pyrene	mg/kg	0.05	MCERTS	14	0.28	1.2	35	LQM	0.28	<0.05	0.56	<0.05	0.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1.2	0.4					
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NCERTS	14	0.28	0.55	500	LQM	<0.05	<0.05	0.28	<0.05	0.45	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.55	0.28					
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	14	<0.05	<0.05	3.5	LQM	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05					
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	14	0.31	0.73	3,900	LQM	<0.05	<0.05	0.31	<0.05	0.46	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.73	0.4					
Total PAH																												
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	14	1.43	11.2	N/A	N/A	2.67	<0.80	6.12	<0.80	7.98	<0.80	<0.80	1.88	<0.80	<0.80	<0.80	<0.80	1.43	11.2	3.68					

Appendix D - Chemical Screening - Soils																								
19-0554.07 Site Two, Image Business Park, Knowsley																								
Key	Below GAC	Above GAC	Below LoD							Exploratory Hole ID	DS101	DS102	DS104	TP101	TP103	TP104	TP9	TP10A	TP10A	TP11	TP12	TP12	BH5	BH6
											0.4	0.5	0.5	0.2	0.2	0.7	0.4	0.2	0.5	0.3	0.7	0.6	0.6	
											Date Sampled	DS	DS	DS	DS	DS	DS	DS	DS	DS	DS	DS	DS	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Acceptation Status	No. tests	Minimum (mg/kg)	Maximum (mg/kg)	Commercial screening criteria (mg/kg)	GAC Source			MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG
											28/04/2021	28/04/2021	28/04/2021	27/04/2021	27/04/2021	27/04/2021	26/06/2019	26/06/2019	26/06/2019	26/06/2019	26/06/2019	27/06/2019	28/06/2019	
Heavy Metals / Metalloids																								
Arsenic (aqueous extractable)	mg/kg	1	MCERTS	14	1.8	96	640	LQM	96	18	12	19	10	40	1.8	5.4	24	8.8	7.2	8.7	14	27		
Cadmium (aqueous extractable)	mg/kg	0.2	MCERTS	14	0.3	0.7	190	LQM	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.4	0.7	< 0.2	0.4	0.3	0.4	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	14	1.5	1.5	33	LQM	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqueous extractable)	mg/kg	1	MCERTS	14	3.2	33	8,600	LQM	23	17	13	14	20	33	3.2	6.6	19	6.1	16	11	15	17		
Copper (aqueous extractable)	mg/kg	1	MCERTS	14	6.7	270	68,000	LQM	83	79	50	41	36	110	6.7	12	120	33	39	34	43	270		
Lead (aqueous extractable)	mg/kg	1	MCERTS	14	12	130	23,000	CASL	120	86	84	39	34	60	12	14	80	26	69	60	100	130		
Mercury (aqueous extractable)	mg/kg	0.3	MCERTS	14	0.4	0.6	1,100	LQM	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.6	0.4	< 0.3		
Nickel (aqueous extractable)	mg/kg	1	MCERTS	14	3	84	980	LQM	43	29	14	21	16	84	3	6.8	48	10	18	13	19	37		
Zinc (aqueous extractable)	mg/kg	1	MCERTS	14	7.8	130	730,000	LQM	96	96	74	58	130	89	7.8	48	100	24	68	48	90	98		
Monoaromatics & Oxygenates																								
Benzene	mg/kg	0.001	MCERTS	14	< 0.001	< 0.001	27	CASL	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	mg/kg	0.001	MCERTS	14	< 0.001	< 0.001	56,000	LQM	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	mg/kg	0.001	MCERTS	14	< 0.001	< 0.001	5,700	LQM	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
p-m-xylene	mg/kg	0.001	MCERTS	14	< 0.001	< 0.001	5,900	LQM	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
o-xylene	mg/kg	0.001	MCERTS	14	< 0.001	< 0.001	6,000	LQM	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	14	< 0.001	< 0.001	7,500	EC	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Petroleum Hydrocarbons																								
TPH-CWG - Aliphatic <EC5 - EC6	mg/kg	0.001	MCERTS	14	< 0.001	< 0.001	3,200	LQM	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic <EC6 - EC8	mg/kg	0.001	MCERTS	14	< 0.001	< 0.001	7,800	LQM	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic <EC8 - EC10	mg/kg	0.001	MCERTS	14	< 0.001	< 0.001	2,000	LQM	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic <EC10 - EC12	mg/kg	1	MCERTS	14	< 1.0	< 1.0	9,700	LQM	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic <EC12 - EC16	mg/kg	2	MCERTS	14	< 2.0	< 2.0	59,000	LQM	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic <EC16 - EC21	mg/kg	8	MCERTS	14	< 8.0	< 8.0	1,600,000	LQM	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic <EC21 - EC35	mg/kg	8	MCERTS	14	< 8.0	< 8.0	1,600,000	LQM	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic <EC35 - EC40	mg/kg	10	MCERTS	14	< 10.0	< 10.0	N/A	N/A	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic <EC40 - EC45	mg/kg	10	MCERTS	14	< 10.0	< 10.0	N/A	N/A	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic <EC5 - EC7	mg/kg	0.001	MCERTS	14	< 0.001	< 0.001	26,000	LQM	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic <EC7 - EC8	mg/kg	0.001	MCERTS	14	< 0.001	< 0.001	56,000	LQM	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic <EC8 - EC10	mg/kg	0.001	MCERTS	14	< 0.001	< 0.001	3,500	LQM	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic <EC10 - EC12	mg/kg	1	MCERTS	14	1.7	3.7	16,000	LQM	< 1.0	< 1.0	2.9	< 1.0	3.7	1.7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic <EC12 - EC16	mg/kg	2	MCERTS	14	< 2.0	5.7	36,000	LQM	< 2.0	< 2.0	5.7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic <EC16 - EC21	mg/kg	10	MCERTS	14	< 10	12	28,000	LQM	12	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic <EC21 - EC35	mg/kg	10	MCERTS	14	< 10	47	28,000	LQM	47	< 10	47	< 10	47	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic <EC35 - EC44	mg/kg	10	MCERTS	14	< 10	17	N/A	N/A	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic <EC44 - EC53	mg/kg	10	MCERTS	14	< 10	58	N/A	N/A	58	20	49	< 10	26	12	< 10	23	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
VOCs																								
Chloroethane	mg/kg	0.001	ISO 17025	6	< 0.001	< 0.001	1	N/A	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	-	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	-
Chloroethane	mg/kg	0.001	NONE	6	< 0.001	< 0.001	960	N/A	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	-	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	-
Bromomethane	mg/kg	0.001	ISO 17025	6	< 0.001	< 0.001	N/A	N/A	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	-	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	-
Bromomethane	mg/kg	0.001	NONE	6	< 0.001	< 0.001	0.059	N/A	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	-	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	-
Trichlorofluoromethane	mg/kg	0.001	NONE	6	< 0.001	< 0.001	N/A	N/A	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	-	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	-
1,1-Dichloroethane	mg/kg	0.001	NONE	6	< 0.001	< 0.001	26	N/A	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	-	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	mg/kg	0.001	ISO 17025	6	< 0.001	< 0.001	N/A	N/A	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	-	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	-
Cis-1,2-dichloroethane	mg/kg	0.001	MCERTS	6	< 0.001	< 0.001	14	N/A	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	-	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	-
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	6	< 0.001	< 0.001	7900	N/A	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	-	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	-
1,1-Dichloroethane	mg/kg	0.001	MCERTS	6	< 0.001	< 0.001	280	N/A	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	-	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	-
2,2-Dichloropropane	mg/kg	0.001	MCERTS	6	< 0.001	< 0.001	N/A	N/A	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	-	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	-
Trichloromethane	mg/kg	0.001	MCERTS	6	< 0.001	< 0.001	96	N/A	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	-	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010	-	-
1,1,1-Trichloroethane	mg/kg	0.001	MCERTS	6	< 0.																			

Appendix D - Chemical Screening - Soils																																																	
19-0654-07 Site Two, Image Business Park, Knowsley																																																	
Key	Below GAC	Above GAC	Below LoD	Exploratory Hole ID		Depth	Consultant	Date Sampled	DS101	DS102	DS104	TP101	TP103	TP104	TP9	TP10A	TP10A	TP11	TP12	TP12	BH5	BH6																											
				0.4	0.5				0.5	0.2	0.2	0.7	0.4	0.2	1	0.5	0.3	0.7	0.6	0.6																													
				DS	DS				DS	DS	DS	DS	DS	DS	DS	DS	DS	DS	DS	DS																													
Analytical Parameter (Soil Analysis)	Units	Limits of detection	Acceptable Status	No. tests	Minimum (mg/kg)	Maximum (mg/kg)	Commercial screening criteria (mg/kg)	GAC Source	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG																											
									28/04/2021	28/04/2021	28/04/2021	27/04/2021	27/04/2021	27/04/2021	26/06/2019	26/06/2019	26/06/2019	26/06/2019	26/06/2019	26/06/2019	27/06/2019	28/06/2019																											
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	6	<0.1	<0.1	N/A	N/A	-	< 0.1	-	-	< 0.1	-	-	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-																											
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	6	<0.2	<0.2	N/A	N/A	-	< 0.2	-	-	< 0.2	-	-	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-																											
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	6	<0.1	<0.1	N/A	N/A	-	< 0.1	-	-	< 0.1	-	-	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-																											
2-Methylphenol	mg/kg	0.3	MCERTS	6	<0.3	<0.3	N/A	N/A	-	< 0.3	-	-	< 0.3	-	-	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-																											
Hexachlorobenzene	mg/kg	0.05	MCERTS	6	<0.05	<0.05	N/A	N/A	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-																											
Nitrobenzene	mg/kg	0.3	MCERTS	6	<0.3	<0.3	N/A	N/A	-	< 0.3	-	-	< 0.3	-	-	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-																											
4-Methylphenol	mg/kg	0.2	NONE	6	<0.2	<0.2	N/A	N/A	-	< 0.2	-	-	< 0.2	-	-	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-																											
Isosorbene	mg/kg	0.2	MCERTS	6	<0.2	<0.2	N/A	N/A	-	< 0.2	-	-	< 0.2	-	-	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-																											
2-Nitrophenol	mg/kg	0.3	MCERTS	6	<0.3	<0.3	N/A	N/A	-	< 0.3	-	-	< 0.3	-	-	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-																											
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	6	<0.3	<0.3	N/A	N/A	-	< 0.3	-	-	< 0.3	-	-	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-																											
Bis(2-chloroisopropyl)methane	mg/kg	0.3	MCERTS	6	<0.3	<0.3	N/A	N/A	-	< 0.3	-	-	< 0.3	-	-	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-																											
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	6	<0.3	<0.3	N/A	N/A	-	< 0.3	-	-	< 0.3	-	-	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-																											
Naphthalene	mg/kg	0.05	MCERTS	6	<0.05	<0.05	190	LQM	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-																											
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	6	<0.3	<0.3	N/A	N/A	-	< 0.3	-	-	< 0.3	-	-	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-																											
4-Chloroaniline	mg/kg	0.1	NONE	6	<0.1	<0.1	N/A	N/A	-	< 0.1	-	-	< 0.1	-	-	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-																											
Hexachlorocyclopentadiene	mg/kg	0.1	MCERTS	6	<0.1	<0.1	N/A	N/A	-	< 0.1	-	-	< 0.1	-	-	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-																											
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	6	<0.1	<0.1	N/A	N/A	-	< 0.1	-	-	< 0.1	-	-	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-																											
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	6	<0.1	<0.1	N/A	N/A	-	< 0.1	-	-	< 0.1	-	-	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-																											
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	6	<0.2	<0.2	N/A	N/A	-	< 0.2	-	-	< 0.2	-	-	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-																											
2-Methylnaphthalene	mg/kg	0.1	NONE	6	<0.1	<0.1	N/A	N/A	-	< 0.1	-	-	< 0.1	-	-	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-																											
2-Chloronaphthalene	mg/kg	0.1	MCERTS	6	<0.1	<0.1	N/A	N/A	-	< 0.1	-	-	< 0.1	-	-	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-																											
Dimethylphthalate	mg/kg	0.1	MCERTS	6	<0.1	<0.1	N/A	N/A	-	< 0.1	-	-	< 0.1	-	-	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-																											
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	6	<0.1	<0.1	N/A	N/A	-	< 0.1	-	-	< 0.1	-	-	< 0.1	-	< 0.1	-	< 0.1	< 0.1	-																											
Acenaphthylene	mg/kg	0.05	MCERTS	6	<0.05	<0.05	83,000	LQM	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-																											
Acenaphthene	mg/kg	0.05	MCERTS	6	<0.05	<0.05	84,000	LQM	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-																											
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	6	<0.2	<0.2	N/A	N/A	-	< 0.2	-	-	< 0.2	-	-	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-																											
Dibenzofuran	mg/kg	0.2	MCERTS	6	<0.2	<0.2	N/A	N/A	-	< 0.2	-	-	< 0.2	-	-	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-																											
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	6	<0.3	<0.3	N/A	N/A	-	< 0.3	-	-	< 0.3	-	-	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-																											
Diethyl phthalate	mg/kg	0.2	MCERTS	6	<0.2	<0.2	N/A	N/A	-	< 0.2	-	-	< 0.2	-	-	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-																											
4-Nitroaniline	mg/kg	0.2	MCERTS	6	<0.2	<0.2	N/A	N/A	-	< 0.2	-	-	< 0.2	-	-	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-																											
Fluorene	mg/kg	0.05	MCERTS	6	<0.05	<0.05	62000	N/A	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-																											
Azobenzene	mg/kg	0.3	MCERTS	6	<0.3	<0.3	N/A	N/A	-	< 0.3	-	-	< 0.3	-	-	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-																											
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	6	<0.2	<0.2	N/A	N/A	-	< 0.2	-	-	< 0.2	-	-	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-																											
Hexachlorobenzene	mg/kg	0.3	MCERTS	6	<0.3	<0.3	N/A	N/A	-	< 0.3	-	-	< 0.3	-	-	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-																											
Phenanthrene	mg/kg	0.05	MCERTS	6	0.23	0.8	22000	N/A	-	< 0.05	-	-	0.48	-	-	0.38	-	< 0.05	-	0.23	0.8	-																											
Carbazole	mg/kg	0.05	MCERTS	6	0.12	0.12	52000	N/A	-	0.12	-	-	0.05	-	-	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-																											
Dibutyl phthalate	mg/kg	0.2	MCERTS	6	<0.2	<0.2	N/A	N/A	-	< 0.2	-	-	< 0.2	-	-	< 0.2	-	< 0.2	-	< 0.2	< 0.2	-																											
Anthracene	mg/kg	0.3	MCERTS	6	<0.3	<0.3	N/A	N/A	-	< 0.3	-	-	< 0.3	-	-	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-																											
Fluoranthene	mg/kg	0.05	MCERTS	6	0.29	1.8	23000	LQM	-	0.29	-	-	1.2	-	-	0.58	-	0.29	-	0.37	1.8	-																											
Pyrene	mg/kg	0.05	MCERTS	6	0.3	2	54000	LQM	-	0.3	-	-	1.1	-	-	0.3	-	0.32	-	0.38	2	-																											
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	6	<0.3	<0.3	N/A	N/A	-	< 0.3	-	-	< 0.3	-	-	< 0.3	-	< 0.3	-	< 0.3	< 0.3	-																											
Chrysene	mg/kg	0.05	MCERTS	6	0.22	1.1	170	LQM	-	0.22	-	-	0.88	-	-	0.24	-	0.21	-	0.4	1.1	-																											
Benzofluoranthene	mg/kg	0.05	MCERTS	6	0.24	1.1	350	LQM	-	0.24	-	-	0.83	-	-	0.28	-	< 0.05	-	< 0.24	1.1	-																											
Benzofluoranthene	mg/kg	0.05	MCERTS	6	1.2	1.4	44	LQM	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05	1.4	-																											
Benzofluoranthene	mg/kg	0.05	MCERTS	6	0.46	0.49	1200	LQM	-	< 0.05	-	-	0.49	-	-	< 0.05	-	< 0.05	-	< 0.05	0.46	-																											
Benzofluoranthene	mg/kg	0.05	MCERTS	6	0.8	1.2	26	LQM	-	< 0.05	-	-	0.8	-	-	< 0.05	-	< 0.05	-	< 0.05	1.2	-																											
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	6	0.45	0.55	500	LQM	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05	0.55	-																											
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	6	<0.05	<0.05	N/A	N/A	-	< 0.05	-	-	< 0.05	-	-	< 0.05	-	< 0.05	-	< 0.05	< 0.05	-																											
Benzofluoranthene	mg/kg	0.05	MCERTS	6	0.46	0.73	9900	LQM	-	< 0.05	-	-	0.46	-	-	< 0.05	-	< 0.05	-	< 0.05	0.73	-																											
PCB Congener 077																						mg/kg	0.001	NONE	2	< 0.0010	< 0.0010	0.24	EA SV	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-							
PCB Congener 081																						mg/kg	0.001	NONE	2	< 0.0010	< 0.0010	0.24	EA SV	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-							
PCB Congener 105																						mg/kg	0.001	NONE	2	< 0.0010	< 0.0010	0.24	EA SV	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-							
PCB Congener 114																						mg/kg	0.001	NONE	2	< 0.0010	< 0.0010	0.24	EA SV	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-							
PCB Congener 118																						mg/kg	0.001	NONE	2	< 0.0010	< 0.0010	0.24	EA SV	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-							
PCB Congener 123																						mg/kg	0.001	NONE	2	< 0.0010	< 0.0010	0.24	EA SV	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-							
PCB Congener 136																						mg/kg	0.001	NONE	2	< 0.0010	< 0.0010	0.24	EA SV	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-							
PCB Congener 156																						mg/kg	0.001	NONE	2	< 0.0010	< 0.0010	0.24	EA SV	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-							
PCB Congener 157																						mg/kg	0.001	NONE	2	< 0.0010	< 0.0010	0.24	EA SV	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-							
PCB Congener 167																						mg/kg	0.001	NONE	2	< 0.0010	< 0.0010	0.24	EA SV	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-							
PCB Congener 169																						mg/kg	0.001	NONE	2	< 0.0010	< 0.0010	0.24	EA SV	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-							
PCB Congener 189																						mg/kg	0.001	NONE	2	< 0.0010	< 0.0010	0.24	EA SV	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-							

Appendix D - Chemical Screening - Leachate															
19-0654.07 - Site 2, Image Business Park, Knowsley															
							Exploratory Hole ID		TP10A	TP11	TP12	BH5	DS101	DS104	TP103
Key	Below GAC		Above GAC		Below LoD		Depth		0.2	0.5	0.7	0.6	0.4	0.5	0.2
							Consultant		DS	DS	DS	DS	DS	DS	DS
							Date Sampled		26/06/2019	26/06/2019	26/06/2019	27/06/2019	28/04/2021	28/04/2021	27/04/2021
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditati on Status	No. tests	Minimum (ug/l)	Maximum (ug/l)	Screening criteria (ug/l)	GAC Source	MG	MG	MG	MG	MG	MG	MG
Arsenic (dissolved)	µg/l	1.1	ISO 17025	7	<1.0	7.9	10	DWQS	< 1.1	5.3	1.1	7.9	5.2	< 1.0	< 1.0
Cadmium (dissolved)	µg/l	0.08	ISO 17025	7	<0.08	<0.08	0.53	WFD	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (dissolved)	µg/l	0.4	ISO 17025	7	<0.4	12	4.7	WFD	12	1.5	1	1.4	0.5	< 0.4	7.1
Copper (dissolved)	µg/l	0.7	ISO 17025	7	2.9	25	2	WFD	7.4	17	2.9	22	25	11	8
Lead (dissolved)	µg/l	1	ISO 17025	7	<1.0	15	10	DWQS	3.8	8.2	7.2	15	3.1	< 1.0	1.1
Mercury (dissolved)	µg/l	0.5	ISO 17025	7	<0.5	<0.5	2.54	WFD	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	7	0.4	3.8	8.48	WFD	2.7	3.8	0.4	2.9	1.5	3.2	3
Zinc (dissolved)	µg/l	0.4	ISO 17025	7	<0.4	19	23.1	WFD	< 0.4	19	4.4	6.1	8	12	12

Reference Sources

DWQS 2016 - The Water Supply (Water Quality) Regulations 2016 [UK Drinking Water Standards]

WFD - Water Framework Directive (Standards and Classification) Durections (England and Wales) 2015



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Analytical Report Number : 21-72759

Replaces Analytical Report Number: 21-72759, issue no. 1
Additional analysis undertaken.

Project / Site name:	Site 2, Knowsley	Samples received on:	30/04/2021
Your job number:	19-0654 07	Samples instructed on/ Analysis started on:	30/04/2021
Your order number:	DS60848	Analysis completed by:	17/05/2021
Report Issue Number:	2	Report issued on:	17/05/2021
Samples Analysed:	3 leachate samples - 6 soil samples		

Signed:

Will Fardon
Technical Reviewer (CS Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 21-72759
Project / Site name: Site 2, Knowsley
Your Order No: DS60848

Lab Sample Number				1858862	1858863	1858864	1858865	1858866
Sample Reference				DS101	DS102	DS104	TP101	TP103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.50	0.50	0.20	0.20
Date Sampled				28/04/2021	28/04/2021	28/04/2021	27/04/2021	27/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	7.9	9.0	11	14	4.7
Total mass of sample received	kg	0.001	NONE	1.5	1.0	1.0	1.0	1.7

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.1	8.4	7.4	7.1	10.8
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	180	110	100	240	740
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivale	g/l	0.00125	MCERTS	0.090	0.056	0.051	0.12	0.37
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivale	mg/l	1.25	MCERTS	90.4	55.7	50.8	118	371
Organic Matter	%	0.1	MCERTS	-	3.0	-	4.4	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.28	< 0.05	0.55	< 0.05	0.48
Anthracene	mg/kg	0.05	MCERTS	0.06	< 0.05	0.13	< 0.05	0.12
Fluoranthene	mg/kg	0.05	MCERTS	0.51	0.29	1.1	< 0.05	1.2
Pyrene	mg/kg	0.05	MCERTS	0.47	0.30	1.1	< 0.05	1.1
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.30	< 0.05	0.60	< 0.05	0.88
Chrysene	mg/kg	0.05	MCERTS	0.27	< 0.05	0.54	< 0.05	0.83
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.35	< 0.05	0.80	< 0.05	1.2
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.15	< 0.05	0.16	< 0.05	0.49
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.28	< 0.05	0.56	< 0.05	0.80
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.28	< 0.05	0.45
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.31	< 0.05	0.46

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	2.67	< 0.80	6.12	< 0.80	7.98
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	96	18	12	19	10
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	17	13	14	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	83	79	50	41	36
Lead (aqua regia extractable)	mg/kg	1	MCERTS	120	86	84	39	34
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	43	29	15	21	16
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	96	96	74	58	130

Analytical Report Number: 21-72759
Project / Site name: Site 2, Knowsley
Your Order No: DS60848

Lab Sample Number				1858862	1858863	1858864	1858865	1858866
Sample Reference				DS101	DS102	DS104	TP101	TP103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.50	0.50	0.20	0.20
Date Sampled				28/04/2021	28/04/2021	28/04/2021	27/04/2021	27/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics & Oxygenates

Benzene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
p & m-xylene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
o-xylene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC35 - EC40	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	2.9	< 1.0	3.7
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	5.7	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	12	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	47	15	30	< 10	21
TPH-CWG - Aromatic >EC35 - EC40	mg/kg	10	NONE	< 10	< 10	< 10	< 10	17
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	58	20	49	< 10	26

TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	17
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Analytical Report Number: 21-72759
Project / Site name: Site 2, Knowsley
Your Order No: DS60848

Lab Sample Number				1858862	1858863	1858864	1858865	1858866
Sample Reference				DS101	DS102	DS104	TP101	TP103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.50	0.50	0.20	0.20
Date Sampled				28/04/2021	28/04/2021	28/04/2021	27/04/2021	27/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
Chloroethane	mg/kg	0.001	NONE	-	< 0.0010	-	-	< 0.0010
Bromomethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
Vinyl Chloride	mg/kg	0.001	NONE	-	< 0.0010	-	-	< 0.0010
Trichlorofluoromethane	mg/kg	0.001	NONE	-	< 0.0010	-	-	< 0.0010
1,1-Dichloroethene	mg/kg	0.001	NONE	-	< 0.0010	-	-	< 0.0010
1,1,2-Trichloro 1,2,2-Trifluoroethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
Cis-1,2-dichloroethene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,1-Dichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
2,2-Dichloropropane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Trichloromethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,1,1-Trichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,2-Dichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,1-Dichloropropene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Trans-1,2-dichloroethene	mg/kg	0.001	NONE	-	< 0.0010	-	-	< 0.0010
Benzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Tetrachloromethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,2-Dichloropropane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Trichloroethene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Dibromomethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Bromodichloromethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Cis-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
Trans-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
Toluene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,1,2-Trichloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,3-Dichloropropane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
Dibromochloromethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
Tetrachloroethene	mg/kg	0.001	NONE	-	< 0.0010	-	-	< 0.0010
1,2-Dibromoethane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
Chlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,1,1,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Ethylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
p & m-Xylene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Styrene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Tribromomethane	mg/kg	0.001	NONE	-	< 0.0010	-	-	< 0.0010
o-Xylene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,1,2,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Isopropylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Bromobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
n-Propylbenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
2-Chlorotoluene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
4-Chlorotoluene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,3,5-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
tert-Butylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,2,4-Trimethylbenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
sec-Butylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,3-Dichlorobenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
p-Isopropyltoluene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
1,2-Dichlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,4-Dichlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Butylbenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010

Analytical Report Number: 21-72759
 Project / Site name: Site 2, Knowsley
 Your Order No: DS60848

Lab Sample Number				1858862	1858863	1858864	1858865	1858866
Sample Reference				DS101	DS102	DS104	TP101	TP103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.50	0.50	0.20	0.20
Date Sampled				28/04/2021	28/04/2021	28/04/2021	27/04/2021	27/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2-Dibromo-3-chloropropane	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010
1,2,4-Trichlorobenzene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
Hexachlorobutadiene	mg/kg	0.001	MCERTS	-	< 0.0010	-	-	< 0.0010
1,2,3-Trichlorobenzene	mg/kg	0.001	ISO 17025	-	< 0.0010	-	-	< 0.0010

Analytical Report Number: 21-72759
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Lab Sample Number				1858862	1858863	1858864	1858865	1858866
Sample Reference				DS101	DS102	DS104	TP101	TP103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.50	0.50	0.20	0.20
Date Sampled				28/04/2021	28/04/2021	28/04/2021	27/04/2021	27/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.48
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.12
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	-	0.29	-	-	1.2
Pyrene	mg/kg	0.05	MCERTS	-	0.30	-	-	1.1
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.88
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.83
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	1.2
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.49
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.80

Analytical Report Number: 21-72759
Project / Site name: Site 2, Knowsley
Your Order No: DS60848

Lab Sample Number				1858862	1858863	1858864	1858865	1858866
Sample Reference				DS101	DS102	DS104	TP101	TP103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.50	0.50	0.20	0.20
Date Sampled				28/04/2021	28/04/2021	28/04/2021	27/04/2021	27/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.45
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.46

PCBs

PCB Congener 077	mg/kg	0.001	NONE	< 0.001	-	-	-	< 0.001
PCB Congener 081	mg/kg	0.001	NONE	< 0.001	-	-	-	< 0.001
PCB Congener 105	mg/kg	0.001	NONE	< 0.001	-	-	-	< 0.001
PCB Congener 114	mg/kg	0.001	NONE	< 0.001	-	-	-	< 0.001
PCB Congener 118	mg/kg	0.001	NONE	< 0.001	-	-	-	< 0.001
PCB Congener 123	mg/kg	0.001	NONE	< 0.001	-	-	-	< 0.001
PCB Congener 126	mg/kg	0.001	NONE	< 0.001	-	-	-	< 0.001
PCB Congener 156	mg/kg	0.001	NONE	< 0.001	-	-	-	< 0.001
PCB Congener 157	mg/kg	0.001	NONE	< 0.001	-	-	-	< 0.001
PCB Congener 167	mg/kg	0.001	NONE	< 0.001	-	-	-	< 0.001
PCB Congener 169	mg/kg	0.001	NONE	< 0.001	-	-	-	< 0.001
PCB Congener 189	mg/kg	0.001	NONE	< 0.001	-	-	-	< 0.001

Total PCBs – WHO12

Total PCBs	mg/kg	0.012	NONE	< 0.012	-	-	-	< 0.012
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U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-72759
Project / Site name: Site 2, Knowsley
Your Order No: DS60848

Lab Sample Number				1858867
Sample Reference				TP104
Sample Number				None Supplied
Depth (m)				0.70
Date Sampled				27/04/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	13
Total mass of sample received	kg	0.001	NONE	0.90

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.005
Asbestos Quantification Total	%	0.001	ISO 17025	0.005

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.9
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1100
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivale	g/l	0.00125	MCERTS	0.55
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivale	mg/l	1.25	MCERTS	552
Organic Matter	%	0.1	MCERTS	2.3

Speciated PAHs

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

Total PAH

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

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	40
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	33
Copper (aqua regia extractable)	mg/kg	1	MCERTS	110
Lead (aqua regia extractable)	mg/kg	1	MCERTS	60
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	84
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	89

Analytical Report Number: 21-72759
Project / Site name: Site 2, Knowsley
Your Order No: DS60848

Lab Sample Number				1858867
Sample Reference				TP104
Sample Number				None Supplied
Depth (m)				0.70
Date Sampled				27/04/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Monoaromatics & Oxygenates				
Benzene	mg/kg	0.001	MCERTS	< 0.001
Toluene	mg/kg	0.001	MCERTS	< 0.001
Ethylbenzene	mg/kg	0.001	MCERTS	< 0.001
p & m-xylene	mg/kg	0.001	MCERTS	< 0.001
o-xylene	mg/kg	0.001	MCERTS	< 0.001
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	< 0.001

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC35 - EC40	mg/kg	10	NONE	< 10
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	1.7
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic >EC35 - EC40	mg/kg	10	NONE	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	12

TPH (C35 - C40)	mg/kg	10	MCERTS	< 10
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Analytical Report Number: 21-72759
Project / Site name: Site 2, Knowsley
Your Order No: DS60848

Lab Sample Number				1858867
Sample Reference				TP104
Sample Number				None Supplied
Depth (m)				0.70
Date Sampled				27/04/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
VOCs				
Chloromethane	mg/kg	0.001	ISO 17025	-
Chloroethane	mg/kg	0.001	NONE	-
Bromomethane	mg/kg	0.001	ISO 17025	-
Vinyl Chloride	mg/kg	0.001	NONE	-
Trichlorofluoromethane	mg/kg	0.001	NONE	-
1,1-Dichloroethene	mg/kg	0.001	NONE	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	mg/kg	0.001	ISO 17025	-
Cis-1,2-dichloroethene	mg/kg	0.001	MCERTS	-
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	-
1,1-Dichloroethane	mg/kg	0.001	MCERTS	-
2,2-Dichloropropane	mg/kg	0.001	MCERTS	-
Trichloromethane	mg/kg	0.001	MCERTS	-
1,1,1-Trichloroethane	mg/kg	0.001	MCERTS	-
1,2-Dichloroethane	mg/kg	0.001	MCERTS	-
1,1-Dichloropropene	mg/kg	0.001	MCERTS	-
Trans-1,2-dichloroethene	mg/kg	0.001	NONE	-
Benzene	mg/kg	0.001	MCERTS	-
Tetrachloromethane	mg/kg	0.001	MCERTS	-
1,2-Dichloropropane	mg/kg	0.001	MCERTS	-
Trichloroethene	mg/kg	0.001	MCERTS	-
Dibromomethane	mg/kg	0.001	MCERTS	-
Bromodichloromethane	mg/kg	0.001	MCERTS	-
Cis-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-
Trans-1,3-dichloropropene	mg/kg	0.001	ISO 17025	-
Toluene	mg/kg	0.001	MCERTS	-
1,1,2-Trichloroethane	mg/kg	0.001	MCERTS	-
1,3-Dichloropropane	mg/kg	0.001	ISO 17025	-
Dibromochloromethane	mg/kg	0.001	ISO 17025	-
Tetrachloroethene	mg/kg	0.001	NONE	-
1,2-Dibromoethane	mg/kg	0.001	ISO 17025	-
Chlorobenzene	mg/kg	0.001	MCERTS	-
1,1,1,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-
Ethylbenzene	mg/kg	0.001	MCERTS	-
p & m-Xylene	mg/kg	0.001	MCERTS	-
Styrene	mg/kg	0.001	MCERTS	-
Tribromomethane	mg/kg	0.001	NONE	-
o-Xylene	mg/kg	0.001	MCERTS	-
1,1,2,2-Tetrachloroethane	mg/kg	0.001	MCERTS	-
Isopropylbenzene	mg/kg	0.001	MCERTS	-
Bromobenzene	mg/kg	0.001	MCERTS	-
n-Propylbenzene	mg/kg	0.001	ISO 17025	-
2-Chlorotoluene	mg/kg	0.001	MCERTS	-
4-Chlorotoluene	mg/kg	0.001	MCERTS	-
1,3,5-Trimethylbenzene	mg/kg	0.001	ISO 17025	-
tert-Butylbenzene	mg/kg	0.001	MCERTS	-
1,2,4-Trimethylbenzene	mg/kg	0.001	ISO 17025	-
sec-Butylbenzene	mg/kg	0.001	MCERTS	-
1,3-Dichlorobenzene	mg/kg	0.001	ISO 17025	-
p-Isopropyltoluene	mg/kg	0.001	ISO 17025	-
1,2-Dichlorobenzene	mg/kg	0.001	MCERTS	-
1,4-Dichlorobenzene	mg/kg	0.001	MCERTS	-
Butylbenzene	mg/kg	0.001	MCERTS	-

Analytical Report Number: 21-72759
 Project / Site name: Site 2, Knowsley
 Your Order No: DS60848

Lab Sample Number					1858867
Sample Reference					TP104
Sample Number					None Supplied
Depth (m)					0.70
Date Sampled					27/04/2021
Time Taken					None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
1,2-Dibromo-3-chloropropane	mg/kg	0.001	ISO 17025	-	
1,2,4-Trichlorobenzene	mg/kg	0.001	MCERTS	-	
Hexachlorobutadiene	mg/kg	0.001	MCERTS	-	
1,2,3-Trichlorobenzene	mg/kg	0.001	ISO 17025	-	

Analytical Report Number: 21-72759
 Project / Site name: Site 2, Knowsley
 Your Order No: DS60848

Lab Sample Number				1858867
Sample Reference				TP104
Sample Number				None Supplied
Depth (m)				0.70
Date Sampled				27/04/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
SVOCs				
Aniline	mg/kg	0.1	NONE	-
Phenol	mg/kg	0.2	ISO 17025	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-
2-Methylphenol	mg/kg	0.3	MCERTS	-
Hexachloroethane	mg/kg	0.05	MCERTS	-
Nitrobenzene	mg/kg	0.3	MCERTS	-
4-Methylphenol	mg/kg	0.2	NONE	-
Isophorone	mg/kg	0.2	MCERTS	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-
Naphthalene	mg/kg	0.05	MCERTS	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-
4-Chloroaniline	mg/kg	0.1	NONE	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-
Acenaphthylene	mg/kg	0.05	MCERTS	-
Acenaphthene	mg/kg	0.05	MCERTS	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-
Dibenzofuran	mg/kg	0.2	MCERTS	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-
Fluorene	mg/kg	0.05	MCERTS	-
Azobenzene	mg/kg	0.3	MCERTS	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-
Phenanthrene	mg/kg	0.05	MCERTS	-
Anthracene	mg/kg	0.05	MCERTS	-
Carbazole	mg/kg	0.3	MCERTS	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-
Anthraquinone	mg/kg	0.3	MCERTS	-
Fluoranthene	mg/kg	0.05	MCERTS	-
Pyrene	mg/kg	0.05	MCERTS	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-
Chrysene	mg/kg	0.05	MCERTS	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-

Analytical Report Number: 21-72759
 Project / Site name: Site 2, Knowsley
 Your Order No: DS60848

Lab Sample Number				1858867
Sample Reference				TP104
Sample Number				None Supplied
Depth (m)				0.70
Date Sampled				27/04/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-

PCBs

PCB Congener 077	mg/kg	0.001	NONE	-
PCB Congener 081	mg/kg	0.001	NONE	-
PCB Congener 105	mg/kg	0.001	NONE	-
PCB Congener 114	mg/kg	0.001	NONE	-
PCB Congener 118	mg/kg	0.001	NONE	-
PCB Congener 123	mg/kg	0.001	NONE	-
PCB Congener 126	mg/kg	0.001	NONE	-
PCB Congener 156	mg/kg	0.001	NONE	-
PCB Congener 157	mg/kg	0.001	NONE	-
PCB Congener 167	mg/kg	0.001	NONE	-
PCB Congener 169	mg/kg	0.001	NONE	-
PCB Congener 189	mg/kg	0.001	NONE	-

Total PCBs – WHO12

Total PCBs	mg/kg	0.012	NONE	-
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U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-72759
Project / Site name: Site 2, Knowsley
Your Order No: DS60848

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1858867	TP104	0.70	134	Loose Fibrous Debris	Chrysotile	0.005	0.005

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.



Analytical Report Number: 21-72759
Project / Site name: Site 2, Knowsley

Your Order No: DS60848

Lab Sample Number				1858868	1858869	1858870
Sample Reference				DS101	DS104	TP103
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.50	0.20
Date Sampled				28/04/2021	28/04/2021	27/04/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status			

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	5.2	< 1.0	< 1.0
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	7.1
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.5	< 0.4	7.1
Copper (dissolved)	µg/l	0.7	ISO 17025	25	11	8.0
Lead (dissolved)	µg/l	1	ISO 17025	3.1	< 1.0	1.1
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.5	3.2	3.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	8.0	12	12

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

Analytical Report Number : 21-72759

Project / Site name: Site 2, Knowsley

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1858862	DS101	None Supplied	0.4	Black loam and gravel with vegetation and brick.
1858863	DS102	None Supplied	0.5	Black loam and sand with vegetation.
1858864	DS104	None Supplied	0.5	Black loam and sand with vegetation.
1858865	TP101	None Supplied	0.2	Black sandy clay with vegetation.
1858866	TP103	None Supplied	0.2	Grey loam and gravel with vegetation and brick.
1858867	TP104	None Supplied	0.7	Black gravelly loam.

Analytical Report Number : 21-72759
Project / Site name: Site 2, Knowsley

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
TPH Chromatogram in Soil	TPH Chromatogram in Soil.	In-house method	L064-PL	D	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Cr (III) in leachate	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
PCBs WHO 12 in soil	Determination of PCBs (WHO-12 Congeners) by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	NONE

Analytical Report Number : 21-72759
Project / Site name: Site 2, Knowsley

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

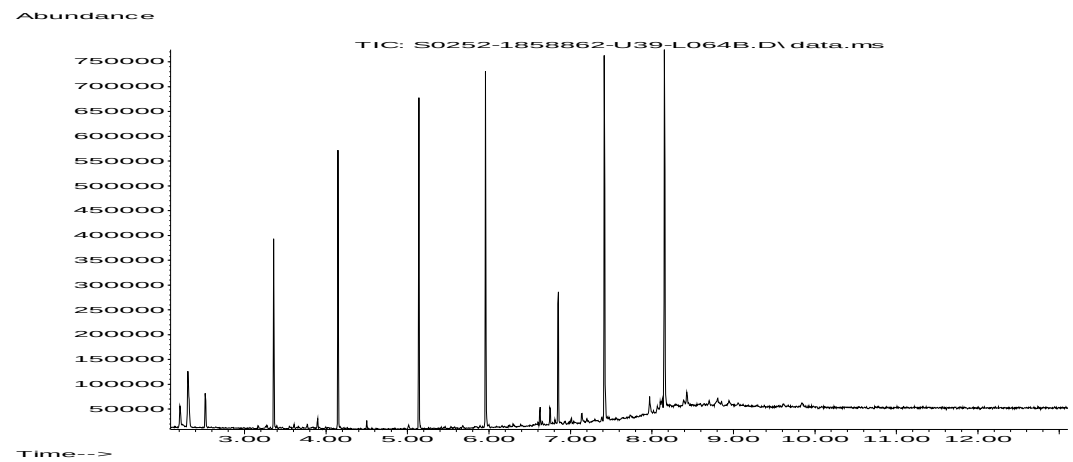
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

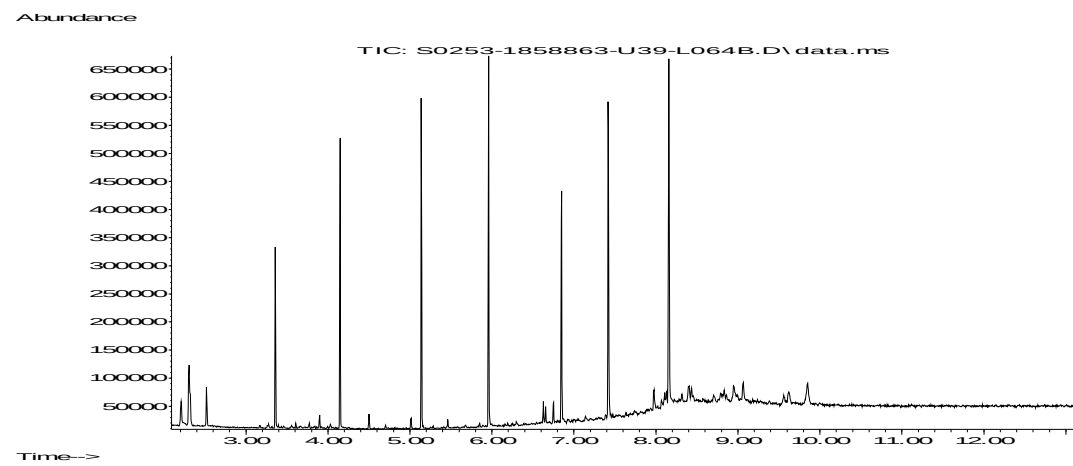
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

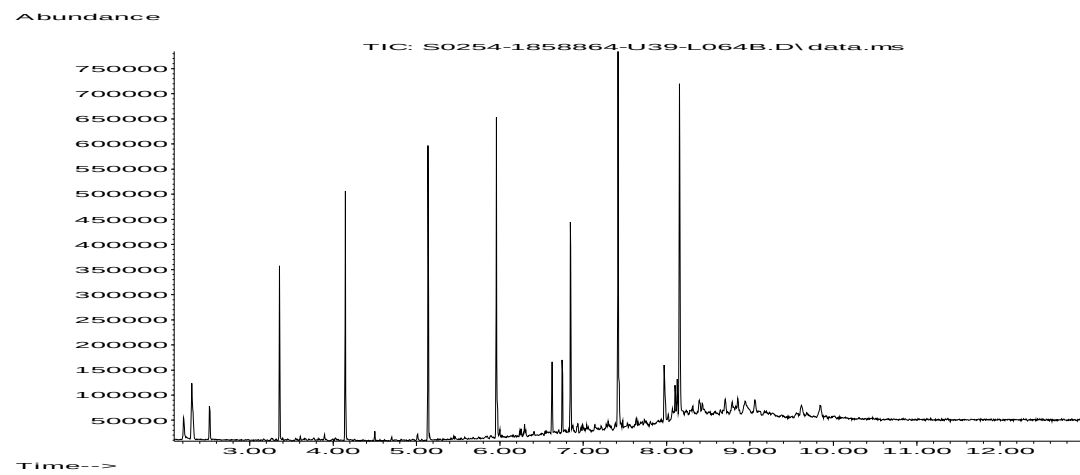
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

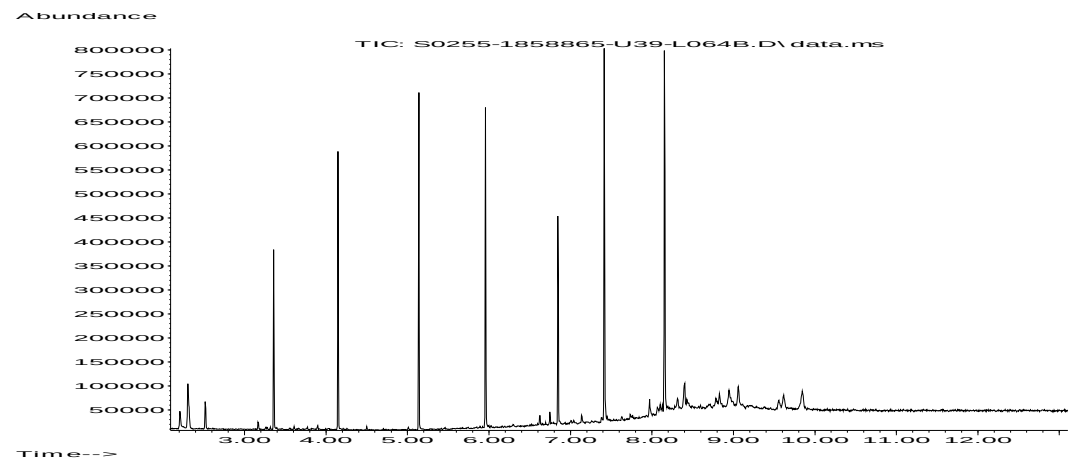
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

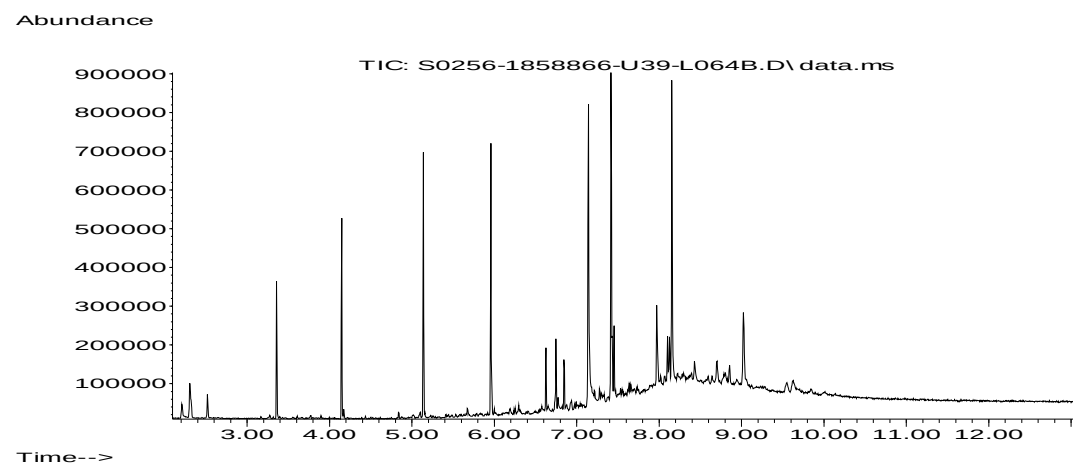
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

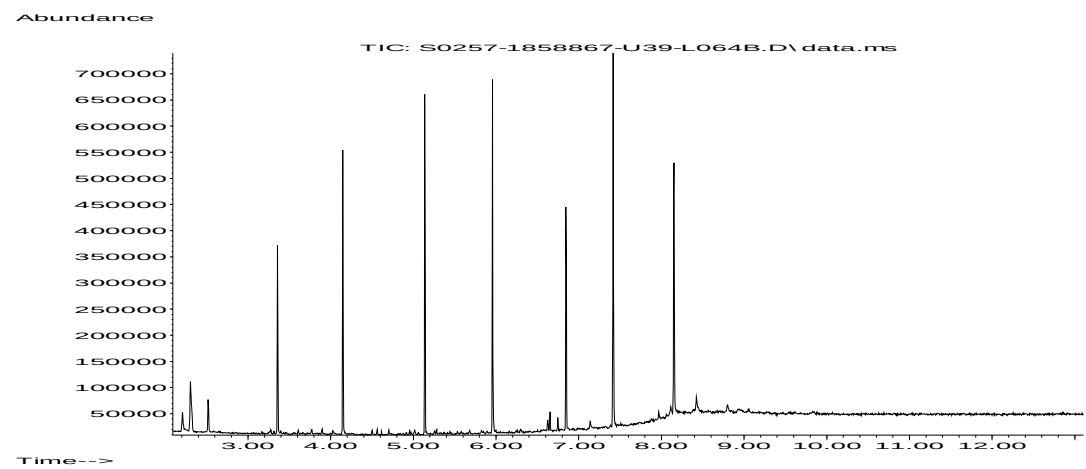














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Analytical Report Number : 21-72762

Project / Site name:	Site 2, Knowsley	Samples received on:	30/04/2021
Your job number:	19-0654 07	Samples instructed on/ Analysis started on:	30/04/2021
Your order number:	DS60848	Analysis completed by:	10/05/2021
Report Issue Number:	1	Report issued on:	10/05/2021
Samples Analysed:	2 10:1 WAC samples		

Signed: *Karolina Marek*

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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



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Waste Acceptance Criteria Analytical Results							
Report No:	21-72762						
				Client: DELTASIM			
Location	Site 2, Knowsley						
Lab Reference (Sample Number)	1858881 / 1858882			Landfill Waste Acceptance Criteria			
Sampling Date	28/04/2021			Limits			
Sample ID	DS101			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Depth (m)	0.40						
Solid Waste Analysis							
TOC (%)**	2.1			3%	5%	6%	
Loss on Ignition (%) **	5.4			--	--	10%	
BTEX (µg/kg) **	< 10			6000	--	--	
Sum of PCBs (mg/kg) **	< 0.007			1	--	--	
Mineral Oil (mg/kg)	< 10			500	--	--	
Total PAH (WAC-17) (mg/kg)	3.89			100	--	--	
pH (units)**	8.0			--	>6	--	
Acid Neutralisation Capacity (mol / kg)	1.8			--	To be evaluated	To be evaluated	
Eluate Analysis							
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1		10:1	Limit values for compliance leaching test			
	mg/l		mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic *	0.0082		0.0722	0.5	2	25	
Barium *	0.0238		0.209	20	100	300	
Cadmium *	< 0.0001		< 0.0008	0.04	1	5	
Chromium *	0.0012		0.011	0.5	10	70	
Copper *	0.011		0.098	2	50	100	
Mercury *	< 0.0005		< 0.0050	0.01	0.2	2	
Molybdenum *	< 0.0004		< 0.0040	0.5	10	30	
Nickel *	0.0032		0.028	0.4	10	40	
Lead *	0.0058		0.051	0.5	10	50	
Antimony *	< 0.0017		< 0.017	0.06	0.7	5	
Selenium *	< 0.0040		< 0.040	0.1	0.5	7	
Zinc *	0.021		0.18	4	50	200	
Chloride *	1.2		11	800	15000	25000	
Fluoride	0.48		4.2	10	150	500	
Sulphate *	3.3		29	1000	20000	50000	
TDS*	44		390	4000	60000	100000	
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-	
DOC	5.32		46.8	500	800	1000	
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.5						
Dry Matter (%)	92						
Moisture (%)	7.9						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.				** = UKAS accredited (liquid eluate analysis only)			
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation				** = MCERTS accredited			
Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.							
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.							



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Waste Acceptance Criteria Analytical Results							
Report No:	21-72762						
					Client: DELTASIM		
Location	Site 2, Knowsley						
Lab Reference (Sample Number)	1858883 / 1858884				Landfill Waste Acceptance Criteria		
Sampling Date	27/04/2021				Limits		
Sample ID	TP103				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Depth (m)	0.20						
Solid Waste Analysis							
TOC (%)**	1.1				3%	5%	6%
Loss on Ignition (%) **	2.6				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	6.05				100	--	--
pH (units)**	11.0				--	>6	--
Acid Neutralisation Capacity (mol / kg)	56				--	To be evaluated	To be evaluated
Eluate Analysis							
	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0010			< 0.0100	0.5	2	25
Barium *	0.0241			0.223	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.021			0.19	0.5	10	70
Copper *	0.050			0.46	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0041			0.0378	0.5	10	30
Nickel *	0.0049			0.045	0.4	10	40
Lead *	0.0050			0.046	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0055			0.051	4	50	200
Chloride *	6.5			60	800	15000	25000
Fluoride	0.37			3.4	10	150	500
Sulphate *	96			880	1000	20000	50000
TDS*	300			2800	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	11.9			110	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.7						
Dry Matter (%)	95						
Moisture (%)	4.7						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.							
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation					** = MCERTS accredited		
Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.							
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.							

Analytical Report Number : 21-72762

Project / Site name: Site 2, Knowsley

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1858881	DS101	None Supplied	0.4	Black loam and gravel with vegetation and brick.
1858883	TP103	None Supplied	0.2	Grey loam and gravel with vegetation and brick.

Analytical Report Number : 21-72762
Project / Site name: Site 2, Knowsley

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073-PL	W	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025

Analytical Report Number : 21-72762
Project / Site name: Site 2, Knowsley

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

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

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

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

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

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

Appendix E – Groundwater Chemical Analysis Results and Screening

Appendix E Chemical Screening - Groundwater
19-0654.07, Site 2, Image Business Park, Knowsley

							Exploratory Hole ID		BH5	BH6
Key	Below GAC		Above GAC		Below LoD		Response Zone Material			
							Consultant		DS	DS
							Date Sampled		18/07/2019	18/07/2019
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status	No. tests	Minimum (ug/l)	Maximum (ug/l)	Screening criteria (ug/l)	GAC Source		
Heavy Metals / Metalloids										
Arsenic (dissolved)	µg/l	1.1	ISO 17025	5	0.36	5.25	10	DWQS	4.64	5.25
Cadmium (dissolved)	µg/l	0.08	ISO 17025	5	0.02	0.06	5	DWQS	< 0.02	0.06
Chromium (hexavalent)	µg/l	5	ISO 17025	5	7.2	7.2	50	DWQS	< 5.0	7.2
Chromium (dissolved)	µg/l	0.4	ISO 17025	5	0.9	9.3	50	DWQS	0.9	9.3
Copper (dissolved)	µg/l	0.7	ISO 17025	5	2.7	6.4	2,000	DWQS	6.3	4.6
Lead (dissolved)	µg/l	1	ISO 17025	5	0.3	12	10	DWQS	0.3	12
Mercury (dissolved)	µg/l	0.5	ISO 17025	5	0	0	2.54	DWQS	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.3	ISO 17025	5	3	8.4	20	DWQS	8.4	3.2
Zinc (dissolved)	µg/l	0.4	ISO 17025	5	7.2	17	3000	WFD	7.2	9.7
Speciated PAH										
Naphthalene	µg/l	0.01	ISO 17025	0	0	0	N/A	N/A	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	0	0	0	N/A	N/A	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	0	0	0	N/A	N/A	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	0	0	0	N/A	N/A	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	0	0	0	N/A	N/A	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	0	0	0	N/A	N/A	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	0	0	0	N/A	N/A	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	0	0	0	N/A	N/A	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	0	0	0	N/A	N/A	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	0	0	0	N/A	N/A	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	0	0	0	0.1	DWQS 2016	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	0	0	0	0.1	DWQS 2016	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	0	0	0	0.01	DWQS 2016	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	0	0	0	0.1	DWQS 2016	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	0	0	0	N/A	N/A	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	0	0	0	0.1	DWQS 2016	< 0.01	< 0.01
Monoaromatics & Oxygenates										
Benzene	µg/l	1	ISO 17025	0	0	0	1	DWQS 2016	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	0	0	0	700	WHO 2017	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	0	0	0	300	WHO 2017	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	0	0	0	500	WHO 2017	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	0	0	0	500	WHO 2017	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	0	0	0	15	DS1	< 1.0	< 1.0
Petroleum Hydrocarbons										
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	0	0	0	300	DS2	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	0	0	0	300	DS2	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	0	0	0	300	WHO 2008	< 1.0	< 1.0
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	0	0	0	1	DWQS 2016	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	0	0	0	700	WHO 2008	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	0	0	0	300	WHO 2008	< 1.0	< 1.0
Aliphatic >C10 - C12	µg/l	10	ISO 17025	0	0	0	300	WHO 2008	< 10	< 10
Aliphatic >C12 - C16	µg/l	10	ISO 17025	0	0	0	300	WHO 2008	< 10	< 10
Aliphatic >C16 - C21	µg/l	10	ISO 17025	1	15	15	N/A	N/A	< 10	15
Aliphatic >C21 - C35	µg/l	10	ISO 17025	1	740	740	N/A	N/A	< 10	740
Aliphatic >C10 - C35	µg/l	10	ISO 17025	1	760	760	N/A	N/A	< 10	760
Aromatic >C10 - C12	µg/l	10	ISO 17025	0	0	0	90	WHO 2008	< 10	< 10
Aromatic >C12 - C16	µg/l	10	ISO 17025	1	23	23	90	WHO 2008	< 10	23
Aromatic >C16 - C21	µg/l	10	ISO 17025	1	39	39	90	WHO 2008	< 10	39
Aromatic >C21 - C35	µg/l	10	ISO 17025	0	0	0	90	WHO 2008	< 10	< 10
Aromatic >C10 - C35	µg/l	10	ISO 17025	1	62	62	N/A	N/A	< 10	62
VOC's										
Chloromethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	0	0	0	0.5	DWQS 2016	< 1.0*	< 1.0*
Bromomethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	0	0	0	0.5	DWQS 2016	< 1.0*	< 1.0*
Trichlorofluoromethane	µg/l	1	NONE	0	0	0			< 1.0	< 1.0
1,1-Dichloroethene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	0	0	0	50	WHO 2017	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,1-Dichloroethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,2-Dichloroethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	0	0	0	50	WHO 2017	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,2-Dichloropropane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	0	0	0	10	DWQS 2016	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	0	0	0	100	DWQS 2016	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	0	0	0	100	DWQS 2016	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	0	0	0	10	DWQS 2016	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
p & m-Xylene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	0	0	0	20	WHO 2017	< 1.0	< 1.0
Tribromomethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
o-Xylene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
tert-Butylbenzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,2-Dichlorobenzene	µg/l	1	ISO 17025	0	0	0	1000	WHO 2017	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025	0	0	0	300	WHO 2017	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0

Appendix E Chemical Screening - Groundwater
19-0654.07, Site 2, Image Business Park, Knowsley

							Exploratory Hole ID		BH5	BH6
Key	Below GAC	Above GAC			Below LoD		Response Zone Material			
							Consultant		DS	DS
							Date Sampled		18/07/2019	18/07/2019
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status	No. tests	Minimum (ug/l)	Maximum (ug/l)	Screening criteria (ug/l)	GAC Source		
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025	0	0	0	0.6	WHO 2017	< 1.0*	< 1.0*
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	0	0	0			< 1.0	< 1.0
SVOC's										
Aniline	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	0	0	0			< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	0	0	0			< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE							

Reference Sources

DWQS 2016 - The Water Supply (Water Quality) Regulations 2016 [UK Drinking Water Standards]

WFD - Water Framework Directive (Standards and Classification) Durections (England and Wales) 2015



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Analytical Report Number : 21-73538

Project / Site name:	Site 2, Knowsley	Samples received on:	07/05/2021
Your job number:	19-0654 07	Samples instructed on/ Analysis started on:	07/05/2021
Your order number:	DS60944	Analysis completed by:	14/05/2021
Report Issue Number:	1	Report issued on:	14/05/2021
Samples Analysed:	3 water samples		

Signed: *Karolina Marek*

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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



Analytical Report Number: 21-73538
Project / Site name: Site 2, Knowsley

Your Order No: DS60944

Lab Sample Number				1863159	1863160	1863161
Sample Reference				DS101	DS103	DS104
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				06/05/2021	06/05/2021	06/05/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

General Inorganics

pH	pH Units	N/A	ISO 17025	6.6	6.7	6.8
Sulphate as SO ₄	µg/l	45	ISO 17025	27900	18700	118000

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16
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Heavy Metals / Metalloids

Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0
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Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.36	0.78	0.77
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.06	0.02	0.03
Chromium (dissolved)	µg/l	0.2	ISO 17025	3.8	2.2	3.3
Copper (dissolved)	µg/l	0.5	ISO 17025	6.4	2.8	2.7
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	3.1	3.0	4.1
Zinc (dissolved)	µg/l	0.5	ISO 17025	17	12	9.3

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0



Analytical Report Number: 21-73538
Project / Site name: Site 2, Knowsley

Your Order No: DS60944

Lab Sample Number				1863159	1863160	1863161
Sample Reference				DS101	DS103	DS104
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				06/05/2021	06/05/2021	06/05/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0

Aliphatic >C10 - C12	µg/l	10	ISO 17025	< 10	< 10	< 10
Aliphatic >C12 - C16	µg/l	10	ISO 17025	< 10	< 10	< 10
Aliphatic >C16 - C21	µg/l	10	ISO 17025	< 10	< 10	< 10
Aliphatic >C21 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10
Aliphatic >C10 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0

Aromatic >C10 - C12	µg/l	10	ISO 17025	< 10	< 10	< 10
Aromatic >C12 - C16	µg/l	10	ISO 17025	< 10	< 10	< 10
Aromatic >C16 - C21	µg/l	10	ISO 17025	< 10	< 10	< 10
Aromatic >C21 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10
Aromatic >C10 - C35	µg/l	10	ISO 17025	< 10	< 10	< 10

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0



Analytical Report Number: 21-73538
Project / Site name: Site 2, Knowsley

Your Order No: DS60944

Lab Sample Number				1863159	1863160	1863161
Sample Reference				DS101	DS103	DS104
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				06/05/2021	06/05/2021	06/05/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
o-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05



Analytical Report Number: 21-73538
Project / Site name: Site 2, Knowsley

Your Order No: DS60944

Lab Sample Number				1863159	1863160	1863161
Sample Reference				DS101	DS103	DS104
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				06/05/2021	06/05/2021	06/05/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10

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



Analytical Report Number : 21-73538
Project / Site name: Site 2, Knowsley

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	ISO 17025
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
TPH C10-C35 by GCxGC-FID	Determination of total petroleum hydrocarbons in water by GC x GC FID with carbon banding aliphatic and aromatic C10-C35. Accredited Matrices SW,GW,PW.	In-house method	L101B-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
TPH Chromatogram in Water	TPH Chromatogram in Water.	In-house method	L070-PL	W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025

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

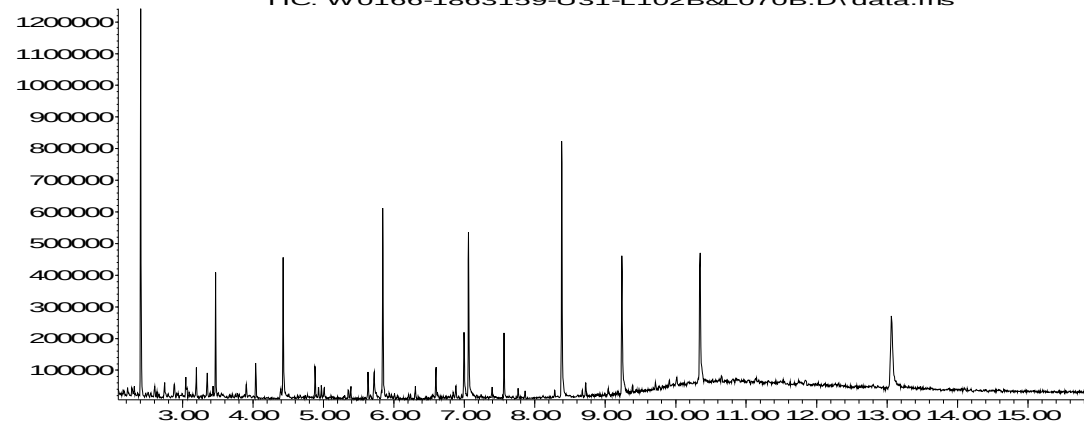
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

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

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

Abundance

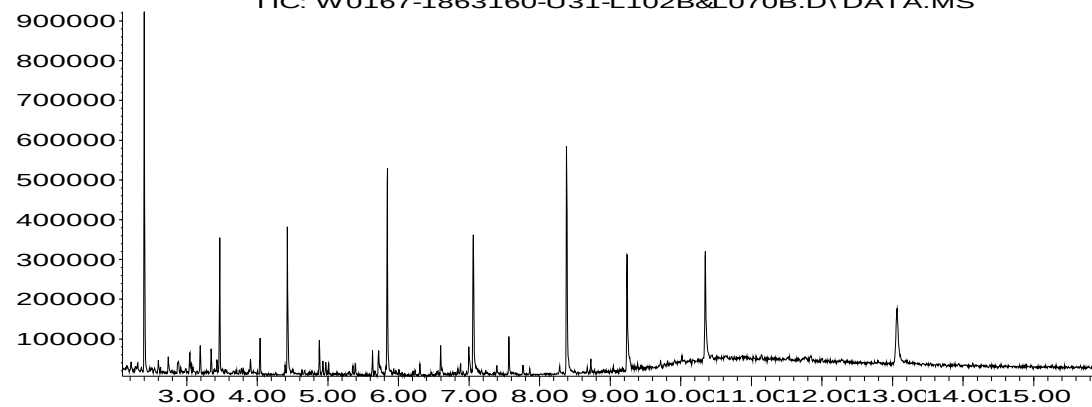
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Time-->

Abundance

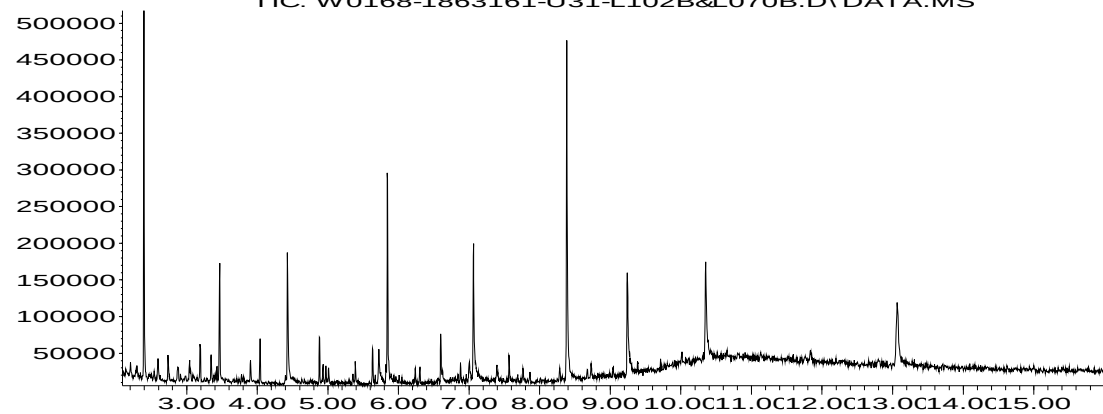
TIC: W0167-1863160-U31-L102B&L070B.D\ DATA.MS



Time-->

Abundance

TIC: W0168-1863161-U31-L102B&L070B.D\ DATA.MS



Time-->

Sample Deviation Report



Analytical Report Number : 21-73538
Project / Site name: Site 2, Knowsley

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
DS101	None Supplied	W	1863159	c	pH at 20oC in water (automated)	L099-PL	c
DS103	None Supplied	W	1863160	c	pH at 20oC in water (automated)	L099-PL	c
DS104	None Supplied	W	1863161	c	pH at 20oC in water (automated)	L099-PL	c

Appendix F – Ground Gas Monitoring Data

[illegible]

