



**H Fraser
Consulting**
Contaminated Land
and Hydrogeology

Southampton Airport

Phase II Land Quality Assessment for runway extension



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1 INTRODUCTION

Ricardo Energy and Environment (Ricardo) has appointed H Fraser Consulting (HFCL) to undertake a Land Quality Assessment (LQA) for a runway extension at Southampton Airport, as required by planning condition 11.

Condition 11 includes:

No work shall commence on Site until the following has been submitted to, and approved in writing by the Local Planning Authority:

- a. A Report of Preliminary Investigation comprising a Desk Study, Conceptual Site Model, and Preliminary Risk Assessment documenting previous and existing land uses of the Site and adjacent land, in accordance with UK Land Contamination Risk Management (LCRM) national guidance and the BS10175:2011+A2:2017 Investigation of potentially contaminated Sites - Code of Practice*
- b. Unless otherwise agreed in writing with LPA, a Site investigation report documenting the ground conditions of the Site and incorporating chemical and gas analysis identified as appropriate by the Preliminary Investigation and in accordance with BS10175:2011+A2:2017, and BS 8576:2013;*
- c. A detailed site-specific scheme (if required) for remedial works and measures to be undertaken to avoid the risk from contaminants and/or gases when the Site is developed, together with proposals for future maintenance and monitoring. Such a scheme shall include nomination of a competent person to oversee the implementation of the works*

1.1 Objective

The objective of this study is to assess the risk of contamination being present and identify the necessary mitigation requirements ahead of commencing works.

1.2 Scope of works

The following works have been undertaken:

- Preliminary risk assessment
- Site investigation (by Ricardo)
- Human health risk assessment
- Controlled waters risk assessment
- Ground gas risk assessment
- Reporting

The 'Site', as referred to in this report, is an area c. 4.8 ha around the proposed runway extension and associated soakaway.

2 DESK STUDY

2.1 Data sources

The desk study has been compiled using the following sources:

- Preliminary (Phase 1) Land Quality Assessment (LQA), H Fraser Consulting Ltd, Report ref. 30691R1.
- Factual Ground Investigation Report for Southampton International Airport Runway Extension, ST Testing, July 2019, Report ref. STL J14044
- Generic Quantitative Risk Assessment (GQRA), Southampton Airport, WSP, September 2019. Report ref. 70048854
- Environmental Statement Chapter 12: Ground Conditions, Southampton International Airport, Eastleigh. Savills.
- Geo-environmental preliminary risk assessment (PRA), Southampton Airport, Eastleigh, WSP, August 2019. Report ref. 70048854-001. This includes
 - an Envirocheck report and historic maps (Ref. 192652561_1_1, dated 31/01/19).
 - A map of historic and current potential contaminative land uses, from Cascade, 2014
- Information on geological mapping and borehole records has been obtained from the Geology of Britain viewer (<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>), the British Geological Survey Geoindex (<http://mapapps2.bgs.ac.uk/geoindex/home.html>), British Geological Survey 1:50,000 Scale Map 315: Southampton (1987).
- Defra 'Magic Map' website, <https://magic.defra.gov.uk>;
- British Geological Survey, 1:50,000 Map Series (1987), Sheet 315: Southampton;
- British Geological Survey 'Geology of Britain' online viewer,

2.2 Site location

Southampton International Airport (SO18 2NL) is located to the southeast of the town of Eastleigh, Hampshire. The Site, as defined in this report, comprises a rectangular area in which the proposed runway extension and proposed soakaway are located. The Airport and Site location are shown in Figure 2-1 and the Site setting is shown in Figure 2-2. Figure 2-3 shows a detailed Site layout.

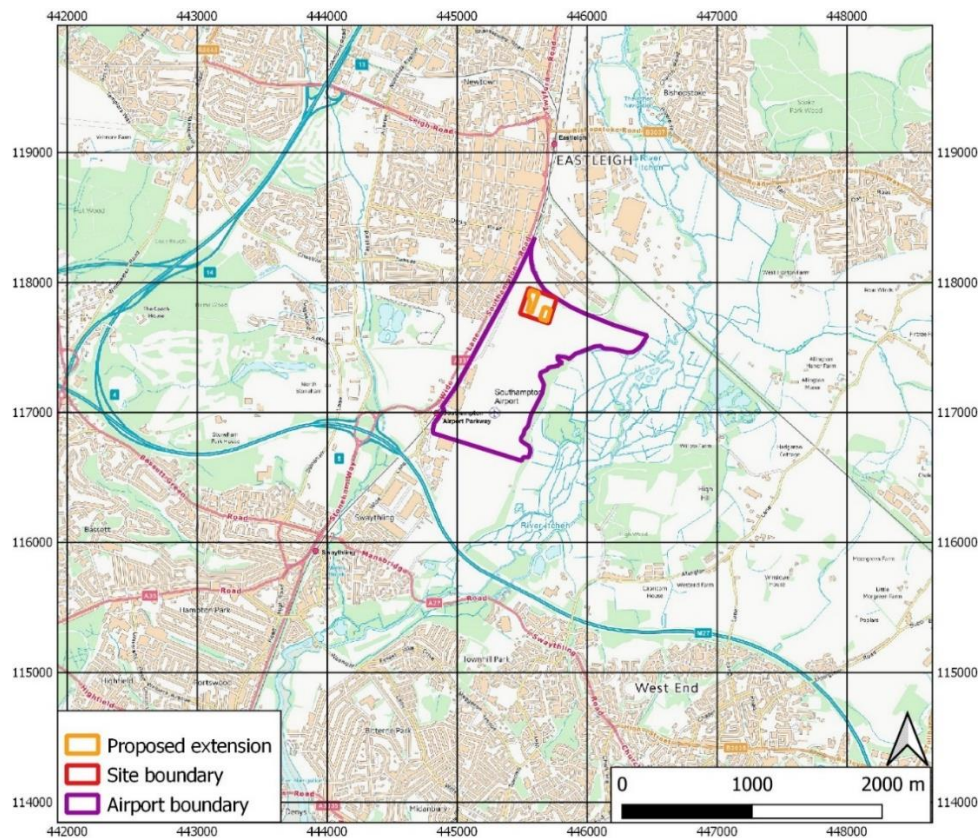


Figure 2-1 Site location

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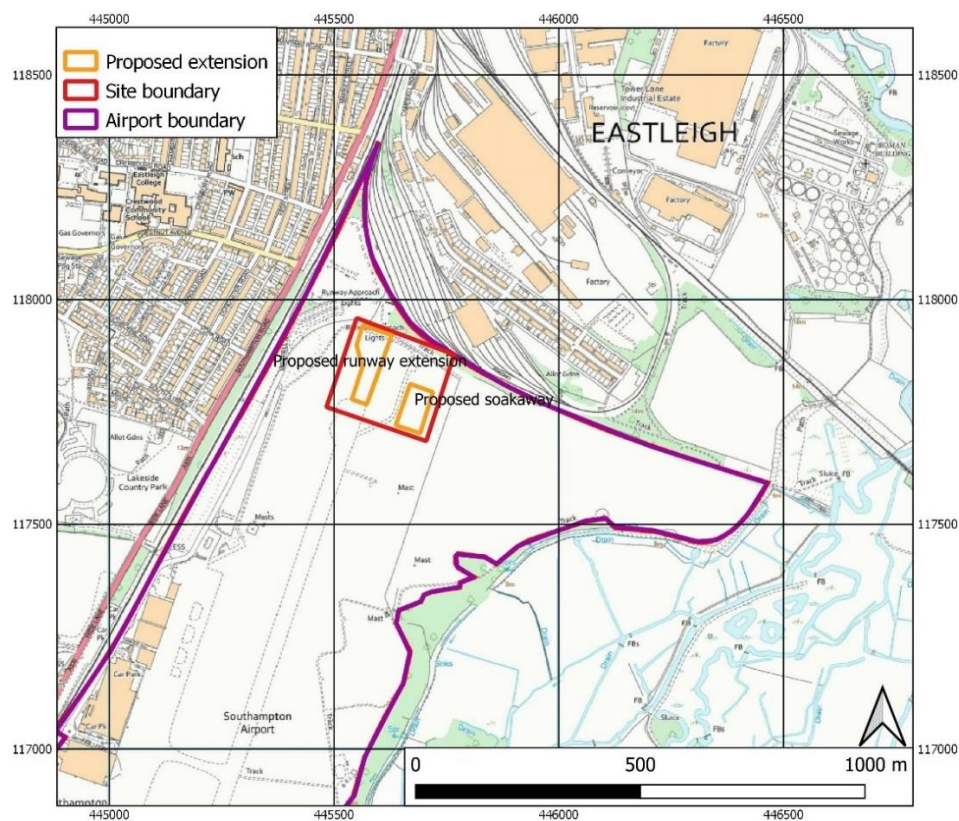


Figure 2-2 Site setting

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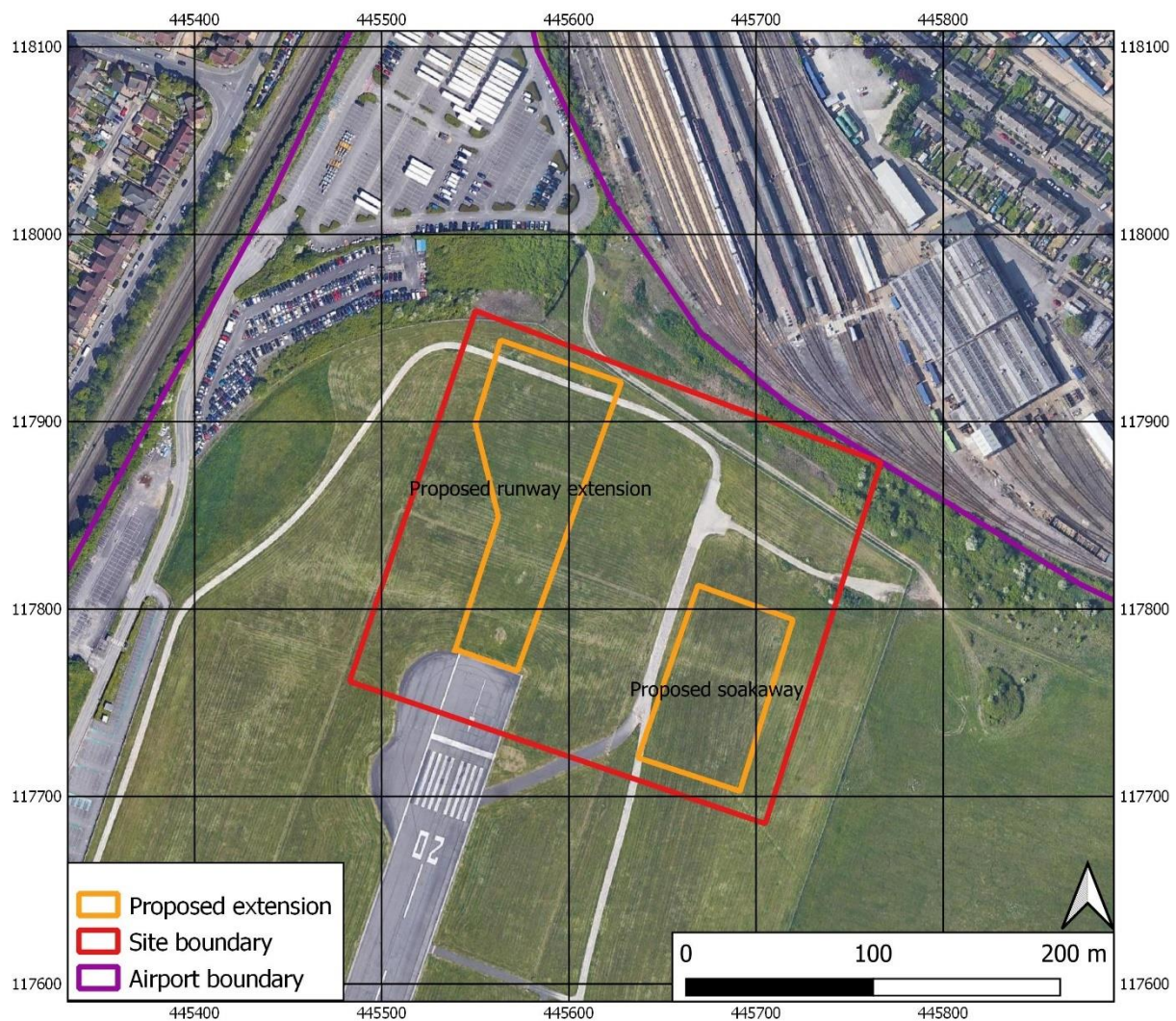


Figure 2-3 Site layout

2.3 Background information

Table 2-1 provides information on the site setting with relevant environmental data.

Table 2-1 Site setting

Item	Description
Site location	The Site comprises a rectangular area in the north of Southampton Airport, Southampton, SO18 2NL.
Grid reference	The Site is centred approximately on national grid reference (NGR) 445622, 117830.
Site area and dimensions	The Site is approximately 4.8 ha in area , with dimensions of c.234 m (NW-SE) by c.209 m (SW to NE)

Item	Description
Topography	The Site topography falls very gently from approximately 13.5 m above Ordnance Datum (aOD) in the west to approximately 12.5 m aOD in the east. ¹
Site description	The Site is predominantly grassed, with the existing runway in the southwest (which extends to the southwest), Site access roads in the north and east and a landscaped area in the northeast, along the north-eastern airport boundary.
Surrounding land use²	The Site is located within Southampton Airport, which consists of a single runway, a terminal building, cargo/maintenance units, areas of car parking and undeveloped, soft landscaping. The west of the airport comprises hardstanding in the form of buildings, car parking areas, aircraft parking stands and taxiways. The remainder of the airport, with the exception of the runway running through the centre of the airport and associated taxi way, comprises soft landscaping in the form of grass. A runway is orientated approximately north-south through the centre of the Airport, with associated taxiways linking to the aircraft parking stands to the west. The runway is surrounded by soft landscaping comprising grass. The northeast corner of the airport comprises an undeveloped grass field. The north of the airport is bound by railway land (railway sidings) and residential land, beyond which the mainline railway track is located c.480 m north of the Site. Land adjacent to the east of the airport is undeveloped, comprising grassland with mature trees and hedgerows and beyond this the River Itchen Special Area of Conservation (SAC). The airport is bound to the west by the A335/Wide Lane, on the other side of which is Lakeside Country Park and the University of Southampton Sports Ground. To the northwest of the airport is residential land.
Proposed development	A runway extension (c.0.8 ha) and a soakaway (c.0.5 ha) are proposed.
Geology	The mapped Site geology comprises River Terrace Deposits (Sand and Gravel; superficial geology), underlain by London Clay Formation

¹ From surveyed site investigation (ST Testing, July 2019)

² From GQRA

Item	Description
	(bedrock geology).³ To the east of the Site the geology varies, with Alluvium (Clay, Sand, Silt and Gravel) mapped 330 m to the southeast, and bedrock of the Wittering Formation (Sand, Silt and Clay) mapped c.250 m east of the Site, overlying the London Clay. Ground investigation data⁴ from the Site is in line with the mapped geology, and a ground model is shown in Table 2-2. The River Terrace Deposits extend to between 1 and 5.6 m below ground level (bgl), and comprise soft brown Clay at shallow depths, underlain by a medium dense brown clayey fine to coarse subangular Gravel of Flint and fine sub-rounded Chalk. No Made Ground or Artificial Ground is mapped beneath the Site, nor was it identified during the ground investigation.
Hydrogeology	Within the Site, the River Terrace Deposits are classed as Secondary Undifferentiated and the underlying London Clay is classed as unproductive. To the east of the Site (at least 250 m) the Alluvium (superficial aquifer) and underlying Wittering Formation (bedrock aquifer) are classified as Secondary A aquifers. There are no groundwater abstraction licenses within 1 km of the Site. The Site is not located in, or within 1 km, of a groundwater Source Protection Zone (SPZ). There are three springs mapped c.330 to c.480 m east/ southeast of the Site. A sink is mapped c. 460 m south of the Site. The springs and sink are located at the mapped boundary between the London Clay and the overlying Wittering Formation, and also between the RTDs and the Alluvium. Two boreholes (BH7 and BH8) were drilled during the previous earlier Site investigations. BH7 comprises a multi-level piezometer with response zones at 8 m and 14 m bgl, both within the London Clay. The response zone of BH8 is 3.5 m to 5 m bgl, within the River Terrace Deposits, with groundwater level varying between c.3.5 m and 4.2 m bgl.⁵ These were not sunk as part of this package of works, but were drilled as part of earlier investigations.

³ British Geological Survey Map No. 315 Southampton 1: 50,000 and BGS's GeoIndex

⁴ Undertaken by Southern Testing, April – May 2019. From Southern Testing, July 2019.

⁵ Based on monitoring data from May to July 2019 and January to March 2020.

Item	Description
	It would be anticipated that based on topography groundwater may locally flow to the southeast towards the River Itchen (located c.700 m southeast, although tributary drainage channels are c.330 m to the southeast). Regional groundwater flow is likely towards the south / southeast. The Solent is located approximately 6 km south of the Site. The Site is not at risk of groundwater flooding.⁶
Surface water and flooding	The nearest surface water feature is a drainage channel, formerly the Itchen Canal, located c.340 m southeast of the Site, adjacent to the eastern airport boundary (see Figure 2-4). The River Itchen is located approximately c.720 m southeast of the Site, although three tributary drainage channels are mapped within 500 m, which flow from the drainage channel to the River Itchen. There are no surface water abstraction licences within 1km of the Site. The Site lies within the Hamble Estuary Eutrophic Nitrate Vulnerable Zone. The Site is at very low risk of flooding from rivers and the sea, and from surface water.
Potentially infilled land	An old Clay pit is mapped c.140 m north of the Site.
Landfill and waste management	On Site: An Old Gravel Pit, licence held by British Rail, deposited waste included household waste, no input dates given – in the north-western corner of the Site and immediately north. A former landfill Site is located c.305 m southwest immediately west of Wide Lane. The licence for household waste / inert landfill was surrendered in 1994. A licensed waste management facility is operated by Hampshire Environmental Services Ltd at the Eastleigh Railworks c.450 m northeast of the Site. The Site is licensed to treat waste to produce soil (<75,000 tonnes per year)
Potentially contaminative land uses	The Site is within an airport, but there are no other mapped industrial land uses on Site.

⁶ Envirocheck 192652561_1.1

Item	Description
	Numerous tanks are located within the Eastleigh Railworks area to the north and east of the Site. The closest tank is c. 110 m east of the Site, immediately north of the airport boundary and also c.320 m – 450 m north of the Site. Aircraft fuel is stored in a tank farm located towards the northern end of the western airport boundary, c.370 m southwest of the Site. This area is secured within fencing. There is understood to be an interceptor for this fuel storage area.
Active discharge consents	There are no active discharge consents within a 250 m radius
Pollution incidents	There are no known pollution incidents within the Site. The Envirocheck Report referenced in the PRA draws upon the following pollution incident data from the Environment Agency records: • c.95 m to the east: Substantiated Pollution Incident Register: Category 2 (Significant Incident) impact on land, from gas and fuel oils on 24/07/2007 – towards centre of northern Site boundary; and, • c.300 m to the east, within the airport: Substantiated Pollution Incident Register: Category 2 (Significant Incident) impact on land, from gas and fuel oils on 27/02/2017 • c.200 m west: Minor incident on 15/07/1994 of sump oil in drains following a road traffic collision into an alleyway off York Road; • c.400 m north: Minor incident on 19/06/1997 of solvents from a fire at Eastleigh Locomotive Works; Records of pollution incidents within 500 m of the Site were also provided by the EA. Those not covered above but listed on the Site include firefighting run-off following a control system failure (on 5/8/02) causing minor impact to land and water. <u>Diesel Spillage to the North of the Site</u> The Contaminated Land Team at Eastleigh Borough Council and the Environment Agency (EA) were contacted as part of the desk-based regulatory enquiries which formed the Geo-environmental Preliminary Risk Assessment. From the information received from both parties, WSP established that:

Item	Description
	• A pollution incident, in the form of a diesel spill, took place on land to the north of the airport in 2001; • The incident occurred at the Arriva TrainCare Site "Eastleigh Depot" and was the result of a "leak in a main fuel line and fuel tanks, the refuelling facility, the subsurface oil collector system and a previous soakaway"; • It is understood that the EA suggested that "as of the end of last year we understand that proposed remediation options for the Site owner were being taken forward voluntarily and that an updated Phase IIA report was being prepared which was to include groundwater and plume monitoring".⁷
Environmentally sensitive sites	The River Itchen Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) are located c.340 m southeast of the Site, adjacent to the eastern airport boundary. The area is designated due to its calcium river. There are no other sensitive land use designations, such as Sites of Special Scientific Interest or Special Protection Areas located within 500 m of the Site. There are no ancient woodland designations within 250m of the Site.
Unexploded ordnance	The airport is located in an area of 'moderate' risk, having a bombing density of 15 to 49 bombs per 1000 acres or less ⁸

Table 2-2 Encountered strata in runway area

Stratum	Depth to base (m bgl)	Thickness (m)	Description
Topsoil	0.2 to 0.3	0.2 to 0.3	Grass over firm brown silty sandy clay with roots. In some places slightly gravelly, comprising fine to coarse sub-angular flints.
River Terrace Deposits	1.0 to 5.6	0.75 to 5.3	At shallow depths soft brown clay with high silt content. At greater depths medium dense brown clayey gravel. Gravel comprising fine to coarse sub-angular flint and fine sub-rounded chalk.

⁷ GQRA

⁸ PRA

Stratum	Depth to base (m bgl)	Thickness (m)	Description
London Clay	20 (base of hole)	14.4 to 14.6	Firm becoming stiff grey / blueish grey fissured clay with high silt content and with frequent thick interlaminae of light grey fine-grained sand.

2.4 Site history

2.4.1 On-site

Earliest historical mapping (dated 1871) shows the Site to be undeveloped, comprising agricultural fields. By 1910 an old gravel pit is marked in the northern corner of the Site, which appears to have been filled in by 1946. Allotment gardens are mapped in the north of the Site from 1909 to 1963. The airport is mapped from 1983 to the present day, with the existing runway in the southwest of the Site, and the current taxi access roads mapped since 2000/2019.

2.4.2 Off site

Historic maps (1:2,500, 1:10,000 and 1: 10,560 scale from Envirocheck 192652561_1_1) show the following potentially contaminative land uses within the vicinity of the Site:

- 1871: Earliest historical mapping (dated 1871) shows the majority of the surrounding area to be undeveloped, apart from:
 - Railways: London and South Western Railway Line c.145 m to the west (along the current western airport boundary) and London and Southern Railway Line c.300 m north.
 - North Stoneham Farm is mapped c.250 m south (last shown on the 2006 map).
 - Itchen Navigation Canal and locks c.330 m southeast (disused from 1963)
- 1897:
 - A gas works is mapped c.500 m to the north (not shown in later maps)
 - Residential development has begun to the northwest of the railway
 - An old clay pit is mapped c.140 m north (not shown on later maps)
- 1910:
 - Railway sidings mapped immediately north of the Site (along the current northern boundary of the airport; still present), with a 'running shed' c.100m north and a locomotive shed c.330 m north (last mapped 1963). Both sheds still present.
 - An old gravel pit is marked immediately north of (and slightly within) the Site, which appears to have been filled in by 1931
 - A gravel pit is shown c.250 m to the southeast, at North Stoneham Farm (no longer mapped in 1963)
- 1951:

- Tanks c.130 m east, within the railway sidings (removed by 1971)
- 1963:
 - The Southampton (Eastleigh) Airport is first shown on historical mapping
 - Housing c.20 m south (removed by 1968)
 - Depot 50 m northeast (still present)
- 1971:
 - Maintenance depot c. 50 m northeast. Still present
- 1983:
 - Airport runway layout as present (access / taxi roads increased until the present day)
 - Car park c.40 m north (still present)
 - Gas governor c.330 m southwest (last mapped 2006)

Selected potentially contaminative land uses are summarised in Figure 2-5.

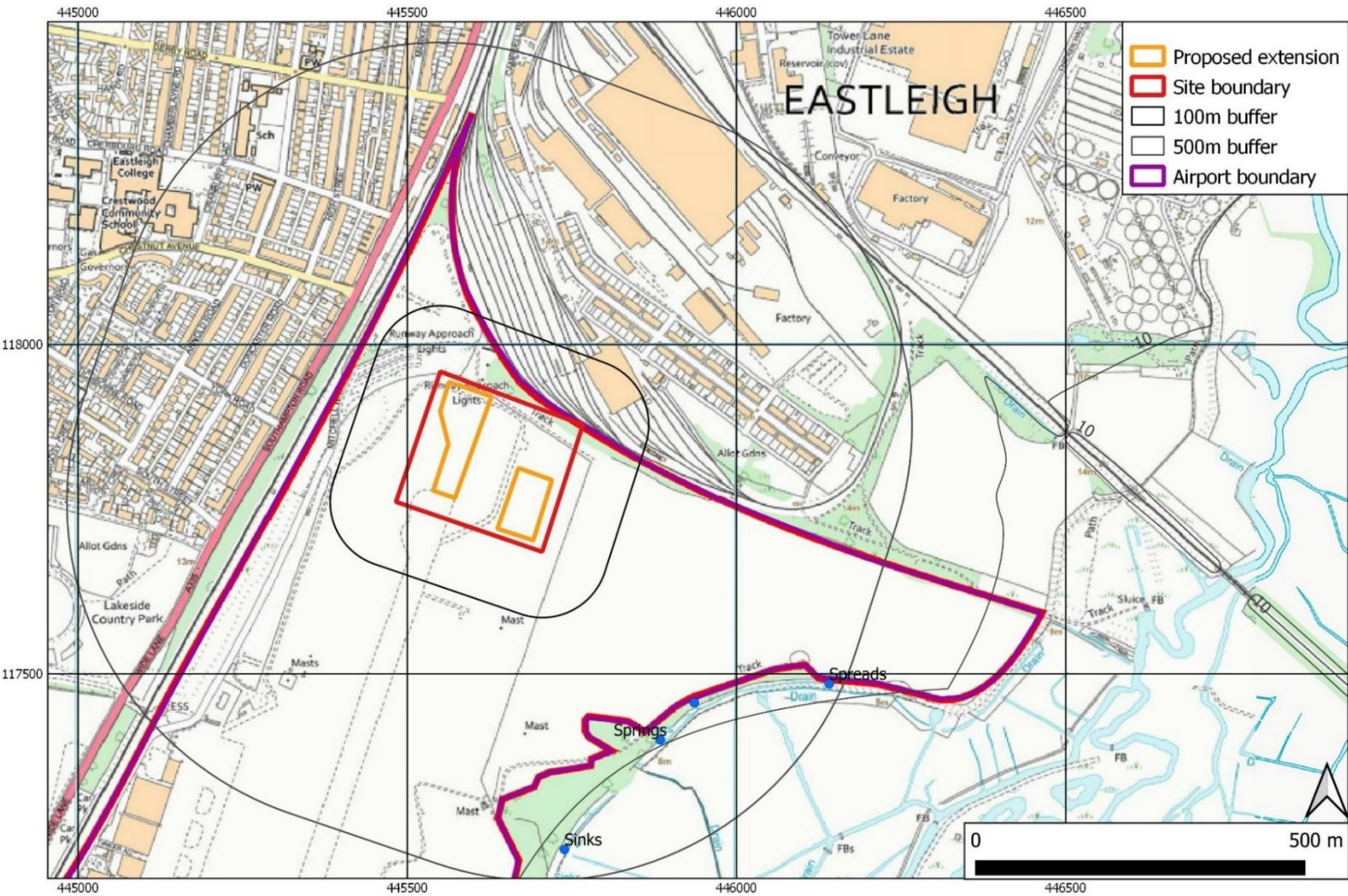


Figure 2-4 Water features

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2.5 Previous reports

WSP's PRA 2019 records the following information

- Environment Agency communication. Records of pollution incidents listed within the Airport include the following:
 - Firefighting run-off following a control system failure, on 5/8/02, causing minor impact to land and water.
 - Oils and fuel following an accidental spillage, on 24/07/07, causing significant impact to land.
 - Oils and fuel following containment and control failure, on 27/02/2017, causing a significant impact to land.
 - Environmental Permits provided by the EA indicated that the drainage on Site comprises soakaways.
 - Information provided by the EA also comprises a 'Contamination Assessment Report and Proposed De-icing Strategy for Southampton International Airport Limited' prepared by ABC Environs in September 2001. The report was commissioned by SIAL following a review of their process of de-icing planes, and relates to the taking and analysis of samples from the Site in order to determine impact on groundwater, and the desire to expand the area where this process is permitted on-site. A summary of the report is given below:
 - De-icing of planes is only permitted in designated areas of the airport, where drains were designed to divert polluted water into the foul drainage system rather than impact the underlying groundwater which is in continuity with the River Itchen (a designated SSSI).
 - The airport was issued with a Prohibition Notice by the EA on 13 January 1997 (Ref. PN2/009//H/97) prohibiting the discharge of effluent consisting of de-icing liquors from the runway, taxiways and associated roads of the airport.
 - Operational personnel reported that de-icing run-off does not always drain into the designated slot drains, and instead seeps into the underlying block paving.
 - One borehole was drilled within the designated de-icing area to target the area of impact and another outside to act as a control.
 - The COSHH data sheet for the de-icing chemical used at the airport shows the primary constituent to be mono-propylene glycol (MPG).
 - Results confirmed no propylene glycol was present in underlying soils. However, results from the block samples showed elevated levels of propylene glycol in both locations.
 - It was suggested that the de-icing run-off was therefore being absorbed by the block paving rather than soaking away into ground or flowing into the drainage system.

- A thick layer of concrete underlies the block paving, which is considered to form greater protection for the aquifers.
- The report also reviewed four months of monthly groundwater monitoring data collected by the airport from a series of 12 boreholes surrounding the Site. ABC Environs stated that the de-icing 'operations had no affect on the groundwater with the majority of results showed no or just a marginal deterioration in quality of the groundwater downstream towards the eastern boundary'.
- The report determined that extension of the designated de-icing area would be feasible.
- The following reports are referenced in WSP's PRA:

Ground Investigation of Field in Northeast Corner of the Site (2004) – significant hydrocarbon contamination Figure 2-5

WSP was instructed by BAA Lynton to undertake a Phase II Environmental Assessment of the field in the northeast corner of the Site. The assessment aimed to confirm the presence of groundwater contamination in the northwest corner as suspected in a Preliminary Environmental Investigation undertaken by WSP. The investigation confirmed a hydrocarbon plume in the groundwater, with Total Petroleum Hydrocarbons (TPHs) recorded in fourteen of eighteen groundwater samples. One round of gas monitoring undertaken found no elevated concentrations of methane or carbon dioxide.

Ground Investigation of Railway Depot Immediately North of the Site (2017)

Ground investigation and monitoring immediately north and in the northeast of the Site in response to possible groundwater contamination. Hydrocarbon contamination was consistently noted within boreholes across both Sites. Further investigation included a Detailed Quantitative Risk Assessment (DQRA).

Mound in Northwest Corner of the Site (2006) – marked 'The Mound' on Figure 2-5

Buro Happold undertook an investigation of a mound located in the northwest corner of the Site. The investigation comprised the excavation of thirteen trial pits in November 2006. The investigation was undertaken in order to prove the thickness of tipped material and provide a waste disposal classification. Waste Acceptance Criteria (WAC) was undertaken on thirteen soil samples. It should be noted this assessment was completed with now superseded guidance. A human health assessment was not completed.

Plan by Cascade: Historic and Current Potential Contaminative Land Uses (2014)

WSP was provided with a 'Historic and Current Potential Contaminative Land Uses' plan taken from the Strategic Support for Future Investment – Phase 2 Report. A number of potential contamination sources were identified, these are shown on Figure 2-5 and Table 2-3.

Table 2-3 Summary of contamination identified in Cascade (2014)

Potential source of contamination	Location within the airport
Heavy metal contamination	In the northwest corner of the airport Towards the centre of the northern boundary of the airport (BH5)
Glycol contamination	Towards the centre of the northern boundary of the airport (BH5)
Historic pollution Incident	Towards northwest corner of the airport Along western boundary of the airport (chemicals pollutant incident)
Crashed aircraft debris	North of the airport
Old royal naval base	Towards the centre of the eastern boundary

Southampton Airport extension phase I risk assessment (2022)

Ricardo Energy and Environment (Ricardo) has appointed H Fraser Consulting (HFCL) to undertake a Land Quality Assessment (LQA) for a runway extension at Southampton Airport, as required by planning condition 11.

The conclusions of the preliminary risk assessment were as follows:

- **Human Health:** The potential risk posed to future Site users by current and historical activities on and near to the Site after development is assessed as being moderate/low. Airport users are not likely to be exposed to potential exposure pathway as they will likely remain in areas offered protection by hardstanding cover. However, potential exposure is possible in areas of soft standing or during excavation works. Maintenance workers may be at risk of exposure to contamination when dealing with sub-surface infrastructure.
- **Controlled Waters:** The potential risk to controlled waters posed by the historical and current activities on and near to the Site during and after Site development is assessed as being moderate indicating that it has been impacted by hydrocarbon contamination. The EA are aware of the situation.
- **Structures and Services:** The potential risk to below ground services on Site is assessed as being moderate. Hydrocarbon impacted soil and groundwater may impact on buried concrete structures.

Site investigation should be undertaken to establish the presence and extent of potential contamination and whether remedial action is required and to inform a remedial strategy if so.

3 PRELIMINARY RISK ASSESSMENT OF LAND CONTAMINATION

Table 3-1 presents the potential contaminant linkages which may exist at the Site, and provides a preliminary assessment of likely risks to the identified receptors.

Table 3-1 Potential pollutant linkages and preliminary risk assessment

Source	Pathway	Receptors	Severity of risk	Probability of risk	Risk	Assessment
Potentially impacted soils from on-site land use: Made Ground; spills associated with bulk fuel storage or car parks; landfill material	Oral, ingestion and dermal contact, and inhalation of dust	Human health: Current workers, airport users, adjacent residents.	Medium	Low	Moderate / Low	Airport users are not likely to be exposed to potential exposure pathway as they will likely remain in areas offered protection by hardstanding cover. The proposed development will comprise hardstanding cover. However, potential exposure present in areas of soft standing or during excavation works.
	Inhalation of vapours from migration and accumulation of vapour in subsurface	Human health: Current workers, airport users, adjacent residents.	Medium	Low	Moderate / Low	Vapours may also migrate laterally off-Site. The potential risks from any volatile vapours at the Site will be further understood following intrusive investigation and soil sampling.

Source	Pathway	Receptors	Severity of risk	Probability of risk	Risk	Assessment
	Leaching and vertical migration	Controlled waters: Secondary A and Undifferentiated Aquifers beneath Site	Medium	Likely	Moderate	There is potential for impacted soils to be present. Intrusive investigation, groundwater and surface water monitoring will be required in order to determine potential risks on controlled waters.
		Buried concrete	Medium	Likely	Moderate	Hydrocarbon impacted soil and groundwater may impact on buried concrete structures.
Potentially impacted groundwater	Lateral migration	Secondary A and Undifferentiated Aquifers, Itchen Navigation and River Itchen (SSSI) to east	Medium	Likely	Moderate	Potential sources of contamination have been identified in the vicinity of the Site. The Itchen Navigation lies 330 m southeast of the Site. Impacted groundwater is likely to be migrating towards the Navigation and the River Itchen. However, given the River Itchen is approximately 770m east of the Site, contaminants in the groundwater may disperse/attenuate before reaching the river given the distance from Site. Further investigation would be required to determine any risk to controlled waters.

Source	Pathway	Receptors	Severity of risk	Probability of risk	Risk	Assessment
Ground gas	Asphyxiation/explosion by accumulation of ground gases in internal/confined spaces	Current workers, airport users, adjacent residents, buildings and structures	Medium	Low	Low/Moderate	Ground gas generation may be associated with depths of landfill/infill material or significant thicknesses of Made Ground. However, no internal / confined spaces are proposed.
Asbestos in Made Ground	Inhalation of asbestos fibres	Current workers, airport users, adjacent residents	Severe	Low	Moderate	Airport users are not likely to be exposed to potential exposure pathway as they will likely remain in areas offered protection by hardstanding cover. The proposed developments will comprise hardstanding cover. However, potential exposure present in areas of soft standing or during excavation works.
Potentially impacted soils/groundwater from offsite land uses: Railway sidings adjacent to north	Oral, ingestion and dermal contact, and inhalation of dust	Human Health: Current workers; and airport users.	Medium	Low	Low/Moderate	Groundwater is known to have hydrocarbon contamination towards the northeast of the Site. Based on the use of the subject Site and offsite (with presence of hardstanding), Site users are not likely to come into contact with soils/groundwater.

Source	Pathway	Receptors	Severity of risk	Probability of risk	Risk	Assessment
	Leaching and vertical/lateral migration	Controlled waters: Secondary A and Undifferentiated Aquifers beneath Site	Medium	High	High	Hydrocarbons from an off-site, upgradient source are known to have impacted groundwater and the aquifers beneath the Site. There is some uncertainty regarding the risk upon the Itchen Navigation, approximately 360m distance from the borehole where free-phase product was observed. However, it is understood that remediation has occurred, although the details are unknown.

4 SITE INVESTIGATION

Site investigations were undertaken Ricardo Energy and Environment (Ricardo). These comprised:

- Drilling six boreholes to a maximum depth of 3 m bgl, to provide overall Site coverage with two soil samples from each borehole.
- Drilling four additional boreholes to a maximum depth of 4 m bgl, to be installed with piezometers for groundwater and ground gas monitoring. Two soil samples were taken from each borehole.
- Nine shallow soil samples were hand dug to depths ranging between 0.3 m and 1.0 m bgl.
- Submission of twenty nine soil samples for analysis of asbestos, metals, speciated TPH, BTEX, PCBs, SVOCs including PAHs, and VOCs. Leachability testing of four soil samples.
- Groundwater level monitoring and soil gas monitoring was undertaken three occasions. It should be noted that BH202 was not accessible during the second monitoring round and therefore could not be monitored during this visit.

Borehole logs are presented in Appendix A. It is noted that the boreholes were drilled to a shallower depth than originally planned due to collapsing ground conditions. This meant that piezometers did not extend through the full extent of the aquifer. Sampling locations are shown in Figure 4.1

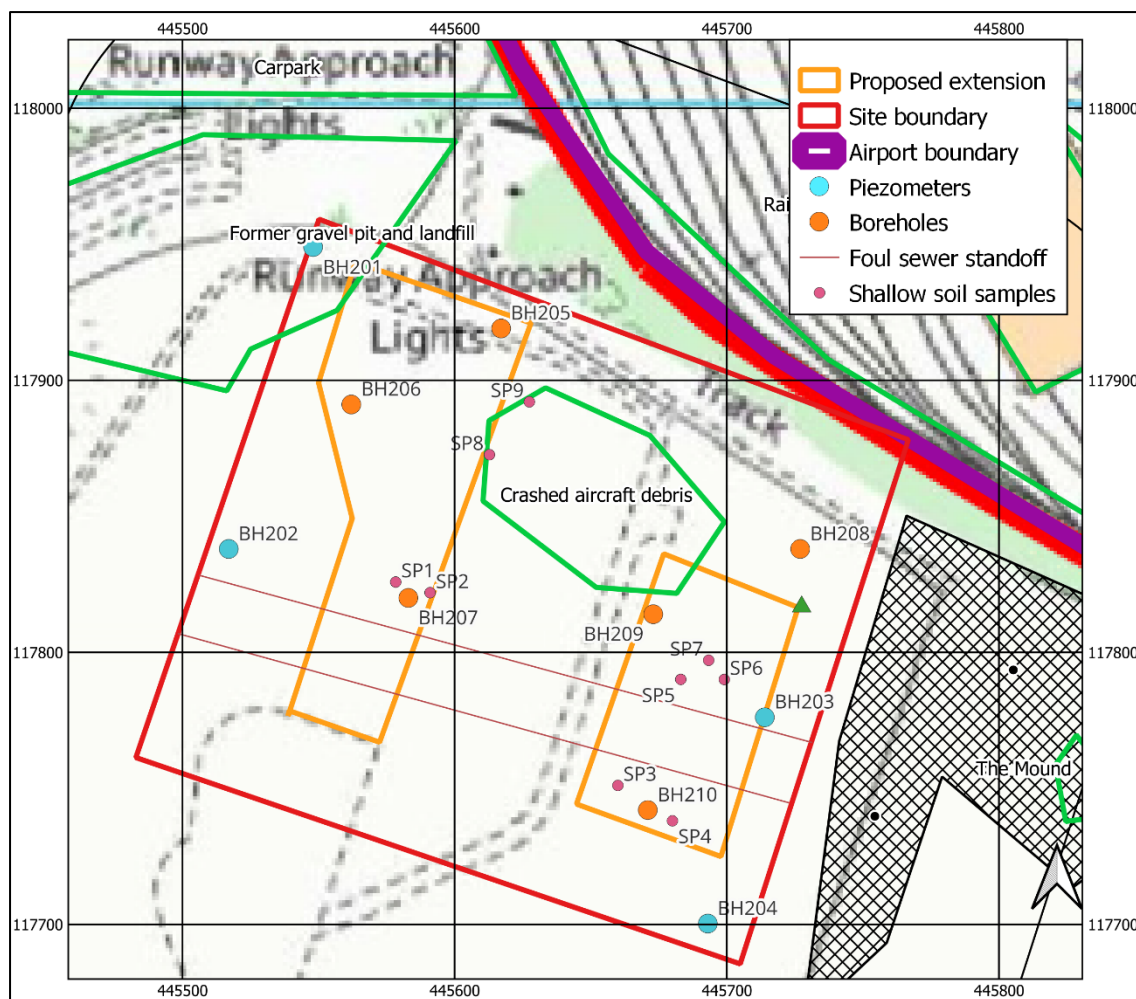


Figure 4.1 Sampling locations

4.1 Visual and olfactory evidence of potential contaminants

A strong hydrocarbon odour with gravels stained grey was encountered from 2.70 – 3.00 m bgl at BH208, towards the northeast of the Site.

4.2 Ground conditions

Made Ground was not encountered in any of the boreholes during this ground investigation.

The primary constituent of the capping topsoil was Sand towards the centre and west of the Site. Towards the east, the primary constituent was Clay, as encountered in BH203-204 and BH208-209. Underlying the topsoil, all boreholes encountered clayey strata overlying sandy gravel.

The shallow geology was found to be broadly similar across the site, with typically 0.25 m Topsoil overlying the River Terrace Deposits (RTD; soft brown Clay at shallow depths, underlain by a brown clayey Gravel).

4.3 Soil sampling results

Laboratory certificates are presented in Appendix B, and the soil sampling results are summarised in Table 4.1. Table 4.1 also shows the Generic Assessment Criteria (GAC) for commercial landuse (Nathanail et.al, 2015) referred to in Section 6, Human Health Risk Assessment.

Table 4.1 Soil sampling results

Determinand	Units	No of samples	No of detects	Maximum	GAC Comm
Chromium, Hexavalent	µg/kg	29	0	0	33
Arsenic	µg/kg	29	29	12.2	640
Cadmium	µg/kg	29	29	0.415	190
Chromium	µg/kg	29	29	27.1	
Copper	µg/kg	29	29	14.3	68000
Lead	µg/kg	29	29	19	2330
Mercury	µg/kg	29	0	0	25.8
Nickel	µg/kg	29	29	36.4	980
Selenium	µg/kg	29	0	0	12000
Vanadium	µg/kg	29	29	57.3	9000
Zinc	µg/kg	29	29	64.6	730000
Chromium, Trivalent	µg/kg	29	29	27.1	8600
Aliphatics >C5-C6	µg/kg	29	1	21.8	3200000
Aliphatics >C6-C8	µg/kg	29	1	88.5	7800000

Determinand	Units	No of samples	No of detects	Maximum	GAC Comm
Aliphatics >C8-C10	µg/kg	29	1	5930	2000000
Aliphatics >C10-C12	µg/kg	29	1	291000	9700000
Aliphatics >C12-C16	µg/kg	29	2	1810000	59000000
Aliphatics >C16-C21	µg/kg	29	2	2660000	1600000000
Aliphatics >C21-C35	µg/kg	29	4	5230000	1600000000
Aliphatics >C35-C44	µg/kg	29	3	2340000	1600000000
Total Aliphatics >C10-C44	µg/kg	29	2	12300000	
Total Aliphatics & Aromatics >C10-C44	µg/kg	29	4	15500000	
Aromatics >EC5-EC7	µg/kg	29	0	0	26000000
Aromatics >EC7-EC8	µg/kg	29	0	0	56000000
Aromatics >EC8-EC10	µg/kg	29	1	3960	3500000
Aromatics > EC10-EC12	µg/kg	29	1	108000	16000000
Aromatics > EC12-EC16	µg/kg	29	1	1310000	36000000
Aromatics > EC16-EC21	µg/kg	29	2	1070000	28000000
Aromatics > EC21-EC35	µg/kg	29	13	647000	28000000
Aromatics >EC35-EC44	µg/kg	29	5	13000	28000000
Aromatics > EC40-EC44	µg/kg	29	3	12200	28000000
Total Aromatics > EC10-EC44	µg/kg	29	5	3140000	
Total Aliphatics & Aromatics >C5-C44	µg/kg	29	4	15500000	
Naphthalene	µg/kg	29	1	228	190000
Acenaphthylene	µg/kg	29	1	226	83000000
Acenaphthene	µg/kg	29	2	579	84000000
Fluorene	µg/kg	29	1	1470	63000000
Phenanthrene	µg/kg	29	2	2660	22000000
Anthracene	µg/kg	29	2	618	52000000
Fluoranthene	µg/kg	29	2	176	23000000
Pyrene	µg/kg	29	2	202	54000000

Determinand	Units	No of samples	No of detects	Maximum	GAC Comm
Benz(a)anthracene	µg/kg	29	1	61.5	170000
Chrysene	µg/kg	29	1	55	350000
Benzo(b)fluoranthene	µg/kg	29	1	80.8	44000
Benzo(k)fluoranthene	µg/kg	29	1	35.8	1200000
Benzo(a)pyrene	µg/kg	29	1	58.7	35000
Indeno(1,2,3-cd)pyrene	µg/kg	29	1	44.5	500000
Dibenzo(a,h)anthracene	µg/kg	29	0	0	3500
Benzo(g,h,i)perylene	µg/kg	29	1	40.5	3900000
PAH, Total Detected USEPA 16	µg/kg	29	2	6150	
Dichlorodifluoromethane	µg/kg	29	0	0	
Chloromethane	µg/kg	29	0	0	

GACs are from Nathanail et.al (2015) unless otherwise stated

a: CLAIRE (2010)

b: Dutch Intervention Value

c: naphthalene surrogate

d: phenol surrogate

e: Defra (2014)

Metals were present at concentrations above the limit of detection in most or all samples, with the exception of hexavalent chromium, mercury and selenium which were below the limit of detection in all samples.

TPH was detected in up to four samples, with the heavier hydrocarbons being more widespread. Sample BH208-02 (2.70-2.70m) was impacted by hydrocarbons (total 15,500 mg/kg) and PAH (6 mg/kg), however the sample from higher up the soil profile was not (BH208-01, 1.50-1.50m). This indicates a lateral migration of hydrocarbons at this location. In addition, it was noted during the drilling works that a hydrocarbon odour was present at this location. The evidence is consistent with migration from the railway depot across the Site boundary.

Apart from BH208, there were trace concentrations of TPH above the level of detection in three other samples. Sample BH204-01 (2.30-2.30 mbgl) detected 32 mg/kg. Sample BH207-01 (2.30-2.30) detected 19 mg/kg. And sample BH210-02 (3.00-3.00) detected 10 mg/kg. All samples were deeper in the soil profile with 'cleaner' samples above, suggesting lateral migration of trace levels of contaminants, likely associated with the depot to the north, present around the zone of groundwater table fluctuation.

Total PAH concentrations were generally below 10 mg/kg at all locations, with the exception of 781 ug/kg at BH207-01 (2.3 m bgl) and 6150 ug/kg at BH208-02 (2.7 mbgl). These are likely to be associated with the presence of TPH, and represent migration of fuel from the north.

4.4 Asbestos results

Asbestos was below the limit of detection in all samples.

4.5 Soil sampling- leachate

Soil sampling leachate results are presented in Table 4.2. Laboratory certificates are presented in Appendix B. The Environmental Quality Standard is also shown in Table 4.2, as discussed in Section 7.

Table 4.2 Soil sampling leachate results

Determinande	Units	no. of samples	no. of detects	max	EQS	Locations
Sulphate	mg/l	4	1	10.4	400	BH207-01
Conductivity @ 20 deg.C (diss.filt)	mS/cm	4	3	0.0742		BH207-01, BH208-01 and S5
Mercury (diss.filt)	µg/l	4	1	4.11		BH207-01
Copper	µg/l	4	4	1.44	1	BH207-01, BH208-01, S5 and S7
Nickel	µg/l	4	1	0.622	4	S7
Vanadium	µg/l	4	1	1.37	20	BH207-01
Zinc	µg/l	4	3	3.29	10.9	BH208-01, S5 and S7
Naphthalene	µg/l	4	1	0.0255	2	BH207-01
Acenaphthene	µg/l	4	1	0.0221		BH207-01
Fluoranthene	µg/l	4	2	0.0361	0.0063	BH207-01 and BH208-01
Anthracene	µg/l	4	1	0.0076	0.1	BH207-01
Phenanthrene	µg/l	4	1	0.106		BH207-01
Fluorene	µg/l	4	1	0.0145		BH207-01
Pyrene	µg/l	4	2	0.0211		BH207-01 and BH208-01

Copper concentrations were above EQS values in leachate from samples BH207-01 (2.30 m bgl) and S7 (0.50 m bgl). Fluorene concentrations were above EQS values in leachate from samples BH207-01 (2.30 m bgl) and BH208-01 (1.50 m bgl).

The following determinands had concentrations below the level of detection. These potential contaminants can therefore be discounted from the assessment:

- Chloride
- Ammoniacal Nitrogen as NH₃
- Chromium, Hexavalent
- Chromium, Trivalent
- Arsenic (diss.filt)
- Cadmium
- Chromium
- Lead
- Selenium
- TPH Aliphatics & Aromatics
- Acenaphthylene
- Chrysene
- Benzo(a)anthracene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Benzo(a)pyrene
- Dibenzo(a,h)anthracene
- Benzo(g,h,i)perylene

4.6 Groundwater monitoring

Groundwater was encountered in boreholes BH204 and BH210 only, both towards the southeast of the Site.

At BH204, groundwater was initially encountered at 3.50 m bgl (c. 9.32 m aOD) within the dense slightly silty sandy GRAVEL.

At BH210, groundwater was encountered at 3.00 m bgl (c. 9.77 m aOD) within the dense slightly silty sandy GRAVEL.

However there were insufficient quantities of groundwater to conduct groundwater sampling. Therefore soil leachate results have been used to quantify a controlled waters risk assessment (see Section 7).

Groundwater monitoring results are presented in Table 4.3 Groundwater monitoring results. It should be noted that BH202 was not accessible during the second monitoring round.

Table 4.3 Groundwater monitoring results

BH_ID	13.12.2022	19.12.22	09.01.23
BH201	Dry	Dry	Dry
BH202	Dry	Borehole inaccessible at time of monitoring	Dry
BH203	Dry	Dry	Dry
BH204	Dry	Dry	Dry

It is noted that the boreholes were drilled to a shallower depth than originally planned due to collapsing ground conditions. This meant that piezometers did not extend through the full extent of the aquifer.

4.7 Ground gas monitoring results

Gas monitoring results are presented in Table 4.4. The full gas results are presented in Appendix A. Carbon dioxide concentrations varied between 1.0% and 4.8%, and methane was not detected. Flows ranged between 0.0 l/h to 4.0 l/h.

It should be noted that BH202 was not accessible during the second monitoring round. The results are summarised below:

Table 4.4 Gas monitoring results

13.12.2022			
	CH ₄	CO ₂	Flow (l/h)
BH_ID	Max concentrations (%)	Max concentrations (%)	Max (l/h)
BH201	0.0	2.3	No Flow
BH202	0.0	1.6	No Flow
BH203	0.0	1.9	No Flow
BH204	0.0	2.0	No Flow

19.12.2022			
	CH ₄	CO ₂	Flow (l/h)
BH_ID	Max concentrations (%)	Max concentrations (%)	Max (l/h)
BH201	0.0	1.0	2.1
BH202	Borehole inaccessible at time of monitoring		

19.12.2022			
	CH4	CO2	Flow (l/h)
BH203	0.0	4.4	4.0
BH204	0.0	4.8	3.6

09.01.2022			
	CH4	CO2	Flow (l/h)
BH_ID	Max concentrations (%)	Max concentrations (%)	Max (l/h)
BH201	0.0	2.1	2.1
BH202	0.0	1.1	3.0
BH203	0.0	3.7	3.4
BH204	0.0	3.4	1.1

5 CONCEPTUAL SITE MODEL

For a risk to exist due to land contamination, there needs to be one or more contaminant-pathway-receptor linkages – “contaminant linkage” – by which a relevant receptor might be affected by the contaminants in question. In other words, there must be contaminants present in, on or under the land in a form and quantity that pose a hazard, and one or more pathways by which they might impact as receptor. Defra (2012) provides the following definitions:

- (a) A “contaminant” is a substance which is in, on or under the land and which has the potential to cause significant harm to a relevant receptor, or to cause significant pollution of controlled waters.
- (b) A “receptor” is something that could be adversely affected by a contaminant, for example a person, an organism, an ecosystem, property, or controlled waters.
- (c) A “pathway” is a route by which a receptor is or might be affected by a contaminant.

The term “contaminant linkage” means the relationship between a contaminant, a pathway and a receptor. All three elements of a contaminant linkage must exist for there to be a risk to the identified receptor.

The conceptual Site model summarises what is known about the ground conditions at the Site, then goes on to describe potential sources, pathways and receptors. Chapter 4 presents the preliminary risk assessment.

5.1 Ground model

The Site is underlain by 1 m to 5.6 m of River Terrace Deposits (RTD; soft brown Clay at shallow depths, underlain by a brown clayey Gravel of Flint Chalk), underlain by London Clay. The RTD are classed as a Secondary Undifferentiated aquifer, with the underlying Clay classed as unproductive. During the Site investigation, groundwater levels were measured between 9.32 m aOD and 9.77 m aOD. Local groundwater flow is likely to be towards to the southeast towards the River Itchen (located c.700 m southeast, although tributary drainage channels are c.330 m to the southeast).

The Site was mostly undeveloped prior to development of the Eastleigh (Southampton) Airport (first mapped 1963), although an infilled gravel pit and allotments are present in the north of the Site. The existing runway in the southwest of the Site, and the current taxi access roads were mapped since 2000/2019. Numerous potential contaminative land uses are mapped in the vicinity of the Site, the most significant being the railway (and associated sidings, tanks and industry) immediately north and 145 m west of the Site.

5.2 Contaminant sources

Following the preliminary risk assessment, the contaminant sources have been redefined and assessed using the findings of the Site investigation combined with the laboratory chemical results. The following contaminant sources have therefore been identified and should be taken into consideration.

- Railways Sidings adjacent to the north including area of former diesel spillage (TPHs, PAHs, VOCs/SVOCs, PCBs, heavy metals, phenols, pesticides/herbicides, asbestos); and,

- Metals (including arsenic, copper, chromium, cadmium, lead, nickel, vanadium and zinc), TPH and PAH present in soils

5.3 Pathways

The following potential pathways for transport of pollutants have been identified:

- Inhalation of vapour outdoors
- Ingestion and inhalation of soil and dust outdoors
- Rainfall infiltration
- Surface water flow
- Groundwater flow
- Wind
- Sub-surface gas migration and accumulation
- Sulphate attack

5.4 Receptors

In the context of the current and proposed commercial land use, the following potential receptors were identified:

Human Health

- Current and future Site users (members of the public and maintenance workers); and
- Neighbouring commercial/residential Site users.

Controlled Waters

- Underlying Secondary (undifferentiated) Aquifer of River Terrace Deposits across the majority of the Site;
- Underlying Secondary A Aquifer(s) of River Terrace Deposits and bedrock Wittering Formation to the east of the Site; and
- Itchen Navigation located 330 m east and River Itchen 550m east.

The effects of sulphate on buried infrastructure are not included in the scope of this assessment.

The assessment does not include for site workers during the construction phase. Suitable measures should be undertaken to protect workers from exposure to potentially contaminated soils (which may contain asbestos) and groundwater during development.

6 HUMAN HEALTH RISK ASSESSMENT

The Human Health risk assessment has been undertaken in accordance with the Environment Agency's (2009) CLEA Framework, having due regard to the relevant statutory guidance regarding land affected by contamination (Defra, 2012). This approach is consistent with Defra and the Environment Agency's (2011) Model Procedures and more recent Land Contamination Risk Management guidance on gov.uk⁹.

Current best practice advocates the following approach to risk assessment:

- Development of the Site conceptual model
- Selection of appropriate generic screening criteria (GACs), taking into consideration the Site specific pollutant linkages that may be operating
- Screening of soil (and other media, if relevant) concentrations against GACs
- Further assessment and development of Site specific screening levels (SSSLs) if soil concentrations exceed GACs.

6.1 Critical receptor and selection of GACs

Under the proposed land use, most 'site users' will be passengers or staff in an aeroplane using the runway, and would not under normal circumstances have any significant exposure to potential soil contaminants. Child passengers are also considered to be at negligible risk of exposure to potential soil contaminants. The critical receptors are therefore considered to be Site workers and maintenance workers who may be exposed to potential soil contaminants while working in the vicinity of the runway extension and associated soakaway.

The Site is a commercial site; under the CLEA framework the critical receptor for a commercial land use is an adult worker aged 16 – 65. The exposure parameters used to derive Generic Assessment Criteria (GACs) for commercial land use are considered to be highly conservative for the runway land use, but have been adopted as an appropriate screening tool. Table 4.1 presents a summary of the soil concentrations, and also provides the Commercial Land Use GACs for comparison. It can be seen that the maximum recorded concentrations of all contaminants are significantly below the GACs for all substances. The Site will partly be covered in hardstanding, as the runway extension with associated taxiways (c.0.8 ha), further reducing exposure to potential contaminants.

It can be concluded that the observed soil concentrations do not present a significant risk to the identified critical receptor, an adult worker, under the proposed land use.

Off-site residents have also been identified as potential receptors. These are less sensitive than the receptors identified above, due to a greater distance from the Site and lower exposure to potential soil contaminants. As the risks to the critical receptors are considered to be low, the risks to off-site residents are also considered to be low.

⁹ <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

7 CONTROLLED WATERS RISK ASSESSMENT

The controlled waters risk assessment has been carried out in accordance with Environment Agency technical guidance on assessing risks to controlled waters (Remedial Targets Methodology (2006); Guiding Principles for Land Contamination GPLC1 – GPLC3 (2010); and Groundwater protection: Principles and Practice (GP3)(2013)).

The Environment Agency's Remedial Targets Methodology (2006) provides a methodology for deriving site-specific remedial targets for contaminated soil and/or groundwater. The methodology is based on a phased approach, with four levels of assessment. A compliance point is identified, at which a compliance concentration should not be exceeded. Each level of assessment predicts with a higher degree of sophistication whether the concentrations on Site will result in exceedances of the compliance concentration at the compliance point. The compliance point might be a controlled waters receptor, or a distance from the Site as set out by the Environment Agency in their Groundwater protection: Principles and Practice (GP3) (Environment Agency, 2013). For a soil source, the following levels of assessment are undertaken.

- At Level 1 the assessor considers whether contaminant concentrations in 'pore water' in soil are sufficient to impact on the receptor, taking no account of dilution, dispersion or attenuation along the transport pathway.
- At Level 2, the assessor considers the effects of attenuation processes in the soil and unsaturated zone and predicts the effects of dilution by groundwater flow below the Site.
- At Level 3 the assessor considers the effects of attenuation between the Site and a down gradient receptor or compliance point. The assessment can include processes such as dilution, dispersion, retardation, degradation or other processes.
- At Level 4 the assessor considers the effects of dilution in the receptor.

At each level of assessment, a remedial target is derived, which is the maximum concentration on Site that would not result in exceedances of the compliance concentration at the compliance point. If the remedial target is exceeded, consideration can be given to undertaking another assessment level, to reduce the conservatism in the assessment, or undertaking remediation.

For a groundwater source, where contaminants are already present measured in groundwater, a Level 3 assessment is undertaken which includes attenuation processes such as dispersion, retardation and degradation.

7.1 Controlled waters risk assessment – conceptual model

Groundwater was encountered between c. 9.32 m aOD and c. 9.77 m aOD within the sandy Gravels of the River Terrace Deposits (RTD). Local groundwater flow is likely to be towards the southeast towards the River Itchen (located c.700 m southeast, although tributary drainage channels are c.330 m to the southeast).

Sources of potential contamination are considered to be metals, TPH and PAH in soils. The railway depot to the north is a known source of non-aqueous phase hydrocarbons with the potential to migrate onto the subject Site.

The appropriate concerns for this risk assessment are:

- whether the construction activities are likely to result in disturbance of potential contamination that could result in pollution;
- whether the future functioning of the development, particularly the soakaway, could result in pollution from existing soil sources.

It is not appropriate for this risk assessment to consider potential contamination beyond the 'Site' boundary or for this development work to trigger remediation across a wider area.

7.2 Quantitative assessment

Copper concentrations in leachate were above EQS values (of 1 µg/l) in samples from BH207-01 (2.30 m bgl) and S7 (0.50 m bgl). The maximum concentration was 1.44 µg/l.

Copper was present at concentrations similar to the EQS, and is a very common element in the natural environment. The observed concentrations in leachate are not considered to be unusual or to suggest the presence of contamination at the Site. In any case, transport of copper is attenuated in groundwater and impacts to the receiving controlled waters would not result from the observed concentrations.

Fluoranthene concentrations in leachate were above EQS values (of 0.0063 µg/l) in samples from BH207-01 (0.036 µg/l at 2.30 m bgl) and BH208-01 (0.0067 µg/l at 1.50 m bgl). The observed fluoranthene concentrations are not considered to be significant on the basis of the available evidence, as follows:

- While the arithmetic mean concentration of fluoranthene in leachate was 0.01 µg/l, the geometric mean (a better indicator of a central value when there is variability in the dataset) was 0.0062 µg/l, below the EQS of 0.0063 µg/l
- Fluoranthene sorbs strongly to organic matter in soils and is heavily attenuated in groundwater. It is highly unlikely that the concentrations observed at the Site would result in significant pollution in the River Itchen, or in measurable change in quality
- In terms of potential impacts to the aquifer and the River Itchen, it is considered that the depot to the north has impacted the aquifer, including groundwater below the Site, albeit at low concentrations. Any remedial work undertaken at the Site would not deal with the source of potential pollution and would be likely reversed by continued migration from the north

All other determinands had concentrations below the EQS and therefore can be discounted from the assessment.

7.3 Discussion

It is evident from soil sampling results that there is an area impacted by hydrocarbons around BH208, likely resulting from migration around the elevation of the water table from the depot to the north. Trace concentrations of TPH have been found at similar depths at BH204, BH207 and BH210 (and fluoranthene at BH207 and BH208). The key mechanism by which pollution might arise as a result of the works is for construction work or the operation of the soakaway to disturb and mobilise existing contamination in the zone around the water table. Works are not planned in the area around BH208, and the risks are therefore deemed to be very low. Nonetheless, given the trace

concentrations of hydrocarbons elsewhere, it is recommended that a watching brief is maintained during excavation works so that any mobile contamination can be identified and a management plan derived with the agreement of the local authority.

The operation of the soakaway has the potential to mobilise contamination by the introduction of water over a small area to the aquifer. The risks are considered to be low because:

- The volume of water is unchanged from the present case, it is just concentrated in one location
- The gravel aquifer is relatively permeable, and groundwater below the soakaway will readily receive the soakaway effluent
- Concentrations of potential contaminants in the vicinity of the soakaway are not considered to present a risk to controlled waters

The risks to controlled waters arising from the impact of the works on the observed potential pollutants in soil at the Site are considered to be low.

It is noted that the original plans for Site investigation were to sample groundwaters and analyse for a wide suite of contaminants associated with airport use, including some compounds not analysed for in soil or leachate (ammonia, glycols, PFOS, PFOA, PBDE, Herbicide screen). This was not possible due to ground conditions at the Site precluding installation of piezometers to depth. However, it is considered highly unlikely that the development would cause pollution by mobilisation of any of these contaminants, for the reasons given above.

8 GROUND GAS RISK ASSESSMENT

A soil gas risk assessment has been undertaken in accordance with CIRIA 665 (Wilson et al, 2007).

Potential sources of ground gas generation may be associated with depths of landfill/infill material or significant thicknesses of Made Ground. The drilling results did not identify a source of significant ground gas at the Site.

With the exception of the soakaway, the Site will comprise open ground and there are no spaces in which ground gas could accumulate to create a hazard (hazards are typically asphyxiation and/or explosion).

Three gas monitoring readings were undertaken to characterise the gas regime (Table 4.4 Gas monitoring results). It should be noted that BH202 was not accessible during the second monitoring round and therefore could not be monitored during this visit.

A gas screening value (GSV) has been calculated by multiplying the highest gas concentration (4.0%) by the highest flow rate (4 l/h), resulting in a GSV of 0.192 l/hr (see Equation 1). This corresponds to CIRIA (R149) characteristic situation 2, classified as being at low risk.

Equation 1

$$\text{max gas concentraions (\%)} \times \text{relevent flow rate } \left(\frac{\text{l}}{\text{hr}}\right) = \text{gas screening value } \left(\frac{\text{l}}{\text{hr}}\right)$$

(CIRIA report 149)

In fact, the highest flow readings were associated with windy conditions rather than venting of soil gas, and it is considered that the conservative gas screening value gives an unrealistically high assessment of risk. In addition, the CIRIA (R149) relates to the ground gas risk for proposed buildings. As the proposed land use is a proposed runway extension (c.0.8 ha) and a soakaway (c.0.5 ha) which would allow venting of the ground gas, the risk can be reduced.

Therefore it has been determined that there is no significant ground gas risk, taking into account the current and proposed land use, and therefore no further remediation is necessary.

9 CONCLUSIONS

Ricardo Energy and Environment has asked H Fraser Consulting Ltd (HFCL) to provide a preliminary (Phase II) land quality assessment for a proposed runway extension and soakaway at Southampton Airport, S18 2NL. The report is required to fulfill planning condition 11 of the planning permission for the work.

A Site investigation was undertaken in November 2022, comprising of drilling six boreholes to a maximum depth of 3 m bgl. In addition, a further four boreholes were sunk to a maximum depth of 4 m bgl, which were installed with piezometers for groundwater and ground gas monitoring. Two soil samples were taken from each borehole. Nine shallow soil samples were hand dug to depths ranging between 0.3 – 1.0 m bgl. Submission of twenty nine soil samples for analysis of metals, speciated TPH, BTEX, PCBs, SVOCs including PAHs, and VOCs. Groundwater level monitoring and soil gas monitoring was undertaken on three occasions (13.12.22, 19.12.22 and 09.01.23).

The Site is underlain by River Terrace Deposits (Secondary Undifferentiated aquifer), underlain by London Clay (unproductive). Groundwater levels have been measured in previous phases of investigation between c.3.5 m and 4.2 m bgl. Local groundwater flow is likely to be towards the southeast towards the River Itchen (located c.700 m southeast, although tributary drainage channels are c.330 m to the southeast). The River Itchen and tributaries are a SSSI and SAC.

Potential contaminants discovered by the Site investigations included:

- Made Ground associated areas of infilling (Inorganics, TPHs, polyaromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), asbestos containing materials (ACMs), metals, polychlorinated biphenyls (PCBs), phenols, ground gases (carbon dioxide, methane);
- Nearby pollution incidents in northern section of the airport (TPHs, PAHs);
- Fuel tanks and chemical storage (Inorganics, TPHs, PAHs, VOCs/SVOCs, phenols);
- Heavy metal and glycol contamination;
- Car parks (TPHs and PAHs);
- Fire-Fighting agents (Glycols, ether alcohols, esters, perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA); and,
- De-Icing agents (Mono-propylene glycol).
- Railways Sidings adjacent to the north including area of former diesel spillage (TPHs, PAHs, VOCs/SVOCs, PCBs, heavy metals, phenols, pesticides/herbicides, asbestos); and,
- Railway line along western boundary (TPHs, PAHs, VOCs/SVOCs, PCBs, heavy metals, pesticides/herbicides, asbestos).

Potential receptors include human health (current and future Site users, neighbouring commercial/residential Site users), controlled waters (Underlying Secondary (undifferentiated) Aquifer of River Terrace Deposits and bedrock Wittering Formation to the east of the Site, Itchen Navigational located 330 m east and River Itchen 550m east) and the runway and buried concrete.

Site investigation and laboratory testing data has been used to quantitatively assess the risk to human health, controlled waters and ground gas in relation to the proposed development.

Soil samples indicate that the northeast corner of the Site is impacted by petroleum hydrocarbons and PAH at depth, indicating migration from the depot to the north. Trace concentrations are detected elsewhere at the Site, also at depth, indicating a wider spread of very low level (and not significant) impact.

The maximum recorded concentrations of all soil contaminants were significantly below the GACs for all substances. The Site will partly be covered in hardstanding, as the runway extension with associated taxiways (c.0.8 ha), further reducing exposure to potential contaminants. It can be concluded that the observed soil concentrations do not present a significant risk to the identified critical receptor, an adult worker, under the proposed land use.

Ground gas risk assessment indicates that there is no significant ground gas risk, taking into account the current and proposed land use, and no remediation is necessary.

The potential for pollution of controlled waters arising from the development, based on observed concentrations of potential contaminants in soil and leachate, is considered low. This is partly because the works are not planned in the area to the northeast that is impacted by hydrocarbons. If mobile hydrocarbons are present within the area directly affected by the works, there is the potential for pollution of controlled waters to be caused (and for construction workers to be affected). It is therefore recommended that a watching brief is maintained during excavation works. If hydrocarbon contamination is observed, a management strategy should be developed in consultation with the local authority.

On this basis, it is concluded that risks to future Site users and the environment arising from development at the Site are low.

Notwithstanding the above, good practice Site procedures should take into consideration the observed soil concentrations, and include appropriate health and safety measures to protect construction workers. Appropriate Site management measures should be employed to prevent pollution of controlled waters arising from construction activities.

10 RECOMMENDATIONS

- A watching brief should be maintained during excavation works. If hydrocarbon contamination is observed, a management strategy should be developed in consultation with the local authority.
- Good practice Site procedures should take into consideration the observed soil concentrations, and include appropriate health and safety measures to protect construction workers.
- Appropriate Site management measures should be employed to prevent pollution of controlled waters arising from construction activities.

11 REFERENCES

British Geological Survey, 1987. Southampton. England and Wales Sheet 315. Solid and drift geology, 1:50.000

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APPENDIX A

Site investigation data including borehole logs

KEY TO EXPLORATORY HOLE LOGS

The logging of soils and rocks has been carried out in general accordance with BS5930: 2015+A1:2020 and BS EN ISO 14688 [Parts 1 and 2]. Where appropriate logging to CIRIA C570 or CIRIA C574 has been adopted.

Sample type

B	Large disturbed sample
C	Core run
CS	Rotary core sub-sample
D	Small disturbed sample
ES	Environmental sample
SPT	Standard penetration test carried out using split spoon (split spoon sample retained)
SPT C	Standard penetration test carried out using solid cone (no sample retained)
U70 or U100	Undisturbed sample followed by nominal dia. of sample. (Using thick-walled open-tube sampler – OS-TK/W)
UT100	Undisturbed sample followed by nominal dia. of sample. (Using thin-walled open-tube sampler – OS-T/W)
W	Water sample

Water levels

		3.00m/Dry
Initial Water Strike	Level after monitoring	Standing Level/No groundwater encountered

In situ Testing

S 30	Denotes SPT undertaken using split spoon followed by N Value (EN ISO 22476-3:2005+A1:2011)
C 30	Denotes SPT undertaken using solid cone followed by N Value (EN ISO 22476-3:2005+A1:2011)
*240	Denotes SPT where full test drive has not been completed and linearly extrapolated N value reported
**	Denotes no effective penetration (Linearly extrapolated N value > 1000)
H 30	Hand shear vane. Direct reading in kPa

Sample range

	Undisturbed sample		Core run		U(T)100 Undisturbed Samples		Rotary core sub-sample
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Strata Boundaries

	Solid boundary
	Estimated boundary
	Gradational boundary

Installation Details

	Porous Tip		Screened Standpipe		Bentonite seal
	Plain standpipe		Granular response zone		Concrete
	Grout		Backfill with arisings		

Revision history

Version	Date	Author	Reviewed by	Reason for revision
V1	19/08/20	E. Withington	M. Atherton	First issue (new format)

WINDOWLESS SAMPLE LOG



Borehole No.

BH201

Sheet 1 of 2

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: info@CCGround.co.uk

Project Name: Southampton Airport	Project No: C7793	Co-ords: E 445548 N 117949	Hole Type WS
Location: Eastleigh	Level: 13.61mAOD	Scale 1 : 25.00	
Client: Ricardo Energy & Environment	Dates: Start: 22/11/2022 End: 22/11/2022	Logged By JW	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result						
1		B	0.10 - 0.30				TOPSOIL: Brown slightly clayey SAND with frequent rootlets. Sand is fine.	0.10	13.51	
		H	0.20	49			Soft brown mottled dark brown slightly sandy CLAY with rare rootlets. Sand is fine.			
		B	0.30 - 0.50							
		B	0.50 - 0.70	63						
		D	0.50							
		H								
2		B	1.00 - 1.20				0.80-1.40m: Slightly gravelly. Gravel is sub-angular to sub-rounded fine to coarse of siliceous material and chert.	(1.70)		
		B	1.20 - 1.60	S 5						
		SPT	1.20 - 1.65				1.40-1.80m: Gravelly.			
		B	1.60 - 2.00							
3		B	2.00 - 3.00	S 43			Dense yellowish brown slightly clayey sandy angular to sub-rounded fine to coarse GRAVEL of chert and siliceous material. Sand is fine to coarse.	1.80	11.81	
		D	2.00							
		SPT	2.00 - 2.45							
4		B	3.00 - 3.80	S 48						
		SPT	3.00 - 3.45							
		SPT	3.80 - 4.25	S 43			Borehole completed at 3.80m	3.80	9.81	

EQUIPMENT: Hand digging tools. Terrier 2002 track mounted rig.

METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous disturbed sampling using 101mm sample barrel: 1.20-3.80m.

CASING: 113mm diam to 2.00m.

GROUNDWATER: Not encountered.

INSTALLATION: 50mm ID HDPE slotted pipe with washed gravel response zone: 1.00-3.80m. 50mm ID HDPE plain pipe with bentonite pellet seal: 0.20-1.00m. Flush 150mm steel cover set in concrete: 0.00-0.20m. Gas valve fitted.

REMARKS: Sampling refused at 3.80m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
22/11/2022 06:00	3.80	2.00	

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
22/11/2022 06:00	3.80	2.00	



WINDOWLESS SAMPLE LOG

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: info@CCGround.co.uk

Project Name: Southampton Airport	Project No: C7793	Co-ords: E 445548 N 117949	Hole Type WS
Location: Eastleigh	Level: 13.61mAOD	Scale 1 : 25.00	
Client: Ricardo Energy & Environment	Dates: Start: 22/11/2022 End: 22/11/2022	Logged By JW	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result						
5										
6										
7										
8										

Groundwater:

Date Strike Depth (m) Casing Depth (m) Depth After Observation (m)

Hole Progress:

Date Hole Depth (m) Casing Depth (m) Water Depth (m)



WINDOWLESS SAMPLE LOG

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: info@CCGround.co.uk

Project Name: Southampton Airport	Project No: C7793	Co-ords: E 445714 N 117776	Hole Type WS
Location: Eastleigh	Level: 12.70m AOD	Scale 1 : 25.00	
Client: Ricardo Energy & Environment	Dates: Start: 24/11/2022 End: 24/11/2022	Logged By AW	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result						
1							TOPSOIL: Soft brown sandy CLAY with frequent roots and rootlets <3mm.	(0.20)		
		B H	0.20 0.25	65			Soft brown mottled light brown slightly gravelly sandy CLAY with rare roots and rootlets <2mm. Gravel is sub-angular fine to medium of siliceous material.	0.20	12.50	
		B	0.70					(0.80)		
		B D SPT	1.10 1.20 - 1.65	S 20			Soft brown gravelly silty CLAY with occasional gravel sized pockets of silt. Gravel is angular to sub-angular fine to coarse of siliceous material.	1.00 (0.20)	11.70 11.50	
							Medium dense brown sandy clayey angular to sub-angular fine to coarse GRAVEL of siliceous material and flint.	1.20 (0.50)		
2							Dense brown sandy silty angular to sub-angular fine to coarse GRAVEL of siliceous material and flint.	1.70 (0.30)	11.00	
		SPT	2.00 - 2.43	S*53			Borehole completed at 2.00m	2.00	10.70	
3										
4										

EQUIPMENT: Hand digging tools. Terrier 2002 track mounted rig.

METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous disturbed sampling using 101mm sample barrel: 1.20-2.00m.

CASING: 113mm diam to 2.00m.

GROUNDWATER: Not encountered.

INSTALLATION: 50mm ID HDPE slotted pipe with washed gravel response zone: 1.00-2.00m. 50mm ID HDPE plain pipe with bentonite pellet seal: 0.20-1.00m. Flush 150mm steel cover set in concrete: 0.00-0.20m. Gas valve fitted.

REMARKS: Sampling refused at 2.00m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
24/11/2022 11:15	2.00	2.00	

WINDOWLESS SAMPLE LOG



Borehole No.

BH204

Sheet 1 of 2

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: info@CCGround.co.uk

Project Name: Southampton Airport	Project No: C7793	Co-ords: E 445693 N 117700	Hole Type WS
Location: Eastleigh	Level: 12.82mAOD	Scale 1 : 25.00	
Client: Ricardo Energy & Environment	Dates: Start: 24/11/2022 End: 24/11/2022	Logged By AW	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result						
1		B	0.20	62			TOPSOIL: Soft brown mottled dark grey slightly gravelly sandy CLAY with frequent roots and rootlets <2mm. Gravel is angular fine to medium of siliceous material.	(0.25)	12.57	
		H					Soft brown mottled orangish brown and grey slightly gravelly slightly sandy silty CLAY with occasional fine gravel sized pockets of silt. Gravel is angular fine to coarse of flint and siliceous material.	0.25		
		B	0.50				0.25-0.50m: With rare roots and rootlets <2mm.	(1.15)		
		B	1.00							
		SPT	1.20 - 1.65	S 20						
2		B	1.40 - 2.20				Medium dense brown sandy clayey angular to sub angular fine to coarse GRAVEL of flint and siliceous material.	1.40	11.42	
		SPT	2.00 - 2.45	S 22				(0.80)		
3							Brown slightly silty sandy angular to sub angular fine to coarse GRAVEL of flint and siliceous material.	2.20	10.62	
		D	2.90 - 3.00				2.90-3.00m: Gravel sized pocket of sandy silt.			
		SPT	3.00 - 3.45	S 42			3.00-4.00m: Dense.	(1.80)		
4		D	3.90 - 4.00							

Borehole completed at 4.00m

EQUIPMENT: Hand digging tools. Terrier 2002 track mounted rig.

METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous disturbed sampling using 101mm and 86mm sample barrels: 1.20-4.00m.

CASING: 113mm diam to 2.00m.

GROUNDWATER: Encountered at 3.50m, rose to 3.20m.

INSTALLATION: 50mm ID HDPE slotted pipe with washed gravel response zone: 1.00-3.20m. 50mm ID HDPE plain pipe with bentonite pellet seal: 0.20-1.00m. Flush 150mm steel cover set in concrete: 0.00-0.20m. Gas valve fitted.

REMARKS: Upon completion of run 3.00-4.00m hole collapsed back to 3.20m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
24/11/22	3.50		3.20

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
24/11/2022 10:15	4.00	2.00	



WINDOWLESS SAMPLE LOG

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: info@CCGround.co.uk

Project Name: Southampton Airport	Project No: C7793	Co-ords: E 445693 N 117700	Hole Type WS
Location: Eastleigh	Level: 12.82mAOD	Scale 1 : 25.00	
Client: Ricardo Energy & Environment	Dates: Start: 24/11/2022 End: 24/11/2022	Logged By AW	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result						
5								4.00	8.82	
6										
7										
8										

Groundwater:

Date Strike Depth (m) Casing Depth (m) Depth After Observation (m)

Hole Progress:

Date Hole Depth (m) Casing Depth (m) Water Depth (m)

WINDOWLESS SAMPLE LOG



Borehole No.

BH205

Sheet 1 of 1

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: info@CCGround.co.uk

Project Name: Southampton Airport	Project No: C7793	Co-ords: E 445617 N 117919	Hole Type WS
Location: Eastleigh	Level: 13.23mAOD	Scale 1 : 25.00	
Client: Ricardo Energy & Environment	Dates: Start: 22/11/2022 End: 22/11/2022	Logged By JW	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result						
1		B	0.10 - 0.30				TOPSOIL: Brown slightly clayey fine SAND with frequent roots and rootlets <3mm.	0.10	13.13	
		H	0.20	43			Soft brown mottled dark brown slightly sandy CLAY with rare rootlets. Sand is fine.			
		B	0.30 - 0.50							
		B	0.50 - 0.70	65						
		H	0.50							
								(1.50)		
2		B	1.00 - 1.20				1.00-1.60m: Slightly gravelly. Gravel is sub-angular to sub-rounded fine to coarse of chert and siliceous material.			
		B	1.20 - 1.60	S 16						
		SPT	1.20 - 1.65							
3		B	1.60 - 2.00				Dense yellowish brown slightly clayey sandy angular to sub-rounded fine to coarse GRAVEL of chert and siliceous material. Sand is fine to coarse.	1.60	11.63	
		B	2.00 - 3.00	S 31						
		SPT	2.00 - 2.45					(1.40)		
4										
		SPT	3.00 - 3.45	S 43			Borehole completed at 3.00m	3.00	10.23	

EQUIPMENT: Hand digging tools. Terrier 2002 track mounted rig.
 METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous disturbed sampling using 101mm sample barrel: 1.20-3.00m.
 CASING: 113mm diam to 2.00m.
 GROUNDWATER: Not encountered.
 BACKFILL: On completion borehole backfilled with bentonite pellets and reinstated with arisings.
 REMARKS: Upon completion of run 2.00-3.00m hole collapsed back to 2.80m.

Groundwater:

Date Strike Depth (m) Casing Depth (m) Depth After Observation (m)

Hole Progress:

Date Hole Depth (m) Casing Depth (m) Water Depth (m)
 22/11/2022 06:00 3.00 2.00

WINDOWLESS SAMPLE LOG



Borehole No.

BH206

Sheet 1 of 1

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: info@CCGround.co.uk

Project Name: Southampton Airport	Project No: C7793	Co-ords: E 445562 N 117891	Hole Type WS
Location: Eastleigh	Level: 13.46mAOD	Scale 1 : 25.00	
Client: Ricardo Energy & Environment	Dates: Start: 22/11/2022 End: 22/11/2022	Logged By JW	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result						
1		B	0.10 - 0.30				TOPSOIL: Brown slightly clayey fine SAND with frequent roots and rootlets <3mm.	0.10	13.36	
		H	0.20	54			Soft brown mottled dark brown slightly sandy CLAY with rare rootlets. Sand is fine.			
		B	0.30 - 0.50							
		B	0.50 - 0.70	70						
		H	0.50							
2		B	1.00 - 1.20				1.00-1.70m: Gravelly. Gravel is sub-angular fine to coarse chert and siliceous material.	(1.60)		
		B	1.20 - 1.70	S 2						
		SPT	1.20 - 1.65							
3							Very dense yellowish brown slightly clayey sandy angular to sub-rounded fine to coarse GRAVEL of chert and siliceous material. Sand is fine to coarse.	1.70	11.76	
								(0.30)		
4		SPT	2.00 - 2.39	S*64			Borehole completed at 2.00m	2.00	11.46	

EQUIPMENT: Hand digging tools. Terrier 2002 track mounted rig.
 METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous disturbed sampling using 101mm sample barrel: 1.20-2.00m.
 CASING: 113mm diam to 2.00m.
 GROUNDWATER: Not encountered.
 BACKFILL: On completion borehole backfilled with bentonite pellets and reinstated with arisings.
 REMARKS: Sampling refused at 2.00m.

Groundwater:

Date Strike Depth (m) Casing Depth (m) Depth After Observation (m)

Hole Progress:

Date Hole Depth (m) Casing Depth (m) Water Depth (m)
 22/11/2022 06:00 0.00 2.00



WINDOWLESS SAMPLE LOG

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: info@CCGround.co.uk

Project Name: Southampton Airport	Project No: C7793	Co-ords: E 445583 N 117820	Hole Type WS
Location: Eastleigh	Level: 13.27mAOD	Scale 1 : 25.00	
Client: Ricardo Energy & Environment	Dates: Start: 23/11/2022 End: 23/11/2022	Logged By JW	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result						
1		B	0.10 - 0.30				TOPSOIL: Brown slightly clayey fine SAND with frequent roots and rootlets.	(0.20)		
		H	0.20	59			Soft brown mottled dark brown slightly sandy CLAY with rare rootlets. Sand is fine.	0.20	13.07	
		B	0.50 - 0.70	70						
		H	0.50							
		B	1.00 - 1.20				1.00-1.45m: Slightly gravelly. Gravel is sub-angular fine and medium chert and siliceous material.	(1.25)		
2		B	1.20 - 1.45	S 12						
		SPT	1.20 - 1.65							
		B	1.45 - 2.25				Dense yellowish brown slightly clayey sandy angular and sub-angular fine to coarse GRAVEL of chert and siliceous material.	1.45	11.82	
		SPT	2.00 - 2.45	S 35				(1.05)		
		SPT	2.50 - 2.95	S 50			Borehole completed at 2.50m	2.50	10.77	
3										
4										

EQUIPMENT: Hand digging tools. Terrier 2002 track mounted rig.
 METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous disturbed sampling using 101mm and 86mm sample barrels: 1.20-2.50m.
 CASING: Not used.
 GROUNDWATER: Not encountered.
 BACKFILL: On completion borehole backfilled with bentonite pellets and reinstated with arisings.
 REMARKS: Sampling refused at 2.50m.

Groundwater:

Date Strike Depth (m) Casing Depth (m) Depth After Observation (m)

Hole Progress:

Date Hole Depth (m) Casing Depth (m) Water Depth (m)
 23/11/2022 06:00 2.50



WINDOWLESS SAMPLE LOG

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: info@CCGround.co.uk

Project Name: Southampton Airport	Project No: C7793	Co-ords: E 445727 N 117838	Hole Type WS
Location: Eastleigh	Level: 12.74mAOD	Scale 1 : 25.00	
Client: Ricardo Energy & Environment	Dates: Start: 24/11/2022 End: 24/11/2022	Logged By AW	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result						
1		B H	0.20	59			TOPSOIL: Soft brown slightly gravelly sandy CLAY with frequent roots and rootlets <4mm. Gravel is angular fine to medium of siliceous material.	(0.40)		
		B	0.50				Soft brown mottled orangish brown gravelly slightly sandy CLAY. Gravel is angular to sub-angular fine to coarse of siliceous material and flint.	0.40 (0.30)	12.34	
		B					Brown sandy clayey angular to sub-angular fine to coarse GRAVEL of siliceous material and flint.	0.70	12.04	
		B SPT D	1.00 1.00 - 1.45 1.10	S 20			Medium dense brown sandy silty angular to sub-angular fine to coarse GRAVEL of siliceous material and flint.	(0.55) 1.25	11.49	
		B	1.50 - 2.60							
2		SPT	2.00 - 2.45	S 39			2.00-3.00m: Dense.	(1.75)		
3							2.70-3.00m Strong hydrocarbon odour. Gravels stained grey.			
							Borehole completed at 3.00m	3.00	9.74	
4										

EQUIPMENT: Hand digging tools. Terrier 2002 track mounted rig.
 METHOD: Hand dug inspection pit: 0.00-1.00m. Continuous disturbed sampling using 101mm and 86mm sample barrels: 1.00-3.00m.
 CASING: 113mm diam to 2.00m.
 GROUNDWATER: Not encountered.
 BACKFILL: On completion borehole backfilled with bentonite pellets and reinstated with arisings.
 REMARKS: Upon completion of run 2.00-3.00m hole collapsed back to 2.70m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
------	------------------	------------------	-----------------------------

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
24/11/2022 12:45	3.00	2.00	



WINDOWLESS SAMPLE LOG

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: info@CCGround.co.uk

Project Name: Southampton Airport	Project No: C7793	Co-ords: E 445673 N 117814	Hole Type WS
Location: Eastleigh	Level: 12.89mAOD	Scale 1 : 25.00	
Client: Ricardo Energy & Environment	Dates: Start: 23/11/2022 End: 23/11/2022	Logged By AW	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result						
1		B	0.20				TOPSOIL: Soft brown mottled back sandy CLAY with frequent roots and rootlets <2mm.	(0.25)		
		B	0.50				Soft brown mottled orangish brown slightly gravelly sandy CLAY. Gravel is sub-rounded fine and medium of chert and siliceous material.	0.25	12.64	
		B	1.00					(1.25)		
		B SPT	1.20 - 1.50 1.20 - 1.65	S 21						
		B	1.50 - 1.80				Brown slightly clayey sandy angular and sub-angular fine to coarse GRAVEL of chert, flint and siliceous material.	1.50 (0.30)	11.39	
		SPT	1.80 - 2.15	S*86			Borehole completed at 1.80m	1.80	11.09	
2										
3										
4										

EQUIPMENT: Hand digging tools. Terrier 2002 track mounted rig.
 METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous disturbed sampling using 101mm sample barrel: 1.20-1.80m.
 CASING: 113mm diam to 1.80m.
 GROUNDWATER: Not encountered.
 BACKFILL: On completion borehole backfilled with bentonite pellets and reinstated with arisings.
 REMARKS: Sampling refused at 1.80m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
23/11/2022 06:00	1.80	1.80	



WINDOWLESS SAMPLE LOG

Telephone: 01452 739 165 , Fax: 01452 739 220 , Email: info@CCGround.co.uk

Project Name: Southampton Airport	Project No: C7793	Co-ords: E 445671 N 117742	Hole Type WS
Location: Eastleigh	Level: 12.77mAOD	Scale 1 : 25.00	
Client: Ricardo Energy & Environment	Dates: Start: 23/11/2022 End: 23/11/2022	Logged By JW	

(m)	Water Levels	Samples & In Situ Testing			Sample	Install	Description	Depth (m)	Level (mAOD)	Legend
		No/Type	Depth (m)	Result						
1		B	0.10 - 0.30				TOPSOIL: Brown slightly clayey fine SAND with frequent roots and rootlets <3mm.	(0.20)		
		H	0.20	59			Soft brown slightly gravelly slightly sandy CLAY with rare roots and rootlets. Sand is fine. Gravel is sub-angular and sub-rounded fine to coarse chert and siliceous material.	0.20	12.57	
		B	0.50 - 0.70	69				(1.00)		
		H	0.50							
2		B	1.00 - 1.20							
		B	1.20 - 1.80	S 16			Medium dense yellowish brown slightly sandy clayey angular and sub-angular fine to coarse GRAVEL of chert and siliceous material.	1.20	11.57	
		SPT	1.20 - 1.65					(0.60)		
		B	1.80 - 3.00				Dense yellowish brown sandy angular fine to coarse GRAVEL of chert and siliceous material. Sand is fine to coarse.	1.80	10.97	
3		SPT	2.00 - 2.45	S 32				(1.20)		
4		SPT	3.00 - 3.45	S 29			Borehole completed at 3.00m	3.00	9.77	

EQUIPMENT: Hand digging tools. Terrier 2002 track mounted rig.
 METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous disturbed sampling using 101mm and 86mm sample barrels: 1.20-3.00m.
 CASING: 113mm diam to 2.00m.
 GROUNDWATER: Groundwater encountered at 3.00m, no rise recorded.
 BACKFILL: On completion borehole backfilled with bentonite pellets and reinstated with arisings.
 REMARKS: Upon completion of run 2.00-3.00m hole collapsed back to 2.00m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
23/11/22	3.00		

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
23/11/2022 06:00	3.00	2.00	

APPENDIX B

Laboratory certificates



Unit 7-8 Hawarden Business Park

Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528777

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

H Fraser Consulting
The Pump House
Coton Hill
Shrewsbury
SY1 2DP

Attention: Hannah Fraser

CERTIFICATE OF ANALYSIS

Date of report Generation:	05 December 2022
Customer:	H Fraser Consulting
Sample Delivery Group (SDG):	221128-15
Your Reference:	30691
Location:	Southampton Airport
Report No:	670973
Order Number:	

We received 9 samples on Friday November 25, 2022 and 9 of these samples were scheduled for analysis which was completed on Monday December 05, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

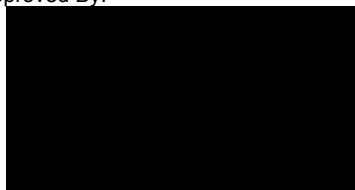
Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



Sonia McWhan

Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 221128-15
Client Ref.: 30691

Report Number: 670973
Location: Southampton Airport

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
27228406	BH203-01		0.70 - 0.70	24/11/2022
27228409	BH203-02		2.00 - 2.00	24/11/2022
27228404	BH204-01		2.30 - 2.30	24/11/2022
27228405	BH204-02		3.90 - 3.90	24/11/2022
27228411	BH208-01		1.50 - 1.50	24/11/2022
27228412	BH208-02		2.70 - 2.70	24/11/2022
27228413	S5		1.00 - 1.00	22/11/2022
27228414	S6		0.90 - 0.90	22/11/2022
27228415	S7		0.50 - 0.50	22/11/2022

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 221128-15
Client Ref.: 30691

Report Number: 670973
Location: Southampton Airport

Superseded Report:

Results Legend

- X** Test
- N** No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	27228406	BH203-01					0.70 - 0.70	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	S		
	27228409	BH203-02					2.00 - 2.00	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	S		
	27228404	BH204-01					2.30 - 2.30	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	S		
	27228405	BH204-02					3.90 - 3.90	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	S		
	27228411	BH208-01					1.50 - 1.50	250ml Amber Gl. PTFE/PE (ALE219)	250g Amber Jar (ALE210)	S		
	27228412	BH208-02					2.70 - 2.70	60g VOC (ALE215)	250g Amber Jar (ALE210)	S		
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 3										
Anions by Kone (soil)	All	NDPs: 0 Tests: 9										
Anions by Kone (w)	All	NDPs: 0 Tests: 3										
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 9										
Chromium III	All	NDPs: 0 Tests: 12										
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3										
EPH CWG (Aliphatic) Filtered GC (W)	All	NDPs: 0 Tests: 3										
EPH CWG (Aromatic) Filtered GC (W)	All	NDPs: 0 Tests: 3										
EPH CWG GC (S)	All	NDPs: 0 Tests: 9										
GRO by GC-FID (S)	All	NDPs: 0 Tests: 9										
GRO by GC-FID (W)	All	NDPs: 0 Tests: 3										
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 9										
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 3										
Mercury Dissolved	All	NDPs: 0 Tests: 3										
Metals in solid samples by OES	All	NDPs: 0 Tests: 9										



CERTIFICATE OF ANALYSIS

Validated

SDG: 221128-15
Client Ref.: 30691

Report Number: 670973
Location: Southampton Airport

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
27228406	BH203-01	0.70 - 0.70	Light Brown	Silty Clay Loam	Vegetation	Stones
27228409	BH203-02	2.00 - 2.00	Light Brown	Sandy Clay	Stones	None
27228404	BH204-01	2.30 - 2.30	Light Brown	Sand	Stones	None
27228405	BH204-02	3.90 - 3.90	Light Brown	Sand	Stones	None
27228411	BH208-01	1.50 - 1.50	Light Brown	Silty Sand	Stones	None
27228412	BH208-02	2.70 - 2.70	Light Brown	Sand	Stones	None
27228413	S5	1.00 - 1.00	Light Brown	Silty Clay	Stones	None
27228414	S6	0.90 - 0.90	Light Brown	Silty Clay	None	None
27228415	S7	0.50 - 0.50	Light Brown	Silty Clay	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 221128-15
Client Ref.: 30691

Report Number: 670973
Location: Southampton Airport

Superseded Report:

Results Legend			Customer Sample Ref.	BH203-01	BH203-02	BH204-01	BH204-02	BH208-01	BH208-02
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4*5@	Sample deviation (see appendix)								
		Depth (m)	0.70 - 0.70	2.00 - 2.00	2.30 - 2.30	3.90 - 3.90	1.50 - 1.50	2.70 - 2.70	
		Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	
		Date Sampled	24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022	
		Sample Time	-	-	-	-	-	-	
		Date Received	25/11/2022	25/11/2022	25/11/2022	25/11/2022	25/11/2022	25/11/2022	
		SDG Ref	221128-15	221128-15	221128-15	221128-15	221128-15	221128-15	
		Lab Sample No.(s)	27228406	27228409	27228404	27228405	27228411	27228412	
		AGS Reference							
Component		LOD/Units	Method						
Moisture Content Ratio (% of as received sample)		%	PM024	17	8.9	12	14	8.1	8.4
Ammoniacal Nitrogen as NH3 NRA leach		<0.2 mg/l	TM099					<0.2	
pH		1 pH Units	TM133	6.79	8.9	8.83	8.84	8.91	8.6
Chromium, Hexavalent		<0.6 mg/kg	TM151	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Chromium, Trivalent NRA leach		<0.03 mg/l	TM152					<0.03	
Arsenic (diss.filt) NRA leach		<0.5 µg/l	TM152					<0.5	
Cadmium (diss.filt) NRA leach		<0.08 µg/l	TM152					<0.08	
Chromium (diss.filt) NRA leach		<1 µg/l	TM152					<1	
Copper (diss.filt) NRA leach		<0.3 µg/l	TM152					0.818	
Lead (diss.filt) NRA leach		<0.2 µg/l	TM152					<0.2	
Nickel (diss.filt) NRA leach		<0.4 µg/l	TM152					<0.4	
Selenium (diss.filt) NRA leach		<1 µg/l	TM152					<1	
Vanadium (diss.filt) NRA leach		<1 µg/l	TM152					<1	
Zinc (diss.filt) NRA leach		<1 µg/l	TM152					1.27	
Naphthalene (diss.filt) NRA leach		<0.01 µg/l	TM178					<0.01	
Acenaphthene (diss.filt) NRA leach		<0.005 µg/l	TM178					<0.005	
Acenaphthylene (diss.filt) NRA leach		<0.005 µg/l	TM178					<0.005	
Fluoranthene (diss.filt) NRA leach		<0.005 µg/l	TM178					0.0067	
Anthracene (diss.filt) NRA leach		<0.005 µg/l	TM178					<0.005	
Phenanthrene (diss.filt) NRA leach		<0.005 µg/l	TM178					<0.005	
Fluorene (diss.filt) NRA leach		<0.005 µg/l	TM178					<0.005	
Chrysene (diss.filt) NRA leach		<0.005 µg/l	TM178					<0.005	
Pyrene (diss.filt) NRA leach		<0.005 µg/l	TM178					0.0058	
Benzo(a)anthracene (diss.filt) NRA leach		<0.005 µg/l	TM178					<0.005	
Benzo(b)fluoranthene (diss.filt) NRA leach		<0.005 µg/l	TM178					<0.005	
Benzo(k)fluoranthene (diss.filt) NRA leach		<0.005 µg/l	TM178					<0.005	
Benzo(a)pyrene (diss.filt) NRA leach		<0.002 µg/l	TM178					<0.002	
Dibenzo(a,h)anthracene (diss.filt) NRA leach		<0.005 µg/l	TM178					<0.005	
Benzo(g,h,i)perylene (diss.filt) NRA leach		<0.005 µg/l	TM178					<0.005	
Indeno(1,2,3-cd)pyrene (diss.filt) NRA leach		<0.005 µg/l	TM178					<0.005	
PAH Sum of EPA 16 detected (Diss filt) NRA leach		<0.082 µg/l	TM178					<0.082	
Chromium, Trivalent		<0.9 mg/kg	TM181	10.9	4.4	5.09	2.58	8.67	3.57
Arsenic		<0.6 mg/kg	TM181	11	5.11	5.39	5.13	3.9	5.25



CERTIFICATE OF ANALYSIS

Validated

SDG: 221128-15
Client Ref.: 30691

Report Number: 670973
Location: Southampton Airport

Superseded Report:

Results Legend		Customer Sample Ref.	S5	S6	S7			
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*5@ Sample deviation (see appendix)		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 1.00 Unspecified Solid (UNS) 22/11/2022	0.90 - 0.90 Unspecified Solid (UNS) 22/11/2022	0.50 - 0.50 Unspecified Solid (UNS) 22/11/2022			
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	16	16	16			
Ammoniacal Nitrogen as NH3 NRA leach	<0.2 mg/l	TM099	<0.2		<0.2			
pH	1 pH Units	TM133	7.73	7.76	7.36			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6	<0.6			
Chromium, Trivalent NRA leach	<0.03 mg/l	TM152	<0.03		<0.03			
Arsenic (diss.filt) NRA leach	<0.5 µg/l	TM152	<0.5		<0.5			
Cadmium (diss.filt) NRA leach	<0.08 µg/l	TM152	<0.08		<0.08			
Chromium (diss.filt) NRA leach	<1 µg/l	TM152	<1		<1			
Copper (diss.filt) NRA leach	<0.3 µg/l	TM152	0.604		1.33			
Lead (diss.filt) NRA leach	<0.2 µg/l	TM152	<0.2		<0.2			
Nickel (diss.filt) NRA leach	<0.4 µg/l	TM152	<0.4		0.622			
Selenium (diss.filt) NRA leach	<1 µg/l	TM152	<1		<1			
Vanadium (diss.filt) NRA leach	<1 µg/l	TM152	<1		<1			
Zinc (diss.filt) NRA leach	<1 µg/l	TM152	1.8		3.29			
Naphthalene (diss.filt) NRA leach	<0.01 µg/l	TM178	<0.01		<0.01			
Acenaphthene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
Acenaphthylene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
Fluoranthene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
Anthracene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
Phenanthrene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
Fluorene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
Chrysene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
Pyrene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
Benzo(a)anthracene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
Benzo(b)fluoranthene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
Benzo(k)fluoranthene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
Benzo(a)pyrene (diss.filt) NRA leach	<0.002 µg/l	TM178	<0.002		<0.002			
Dibenzo(a,h)anthracene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
Benzo(g,h,i)perylene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
Indeno(1,2,3-cd)pyrene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005		<0.005			
PAH Sum of EPA 16 detected (Diss filt) NRA leach	<0.082 µg/l	TM178	<0.082		<0.082			
Chromium, Trivalent	<0.9 mg/kg	TM181	20.2	17.9	21.6			
Arsenic	<0.6 mg/kg	TM181	10.4	8.17	8.36			



Superseded Report:



CERTIFICATE OF ANALYSIS

Validated

SDG: 221128-15
Client Ref.: 30691Report Number: 670973
Location: Southampton Airport

Superseded Report:

VOC MS (S)

Results Legend			Customer Sample Ref.		BH203-01	BH203-02	BH204-01	BH204-02	BH208-01	BH208-02
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.flit Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*§@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.70 - 0.70 Unspecified Solid (UNS) 24/11/2022	2.00 - 2.00 Unspecified Solid (UNS) 24/11/2022	2.30 - 2.30 Unspecified Solid (UNS) 24/11/2022	3.90 - 3.90 Unspecified Solid (UNS) 24/11/2022	1.50 - 1.50 Unspecified Solid (UNS) 24/11/2022	2.70 - 2.70 Unspecified Solid (UNS) 24/11/2022		
Component	LOD/Units	Method								
Dibromofluoromethane**	%	TM116	105	107	117	109	109	114		
Toluene-d8**	%	TM116	97	99.3	98.3	97.6	98.8	93.9		
4-Bromofluorobenzene**	%	TM116	82.5	94.8	94.5	94.8	93.4	92		
Dichlorodifluoromethane	<6 µg/kg	TM116					<6	<120		
Chloromethane	<7 µg/kg	TM116					<7	<140		
Vinyl Chloride	<6 µg/kg	TM116					<6	<120		
Bromomethane	<10 µg/kg	TM116					<10	<200		
Chloroethane	<10 µg/kg	TM116					<10	<200		
Trichlorofluoromethane	<6 µg/kg	TM116					<6	<120		
1,1-Dichloroethene	<10 µg/kg	TM116					<10	<200		
Carbon Disulphide	<7 µg/kg	TM116					<7	<140		
Dichloromethane	<10 µg/kg	TM116					<10	<200		
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	<10	<10	<10	<10	<200		
trans-1,2-Dichloroethene	<10 µg/kg	TM116					<10	<200		
1,1-Dichloroethane	<8 µg/kg	TM116					<8	<160		
cis-1,2-Dichloroethene	<6 µg/kg	TM116					<6	<120		
2,2-Dichloropropane	<10 µg/kg	TM116					<10	<200		
Bromochloromethane	<10 µg/kg	TM116					<10	<200		
Chloroform	<8 µg/kg	TM116					<8	<160		
1,1,1-Trichloroethane	<7 µg/kg	TM116					<7	<140		
1,1-Dichloropropene	<10 µg/kg	TM116					<10	<200		
Carbontetrachloride	<10 µg/kg	TM116					<10	<200		
1,2-Dichloroethane	<5 µg/kg	TM116					<5	<100		
Benzene	<9 µg/kg	TM116	<9	<9	<9	<9	<9	<180		
Trichloroethene	<9 µg/kg	TM116					<9	<180		
1,2-Dichloropropane	<10 µg/kg	TM116					<10	<200		
Dibromomethane	<9 µg/kg	TM116					<9	<180		
Bromodichloromethane	<7 µg/kg	TM116					<7	<140		
cis-1,3-Dichloropropene	<10 µg/kg	TM116					<10	<200		
Toluene	<7 µg/kg	TM116	<7	<7	<7	<7	<7	<140		
trans-1,3-Dichloropropene	<10 µg/kg	TM116					<10	<200		
1,1,2-Trichloroethane	<10 µg/kg	TM116					<10	<200		
1,3-Dichloropropane	<7 µg/kg	TM116					<7	<140		



CERTIFICATE OF ANALYSIS

Validated

SDG: 221128-15
Client Ref.: 30691

Report Number: 670973
Location: Southampton Airport

Superseded Report:

VOC MS (S)

Results Legend			Customer Sample Ref.		BH203-01	BH203-02	BH204-01	BH204-02	BH208-01	BH208-02
# ISO17025 accredited. M mCERTS accredited. as. Aqueous / settled sample. dis. fil. Dissolved / filtered sample. tot.unfilt. Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4# Sample deviation (see appendix)			Depth (m)		0.70 - 0.70	2.00 - 2.00	2.30 - 2.30	3.90 - 3.90	1.50 - 1.50	2.70 - 2.70
			Sample Type		Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)
			Date Sampled		24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022
			Sample Time							
			Date Received		25/11/2022	25/11/2022	25/11/2022	25/11/2022	25/11/2022	25/11/2022
			SDG Ref		221128-15	221128-15	221128-15	221128-15	221128-15	221128-15
			Lab Sample No.(s)		27228406	27228409	27228404	27228405	27228411	27228412
			AGS Reference							
Component	LOD/Units	Method								
Tetrachloroethene	<5 µg/kg	TM116							<5	<100
Dibromochloromethane	<10 µg/kg	TM116							<10	<200
1,2-Dibromoethane	<10 µg/kg	TM116							<10	<200
Chlorobenzene	<5 µg/kg	TM116							<5	<100
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116							<10	<200
Ethylbenzene	<4 µg/kg	TM116	<4	<4	<4	<4	<4	<4	<4	<80
p/m-Xylene	<10 µg/kg	TM116	<10	<10	<10	<10	<10	<10	<10	<200
o-Xylene	<10 µg/kg	TM116	<10	<10	<10	<10	<10	<10	<10	<200
Styrene	<10 µg/kg	TM116							<10	<200
Bromofom	<10 µg/kg	TM116							<10	<200
Isopropylbenzene	<5 µg/kg	TM116							<5	<100
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116							<10	<200
1,2,3-Trichloropropane	<16 µg/kg	TM116							<16	<320
Bromobenzene	<10 µg/kg	TM116							<10	<200
Propylbenzene	<10 µg/kg	TM116							<10	<200
2-Chlorotoluene	<9 µg/kg	TM116							<9	<180
1,3,5-Trimethylbenzene	<8 µg/kg	TM116							<8	<160
4-Chlorotoluene	<10 µg/kg	TM116							<10	<200
tert-Butylbenzene	<14 µg/kg	TM116							<14	<280
1,2,4-Trimethylbenzene	<9 µg/kg	TM116							<9	<180
sec-Butylbenzene	<10 µg/kg	TM116							<10	306
4-Isopropyltoluene	<10 µg/kg	TM116							<10	<200
1,3-Dichlorobenzene	<8 µg/kg	TM116							<8	<160
1,4-Dichlorobenzene	<5 µg/kg	TM116							<5	<100
n-Butylbenzene	<11 µg/kg	TM116							<11	266
1,2-Dichlorobenzene	<10 µg/kg	TM116							<10	<200
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116							<14	<280
Tert-amyl methyl ether	<10 µg/kg	TM116							<10	<200
1,2,4-Trichlorobenzene	<20 µg/kg	TM116							<20	<400
Hexachlorobutadiene	<20 µg/kg	TM116							<20	<400
Naphthalene	<13 µg/kg	TM116							<13	<260
1,2,3-Trichlorobenzene	<20 µg/kg	TM116							<20	<400
1,3,5-Trichlorobenzene	<20 µg/kg	TM116							<20	<400

SDG: 221128-15
Client Ref.: 30691

Report Number: 670973

Superseded Report:

Location: Southampton Airport

VOC MS (S)

Results Legend			Customer Sample Ref.		BH203-01	BH203-02	BH204-01	BH204-02	BH208-01	BH208-02	
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH203-01		BH203-02		BH204-01		BH204-02	
M	mCERTS accredited.			BH208-01		BH208-02		BH208-01		BH208-02	
aq	Aqueous / settled sample.			BH203-01		BH203-02		BH204-01		BH204-02	
diss.filt	Dissolved / filtered sample.			BH208-01		BH208-02		BH208-01		BH208-02	
tot.unfilt	Total / unfiltered sample.			BH203-01		BH203-02		BH204-01		BH204-02	
*	Subcontracted - refer to subcontractor report for accreditation status.			BH208-01		BH208-02		BH208-01		BH208-02	
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			BH203-01		BH203-02		BH204-01		BH204-02	
(F)	Trigger breach confirmed			BH208-01		BH208-02		BH208-01		BH208-02	
1-4	Sample deviation (see appendix)			BH203-01		BH203-02		BH204-01		BH204-02	
5				BH208-01		BH208-02		BH208-01		BH208-02	
Component	LOD/Units	Method	BH203-01		BH203-02		BH204-01		BH204-02		
Sum of Detected Xylenes	<0.02 mg/kg	TM116	BH208-01		BH208-02		BH208-01		BH208-02		
Sum of BTEX	<40 µg/kg	TM116	BH203-01		BH203-02		BH204-01		BH204-02		
			BH208-01		BH208-02		BH208-01		BH208-02		
			BH203-01		BH203-02		BH204-01		BH204-02		
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			BH203-01		BH203-02		BH204-01		BH204-02		



CERTIFICATE OF ANALYSIS

Validated

SDG: 221128-15
Client Ref.: 30691

Report Number: 670973
Location: Southampton Airport

Superseded Report:

VOC MS (S)

Results Legend			Customer Sample Ref.					
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*\$@ Sample deviation (see appendix)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference			S5	S6	S7
						1.00 - 1.00 Unspecified Solid (UNS) 22/11/2022	0.90 - 0.90 Unspecified Solid (UNS) 22/11/2022	0.50 - 0.50 Unspecified Solid (UNS) 22/11/2022
						25/11/2022 221128-15 27228413	25/11/2022 221128-15 27228414	25/11/2022 221128-15 27228415
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	107	108	109			
Toluene-d8**	%	TM116	98.6	97.8	97.2			
4-Bromofluorobenzene**	%	TM116	92.7	91.3	87.6			
Dichlorodifluoromethane	<6 µg/kg	TM116		<6				
Chloromethane	<7 µg/kg	TM116		<7				
Vinyl Chloride	<6 µg/kg	TM116		<6				
Bromomethane	<10 µg/kg	TM116		<10				
Chloroethane	<10 µg/kg	TM116		<10				
Trichlorofluoromethane	<6 µg/kg	TM116		<6				
1,1-Dichloroethene	<10 µg/kg	TM116		<10				
Carbon Disulphide	<7 µg/kg	TM116		<7				
Dichloromethane	<10 µg/kg	TM116		<10				
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	<10	<10			
trans-1,2-Dichloroethene	<10 µg/kg	TM116		<10				
1,1-Dichloroethane	<8 µg/kg	TM116		<8				
cis-1,2-Dichloroethene	<6 µg/kg	TM116		<6				
2,2-Dichloropropane	<10 µg/kg	TM116		<10				
Bromochloromethane	<10 µg/kg	TM116		<10				
Chloroform	<8 µg/kg	TM116		<8				
1,1,1-Trichloroethane	<7 µg/kg	TM116		<7				
1,1-Dichloropropene	<10 µg/kg	TM116		<10				
Carbontetrachloride	<10 µg/kg	TM116		<10				
1,2-Dichloroethane	<5 µg/kg	TM116		<5				
Benzene	<9 µg/kg	TM116	<9	<9	<9			
Trichloroethene	<9 µg/kg	TM116		<9				
1,2-Dichloropropane	<10 µg/kg	TM116		<10				
Dibromomethane	<9 µg/kg	TM116		<9				
Bromodichloromethane	<7 µg/kg	TM116		<7				
cis-1,3-Dichloropropene	<10 µg/kg	TM116		<10				
Toluene	<7 µg/kg	TM116	<7	<7	<7			
trans-1,3-Dichloropropene	<10 µg/kg	TM116		<10				
1,1,2-Trichloroethane	<10 µg/kg	TM116		<10				
1,3-Dichloropropane	<7 µg/kg	TM116		<7				



CERTIFICATE OF ANALYSIS

Validated

SDG: 221128-15
Client Ref.: 30691

Report Number: 670973
Location: Southampton Airport

Superseded Report:

VOC MS (S)

Results Legend			Customer Sample Ref.	S5	S6	S7			
# ISO17025 accredited. M mCERTS accredited. aq. Aqueous / settled sample. dis.filt. Dissolved / filtered sample. tot.unfilt. Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4# Sample deviation (see appendix)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 1.00 Unspecified Solid (UNS) 22/11/2022 25/11/2022 221128-15 27228413	0.90 - 0.90 Unspecified Solid (UNS) 22/11/2022 25/11/2022 221128-15 27228414	0.50 - 0.50 Unspecified Solid (UNS) 22/11/2022 25/11/2022 221128-15 27228415			
Component	LOD/Units	Method							
Tetrachloroethene	<5 µg/kg	TM116			<5				
Dibromochloromethane	<10 µg/kg	TM116			<10				
1,2-Dibromoethane	<10 µg/kg	TM116			<10				
Chlorobenzene	<5 µg/kg	TM116			<5				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116			<10				
Ethylbenzene	<4 µg/kg	TM116		<4	<4	<4			
p/m-Xylene	<10 µg/kg	TM116		<10	<10	<10			
o-Xylene	<10 µg/kg	TM116		<10	<10	<10			
Styrene	<10 µg/kg	TM116			<10	@			
Bromofom	<10 µg/kg	TM116			<10				
Isopropylbenzene	<5 µg/kg	TM116			<5				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116			<10				
1,2,3-Trichloropropane	<16 µg/kg	TM116			<16				
Bromobenzene	<10 µg/kg	TM116			<10				
Propylbenzene	<10 µg/kg	TM116			<10				
2-Chlorotoluene	<9 µg/kg	TM116			<9				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116			<8				
4-Chlorotoluene	<10 µg/kg	TM116			<10				
tert-Butylbenzene	<14 µg/kg	TM116			<14				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116			<9				
sec-Butylbenzene	<10 µg/kg	TM116			<10				
4-Isopropyltoluene	<10 µg/kg	TM116			<10				
1,3-Dichlorobenzene	<8 µg/kg	TM116			<8				
1,4-Dichlorobenzene	<5 µg/kg	TM116			<5				
n-Butylbenzene	<11 µg/kg	TM116			<11				
1,2-Dichlorobenzene	<10 µg/kg	TM116			<10				
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116			<14				
Tert-amyl methyl ether	<10 µg/kg	TM116			<10				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116			<20				
Hexachlorobutadiene	<20 µg/kg	TM116			<20				
Naphthalene	<13 µg/kg	TM116			<13				
1,2,3-Trichlorobenzene	<20 µg/kg	TM116			<20				
1,3,5-Trichlorobenzene	<20 µg/kg	TM116			<20				

SDG: 221128-15
Client Ref.: 30691

Report Number: 670973

Superseded Report:

Client Ref.: 30691

Location: Southampton Airport

VOC MS (S)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 221128-15
Client Ref.: 30691

Report Number: 670973
Location: Southampton Airport

Superseded Report:

Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&*%@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH203-01 0.70 - 0.70 MISC_SOLID 24/11/2022 00:00:00 25/11/2022 13:00:00 221128-15 27228406 TM048	02/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH203-02 2.00 - 2.00 MISC_SOLID 24/11/2022 00:00:00 25/11/2022 13:00:00 221128-15 27228409 TM048	02/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH204-01 2.30 - 2.30 MISC_SOLID 24/11/2022 00:00:00 25/11/2022 13:00:00 221128-15 27228404 TM048	05/12/2022	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH204-02 3.90 - 3.90 MISC_SOLID 24/11/2022 00:00:00 25/11/2022 13:00:00 221128-15 27228405 TM048	05/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH208-01 1.50 - 1.50 MISC_SOLID 24/11/2022 00:00:00 25/11/2022 13:00:00 221128-15 27228411 TM048	03/12/22	Eva Guerra	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH208-02 2.70 - 2.70 MISC_SOLID 24/11/2022 00:00:00 25/11/2022 13:00:00 221128-15 27228412 TM048	03/12/22	Eva Guerra	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	S5 1.00 - 1.00 MISC_SOLID 22/11/2022 00:00:00 25/11/2022 13:00:00 221128-15 27228413 TM048	02/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	S6 0.90 - 0.90 MISC_SOLID 22/11/2022 00:00:00 25/11/2022 13:00:00 221128-15 27228414 TM048	03/12/22	Eva Guerra	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

SDG: 221128-15
Client Ref.: 30691Report Number: 670973
Location: Southampton Airport

Superseded Report:

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	S7 0.50 - 0.50 MISC_SOLID 22/11/2022 00:00:00 25/11/2022 13:00:00 221128-15 27228415 TM048	03/12/22	Eva Guerra	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 221128-15
Client Ref.: 30691

Report Number: 670973
Location: Southampton Airport

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM023	Leaching test method for the Assessment of Contaminated Land: Interim NRA Guidance. National Rivers Authority R & D note 301. (1994).	Leaching Procedure for NRA Leachates
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid Extractable Sulphate in Soils by ICP OES
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM243		Mixed Anions In Soils By Kone
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 221128-15
Client Ref.: 30691

Report Number: 670973
Location: Southampton Airport

Superseded Report:

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.

Depth

Type

	27228406	27228409	27228404	27228405	27228411	27228412	27228413	27228414	27228415
	BH203-01	BH203-02	BH204-01	BH204-02	BH208-01	BH208-02	S5	S6	S7
	0.70 - 0.70	2.00 - 2.00	2.30 - 2.30	3.90 - 3.90	1.50 - 1.50	2.70 - 2.70	1.00 - 1.00	0.90 - 0.90	0.50 - 0.50
	Unspecified So	Unspecified So	Unspecified So	Unspecified So	Unspecified So	Unspecified So	Unspecified So	Unspecified So	Unspecified So
Ammoniacal Nitrogen					01-Dec-2022		01-Dec-2022		01-Dec-2022
Anions by Kone (soil)	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	30-Nov-2022	01-Dec-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022
Anions by Kone (w)					05-Dec-2022		05-Dec-2022		05-Dec-2022
Asbestos ID in Solid Samples	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022	05-Dec-2022
Chromium III	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	02-Dec-2022	01-Dec-2022	02-Dec-2022	01-Dec-2022	02-Dec-2022
Dissolved Metals by ICP-MS					02-Dec-2022		02-Dec-2022		02-Dec-2022
EPH CWG (Aliphatic) Filtered GC (W)					05-Dec-2022		05-Dec-2022		05-Dec-2022
EPH CWG (Aromatic) Filtered GC (W)					05-Dec-2022		05-Dec-2022		05-Dec-2022
EPH CWG GC (S)	02-Dec-2022	02-Dec-2022	02-Dec-2022	02-Dec-2022	02-Dec-2022	05-Dec-2022	01-Dec-2022	02-Dec-2022	01-Dec-2022
GRO by GC-FID (S)	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022
GRO by GC-FID (W)					01-Dec-2022		01-Dec-2022		01-Dec-2022
Hexavalent Chromium (s)	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	29-Nov-2022	01-Dec-2022	29-Nov-2022
Hexavalent Chromium (w)					01-Dec-2022		01-Dec-2022		01-Dec-2022
Mercury Dissolved					05-Dec-2022		05-Dec-2022		05-Dec-2022
Metals in solid samples by OES	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
NRA Leachate					29-Nov-2022		29-Nov-2022		29-Nov-2022
PAH by GCMS	01-Dec-2022	01-Dec-2022	01-Dec-2022	30-Nov-2022	30-Nov-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
PAH in waters by GC-MS (diss.filt)					02-Dec-2022		02-Dec-2022		02-Dec-2022
pH	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	01-Dec-2022	30-Nov-2022	01-Dec-2022
pH Value of Filtered Water					01-Dec-2022		02-Dec-2022		02-Dec-2022
Sample description	29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022	28-Nov-2022	29-Nov-2022	28-Nov-2022
Total Sulphate	02-Dec-2022	01-Dec-2022	01-Dec-2022	02-Dec-2022	02-Dec-2022	02-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
TPH CWG Filtered (W)					05-Dec-2022		05-Dec-2022		05-Dec-2022
TPH CWG GC (S)	02-Dec-2022	02-Dec-2022	02-Dec-2022	02-Dec-2022	02-Dec-2022	05-Dec-2022	01-Dec-2022	02-Dec-2022	01-Dec-2022
VOC MS (S)	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	01-Dec-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022
VOC MS (W)					01-Dec-2022		01-Dec-2022		01-Dec-2022



CERTIFICATE OF ANALYSIS

SDG: 221128-15
Client Ref: 30691

Report Number: 670973
Location: Southampton Airport

Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

H Fraser Consulting
The Pump House
Coton Hill
Shrewsbury
SY1 2DP

Attention: Hannah Fraser

CERTIFICATE OF ANALYSIS

Date of report Generation: 06 December 2022
Customer: H Fraser Consulting
Sample Delivery Group (SDG): 221125-81
Your Reference: 30691
Location: Southampton Airport
Report No: 671148
Order Number:

This report has been revised and directly supersedes 670860 in its entirety.

We received 12 samples on Thursday November 24, 2022 and 12 of these samples were scheduled for analysis which was completed on Tuesday December 06, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

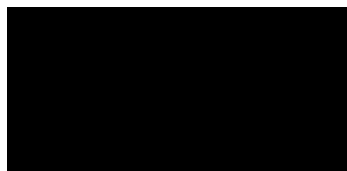
Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-81
Client Ref.: 30691

Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
27218727	BH202-01		0.50	22/11/2022
27218728	BH202-02		1.80	22/11/2022
27218732	BH207-01		2.30	22/11/2022
27218733	BH207-02		1.50	22/11/2022
27218734	BH209-01		1.00	22/11/2022
27218736	BH209-02		1.70	22/11/2022
27218737	BH210-01		2.00	22/11/2022
27218738	BH210-02		3.00	22/11/2022
27218729	S1		0.30	22/11/2022
27218731	S2		0.80	22/11/2022
27218739	S3		0.80	22/11/2022
27218740	S4		0.60	22/11/2022

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

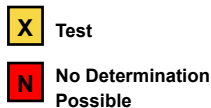
Validated

SDG: 221125-81
Client Ref.: 30691

Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

Results Legend



Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend X Test N No Determination Possible Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	27218737		BH210-01				2.00		1kg TUB with Handle (ALE260)		S	
	27218736		BH209-02				1.70		60g VOC (ALE215)		S	
	27218734		BH209-01				1.00		250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 60g VOC (ALE215)		S	
	27218733		BH207-02				1.50		250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 60g VOC (ALE215)		S	
	27218732		BH207-01				2.30		250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 60g VOC (ALE215)		S	
	27218728		BH202-02				1.80		250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 60g VOC (ALE215)		S	
27218727		BH202-01				0.50		250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 60g VOC (ALE215)		S		
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 1										
Anions by Kone (soil)	All	NDPs: 0 Tests: 12										
Anions by Kone (w)	All	NDPs: 0 Tests: 1										
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 12										
Chromium III	All	NDPs: 0 Tests: 13										
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1										
EPH CWG (Aliphatic) Filtered GC (W)	All	NDPs: 0 Tests: 1										
EPH CWG (Aromatic) Filtered GC (W)	All	NDPs: 0 Tests: 1										
EPH CWG GC (S)	All	NDPs: 0 Tests: 12										
GRO by GC-FID (S)	All	NDPs: 0 Tests: 12										
GRO by GC-FID (W)	All	NDPs: 0 Tests: 1										
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 12										
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1										
Mercury Dissolved	All	NDPs: 0 Tests: 1										
Metals in solid samples by OES	All	NDPs: 0 Tests: 12										



CERTIFICATE OF ANALYSIS

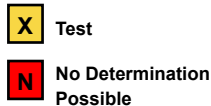
Validated

SDG: 221125-81
Client Ref.: 30691

Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

Results Legend



Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend X Test N No Determination Possible Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-81
Client Ref.: 30691

Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
27218727	BH202-01	0.50	Light Brown	Clay	Vegetation	None
27218728	BH202-02	1.80	Light Brown	Sandy Clay	Stones	None
27218732	BH207-01	2.30	Light Brown	Loamy Sand	Stones	None
27218733	BH207-02	1.50	Light Brown	Silty Clay	Vegetation	None
27218734	BH209-01	1.00	Light Brown	Silty Clay	None	None
27218736	BH209-02	1.70	Light Brown	Sand	Stones	Vegetation
27218737	BH210-01	2.00	Light Brown	Gravel	Stones	Vegetation
27218738	BH210-02	3.00	Light Brown	Gravel	Stones	Vegetation
27218729	S1	0.30	Light Brown	Clay Loam	Stones	Vegetation
27218731	S2	0.80	Light Brown	Clay	Vegetation	None
27218739	S3	0.80	Light Brown	Silty Clay	None	None
27218740	S4	0.60	Light Brown	Silty Clay	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-81
Client Ref.: 30691Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

Results Legend			Customer Sample Ref.		BH202-01	BH202-02	BH207-01	BH207-02	BH209-01	BH209-02
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.50	1.80	2.30	1.50	1.00	1.70
M	mCERTS accredited.				Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq	Aqueous / settled sample.				22/11/2022	22/11/2022	22/11/2022	22/11/2022	22/11/2022	22/11/2022
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.				24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022
* Subcontracted - refer to subcontractor report for accreditation status.					221125-81	221125-81	221125-81	221125-81	221125-81	221125-81
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery					27218727	27218728	27218732	27218733	27218734	27218736
(F) Trigger breach confirmed										
1-4*§ Sample deviation (see appendix)										
Component	LOD/Units	Method								
Moisture Content Ratio (% of as received sample)	%	PM024			16	8.4	5.8	14	15	13
Ammoniacal Nitrogen as NH3 NRA leach	<0.2 mg/l	TM099					<0.2			
pH	1 pH Units	TM133			7.73	8.71	8.87	8.18	7.67	8.88
					M	M	M	M	M	M
Chromium, Hexavalent	<0.6 mg/kg	TM151			<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
					M	M	M	M	M	M
Chromium, Trivalent NRA leach	<0.03 mg/l	TM152					<0.03			
Arsenic (diss.filt) NRA leach	<0.5 µg/l	TM152					<0.5			
Cadmium (diss.filt) NRA leach	<0.08 µg/l	TM152					<0.08			
Chromium (diss.filt) NRA leach	<1 µg/l	TM152					<1			
Copper (diss.filt) NRA leach	<0.3 µg/l	TM152					1.44			
Lead (diss.filt) NRA leach	<0.2 µg/l	TM152					<0.2			
Nickel (diss.filt) NRA leach	<0.4 µg/l	TM152					<0.4			
Selenium (diss.filt) NRA leach	<1 µg/l	TM152					<1			
Vanadium (diss.filt) NRA leach	<1 µg/l	TM152					1.37			
Zinc (diss.filt) NRA leach	<1 µg/l	TM152					<1			
Naphthalene (diss.filt) NRA leach	<0.01 µg/l	TM178					0.0255			
Acenaphthene (diss.filt) NRA leach	<0.005 µg/l	TM178					0.0221			
Acenaphthylene (diss.filt) NRA leach	<0.005 µg/l	TM178					<0.005			
Fluoranthene (diss.filt) NRA leach	<0.005 µg/l	TM178					0.0361			
Anthracene (diss.filt) NRA leach	<0.005 µg/l	TM178					0.0076			
Phenanthrene (diss.filt) NRA leach	<0.005 µg/l	TM178					0.106			
Fluorene (diss.filt) NRA leach	<0.005 µg/l	TM178					0.0145			
Chrysene (diss.filt) NRA leach	<0.005 µg/l	TM178					<0.005			
Pyrene (diss.filt) NRA leach	<0.005 µg/l	TM178					0.0211			
Benzo(a)anthracene (diss.filt) NRA leach	<0.005 µg/l	TM178					<0.005			
Benzo(b)fluoranthene (diss.filt) NRA leach	<0.005 µg/l	TM178					<0.005			
Benzo(k)fluoranthene (diss.filt) NRA leach	<0.005 µg/l	TM178					<0.005			
Benzo(a)pyrene (diss.filt) NRA leach	<0.002 µg/l	TM178					<0.002			
Dibenzo(a,h)anthracene (diss.filt) NRA leach	<0.005 µg/l	TM178					<0.005			
Benzo(g,h,i)perylene (diss.filt) NRA leach	<0.005 µg/l	TM178					<0.005			
Indeno(1,2,3-cd)pyrene (diss.filt) NRA leach	<0.005 µg/l	TM178					<0.005			
PAH Sum of EPA 16 detected (Diss filt) NRA leach	<0.082 µg/l	TM178					0.232			
Chromium, Trivalent	<0.9 mg/kg	TM181			20.6	4.21	4.53	23.1	18.6	5.86
Arsenic	<0.6 mg/kg	TM181			5.47	3.98	3.03	5.58	6.48	3.47
					M	M	M	M	M	M

CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-81
Client Ref.: 30691

Report Number: 671148

Superseded Report: 670860

Location: Southampton Airport

PAH by GCMS

[illegible]

SDG: 221125-81
Client Ref.: 30691

Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

TPH CWG (S)

[illegible]



CERTIFICATE OF ANALYSIS

SDG: 221125-81
Client Ref.: 30691Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

VOC MS (S)

Results Legend			Customer Sample Ref.		BH202-01	BH202-02	BH207-01	BH207-02	BH209-01	BH209-02
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.50	1.80	2.30	1.50	1.00	1.70
M	mCERTS accredited.				Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq	Aqueous / settled sample.				22/11/2022	22/11/2022	22/11/2022	22/11/2022	22/11/2022	22/11/2022
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.				24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022
* Subcontracted - refer to subcontractor report for accreditation status.					221125-81	221125-81	221125-81	221125-81	221125-81	221125-81
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery					27218727	27218728	27218732	27218733	27218734	27218736
(F) Trigger breach confirmed										
1-4*§@ Sample deviation (see appendix)										
Component	LOD/Units	Method								
Dibromofluoromethane**	%	TM116			114	113	111	113	113	112
Toluene-d8**	%	TM116			97.7	98.1	94.1	98.6	97.5	97.7
4-Bromofluorobenzene**	%	TM116			92.1	96.2	83.3	94	92.4	97.5
Dichlorodifluoromethane	<6 µg/kg	TM116					<6	<6		
							#	#		
Chloromethane	<7 µg/kg	TM116					<7	<7		
							#	#		
Vinyl Chloride	<6 µg/kg	TM116					<6	<6		
							M	M		
Bromomethane	<10 µg/kg	TM116					<10	<10		
							M	M		
Chloroethane	<10 µg/kg	TM116					<10	<10		
							M	M		
Trichlorofluoromethane	<6 µg/kg	TM116					<6	<6		
							M	M		
1,1-Dichloroethene	<10 µg/kg	TM116					<10	<10		
							#	#		
Carbon Disulphide	<7 µg/kg	TM116					<7	<7		
							M	M		
Dichloromethane	<10 µg/kg	TM116					<10	<10		
							#	#		
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116			<10	<10	<10	<10	<10	<10
					M	M	M	M	M	M
trans-1,2-Dichloroethene	<10 µg/kg	TM116					<10	<10		
							M	M		
1,1-Dichloroethane	<8 µg/kg	TM116					<8	<8		
							M	M		
cis-1,2-Dichloroethene	<6 µg/kg	TM116					<6	<6		
							M	M		
2,2-Dichloropropane	<10 µg/kg	TM116					<10	<10		
Bromochloromethane	<10 µg/kg	TM116					<10	<10		
							M	M		
Chloroform	<8 µg/kg	TM116					<8	<8		
							M	M		
1,1,1-Trichloroethane	<7 µg/kg	TM116					<7	<7		
							M	M		
1,1-Dichloropropene	<10 µg/kg	TM116					<10	<10		
							M	M		
Carbontetrachloride	<10 µg/kg	TM116					<10	<10		
							M	M		
1,2-Dichloroethane	<5 µg/kg	TM116					<5	<5		
							M	M		
Benzene	<9 µg/kg	TM116			<9	<9	<9	<9	<9	<9
					M	M	M	M	M	M
Trichloroethene	<9 µg/kg	TM116					<9	<9		
							#	#		
1,2-Dichloropropane	<10 µg/kg	TM116					<10	<10		
							M	M		
Dibromomethane	<9 µg/kg	TM116					<9	<9		
							M	M		
Bromodichloromethane	<7 µg/kg	TM116					<7	<7		
							M	M		
cis-1,3-Dichloropropene	<10 µg/kg	TM116					<10	<10		
							M	M		
Toluene	<7 µg/kg	TM116			<7	<7	<7	<7	<7	<7
					M	M	M	M	M	M
trans-1,3-Dichloropropene	<10 µg/kg	TM116					<10	<10		
1,1,2-Trichloroethane	<10 µg/kg	TM116					<10	<10		
							M	M		
1,3-Dichloropropane	<7 µg/kg	TM116					<7	<7		
							M	M		



CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-81
Client Ref.: 30691

Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

VOC MS (S)

Results Legend			Customer Sample Ref.		BH202-01	BH202-02	BH207-01	BH207-02	BH209-01	BH209-02
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.50	1.80	2.30	1.50	1.00	1.70
M	mCERTS accredited.				Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq	Aqueous / settled sample.				22/11/2022	22/11/2022	22/11/2022	22/11/2022	22/11/2022	22/11/2022
dis.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.				24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022
* Subcontracted - refer to subcontractor report for accreditation status.					221125-81	221125-81	221125-81	221125-81	221125-81	221125-81
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery					27218727	27218728	27218732	27218733	27218734	27218736
(F) Trigger breach confirmed										
1-4# Sample deviation (see appendix)										
Component	LOD/Units	Method								
Tetrachloroethene	<5 µg/kg	TM116					<5	<5		
							M	M		
Dibromochloromethane	<10 µg/kg	TM116					<10	<10		
							M	M		
1,2-Dibromoethane	<10 µg/kg	TM116					<10	<10		
							M	M		
Chlorobenzene	<5 µg/kg	TM116					<5	<5		
							M	M		
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116					<10	<10		
							M	M		
Ethylbenzene	<4 µg/kg	TM116	<4		<4		<4	<4	<4	<4
			M		M		M	M	M	M
p/m-Xylene	<10 µg/kg	TM116	<10		<10		<10	<10	<10	<10
			#		#		#	#	#	#
o-Xylene	<10 µg/kg	TM116	<10		<10		<10	<10	<10	<10
			M		M		M	M	M	M
Styrene	<10 µg/kg	TM116					<10	<10		
							#	#		
Bromofom	<10 µg/kg	TM116					<10	<10		
							M	M		
Isopropylbenzene	<5 µg/kg	TM116					<5	<5		
							#	#		
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116					<10	<10		
							#	#		
1,2,3-Trichloropropane	<16 µg/kg	TM116					<16	<16		
							M	M		
Bromobenzene	<10 µg/kg	TM116					<10	<10		
							M	M		
Propylbenzene	<10 µg/kg	TM116					<10	<10		
							M	M		
2-Chlorotoluene	<9 µg/kg	TM116					<9	<9		
							M	M		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116					<8	<8		
							M	M		
4-Chlorotoluene	<10 µg/kg	TM116					<10	<10		
							M	M		
tert-Butylbenzene	<14 µg/kg	TM116					<14	<14		
							#	#		
1,2,4-Trimethylbenzene	<9 µg/kg	TM116					<9	<9		
							#	#		
sec-Butylbenzene	<10 µg/kg	TM116					<10	<10		
4-Isopropyltoluene	<10 µg/kg	TM116					<10	<10		
1,3-Dichlorobenzene	<8 µg/kg	TM116					<8	<8		
							M	M		
1,4-Dichlorobenzene	<5 µg/kg	TM116					<5	<5		
							M	M		
n-Butylbenzene	<11 µg/kg	TM116					<11	<11		
1,2-Dichlorobenzene	<10 µg/kg	TM116					<10	<10		
							M	M		
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116					<14	<14		
							M	M		
Tert-amyl methyl ether	<10 µg/kg	TM116					<10	<10		
							#	#		
1,2,4-Trichlorobenzene	<20 µg/kg	TM116					<20	<20		
Hexachlorobutadiene	<20 µg/kg	TM116					<20	<20		
Naphthalene	<13 µg/kg	TM116					<13	<13		
							M	M		
1,2,3-Trichlorobenzene	<20 µg/kg	TM116					<20	<20		
							#	#		
1,3,5-Trichlorobenzene	<20 µg/kg	TM116					<20	<20		

SDG: 221125-81
Client Ref.: 30691

Report Number: 671148

Superseded Report: 670860

Client Ref.: 30691

Location: Southampton Airport

VOC MS (S)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-81
Client Ref.: 30691Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

VOC MS (S)

Results Legend			Customer Sample Ref.		BH210-01	BH210-02	S1	S2	S3	S4
# ISO17025 accredited.	M mCERTS accredited.	aq Aqueous / settled sample.	Depth (m)		2.00	3.00	0.30	0.80	0.80	0.60
diss.filt Dissolved / filtered sample.		tot.unfilt Total / unfiltered sample.	Sample Type		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
* Subcontracted - refer to subcontractor report for accreditation status.			Date Sampled		22/11/2022	22/11/2022	22/11/2022	22/11/2022	22/11/2022	22/11/2022
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			Sample Time							
(F) Trigger breach confirmed			Date Received		24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022
1-4*§@ Sample deviation (see appendix)			SDG Ref		221125-81	221125-81	221125-81	221125-81	221125-81	221125-81
			Lab Sample No.(s)		27218737	27218738	27218729	27218731	27218739	27218740
			AGS Reference							
Component	LOD/Units	Method								
Dibromofluoromethane**	%	TM116			111	112	111	108	114	113
								2		
Toluene-d8**	%	TM116			97.4	97	98.3	97.5	97.7	97.9
								2		
4-Bromofluorobenzene**	%	TM116			96.8	94.8	87.6	98.5	90.8	92.6
								2		
Dichlorodifluoromethane	<6 µg/kg	TM116				<6			<6	
						#			#	
Chloromethane	<7 µg/kg	TM116				<7			<7	
						#			#	
Vinyl Chloride	<6 µg/kg	TM116				<6			<6	
						#			M	
Bromomethane	<10 µg/kg	TM116				<10			<10	
						#			M	
Chloroethane	<10 µg/kg	TM116				<10			<10	
						#			M	
Trichlorofluoromethane	<6 µg/kg	TM116				<6			<6	
						#			M	
1,1-Dichloroethene	<10 µg/kg	TM116				<10			<10	
						#			#	
Carbon Disulphide	<7 µg/kg	TM116				<7			<7	
						#			M	
Dichloromethane	<10 µg/kg	TM116				<10			<10	
						#			#	
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116			<10	<10	<10	<10	<10	<10
					#	#	M	2 M	M	M
trans-1,2-Dichloroethene	<10 µg/kg	TM116				<10			<10	
						#			M	
1,1-Dichloroethane	<8 µg/kg	TM116				<8			<8	
						#			M	
cis-1,2-Dichloroethene	<6 µg/kg	TM116				<6			<6	
						#			M	
2,2-Dichloropropane	<10 µg/kg	TM116				<10			<10	
Bromochloromethane	<10 µg/kg	TM116				<10			<10	
						#			M	
Chloroform	<8 µg/kg	TM116				<8			<8	
						#			M	
1,1,1-Trichloroethane	<7 µg/kg	TM116				<7			<7	
						#			M	
1,1-Dichloropropene	<10 µg/kg	TM116				<10			<10	
						#			M	
Carbontetrachloride	<10 µg/kg	TM116				<10			<10	
						#			M	
1,2-Dichloroethane	<5 µg/kg	TM116				<5			<5	
						#			M	
Benzene	<9 µg/kg	TM116			<9	<9	<9	<9	<9	<9
					#	#	M	2 M	M	M
Trichloroethene	<9 µg/kg	TM116				<9			<9	
						#			#	
1,2-Dichloropropane	<10 µg/kg	TM116				<10			<10	
						#			M	
Dibromomethane	<9 µg/kg	TM116				<9			<9	
						#			M	
Bromodichloromethane	<7 µg/kg	TM116				<7			<7	
						#			M	
cis-1,3-Dichloropropene	<10 µg/kg	TM116				<10			<10	
						#			M	
Toluene	<7 µg/kg	TM116			<7	<7	<7	<7	<7	<7
					#	#	M	2 M	M	M
trans-1,3-Dichloropropene	<10 µg/kg	TM116				<10			<10	
1,1,2-Trichloroethane	<10 µg/kg	TM116				<10			<10	
						#			M	
1,3-Dichloropropane	<7 µg/kg	TM116				<7			<7	
						#			M	



CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-81
Client Ref.: 30691

Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

VOC MS (S)

Results Legend			Customer Sample Ref.		BH210-01	BH210-02	S1	S2	S3	S4
# ISO17025 accredited. M MCERTS accredited. sq. Aqueous / settled sample. diss. fil. Dissolved / filtered sample. tot.unfilt. Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4# Sample deviation (see appendix)			Depth (m)		2.00	3.00	0.30	0.80	0.80	0.60
Sample Type			Date Sampled		22/11/2022	22/11/2022	22/11/2022	22/11/2022	22/11/2022	22/11/2022
Sample Time			Date Received		24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022
SDG Ref			Lab Sample No.(s)		221125-81	221125-81	221125-81	221125-81	221125-81	221125-81
AGS Reference					27218737	27218738	27218729	27218731	27218739	27218740
Component	LOD/Units	Method								
Tetrachloroethene	<5 µg/kg	TM116				<5			<5	
						#			M	
Dibromochloromethane	<10 µg/kg	TM116				<10			<10	
						#			M	
1,2-Dibromoethane	<10 µg/kg	TM116				<10			<10	
						#			M	
Chlorobenzene	<5 µg/kg	TM116				<5			<5	
						#			M	
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116				<10			<10	
						#			M	
Ethylbenzene	<4 µg/kg	TM116		<4	#	<4	#	<4	<4	M
							M	2 M	M	M
p/m-Xylene	<10 µg/kg	TM116		<10	#	<10	#	<10	<10	#
								2 #	#	#
o-Xylene	<10 µg/kg	TM116		<10	#	<10	#	<10	<10	#
							M	2 M	M	M
Styrene	<10 µg/kg	TM116				<10	#		<10	#
						#			#	
Bromoform	<10 µg/kg	TM116				<10	#		<10	M
						#			M	
Isopropylbenzene	<5 µg/kg	TM116				<5	#		<5	#
						#			#	
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116				<10	#		<10	#
						#			#	
1,2,3-Trichloropropane	<16 µg/kg	TM116				<16	#		<16	M
						#			M	
Bromobenzene	<10 µg/kg	TM116				<10	#		<10	M
						#			M	
Propylbenzene	<10 µg/kg	TM116				<10	#		<10	M
						#			M	
2-Chlorotoluene	<9 µg/kg	TM116				<9	#		<9	M
						#			M	
1,3,5-Trimethylbenzene	<8 µg/kg	TM116				<8	#		<8	M
						#			M	
4-Chlorotoluene	<10 µg/kg	TM116				<10	#		<10	M
						#			M	
tert-Butylbenzene	<14 µg/kg	TM116				<14	#		<14	#
						#			#	
1,2,4-Trimethylbenzene	<9 µg/kg	TM116				<9	#		<9	#
						#			#	
sec-Butylbenzene	<10 µg/kg	TM116				<10			<10	
4-Isopropyltoluene	<10 µg/kg	TM116				<10			<10	
1,3-Dichlorobenzene	<8 µg/kg	TM116				<8	#		<8	M
						#			M	
1,4-Dichlorobenzene	<5 µg/kg	TM116				<5	#		<5	M
						#			M	
n-Butylbenzene	<11 µg/kg	TM116				<11			<11	
1,2-Dichlorobenzene	<10 µg/kg	TM116				<10	#		<10	M
						#			M	
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116				<14	#		<14	M
						#			M	
Tert-amyl methyl ether	<10 µg/kg	TM116				<10	#		<10	#
						#			#	
1,2,4-Trichlorobenzene	<20 µg/kg	TM116				<20			<20	
Hexachlorobutadiene	<20 µg/kg	TM116				<20			<20	
Naphthalene	<13 µg/kg	TM116				<13	#		<13	M
						#			M	
1,2,3-Trichlorobenzene	<20 µg/kg	TM116				<20	#		<20	#
						#			#	
1,3,5-Trichlorobenzene	<20 µg/kg	TM116				<20			<20	

SDG: 221125-81
Client Ref.: 30691

Report Number: 671148

Superseded Report: 670860

Client Ref.: 30691

Location: Southampton Airport

VOC MS (S)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-81
Client Ref.: 30691

Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&*&@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH202-01 0.50 SOLID 22/11/2022 00:00:00 24/11/2022 05:00:00 221125-81 27218727 TM048	06/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH202-02 1.80 SOLID 22/11/2022 00:00:00 24/11/2022 05:00:00 221125-81 27218728 TM048	06/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH207-01 2.30 SOLID 22/11/2022 00:00:00 24/11/2022 05:00:00 221125-81 27218732 TM048	06/12/2022	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH207-02 1.50 SOLID 22/11/2022 00:00:00 24/11/2022 05:00:00 221125-81 27218733 TM048	06/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH209-01 1.00 SOLID 22/11/2022 00:00:00 24/11/2022 05:00:00 221125-81 27218734 TM048	06/12/2022	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH209-02 1.70 SOLID 22/11/2022 00:00:00 24/11/2022 05:00:00 221125-81 27218736 TM048	06/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH210-01 2.00 SOLID 22/11/2022 00:00:00 24/11/2022 05:00:00 221125-81 27218737 TM048	06/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH210-02 3.00 SOLID 22/11/2022 00:00:00 24/11/2022 05:00:00 221125-81 27218738 TM048	06/12/2022	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

SDG: 221125-81
Client Ref.: 30691Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	S1 0.30 SOLID 22/11/2022 00:00:00 24/11/2022 05:00:00 221125-81 27218729 TM048	06/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	S2 0.80 SOLID 22/11/2022 00:00:00 24/11/2022 05:00:00 221125-81 27218731 TM048	06/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	S3 0.80 SOLID 22/11/2022 00:00:00 24/11/2022 05:00:00 221125-81 27218739 TM048	06/12/2022	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	S4 0.60 SOLID 22/11/2022 00:00:00 24/11/2022 05:00:00 221125-81 27218740 TM048	06/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-81
Client Ref.: 30691

Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

Table of Results - Appendix

Method No	Reference	Description
PM023	Leaching test method for the Assessment of Contaminated Land: Interim NRA Guidance. National Rivers Authority R & D note 301. (1994).	Leaching Procedure for NRA Leachates
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid Extractable Sulphate in Soils by ICP OES
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM243		Mixed Anions In Soils By Kone
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-81
Client Ref.: 30691

Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

Test Completion Dates

Lab Sample No(s)	27218727	27218728	27218732	27218733	27218734	27218736	27218737	27218738	27218729	27218731
Customer Sample Ref.	BH202-01	BH202-02	BH207-01	BH207-02	BH209-01	BH209-02	BH210-01	BH210-02	S1	S2
AGS Ref.										
Depth	0.50	1.80	2.30	1.50	1.00	1.70	2.00	3.00	0.30	0.80
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammoniacal Nitrogen			30-Nov-2022							
Anions by Kone (soil)	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022
Anions by Kone (w)			30-Nov-2022							
Asbestos ID in Solid Samples	06-Dec-2022	06-Dec-2022	06-Dec-2022	06-Dec-2022	06-Dec-2022	06-Dec-2022	06-Dec-2022	06-Dec-2022	06-Dec-2022	06-Dec-2022
Chromium III	30-Nov-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	30-Nov-2022	30-Nov-2022
Dissolved Metals by ICP-MS			01-Dec-2022							
EPH CWG (Aliphatic) Filtered GC (W)			05-Dec-2022							
EPH CWG (Aromatic) Filtered GC (W)			05-Dec-2022							
EPH CWG GC (S)	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
GRO by GC-FID (S)	29-Nov-2022	29-Nov-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	29-Nov-2022	30-Nov-2022
GRO by GC-FID (W)			01-Dec-2022							
Hexavalent Chromium (s)	29-Nov-2022	29-Nov-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	29-Nov-2022	29-Nov-2022
Hexavalent Chromium (w)			29-Nov-2022							
Mercury Dissolved			01-Dec-2022							
Metals in solid samples by OES	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
NRA Leachate			26-Nov-2022							
PAH by GCMS	01-Dec-2022	01-Dec-2022	30-Nov-2022	01-Dec-2022	30-Nov-2022	30-Nov-2022	01-Dec-2022	30-Nov-2022	29-Nov-2022	29-Nov-2022
PAH in waters by GC-MS (diss.filt)			01-Dec-2022							
pH	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022
pH Value of Filtered Water			30-Nov-2022							
Sample description	26-Nov-2022	26-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022	26-Nov-2022	26-Nov-2022
Total Sulphate	01-Dec-2022	30-Nov-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
TPH CWG Filtered (W)			05-Dec-2022							
TPH CWG GC (S)	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
VOC MS (S)	29-Nov-2022	29-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	29-Nov-2022	30-Nov-2022
VOC MS (W)			30-Nov-2022							

Lab Sample No(s)	27218739	27218740
Customer Sample Ref.	S3	S4
AGS Ref.		
Depth	0.80	0.60
Type	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	30-Nov-2022	30-Nov-2022
Asbestos ID in Solid Samples	06-Dec-2022	06-Dec-2022
Chromium III	01-Dec-2022	01-Dec-2022
EPH CWG GC (S)	01-Dec-2022	01-Dec-2022
GRO by GC-FID (S)	01-Dec-2022	01-Dec-2022
Hexavalent Chromium (s)	01-Dec-2022	01-Dec-2022
Metals in solid samples by OES	01-Dec-2022	01-Dec-2022
PAH by GCMS	01-Dec-2022	01-Dec-2022
pH	30-Nov-2022	30-Nov-2022
Sample description	29-Nov-2022	29-Nov-2022
Total Sulphate	01-Dec-2022	01-Dec-2022
TPH CWG GC (S)	01-Dec-2022	01-Dec-2022
VOC MS (S)	30-Nov-2022	30-Nov-2022



CERTIFICATE OF ANALYSIS

SDG: 221125-81
Client Ref: 30691

Report Number: 671148
Location: Southampton Airport

Superseded Report: 670860

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Unit 7-8 Hawarden Business Park

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Hawarden

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H Fraser Consulting
The Pump House
Coton Hill
Shrewsbury
SY1 2DP

Attention: Hannah Fraser

CERTIFICATE OF ANALYSIS

Date of report Generation: 06 December 2022
Customer: H Fraser Consulting
Sample Delivery Group (SDG): 221125-67
Your Reference: 30691
Location: Southampton Airport
Report No: 671149
Order Number:

This report has been revised and directly supersedes 670720 in its entirety.

We received 8 samples on Thursday November 24, 2022 and 8 of these samples were scheduled for analysis which was completed on Tuesday December 06, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

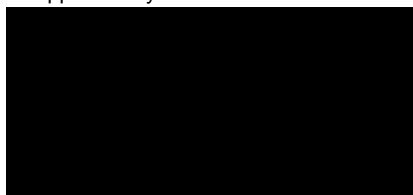
Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-67
Client Ref.: 30691

Report Number: 671149
Location: Southampton Airport

Superseded Report: 670720

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
27217245	BH201-01		2.00	21/11/2022
27217250	BH201-02		3.50	21/11/2022
27217244	BH205-01		1.00	21/11/2022
27217249	BH205-02		2.40	21/11/2022
27217243	BH206-01		0.50	21/11/2022
27217248	BH206-02		1.90	21/11/2022
27217247	S8		1.00	21/11/2022
27217246	S9		1.00	21/11/2022

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-67
Client Ref.: 30691

Report Number: 671149
Location: Southampton Airport

Superseded Report: 670720

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
US - Treated Sewage
TS - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	27217247		S8				1.00		1kg TUB with Handle (ALE260)	S		
	27217248	BH206-02					1.90		60g VOC (ALE215)	S		
	27217243	BH206-01					0.50		250g Amber Jar (ALE210)	S		
	27217249	BH205-02					2.40		1kg TUB with Handle (ALE260)	S		
	27217244	BH205-01					1.00		60g VOC (ALE215)	S		
Anions by Kone (soil)	All	NDPs: 0 Tests: 8										
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 8										
Chromium III	All	NDPs: 0 Tests: 8										
EPH CWG GC (S)	All	NDPs: 0 Tests: 8										
GRO by GC-FID (S)	All	NDPs: 0 Tests: 8										
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 8										
Metals in solid samples by OES	All	NDPs: 0 Tests: 8										
PAH by GCMS	All	NDPs: 0 Tests: 8										
pH	All	NDPs: 0 Tests: 8										
Sample description	All	NDPs: 0 Tests: 8										
Total Sulphate	All	NDPs: 0 Tests: 8										
TPH CWG GC (S)	All	NDPs: 0 Tests: 8										
VOC MS (S)	All	NDPs: 0 Tests: 8										



CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-67
Client Ref.: 30691

Report Number: 671149
Location: Southampton Airport

Superseded Report: 670720

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
27217245	BH201-01	2.00	Light Brown	Sandy Clay Loam	Stones	None
27217250	BH201-02	3.50	Light Brown	Sand	Stones	Plastic
27217244	BH205-01	1.00	Light Brown	Sandy Clay Loam	Stones	None
27217249	BH205-02	2.40	Beige	Sand	Stones	None
27217243	BH206-01	0.50	Light Brown	Silty Clay	None	None
27217248	BH206-02	1.90	Light Brown	Sand	Stones	None
27217247	S8	1.00	Light Brown	Silty Clay	Vegetation	None
27217246	S9	1.00	Light Brown	Silty Clay	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 221125-67
Client Ref.: 30691

Report Number: 671149
Location: Southampton Airport

Superseded Report: 670720

TPH CWG (S)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-67
Client Ref.: 30691Report Number: 671149
Location: Southampton Airport

Superseded Report: 670720

VOC MS (S)

Results Legend			Customer Sample Ref.		BH201-01	BH201-02	BH205-01	BH205-02	BH206-01	BH206-02
# ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	M mCERTS accredited. aq Aqueous / settled sample. diss.flit Dissolved / filtered sample. tot.unflit Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*§@ Sample deviation (see appendix)	2.00 Soil/Solid (S) 21/11/2022 24/11/2022 221125-67 27217245	3.50 Soil/Solid (S) 21/11/2022 24/11/2022 221125-67 27217250	1.00 Soil/Solid (S) 21/11/2022 24/11/2022 221125-67 27217244	2.40 Soil/Solid (S) 21/11/2022 24/11/2022 221125-67 27217249	0.50 Soil/Solid (S) 21/11/2022 24/11/2022 221125-67 27217243	1.90 Soil/Solid (S) 21/11/2022 24/11/2022 221125-67 27217248		
Component										
LOD/Units										
Method										
Dibromofluoromethane**										
Toluene-d8**										
4-Bromofluorobenzene**										
Dichlorodifluoromethane	<6 µg/kg	TM116	113	112	112	104	107	114		
Chloromethane	<7 µg/kg	TM116	99.2	97.5	98.1	97.8	96.1	97.9		
Vinyl Chloride	<6 µg/kg	TM116	95	92.9	93.9	97.2	94.3	93.9		
Bromomethane	<10 µg/kg	TM116								
Chloroethane	<10 µg/kg	TM116								
Trichlorofluoromethane	<6 µg/kg	TM116								
1,1-Dichloroethene	<10 µg/kg	TM116								
Carbon Disulphide	<7 µg/kg	TM116								
Dichloromethane	<10 µg/kg	TM116								
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	<10	<10	<10	<10	<10	<10	<10
trans-1,2-Dichloroethene	<10 µg/kg	TM116								
1,1-Dichloroethane	<8 µg/kg	TM116								
cis-1,2-Dichloroethene	<6 µg/kg	TM116								
2,2-Dichloropropane	<10 µg/kg	TM116								
Bromochloromethane	<10 µg/kg	TM116								
Chloroform	<8 µg/kg	TM116								
1,1,1-Trichloroethane	<7 µg/kg	TM116								
1,1-Dichloropropene	<10 µg/kg	TM116								
Carbontetrachloride	<10 µg/kg	TM116								
1,2-Dichloroethane	<5 µg/kg	TM116								
Benzene	<9 µg/kg	TM116	<9	<9	<9	<9	<9	<9	<9	<9
Trichloroethene	<9 µg/kg	TM116								
1,2-Dichloropropane	<10 µg/kg	TM116								
Dibromomethane	<9 µg/kg	TM116								
Bromodichloromethane	<7 µg/kg	TM116								
cis-1,3-Dichloropropene	<10 µg/kg	TM116								
Toluene	<7 µg/kg	TM116	<7	<7	<7	<7	<7	<7	<7	<7
trans-1,3-Dichloropropene	<10 µg/kg	TM116								
1,1,2-Trichloroethane	<10 µg/kg	TM116								
1,3-Dichloropropane	<7 µg/kg	TM116								



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Validated

SDG: 221125-67
Client Ref.: 30691

Report Number: 671149
Location: Southampton Airport

Superseded Report: 670720

VOC MS (S)

Results Legend			Customer Sample Ref.		BH201-01	BH201-02	BH205-01	BH205-02	BH206-01	BH206-02
# ISO17025 accredited. M mCERTS accredited. sq. Aqueous / settled sample. diss. fil. Dissolved / filtered sample. tot.unfilt. Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4# Sample deviation (see appendix)			Depth (m)		2.00	3.50	1.00	2.40	0.50	1.90
			Sample Type		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled		21/11/2022	21/11/2022	21/11/2022	21/11/2022	21/11/2022	21/11/2022
			Sample Time		.	.	.	.	.	.
			Date Received		24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022	24/11/2022
			SDG Ref		221125-67	221125-67	221125-67	221125-67	221125-67	221125-67
			Lab Sample No.(s)		27217245	27217250	27217244	27217249	27217243	27217248
			AGS Reference							
Component	LOD/Units	Method								
Tetrachloroethene	<5 µg/kg	TM116						<5	M	
Dibromochloromethane	<10 µg/kg	TM116						<10	M	
1,2-Dibromoethane	<10 µg/kg	TM116						<10	M	
Chlorobenzene	<5 µg/kg	TM116						<5	M	
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116						<10	M	
Ethylbenzene	<4 µg/kg	TM116	<4	M	<4	M	<4	M	<4	M
p/m-Xylene	<10 µg/kg	TM116	<10	#	<10	#	<10	#	<10	#
o-Xylene	<10 µg/kg	TM116	<10	M	<10	M	<10	M	<10	M
Styrene	<10 µg/kg	TM116					<10	@ #		
Bromofom	<10 µg/kg	TM116					<10	M		
Isopropylbenzene	<5 µg/kg	TM116					<5	#		
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116					<10	#		
1,2,3-Trichloropropane	<16 µg/kg	TM116					<16	M		
Bromobenzene	<10 µg/kg	TM116					<10	M		
Propylbenzene	<10 µg/kg	TM116					<10	M		
2-Chlorotoluene	<9 µg/kg	TM116					<9	M		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116					<8	M		
4-Chlorotoluene	<10 µg/kg	TM116					<10	M		
tert-Butylbenzene	<14 µg/kg	TM116					<14	#		
1,2,4-Trimethylbenzene	<9 µg/kg	TM116					<9	#		
sec-Butylbenzene	<10 µg/kg	TM116					<10			
4-Isopropyltoluene	<10 µg/kg	TM116					<10			
1,3-Dichlorobenzene	<8 µg/kg	TM116					<8	M		
1,4-Dichlorobenzene	<5 µg/kg	TM116					<5	M		
n-Butylbenzene	<11 µg/kg	TM116					<11			
1,2-Dichlorobenzene	<10 µg/kg	TM116					<10	M		
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116					<14	M		
Tert-amyl methyl ether	<10 µg/kg	TM116					<10	#		
1,2,4-Trichlorobenzene	<20 µg/kg	TM116					<20			
Hexachlorobutadiene	<20 µg/kg	TM116					<20			
Naphthalene	<13 µg/kg	TM116					<13	M		
1,2,3-Trichlorobenzene	<20 µg/kg	TM116					<20	#		
1,3,5-Trichlorobenzene	<20 µg/kg	TM116					<20			

SDG: 221125-67
Client Ref.: 30691

Report Number: 671149

Superseded Report: 670720

Client Ref.: 30691

Location: Southampton Airport

VOC MS (S)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-67
Client Ref.: 30691

Report Number: 671149
Location: Southampton Airport

Superseded Report: 670720

VOC MS (S)

Results Legend			Customer Sample Ref.		S8	S9			
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.flit Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*§@ Sample deviation (see appendix)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		1.00 Soil/Solid (S) 21/11/2022	1.00 Soil/Solid (S) 21/11/2022			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM116	114	115					
Toluene-d8**	%	TM116	99.1	97.7					
4-Bromofluorobenzene**	%	TM116	93.6	91.4					
Dichlorodifluoromethane	<6 µg/kg	TM116	<6						
Chloromethane	<7 µg/kg	TM116	<7						
Vinyl Chloride	<6 µg/kg	TM116	<6						
Bromomethane	<10 µg/kg	TM116	<10						
Chloroethane	<10 µg/kg	TM116	<10						
Trichlorofluoromethane	<6 µg/kg	TM116	<6						
1,1-Dichloroethene	<10 µg/kg	TM116	<10						
Carbon Disulphide	<7 µg/kg	TM116	<7						
Dichloromethane	<10 µg/kg	TM116	<10						
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	<10					
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10						
1,1-Dichloroethane	<8 µg/kg	TM116	<8						
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6						
2,2-Dichloropropane	<10 µg/kg	TM116	<10						
Bromochloromethane	<10 µg/kg	TM116	<10						
Chloroform	<8 µg/kg	TM116	<8						
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7						
1,1-Dichloropropene	<10 µg/kg	TM116	<10						
Carbontetrachloride	<10 µg/kg	TM116	<10						
1,2-Dichloroethane	<5 µg/kg	TM116	<5						
Benzene	<9 µg/kg	TM116	<9	<9					
Trichloroethene	<9 µg/kg	TM116	<9						
1,2-Dichloropropane	<10 µg/kg	TM116	<10						
Dibromomethane	<9 µg/kg	TM116	<9						
Bromodichloromethane	<7 µg/kg	TM116	<7						
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10						
Toluene	<7 µg/kg	TM116	<7	<7					
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10						
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10						
1,3-Dichloropropane	<7 µg/kg	TM116	<7						



CERTIFICATE OF ANALYSIS

Validated

SDG: 221125-67
Client Ref.: 30691

Report Number: 671149
Location: Southampton Airport

Superseded Report: 670720

VOC MS (S)

Results Legend			Customer Sample Ref.		S8	S9			
# ISO17025 accredited. M mCERTS accredited. sq. Aqueous / settled sample. dis.filt. Dissolved / filtered sample. tot.unfilt. Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery. (F) Trigger breach confirmed 1-4# Sample deviation (see appendix)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		1.00 Soil/Solid (S) 21/11/2022 . 24/11/2022 221125-67 27217247	1.00 Soil/Solid (S) 21/11/2022 . 24/11/2022 221125-67 27217246			
Component	LOD/Units	Method							
Tetrachloroethene	<5 µg/kg	TM116	<5	M					
Dibromochloromethane	<10 µg/kg	TM116	<10	M					
1,2-Dibromoethane	<10 µg/kg	TM116	<10	M					
Chlorobenzene	<5 µg/kg	TM116	<5	M					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10	M					
Ethylbenzene	<4 µg/kg	TM116	<4	M	<4	M			
p/m-Xylene	<10 µg/kg	TM116	<10	#	<10	#			
o-Xylene	<10 µg/kg	TM116	<10	M	<10	M			
Styrene	<10 µg/kg	TM116	<10	@ #					
Bromofom	<10 µg/kg	TM116	<10	M					
Isopropylbenzene	<5 µg/kg	TM116	<5	#					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10	#					
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16	M					
Bromobenzene	<10 µg/kg	TM116	<10	M					
Propylbenzene	<10 µg/kg	TM116	<10	M					
2-Chlorotoluene	<9 µg/kg	TM116	<9	M					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8	M					
4-Chlorotoluene	<10 µg/kg	TM116	<10	M					
tert-Butylbenzene	<14 µg/kg	TM116	<14	#					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9	#					
sec-Butylbenzene	<10 µg/kg	TM116	<10						
4-Isopropyltoluene	<10 µg/kg	TM116	<10						
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8	M					
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5	M					
n-Butylbenzene	<11 µg/kg	TM116	<11						
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10	M					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14	M					
Tert-amyl methyl ether	<10 µg/kg	TM116	<10	#					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20						
Hexachlorobutadiene	<20 µg/kg	TM116	<20						
Naphthalene	<13 µg/kg	TM116	<13	M					
1,2,3-Trichlorobenzene	<20 µg/kg	TM116	<20	#					
1,3,5-Trichlorobenzene	<20 µg/kg	TM116	<20						

SDG: 221125-67
Client Ref.: 30691

Report Number: 671149

Superseded Report: 670720

Location: Southampton Airport

VOC MS (S)

[illegible]



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Validated

SDG: 221125-67
Client Ref.: 30691

Report Number: 671149
Location: Southampton Airport

Superseded Report: 670720

Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERIS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&*\$@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH201-01 2.00 SOLID 21/11/2022 00:00:00 24/11/2022 05:00:00 221125-67 27217245 TM048	06/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH201-02 3.50 SOLID 21/11/2022 00:00:00 24/11/2022 05:00:00 221125-67 27217250 TM048	06/12/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH205-01 1.00 SOLID 21/11/2022 00:00:00 24/11/2022 05:00:00 221125-67 27217244 TM048	06/12/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH205-02 2.40 SOLID 21/11/2022 00:00:00 24/11/2022 05:00:00 221125-67 27217249 TM048	06/12/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH206-01 0.50 SOLID 21/11/2022 00:00:00 24/11/2022 05:00:00 221125-67 27217243 TM048	06/12/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH206-02 1.90 SOLID 21/11/2022 00:00:00 24/11/2022 05:00:00 221125-67 27217248 TM048	06/12/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	S8 1.00 SOLID 21/11/2022 00:00:00 24/11/2022 05:00:00 221125-67 27217247 TM048	06/12/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	S9 1.00 SOLID 21/11/2022 00:00:00 24/11/2022 05:00:00 221125-67 27217246 TM048	06/12/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



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Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid Extractable Sulphate in Soils by ICP OES
TM243		Mixed Anions In Soils By Kone
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).



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Test Completion Dates

Lab Sample No(s)	27217245	27217250	27217244	27217249	27217243	27217248	27217247	27217246
Customer Sample Ref.	BH201-01	BH201-02	BH205-01	BH205-02	BH206-01	BH206-02	S8	S9
AGS Ref.								
Depth	2.00	3.50	1.00	2.40	0.50	1.90	1.00	1.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022
Asbestos ID in Solid Samples	06-Dec-2022	06-Dec-2022	06-Dec-2022	06-Dec-2022	06-Dec-2022	06-Dec-2022	06-Dec-2022	06-Dec-2022
Chromium III	01-Dec-2022	30-Nov-2022	01-Dec-2022	30-Nov-2022	01-Dec-2022	30-Nov-2022	30-Nov-2022	01-Dec-2022
EPH CWG GC (S)	02-Dec-2022	01-Dec-2022	01-Dec-2022	30-Nov-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
GRO by GC-FID (S)	01-Dec-2022	29-Nov-2022	01-Dec-2022	29-Nov-2022	01-Dec-2022	29-Nov-2022	29-Nov-2022	01-Dec-2022
Hexavalent Chromium (s)	01-Dec-2022	29-Nov-2022	01-Dec-2022	29-Nov-2022	01-Dec-2022	29-Nov-2022	29-Nov-2022	01-Dec-2022
Metals in solid samples by OES	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
PAH by GCMS	30-Nov-2022	01-Dec-2022	30-Nov-2022	01-Dec-2022	30-Nov-2022	29-Nov-2022	01-Dec-2022	30-Nov-2022
pH	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022	30-Nov-2022
Sample description	29-Nov-2022	25-Nov-2022	29-Nov-2022	26-Nov-2022	29-Nov-2022	25-Nov-2022	26-Nov-2022	29-Nov-2022
Total Sulphate	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
TPH CWG GC (S)	02-Dec-2022	01-Dec-2022	01-Dec-2022	30-Nov-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
VOC MS (S)	30-Nov-2022	29-Nov-2022	30-Nov-2022	29-Nov-2022	30-Nov-2022	29-Nov-2022	29-Nov-2022	30-Nov-2022



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Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.