



Consulting Engineers

**Site Investigation for the Wastefront Development  
at the Port of Sunderland  
Volume 3 of 4**



Issue:

1

**INFORMATION**

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Project No: 3717

**ISSUE STATUS**

<b>Issue</b>	<b>Date</b>	<b>Description</b>	<b>Prepared</b>	<b>Reviewed</b>
1	3-2-21	Draft Issue	MAT/CA	MF

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1.0 INTRODUCTION

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## 1.0 INTRODUCTION

- 1.1 Volume 3 contains a draft copy of the Phase 2 Ground Investigation Report and will be updated when further test information is available.

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## **PHASE 2 GROUND INVESTIGATION ON LAND AT HUDSON DOCK EAST, PORT OF SUNDERLAND**

3899OR02/January 2021

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<b>PROJECT NUMBER</b>	3899	
<b>PROJECT TITLE</b>	Wastefront, Sunderland	
<b>CLIENT</b>	DTA Consulting Engineers North East Business & Innovation Centre Enterprise Park East Sunderland SR5 2TA	
<b>REPORT TITLE</b>	Phase 2 Ground Investigation on Land At Hudson Dock East, Port Of Sunderland	
<b>REPORT REFERENCE</b>	3899OR02	
<b>REVISION</b>	<b>Date</b>	<b>Checked</b>
Rev00 DRAFT	29/01/2021	CM

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## PHASE 2 GROUND INVESTIGATION ON LAND AT HUDSON DOCK EAST, PORT OF SUNDERLAND

### 1 INTRODUCTION

FWS Consultants Ltd (FWS) carried out a Phase 2 ground investigation on land at Hudson Dock East, Port of Sunderland (the 'site') for DTA Consulting Engineers to provide information for a tyre storage and processing plant. The site location is shown on Drawing 3899OD01, Appendix 1.

A Phase 1 Preliminary Contamination Risk Assessment was undertaken in November 2020 and revised in January 2021 (Ref. 1)

This report presents the results of the Phase II Ground Investigation carried out between 30 November 2020 and 26 January 2021, which has been undertaken in accordance with the principles of current guidance including BS10175:2011+A1:2013 "Code of Practice for the Investigation of Potentially Contaminated Sites" (Ref. 2) and BS5930:2015+A1:2020 "Code of Practice for Ground Investigations" (Ref. 3), Environment Agency guidance document "Land Contamination: Risk Management" Guidance 2020 (Ref. 3), and DEFRA "Environmental Protection Act 1990: Part 2A, Contaminated Land Statutory Guidance" (2012) (Ref. 4).

The objectives of the investigation were to:-

- assess the historical landuse, geological and hydrogeological setting;
- provide information on ground and groundwater contamination across the site;
- provide information on soil gas conditions;
- provide a Generic Quantitative Risk Assessment in relation to the proposed development and wider environment.;
- assess remediation requirements, waste characterisation and potential reclamation costs
- provide geotechnical information for the design of the design of piled foundations for structures on the site;
- provide recommendations on further investigations.

The following sources of information were utilised in the preparation of this report:-

#### **Previous Reports**

Previous investigations of this site are summarised in the FWS desk study (Ref. 1).

#### **Development Details**

The following development detail drawings are presented in Appendix 1.2.

- W4-01-20-06 – Site Layout Plan
- WF1-0401-PLP-0001 Rev00 – Plot Plan
- 23903\_T Rev11 – Topographical Survey With Exploratory Hole Locations

As part the investigation works the following has been carried out by the Client:-

- Ground penetrating radar scan of the site (Ref. 6)
- Sub surface UXO scan (Ref. 7)

## 2 DEVELOPMENT PROPOSALS

The proposed development is for an industrial tyre recycling processing plant as proposed is shown in Drawing WF1-0401-PLP-001, Appendix 1.2. The development is to comprise:-

### Earthworks

- No significant earthworks are expected

### Buildings

- In the northwest of Area A a lab, workshop, control room and administration block are proposed with a large process area pump house and storage area in the west of the area. The central western area is to comprise a pyrolysis and tyre shredding areas with a cooling tower and distillation and slops tank in the central eastern part of the area. In the south west of the area is tank farm with 11 tanks between 2 and 15 m diameter. In the southeast of the site is a fuel gas tank, utility block, chemical storage, thermal oxidizer, scrubber and chemical store with a flare on the eastern boundary. In the southern tip of the site is a wastewater treatment plant.
- Area A2 is proposed to be a hardstanding tyre and wire storage and handling area with a nitrogen storage area
- In Area B, a barge loading station with loading arm will be present in the south of the area with a tanker loading gantry and weigh bridge in the north.

### Car Parking and Roadways

- Roadways intersect the whole site with a car parking area and hardstanding areas for future expansion in the north .

## 3 SITE DESCRIPTION

The site centred on approximate National Grid Reference 441320E, 556920N with an area of around 4.4 ha and is situated within the Port of Sunderland east of Sunderland city centre, as shown in Drawing 3899OD01, Appendix 1.1.

The site is generally flat at an elevation of approximately 5 to 5.5 m AOD in the central and west (Area A and Area B) and 4.5 to 5 m AOD in the northeastern corner (Area A2).

The site is to comprise three development areas; the former SOSL site in the east (Area A) with a triangular area (Area A2) present in the northeast of the site and Sheers Quay (Area B) in the west. As shown on Drawing 3899OD02Rev01, Appendix 1.1.

### Area A – Former SOSL Site

The site was generally covered by gravel hardstanding and used to store industrial mechanical presses, as shown in Drawing 3899OD02 Rev01, Appendix 1.1. Scaffold board were also stored in the northeast. Containers containing presses, and empty skips were present in the northeast.

In the central area was a small brick structure, with some self-seeded bushes adjacent to it. In the western area, the ground was heavily weathered with mostly gravel hardstanding. Some concrete slabs of different state of weathering (ranging from intact to fractured) were present, as shown in Drawing 3899OD02 Rev01, Appendix 1.1.

In the northwest, overgrown vegetation was overlying gravel hardstanding.

A 2 m tall retaining wall down to sea level was present around 5 m to the east of the site, made of sheet pile, indicating the sea mean high water level.

### **Area A2**

This area comprises a triangular shaped parcel of land with an asphalt road along the northern boundary. The eastern boundary is marked by a steep slope to the sea and the southern and western boundaries comprise a metal fence.

Generally the site is covered by grassed vegetation and brambles, with loose gravel and concrete floor slabs in the south. The ground is occasionally boggy.

The centre of the area contains a stockpile of tyres covered with topsoil approximately 3 to 4 m high, and mounds of potentially fly-tipped waste including fibreglass boat panels, refrigerators, a vending machine, empty IBCs, rubble, plastic, rope, timber and metal.

### **Area B – Shears Quay Area**

The area is generally covered by gravel hardstanding with an asphalt access path in the north. An electric substation was present in the north surrounded by concrete hardstanding.

In the south was several containers and skips stored. An unknown small building was present in the central area.

The western boundary was delineated by an approximately 5 m tall quayside brick wall.

There was no evidence of invasive species on site.

## **4 ENVIRONMENTAL SETTING**

### **4.1 Ground and Groundwater Conditions**

From prior investigations and the BGS GeoIndex, the following ground conditions are expected.

It is expected that underlying gravel hardstanding with occasional concrete and tarmac relict structures at surface, thick granular made ground with interbedded cohesive made ground is expected across the site to depths of between 6 to 9 m bgl, comprising sands and gravels of brick, glass, ash, clinker, ceramics, concrete, iron, flint, timber, dolomite, sandstone and limestone with occasional cobbles and boulders and possible relict structures. Made ground is expected to deepen in the south of the site in the Hendon Channel to up to 12 m .

Superficial deposits are not expected beneath the made ground but if present, will comprise thin gravely sand beach deposits and possible clays.

Rockhead is expected between 4 to 12 m bgl dipping to the southwest direction comprising very weak to moderately strong thinly to thickly bedded dolomitic limestone of the Roker Formation, with a high fracture index (>25). Often recovered as a gravel with cobbles at rockhead with gravelly clay bands

It is anticipated that a shallow tidally influenced water table is present within the granular made ground materials. The main water table is expected at a depth within the underlying bedrock.

## 4.2 Potential Contamination Sources

The table below summarises the potential sources and nature of contaminants identified from the Desk Study (Ref. 1) as shown in Drawing 3899OD04Rev01, Appendix 1.1:-

**Table 1: Potential Contamination Sources**

Source of Potential Hazard/Pollutant			Potential Contaminants
Onsite	H1	General made ground	Hydrocarbons, BTEX, PAH, heavy metals, sulphate, asbestos, mercury, PCBs, SVOCs, VOCs, chlorides, phenols, alcohols, ketones, coal tar, cyanides, carbon dioxide, methane
	H2	Magnesian Limestone bedrock	Soil gas – elevated carbon dioxide
Offsite	H3	Chemical industries	Hydrocarbons, heavy metals, asbestos

## 4.3 Potential Geotechnical Constraints

The desk study (Ref. 1) has identified the potential for the following geotechnical constraints:-

- Possible buried concrete relict structures may be present across the site associated with the past uses, in addition to the existing concrete slabs present at surface.
- Possible dock and quay structures left in place in areas of reclaimed channels in the south, centre and east of the site.
- The site is flat and is part of a built-up dock area with interbedded cohesive and granular made ground up to 8.6 m thick.
- Directly underlying the made ground is either thin loose to medium dense sands and silts on to weathered rockhead of limestone or made ground directly on to weathered rockhead of limestone.

## 5 PREVIOUS INVESTIGATIONS

Previous investigations of this site are summarised below, and the locations of the previous exploratory holes are shown on Drawing 3899OD02Rev01 and 03Rev01, Appendix 1.1.

- December 2001 – Norwest Holst Soil Engineering Ltd – Investigations of the whole port area on and adjacent to the site. Investigation on site included 14 trial pits, 2 cable percussive holes and 1 rotary follow on hole including insitu geotechnical SPT/CPT, gas monitoring, chemical and geotechnical testing.
- July 2014 – IOM – Certificate of analysis for 51 soil samples from 17 trial pits for qualitative and quantitative asbestos.

- March 2015 – RSK – Compilation of capping thickness at SOSL. Comprising 26 hand dug pits and chemical/asbestos testing of imported fill material.

A summary of the ground conditions determined by the historical site investigations is presented within the desk study (Ref. 1). Where relevant historical exploratory hole information, chemical, geotechnical and monitoring data is available, this factual information has been included in the following sections.

## 6 GROUND INVESTIGATION

### 6.1 Design Objectives

The ground investigation was carried out to determine the following geotechnical and environmental conditions:

#### Geotechnical

- the extent, depth and geotechnical conditions of the made ground across the site in relation to the development;
- the location, depth and geotechnical conditions of relict structures in relation to the development;
- the extent (if any), depth and geotechnical conditions of the superficial deposits and dolomitic bedrock.

#### Contamination

- the extent and levels of ground and groundwater contamination associated with historical development on the site;
- the presence of free phase hydrocarbon contamination associated with the previous oil depot;
- soil gas emissions within the general made ground across the site and dolomitic limestone bedrock
- soil vapour and odour conditions associated with the previous oil depot.

### 6.2 Constraints to Ground investigation

Presented below is a summary of how the encountered ground conditions locally restricted investigations:-

#### Area A

In the west and central south of Area A, TPs 3, 15 and 21 encountered concrete hardstanding at 0.3, 0.8 and 0.6 m respectively.

Most trial pits in Area A contained a varying low to high cobble with occasional boulder content.

Tps 4, 5, 7, 8, 14, 16, 17 were terminated due to instability and collapse of the side walls during excavation.

During the drilling of BHs 18, 19 and 20 a strong hydrocarbon odour was encountered within the granular made ground and groundwater, resulting in all three boreholes being terminated at depths of between 4 and 5 m bgl.

During the rotary drilling of BHs 4, 16 and 17 a strong hydrogen sulphide odour was noted within the dolomitic limestone bedrock. These boreholes were terminated early at a depths of 14.5 to 17 m bgl.

### **Area A2**

In Area A2, due to hard digging, unstable side walls with collapse and concrete cobble and boulder obstructions, no trial pits in this area were taken below 2.5 m bgl.

### **Area B**

In the south of Area B, TPs 29 and 29A encountered timber railway sleepers with connected steel rail and concrete obstruction at 0.3 and 1.0 m respectively.

Relict structures including an unrecorded brick service duct with metal pipework was encountered in BH14 at a depth of 2.0 m. Concrete hardstanding was encountered at depths of 1.5 and 2.5 m in BHs 14B and 14A, respectively.

Most trial pits in Area B contained a varying low to medium cobble content.

TP 30 was terminated due to instability and collapse of the side walls during excavation.

## **6.3 Investigation Works Undertaken**

The following ground investigation was undertaken between 30 November 2020 to 25 January 2021. Borehole and trial pit locations are presented in Drawing 3899OD05, Appendix 1.1 for which the exploratory logs are provided in Appendix 2.

- UXO magnetometer survey prior to start of borehole and trial pit locations.
- 35 trial pits to a depths of between 0.3 and 3.8 m to enable the made ground to be examined and buried obstructions to be identified. The investigation included 25 trial pits in Area A, five trial pits in Area A2 and five trial pits in Area B.
- 31 cable percussion boreholes with Standard Penetration Testing (SPT) to a depths of up to 12 m to enable the made ground, natural superficial deposits and weathered bedrock to be examined. The investigation included 25 boreholes in Area A, three in Area A2 and four in Area B.
- 15 follow on rotary continuous SPT / cored boreholes to a depths of 20 m to investigate the nature of the rock beneath the site. Of which twelve were in Area A and three in Area B.
- Appropriate sampling to enable chemical and geotechnical testing to be carried out.
- Installation of monitoring wells to enable subsequent groundwater and gas measurements.

## **6.4 Insitu Testing**

Prior to intrusive works a surface magnetometer survey was undertaken which identified several ferro-magnetic anomalies (Ref. 7). During the drilling of boreholes and excavation of trial pits, explosive ordnance clearance was carried out by down hole magnetometer survey by Planit UXB

Ltd. A survey was undertaken at surface and then at 6 m. All positions were cleared of unexploded ordnance (UXO).

During drilling of the cable percussive boreholes SPTs were undertaken at 1 to 1.5 m intervals.

During the drilling of the rotary boreholes continuous SPT's were undertaken every 0.5 m when core recovery was poor and core could not be recovered.

## 6.5 Monitoring Undertaken

During excavation of the trial pits Volatile Organic Compounds (VOCs) were monitored using a photo ionization detector and the results are recorded on the logs in Appendix 2.

Details of the standpipes installed for ground gas and groundwater monitoring are summarised in Table 2, below, and their locations are shown on Drawing 3899OD05, Appendix 1.1.

**Table 2 Summary of Monitoring Installations**

Borehole	Installation Response Zone Depth (m)	Target Strata	Area
BH1	3 - 4.2 m	Granular Made Ground	Area A – Former SOSL site
BH2	1.5 - 5 m		
BH4	12 - 16 m	Dolomite	
BH5	1 - 5.5 m	Granular Made Ground	
BH6	1 - 6 m		
BH7	2 - 4.5 m		
BH8	2 - 4 m		
BH9	1 - 4 m		
BH11	1 - 6 m		
BH12	2 - 4		
BH17	14 - 16 m	Dolomite	
BH18	1 - 4 m	Granular Made Ground	
BH24	2 - 5 m		
BH25	2 - 5 m		
BH26	2 - 6 m		
BH27	2 - 5 m		
BH28	8 - 18 m		Dolomite
BH29	2 - 5 m	Granular Made Ground	
BH30	2 - 5 m		
BH31	3 - 5 m		
BH13	2 - 4 m	Granular Made Ground	Area B – Shears Quay

The soil gas monitoring of the twenty standpipes was carried out for methane, carbon dioxide, oxygen, barometric pressure, gas flow and water level, using a Geotechnical Instruments Infra-Red Gas Analyser (GA500) with internal flow measurement and a Pro-tiger Photo-Ionisation Detector . Observations of the prevailing weather conditions and measured atmospheric pressure were also recorded. Monitoring has been undertaken on one occasion and the results of these visits are presented in Appendix 3.

Groundwater level readings within the made ground and weathered dolomitic bedrock were taken within all BHs during the monitoring visits. The results are also presented in Appendix 3.

## 6.6 Laboratory Testing

### 6.6.1 Chemical Analysis

#### Historical Analysis

Historical chemical analysis results from the Shears Quay and 'A' area were reported within the desk study (Ref. 1) from the previous investigation in Norwest Holst Volume 3 and IOM testing in 2014.

The following chemical soil analysis has been undertaken by previous investigations on the site:-

- Norquest Holst undertook testing of twenty five samples of made ground in 2001 for a suite of metals, sulphates, TPH, PAH and Phenols, of which three samples were tested for speciated PAHs. In addition, twenty two samples of made ground were tested for asbestos ID by Norquest Holst in 2001. None of the samples recorded asbestos above 0.001%.
- IOM undertook testing for 51 soil samples from 17 trial pits at depths of between 0.0 and 3.5 m for qualitative and quantitative asbestos within Area A in July 2014. From this analysis 18 samples were found to contain ACMs, principally chrysolite and amosite, with minor crocidolite.

There have been no investigations in the Area A2 to date.

#### Current Investigation

The following chemical soil and groundwater analysis has been carried out by a MCERTS/UKAS accredited laboratory. Chemical testing was carried out on selected soil samples and the results received to date are included in Appendix 4.

#### Soils

- General made ground 60 samples were tested for a general suite of contaminants including – total phenols, total TPH, arsenic, boron, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, zinc, total cyanide, free cyanide, chloride, PAH (16 priority), pH, total sulphate, water soluble sulphate, TPH (CWG C5-C35), BTEX, asbestos screening and soil organic matter. In addition, five were tested for VOC/ SVOCS suite, PCBs and WAC testing
- Seven further samples from the south of the site associated with the hydrocarbon contamination within the groundwater were tested for a Standard Soil Suite (above), TPH CWG Suite, Speciated PAH USEPA 16 by GC FID, VOCs with TICS, SVOCs with TICS
- Twenty seven samples were selected, and tested for an asbestos quantification.

#### Groundwater

- Thirty groundwater samples from within the granular made ground in the south of the site and four within the dolomite, were tested for a standard water suite , TPH CWG Ali/Aro with MTBE and BTEX, VOCs with TICS, SVOCs with TICS, Speciated PAH, and two (BH18 and 20) were tested for TPH CWG Ali/Aro with MTBE and BTEX, VOCs with TICS, SVOCs with TICS, Speciated PAH, Hardness (CaCO3) only.



## 6.6.2 Geotechnical Analysis

As summarised below, geotechnical testing was carried out on selected soil samples and the results are included in Appendix 8.

Geotechnical analysis was carried out on samples of granular and cohesive made ground by a UKAS accredited laboratory for moisture content, Atterberg limits, particle size distribution, compactions and CBRs.

## 6.6.3 Quality Assurance and Quality Control

Quality assurance and control of the investigation was implemented in accordance with the following standards and industry guidance:

- Site Investigation Protocols the fieldwork was carried out following the principles of BS 10175:2011+A1:2013 (Ref. 2), BS 5930:2015+A1:2020 (Ref. 3) and BS EN ISO 14688 (Ref. 13).
- Sampling Protocols were carried out following the principles of BS 5930:2015+A1:2020 (Ref. 3).
- Insitu testing was carried out following the principles of BS 5930:2015+A1:2020 (Ref. 3) and SPT testing to BS EN ISO 22476-3:2005+A1:2011 (Ref. 8) and BS EN ISO 14688-1:2002 (Ref. 9).
- Insitu testing to BS 5930:2015+A1:2020 (Ref. 3).
- Soil gas monitoring and reporting was undertaken following the principles of CIRIA 665 (Ref. 10) and BS 8485 (Ref. 11).
- The environmental testing was undertaken by Derwentside Environmental Testing Services (DETS), a MCERTS/UKAS accredited laboratory.
- The geotechnical testing was undertaken by Solmek Ltd, a UKAS accredited laboratory.

## 6.7 Ground Conditions

### 6.7.1 Hardstanding and Below Ground Structures

#### **Area A – Former SOSL Site**

In the west of the main site, TP 3 and 21 encountered concrete hardstanding between 1.2 and 0.65 m.

#### **Area A2**

No below ground structures were encountered in this part of the site.

#### **Area B – Shears Quay**

Relict structures including an unrecorded brick service duct with metal pipework was encountered in BH14 at a depth of 2.0 m.

Concrete hardstanding at least 0.1 m thick was encountered at between 1.5 and 2.5 m in BHs 14B and 14A, respectively. Nearby trial pits (TP29A and TP30) also identified a concrete slab at between 1.0 and 2.0 m, respectively.

### 6.7.2 Topsoil

Topsoil was not encountered during the ground investigation.

### 6.7.3 Made Ground

#### Area A – Former SOSL Site

Granular made ground fill comprising thickly interbedded loose to medium dense multicoloured heterogeneous gravelly, clayey fine to coarse sand or sandy fine to coarse gravel with a variable low to high cobble content and occasional sandy gravelly clay horizons was encountered to depths of between 6 to 9.2 m bgl (-1.8 to -3.4 m OD) in the north of the site and up between 8.4 to 12.5 m bgl (-3 to -7.3 m OD) in the south of the site. The gravels comprised mainly demolition arisings of generally brick, concrete, limestone, dolomite, sandstone, chert, chalk with occasional disseminated slag, ash, basalt, metal pieces, timber, glass, plastic, ceramics and shells.

#### Area A2

Granular made ground fill comprising thickly interbedded loose to medium dense clayey sandy fine to coarse gravel or clayey gravelly sand with bricks, concrete, dolomite, sandstone, mudstone with occasional metal rebar, glass plastic sheeting and polystyrene was encountered to depths of between 5 and 9 m bgl with a high cobble and boulder content. Concrete boulders were recorded up to 1.5 m across. .

#### Area B – Shears Quay

Granular made ground fill comprising thinly to thickly interbedded loose to medium dense clayey sandy fine to coarse gravel or clayey gravelly sand or sandy gravelly clay with bricks, concrete, dolomite, sandstone, mudstone with low cobble content to depths of between 8 to 8.3 m bgl (-2.65 to -2.95 m OD).

### 6.7.4 Superficial Deposits

Localised possible natural superficial deposits comprising beds of medium dense, fine to coarse gravelly sand with gravel of shells, chert, dolomite and sandstone was encountered locally in Area A in BH4; 10.8 to 11.5 m bgl, BH8; 6 to 8.1 m bgl and BH23; 5.2 to 6.5 m bgl.

Localised possible natural superficial deposits comprising beds of soft black occasionally slightly sandy clay were also encountered locally in Area A in BH4; 11.5 to 12 m bgl, BH 9; 8.4 to 13 m bgl with a dark brown slightly sandy clay with occasional shells in TPs 6 and 7 at a depths from 3.1 and 3.6 m bgl (possible dredge material).

### 6.7.5 Bedrock

The bedrock was variably thinly to thickly interbedded destructured to distinctly weathered very weak to moderately strong light brownish yellow dolomitic limestone. Core loss and non-intact zones were identified throughout the cored sections with clayey weak zones. Core became more competent with depth however recovery remained low with extensive areas of core loss and non-intact zones, the recorded values of FI are however, limited by the poor core quality in this highly weathered and destructured rock.

In Area A bedrock was encountered from depths of around 7 to 9.2 m bgl (-1.8 to -3.4 m OD) in the north of Area A, from 9.2 to 13.4 m bgl (-4.6 to -8.4 m OD) in the south of Area in the Hendon Channel and 7.8 m bgl (-2.9 m OD) to the south of the channel (BH 31).

In Area A2 bedrock was encountered at depths of around 6.5 to 9 m bgl (-1.8 to -4.5 m OD) dipping to the south east.

In Area B bedrock was encountered at depths of around 8 to 8.3 m bgl (-2.65 to -2.9 m OD).

### 6.7.6 Groundwater

Groundwater was encountered within the granular made ground in all boreholes (BH1 to 31) at depths between 3.3 and 5.2 m bgl and within TPs 2, 12, 16 and 17 at depths of between 3.4 and 3.6 m bgl.

The first monitoring visit was undertaken on 28 January 2021, during which groundwater was recorded at 3 to 4 m bgl (1.6 to 2.0 m AOD).

From the groundwater conditions encountered during the site investigations and subsequent monitoring to date, it is determined that a mobile tidally influenced groundwater table may exist within the granular made ground deposits and interconnected with bedrock aquifer.

## 7 MATERIAL PROPERTIES

### 7.1 Chemical Properties

#### 7.1.1 General

The results of all chemical testing have been compiled into data tables, which are presented in Appendix 5. These tables present the minimum, mean, maximum and US<sub>95</sub> (where applicable) concentrations of determinands for contaminants detected during the ground investigations and highlight determinands that exceed the Generic Assessment Criteria (GAC) (Appendix 6) for contaminants detected during the ground investigations.

In accordance with CL:AIRE (Ref. 18), a statistical analysis of the chemical results has been undertaken to identify “outlier” concentrations indicative of hotspots, and Upper Confidence Level 95<sup>th</sup> percentile concentrations (US<sub>95</sub> values). Where insufficient data exists, maximum concentrations are provided.

Based on the statistical analysis, evidence of contamination was identified associated with the former SOSL site for hydrocarbons within the granular made ground and groundwaters.

#### 7.1.2 Visual/Olfactory Evidence of Contamination

Made ground across the site contained evidence of contamination, as shown in Table 4.

**Table 3 Summary of Olfactory Evidence of Contamination**

Exploratory Hole	Depth from (m)	Nature
TP16	0.25 - 0.9	Slight hydrocarbon odour in a dolomitic gravel (PID values of 1.5 ppm)
	2.0 - 3.4	Strong becoming very strong at 3.4 m hydrocarbon odour in grey sand. Groundwater seepage at 3.4 (PID value of 27 to 33 ppm)
TP17	1.2 - 3.6	Slight hydrocarbon odour in gravelly sand. Groundwater encountered at 3.6 m with slight hydrocarbon odour (PID values of 2.1 to 6.6 ppm).
TP22	1.9	Slight creosote odour within sandy gravel associated with timber (PID values of 1.8 ppm).
TP25	0.3 - 0.9	Slight hydrocarbon/sulphurous odour with a very slight 'fruity' odour (naphthalene/phenols) in sandy gravel (PID values of 1.6 ppm).
TP26	0.3 - 1.5	Slight creosote odour in gravelly sandy (PID values of 2.2 ppm).
TP30	0.8	Slight hydrocarbon odour in sandy gravel (PID values of 0.2 ppm).
BH4	15.0	Sulphurous odour in dolomite and groundwater.
BH10	6.3-8.2	Slight hydrocarbon odour in gravelly sand.
BH15	2.9-5.0	Slight hydrocarbon odour in sandy gravelly clay.
BH16	4.2 - 7.9	Hydrocarbon odour with slight iridescence in gravelly sand and groundwater.
	15	Sulphurous odour within dolomite and groundwater.
BH17	4.3-5.0	Slight hydrocarbon/fuel oil odour with slight iridescence in sandy gravel and groundwater.
	11.5	Sulphurous odour within dolomite and groundwater.
BH18	3.0	Strong hydrocarbon odour with slight iridescence in gravelly sand and groundwater.
BH19	4.0	Very strong hydrocarbon odour with phenolic odour with slight iridescence in gravelly sand and groundwater.
BH20	3.1	Very strong hydrocarbon odour with slight iridescence in sandy gravel and groundwater.
BH24	4	Strong odour of fuel oil with slight iridescence in gravelly sand and groundwater.
BH25	4	Strong odour of fuel oil in with slight iridescence gravelly sand and groundwater.
BH26	3.5	Slight hydrocarbon odour with slight iridescence in sandy gravel and groundwater.
	4.5	Strong odour of fuel oil in sandy gravel and groundwater.
BH27	3.5	Odour of fuel oil, tyre rubber with slight iridescence.
BH28	3.5	Odour of fuel oil, tyre with slight iridescence in sandy gravel and groundwater.
BH29	3.5	Hydrocarbon odour with slight iridescence in sandy gravel and groundwater.
	4.5	Fuel oil odour with slight iridescence in sandy gravel and groundwater.
BH30	3.3 - 4.5	Hydrocarbon odour with slight iridescence in gravelly sand and groundwater.
BH31	3.2 – 7.8	Hydrocarbon odour with slight iridescence in gravelly sand and groundwater.

### 7.1.3 Soils - Total Concentrations

The results of the soils testing have been assessed to identify contaminants recorded at concentrations above the GAC (Appendix 6).

The following concentrations received to date were found to be above the GAC.

**Table 4: Recorded Elevated Contaminants (Made Ground)**

Location of Contamination	BH/TP No.	Sample Depth (m bgl)	Material	Determinand	US95 or Maximum Concentration (mg/kg)	Generic Assessment Value (mg/kg)	Receptor
Area A	TP17	1.6	Granular Made Ground	Benzo(a)pyrene	42	35	Human Health
	TP3	0.35		Dibenzo(a,h)anthracene	6.6	3.5	
	TP12	0.2			5.8		
	TP13	1.2			4.0		
	TP1	0.85			3.9		
	TP12	2.0		Sulphate	1,500	500 mg/l	
	TP20	0.7			560		
	BH4	2.0			1,300		
		9.5			1,600		
	BH16	7.0			540		
	TP16	2.0			650		
	BH16	6.0			Chloride		280
		7.0		370			
		BH18		6.0		180	
		BH24		140		140	
BH29		4.0	210				
TP9	0.4	Copper	660	39	Plants		
Area A2	BH23	0.6	Granular Made Ground	Dibenzo(a,h)anthracene	5.1	3.5	Human Health
	BH21	6.5		Chloride	1,200	100 mg/l	
	BH22	3.0			160		
	BH23	5.0			340		
Area B	BH15	4.0	Granular Made Ground	Chloride	100	100 mg/l	Property and In ground water services
	TP26	0.4			110		
	TP30	3.5			780		
	TP32	0.6		Sulphate	520	500 mg/l	
	TP33	0.3			530		
	TP26	1.6		Cadmium	28	15	Plants
	TP27	0.7		Zinc	82,000	3,000	
				Arsenic	230	39	

#### 7.1.4 Asbestos in Soils

Asbestos screening tests were undertaken on 133 samples of the general made ground from Areas A, A2 and B.

Asbestos was reported in 50 of the 133 samples tested at depths of between 0.4 and 7.0 m and comprised Amosite, Chrysotile and Crocidolite as microscopic loose fibres, loose fibres, bundles of fibres, asbestos debris and bundles in bitumen and insulation and debris. Asbestos quantification testing presented asbestos as <0.001% to a maximum 0.097%.

#### 7.1.5 Assessment of Hazardous / Non-Hazardous Waste Properties

#### 7.1.6 Waste Acceptance Criteria Testing

### 7.1.7 Groundwaters – Concentrations

The results of the chemical testing programme for total concentrations within the groundwaters have been assessed to determine the main contaminants recorded at concentrations above generic assessment criteria (Appendix 6). The following concentrations were found to be above the generic criteria from the results received to date.

**Table 5: Recorded Elevated Contaminants (Groundwater)**

Site Area (Aquifer / Perched water)	Groundwater – Concentrations				
	BH No.	Determinand	Total Concentration (ug/l)	Assessment Value (ug/l)	Receptor
Ground water in Made ground	BH16	Boron	1,000	1,000	Potable water
	BH16, 25, 28, 29, 30	Chloride	320-2000	250	Aquatic life
	BH16, 18, 20, 24, 15, 16, 17, 28, 29, 30, 31	Manganese	180-2,800	30	
	BH24	Copper	100	28	Surface/ground water
	Bh24, 25, 31	Lead	15-200	7.2	
		Mercury	0.05	0.05	
		Naphthalene	1.1-360	2.4	
	BH16, 18, 20, 24, 15, 16, 17, 28, 29, 30, 31	Anthracene	1.5-73.0	0.1	
		Fluoranthene	1.9-520	0.1	
		Benzo(b)fluoranthene	0.91-310	0.03	
		Benzo(k)fluoranthene	0.4-100	0.03	
		Benzo(a)pyrene	0.87-250	0.05	
		Indeno(1,2,3-c,d)pyrene	0.64-190	0.002	
		Benzo(g,h,i)perylene	0.57-170	0.002	
		Various VOC/SVOCs and TICS		Present	
		TPH/EPH	210-130,000	10	Drinking water
		PAH Total	13-3000	0.1	
BH28	Sulphate	520	400	Property	

There are no specific assessment values for TPH/VOCs/SVOCs in the environment so the low assessment value for drinking water can be dismissed. However the visual evidence of iridescence on the water surface during drilling and sampling confirms that limited free product is present.

### 7.1.8 Ground Gas/Vapours

Made ground recorded to depths of 5.2 to 10.4 m bgl comprised heterogeneous granular fill with occasional cohesive horizons with some putrescible or biodegradable content with slight to strong unidentified hydrocarbon (possible fuel oils) vapours. Overlying locally present sand or clay superficial deposits that overlie dolomitic limestone.

The table below presents a summary of the ground gas conditions recorded onsite.

**Table 6: Summary of Ground Gas Conditions**

Source Area and Materials	CH <sub>4</sub>	CO <sub>2</sub>	O <sub>2</sub>	Flow Rate	Dates of readings during a period low and falling pressure	Gas Screening Value (GSV) and Characteristic Situation (CS)
	Min and Max Concentrations (%)			l/hr		
General made ground	<0.1 to 1.0	0.3 to 11.3	4.7 to 21.0	<0.1	28/01/2021	GSV = 0.1 x 0.113 (CO <sub>2</sub> ) = 0.0113  CS2
Dolomitic Limestone	<0.1 to 3	<0.1 to 2.6	19.6 to 22.5	<0.1		

## 7.2 Geotechnical Properties

### 7.2.1 General

The geotechnical results from the ground investigations are presented in Appendix 8, and summarised below.

### 7.2.2 Made Ground

### 7.2.3 Superficial Deposits

### 7.2.4 Bedrock

## 8 CONTAMINATION RISK ASSESSMENT

### 8.1 Conceptual Site Model

A Conceptual Site Model (CSM) for the proposed commercial development has been prepared in accordance with current guidance (Ref. 4) by consideration of the site specific Contamination Sources, Receptors and Pathways described in the following sections. A schematic conceptual model of the site is presented in Drawing 3899OD04Rev01, Appendix 1.1.

### 8.2 Contamination Sources

#### 8.2.1 General

The presence of significant contamination hazards have been identified by evaluation of the contaminant concentrations in relation to the GAC developed for this commercial development, as presented in Appendix 6. Direct comparison is made between the assessment criteria and the US95 or maximum concentrations and hot spot values to determine which contaminants in which materials present a risk of harm or pollution. In addition, consideration is also given to the potential sources of contamination, identified from the desk study, walkover and visual and olfactory evidence from the ground investigation and soil gas concentrations detected in the monitoring.

## 8.2.2 Hazards Identified

The hazards to the development and wider environment identified from this investigation are summarised below and schematically presented on the CSM Drawing 3899OD04, Appendix 1:-

**Table 7: Summary of Hazards Identified**

SOILS				
Proposed Development Area	Location of Contamination	Material and Depth of Contamination	Contaminants Identified	Receptor At Risk of Harm
Proposed buildings and roadways	General Made Ground (H1)	Made Ground 0 to 10.4 m	Asbestos, PAHs, Sulphates, Chlorides	Human Health, Buildings and Services
Proposed landscaped areas			Heavy Metals	Plants
SOIL GAS / VAPOURS				
Proposed Development Area	Source and location of gas emissions	Characteristic Situation (Ref. 17)		Receptor At Risk of Harm
Proposed Buildings	General Made Ground (H1)	Characteristic Situation 2 based on carbon dioxide concentration		Human Health & Property
GROUND WATERS				
Proposed Development Area	Location Of Contamination	Contaminants Identified	Receptor At Risk of Harm	
Proposed buildings and roadways	Perched groundwater	TPH	Human Health, Property & Controlled Waters	

## 8.3 Receptor Characterisation

Based on environmental conditions determined, the following site-specific receptors have been identified and are considered within the CSM Drawing 3899OD04, Appendix 1:-

**Table \*8: Receptor Characterisation**

Part 2A Classification	Group	Receptor
Part 2A Receptors	R1	Human Health
		Future site endusers in buildings and landscaped areas
		Residents/Site users of commercial/industrial within and/or adjacent to the site boundaries
	R2	Property
		Proposed development comprising tyre processing facility
		Existing buildings
		Services
	R3	Controlled Waters/Water Environment
		Surface water the nearest surface water body is Hendon Dock and the North Sea, adjacent to the west and east of the site respectively which are expected to be in hydraulic continuity with the site.
	R4	
		Roker Formation is classified as a 'Principal Aquifer'
Non Part 2A Receptors	R5	Construction workers
	R6	Plants and landscaped areas



## 8.4 Pathway Characterisation

From the site conditions and development layout the following potential pathways by which receptors might be exposed to contaminants, as illustrated in the CSM Drawing 3899OD04, Appendix 1:-

**Table 9: Pathway Characterisation**

Pathway		Receptor
P1	Inhalation, ingestion and dermal contact	Human Health
P2	Direct contact	Plants
P3	Soil gas or soil vapours pooling within the structures	Buildings, Property and Services
	Contact with aggressive or acidic soils or hydrocarbon impacted soils (made ground)	
P4	Leaching of contaminants from the soil migrating vertically or laterally to groundwater	Water Environment

## 8.5 Generic Quantitative Contamination Risk Assessment

The CSM outlined above and illustrated in Drawing 3899OD04, Appendix 1, has been used to undertake a semi quantitative contamination risk assessment for the development site. Details of the approach adopted for this risk assessment are presented in Appendix 7.

From this risk assessment, and reference to the DEFRA Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance 2012 (Ref. 5), the following contaminant linkages have been identified to human health, property, controlled waters and to non Part 2A receptors including plants and landscaped areas:-

### 8.5.1 Human Health

Based on this CSM, potentially unacceptable risks to human health from elevated concentrations of hydrocarbons and asbestos sourced from made ground across the site (H1) have been identified.

In addition, gas emissions and vapours from the made ground and/or shallow dolomitic limestone beneath the site pose a risk to future end users and construction workers.

### 8.5.2 Property

Elevated concentrations of sulphates, chlorides and localised hydrocarbons within the general made ground (H1) pose a risk to property below ground and services.

### 8.5.3 Controlled Waters/Water Environment

The saline groundwaters below the site will be in hydraulic continuity with the seawater to the west of the site, with no pollution linkage to surface.

The hard standing development will reduce the potential for leaching contaminants in the made ground and due to the high potential for dilution by the sea water, the concentration of contaminants recorded in the soils and groundwater are considered to present only a low risk to the water environment. As such, contamination within groundwater pose no risk to site end users.

Elevated concentrations of hydrocarbons has been proven within the shallow groundwater within the made ground present a high risk to the controlled waters (North Sea and Hudson Dock).

#### 8.5.4 Plants and Landscaped Areas

With the exception of a localised occurrence of elevated arsenic, cadmium, copper, zinc in the shallow made ground, the made ground on site contained no significant concentrations of contaminants that present a phytotoxic risk to plants and landscaped areas.

However, the made ground materials are not considered to be suitable as a growing medium for plants in landscaped areas.

### 8.6 Recommendations on Remedial Mitigation Measures

#### 8.6.1 Additional Investigations

No specific additional investigations are required.

#### 8.6.2 Health and Safety Considerations During Construction

Normal brown health and safety precautions should be adopted as a minimum to protect workers from the general contamination present within the made ground onsite.

Due to the presence of asbestos containing materials and potentially loose disseminated fibres within all the made ground materials, the site health and safety file should be updated to highlight the potential for asbestos together with hydrocarbons and PAHs to be encountered during intrusive site works. This information should be made available to all future construction and maintenance workers that may come into contact with the made ground materials onsite. All future construction works should be undertaken in accordance with the current CIRIA guidance document C733 - Asbestos in soil and made ground: a guide to understanding and managing risks (Ref. 12).

#### 8.6.3 Measures within Preparatory / Advance Works

Relict foundations and buried concrete slabs should be anticipated throughout the site. These structures will need consideration during the detailed design stage and may need to be broken out as part of the site preparatory works, as detailed below:-

- Redundant services and drainage across the site will need to be removed and 'grubbed-out' and if significant visual or olfactory evidence of contamination is noted during these works, then these areas should be further investigated prior to redevelopment.
- Concrete or metal below ground structures identified across the site need to be removed and stabilised, with voids filled with an engineered fill.
- If significant visual or olfactory evidence of contamination is noted during these works, then this area should be further investigated prior to redevelopment.
- Reuse of geotechnically / chemically acceptable materials as engineered fill in accordance with a Materials Management Plan for reprofiling site levels.
- Further UXO assessment will need to be carried out in areas where a magnetometer survey has not yet been carried out or areas surrounding anomalies identified within the Planit UXB Ltd survey (Ref. 7).

- Removal of hotspot contamination.
- Groundwater clean up

The possibility exists that localised asbestos may be present within the made ground across the site and, therefore, it is advised that a 'watching brief' is undertaken during the construction works and advice sought if asbestos is found or suspected.

#### 8.6.4 Measures within Built Development

##### **Materials for in Ground Services**

Due to the presence of PAH, hydrocarbons, phenols, Chloride Aqueous Extract and Sulphate Aqueous Extract as SO<sub>4</sub> in the made ground, Polyethylene (PE) and polyvinyl chloride (PVC) water supply pipework will not be suitable for use within the made ground throughout the site. As such, subject to the approval from Northumbrian Water, in ground water supply pipework will need to be hydrocarbon resistant.

All services should be placed in a clean inert fill to reduce contact with the hydrocarbon and asbestos contaminated soils.

Based on the sulphate conditions determined in the groundwater and shallow made ground, in-ground concrete should be designed for Sulphate Class DS-2, ACEC Class AC-2s (Ref. 13).

##### **Gas Protection Measures from BS 8485 (Ref. 11)**

The gas monitoring undertaken to date has identified Characteristic Situation 2 conditions and, therefore, gas protection measures are required in line with current guidance (Refs. 10 and 11).

##### **Clean Soil Covers**

Any future landscaped areas should incorporate a designed soil cover system in accordance with BRE 465 (Refs. 14 and 15) to isolate future end users from localised asbestos and hydrocarbon contamination within made ground onsite. As a minimum the clean cover soil layer in landscaped areas should comprise 0.6 m of subsoil and 0.15 m of topsoil. Following the principles of CIRIA C733 (Ref. 12), an anti-dig layer comprising compacted engineered fill and/or a geotextile membrane should be installed in all soft landscaped areas to mitigate the risk from asbestos. A capping layer comprised of at least 0.6 m thick inert material should be installed above the anti-dig layer.

However, the soil gas conditions across the site will need to be re-evaluated following completion of the gas monitoring programme.

#### 8.6.5 Waste Characterisation

## 9 ENGINEERING ASSESSMENT

### 9.1 Design Elements and Requirements

## 9.2 Geotechnical Considerations for Proposed Development

From the ground conditions determined onsite, the following geotechnical issues have been identified that require consideration in the design of the proposed development:-

- Presence of some surface hardstanding and below ground relict structures of concrete and metal.
- Hardstanding and relict structures in the made ground presenting a constraint to excavation and piling.
- Buried voids, relict structures and potentially anchors and ties behind the quay wall presenting a constraint to piling.
- Cobble and boulder obstructions presenting a constraint to piling.
- Deep variable and compressible made ground of low bearing capacity and placed engineered made ground fill.
- Cut and fill to reprofile site levels.
- Indistinct rockhead level and highly weathered and variable strength rock head presenting a constraint to end bearing piles.
- Shallow and tidal groundwater table in granular fill presenting an instability issue to deep excavations.
- Partially weathered weak dolomite rockhead which is at around 4.0 m becoming medium strong from around 6.0 to 7.0 m.

## 9.3 Mining

The site is not in an area affected by coal mining.

## 9.4 Foundation Design

At present there are no design levels available for review and only preliminary/indicative foundation loads and, therefore, the following comments are preliminary only.

### 9.4.1 Foundation Design

### 9.4.2 Floor Slabs

## 9.5 Pavement Design for Car Parking and Roadways

The finished levels of the car park and roadways are assumed to be between 4 to 5.5 m AOD. The predominant subgrade of the car parks and roadways will be granular made ground where a CBR values of 3 should be suitable from laboratory and insitu testing. (Ref. 16). Where reprofiling is to be carried out the predominant subgrade will be reworked/engineered granular material where an expected CBR value of 3% should be adopted.

## 9.6 Chemical Attack on Buried Concrete

Based on sulphate results from the current investigation in accordance with Ref. 13, in-ground concrete should be designed for Sulphate Class DS-2, ACEC Class AC-2 for future structures on this site.

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GEO-ENVIRONMENTAL SCIENTIST

C MILLER  
DIRECTOR

DRAFT

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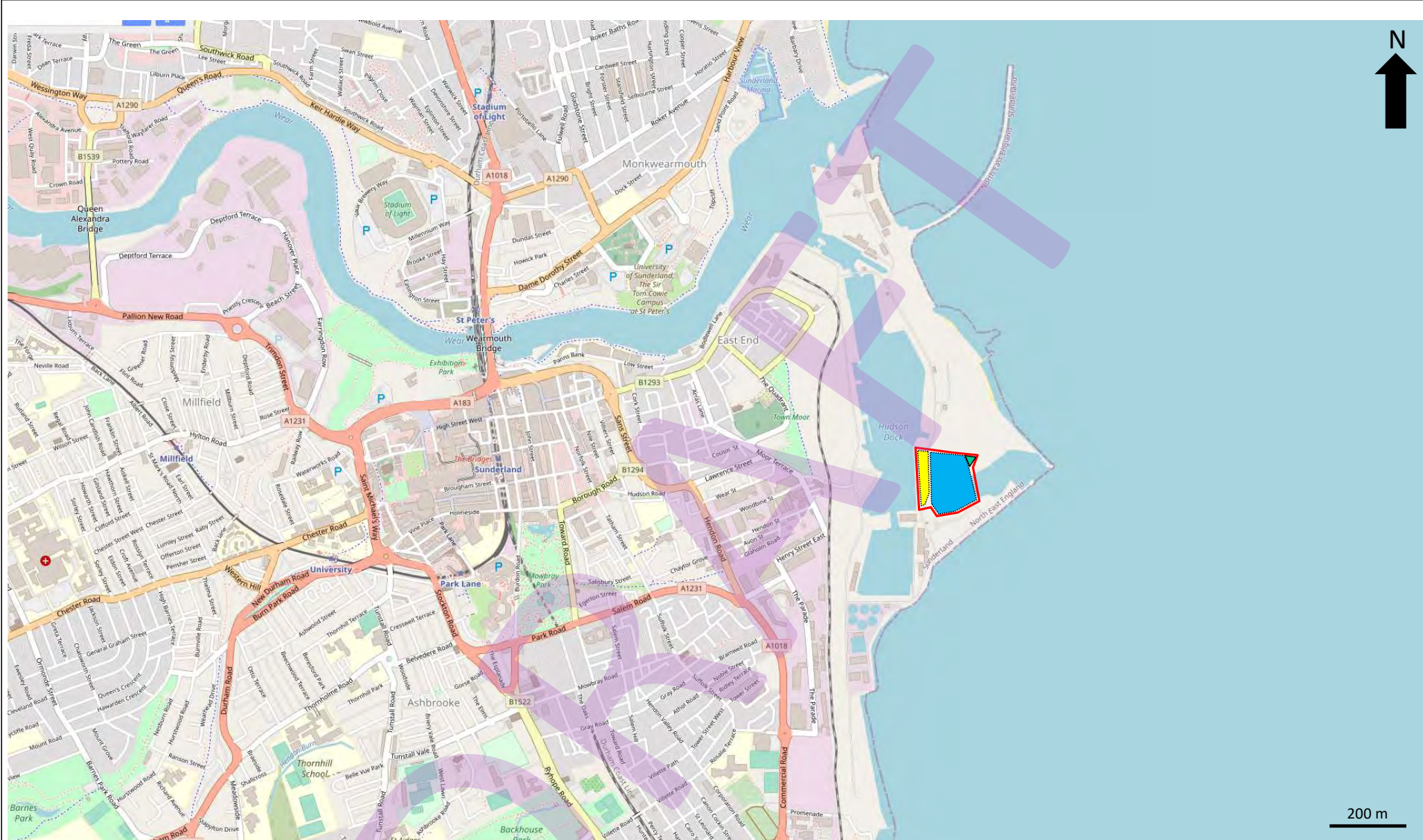
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**APPENDIX 1**

**DRAWINGS**





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**NOTES / KEY**

SITE BOUNDARY



AREA A - FORMER SOSL SITE



AREA A2 - NORTH EAST TRIANGULAR AREA



AREA B - SHEERS QUAY AREA



**DRAWING TITLE**

SITE LOCATION PLAN

**PROJECT TITLE**

PRELIMINARY CONTAMINATION AND MINING RISK ASSESSMENT ON LAND AT HUDSON DOCK EAST, PORT OF SUNDERLAND

**CLIENT**

DTA Consulting Engineers

**STATUS**

FINAL

**PROJECT NUMBER**

3899

**DRAWN BY**

AF/JD

**DATE**

January 2021

**SCALE**

AS SHOWN

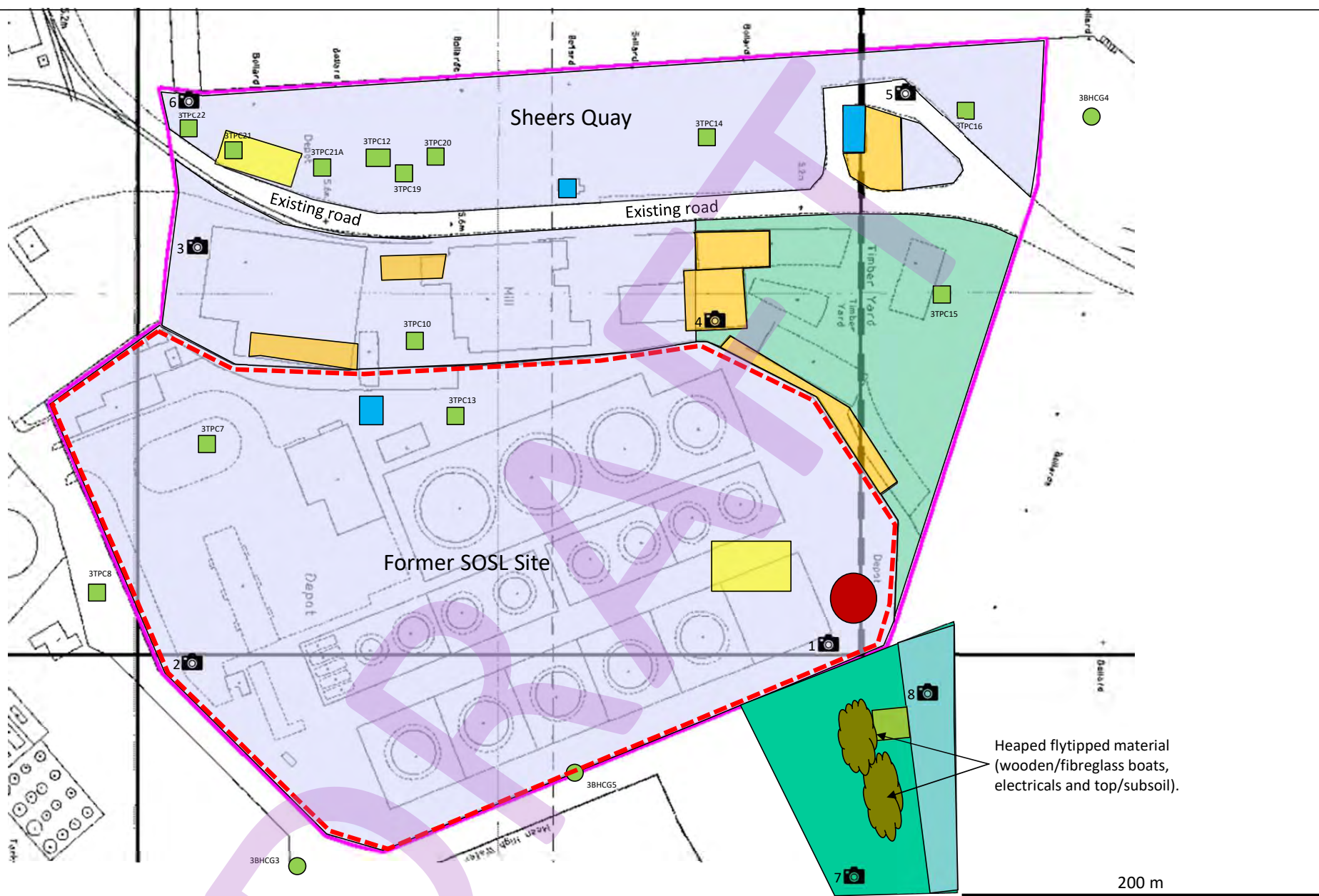
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3899OD01Rev01

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**NOTES / KEY**

SITE BOUNDARY		CONCRETE SLAB	
HISTORICAL BOREHOLE	3BHC65	BUILDING	
HISTORICAL TRIAL PIT	3TPC8	PRESS STORAGE AREA/FENCE	
GRAVEL HARDSTANDING		SCAFFOLD BOARD	
OVERGROWN GRASS		CONTAINER/SKIP	

**DRAWING TITLE**

CURRENT SITE FEATURES

**PROJECT TITLE**

PRELIMINARY CONTAMINATION AND MINING RISK ASSESSMENT ON LAND AT HUDSON DOCK EAST, PORT OF SUNDERLAND

**CLIENT**

DTA Consulting Engineers

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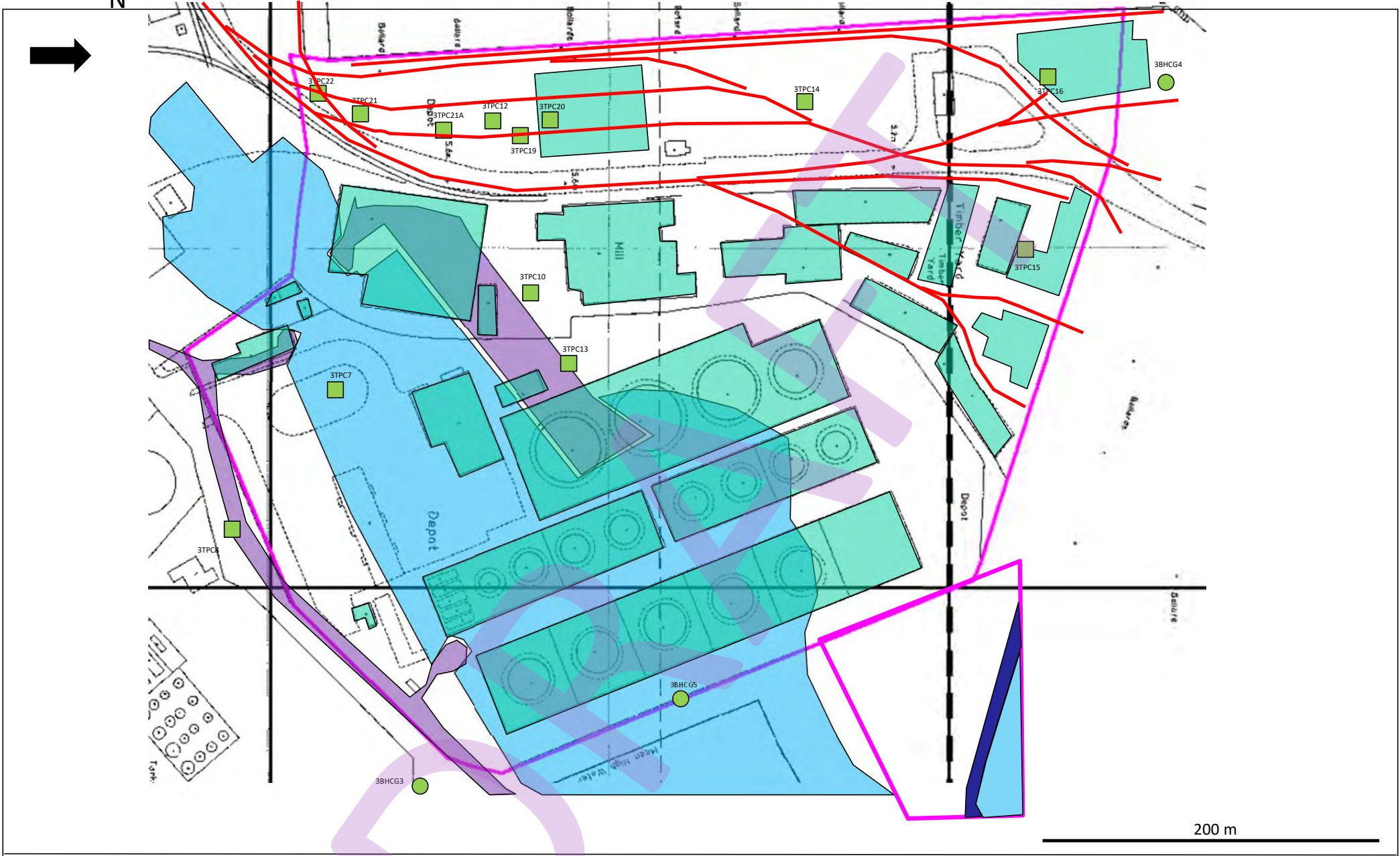
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**NOTES / KEY**

SITE BOUNDARY		FORMER QUAY/JETTY	
HISTORICAL BOREHOLE		FORMER RAILWAY LINE	
HISTORICAL TRIAL PIT		FORMER BREAKWATER	
FORMER BUILDING			
FORMER CHANNEL			

**DRAWING TITLE**  
 HISTORICAL SITE FEATURES

**PROJECT TITLE**  
 PRELIMINARY CONTAMINATION AND MINING RISK ASSESSMENT ON LAND AT HUDSON DOCK EAST, PORT OF SUNDERLAND

**CLIENT**  
 DTA Consulting Engineers

<b>STATUS</b> FINAL	<b>PROJECT NUMBER</b> 3899
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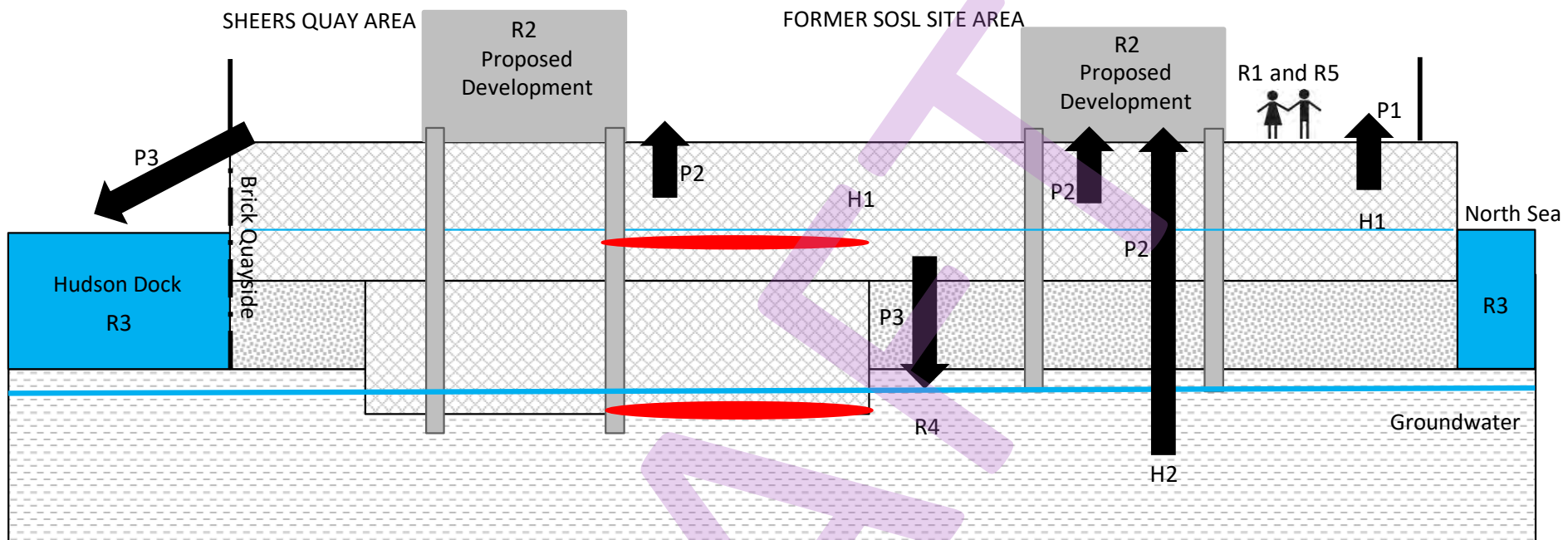
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Hazard / Pollutant		Pathway		Receptor		Severity of Consequence	Probability of Occurrence	Level of Risk
H1	Elevated hydrocarbons, PAHS, heavy metals,, sulphate, asbestos, chlorides and soil gas within the made ground	P1	Inhalation, ingestion and dermal contact	R1 R5	Future End Users Construction Workers	Severe	High Likelihood (Unlikely for future end users)	High (Very Low for future end users)
		P2 P4	Contact with aggressive or acidic soils Soil gas or soil vapours pooling within the structures	R2	Property Property (Human Health in confined spaces)	Medium	High Likelihood	High
		P3	Leaching of contaminants vertically or laterally to groundwater Surface water runoff into surface water bodies	R3 R4	Hudson Dock waters North Sea Roker Formation Principal Aquifer	Medium	Likely	Likely
H2	Elevated carbon dioxide from bedrock	P4	Soil gas or soil vapours pooling within the structures	R2	Property (Human Health in confined spaces)	Medium	Low likelihood	Low

NOTES / KEY

-  MADE GROUND
-  SUPERFICIAL DEPOSITS (SANDS AND GRAVELS)
-  BEDROCK STRATA (DOLOMITE/LIMESTONE – ROCKER FORMATION)

DRAWING TITLE

CONCEPTUAL SITE MODEL AND PRELIMINARY RISK ASSESSMENT

PROJECT TITLE

PRELIMINARY CONTAMINATION AND MINING RISK ASSESSMENT ON LAND AT HUDSON DOCK EAST, PORT OF SUNDERLAND

CLIENT

DTA Consulting Engineers

STATUS

FINAL

PROJECT NUMBER

3899

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January 2020

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NOT TO SCALE

DRG. No.

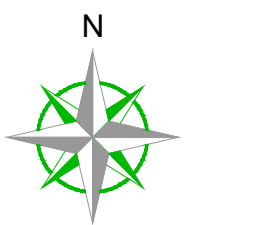
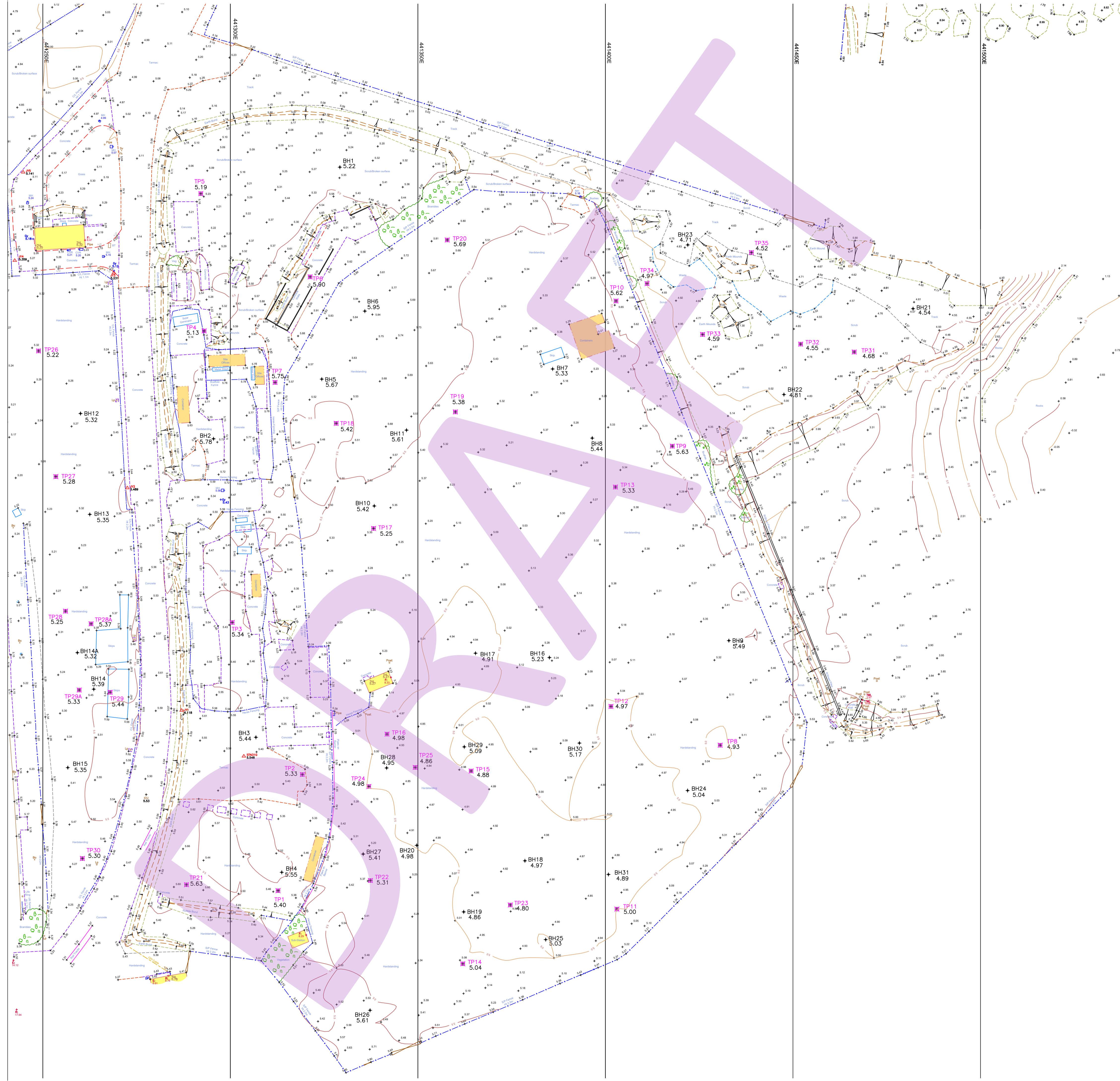
3899OD04REV01

**FWS** Geotechnical & Environmental Consultants

Unit 2 City West Business Park  
St Johns Road  
Meadowfield Industrial Estate  
Durham  
County Durham  
DH7 8ER

Tel: 01388 420633  
admin@fwsconsultants.com www.fwsconsultants.com





**Station Information:**

Station	Easting (m)	Northing (m)	Level (m)
ST1	440658.1113	599598.8524	13.9623
ST2	440658.8679	597958.8708	13.8772
ST3	440773.7287	597222.8311	13.8999
ST4	440745.3623	597376.6888	14.3387
ST5	440737.8883	597483.5734	14.4381
ST6	440685.8524	597540.7019	15.1116
ST7	440603.2087	597603.3211	14.2408
ST8	440583.4882	597611.8176	13.7587
ST9	440567.4150	596884.5378	8.4470
ST10	441910.3404	596807.2341	8.1528
ST11	441915.9793	596879.7802	5.3710
ST12	441932.0863	597076.2014	4.4784
ST13	441930.4118	597234.3790	4.2835
ST14	440977.8207	597368.8176	4.6332
ST15	440972.7892	597480.3784	4.7341
ST16	441348.6258	596749.9900	5.3412
ST17	441386.8845	597069.5314	4.9686
ST18	441317.3531	597259.5677	5.3082
ST19	441388.8070	597376.1372	5.9503
ST20	441188.4887	597533.1220	5.8601
ST21	441138.9287	597640.6889	5.5154
ST22	441125.3711	597714.0370	5.8072
ST23	441036.4126	597862.9851	4.4382
ST24	441036.8713	597983.8816	4.9032
ST25	441033.5822	598169.4889	5.5478
ST26	441035.2810	598483.8962	6.1002

**OS Note:**  
Some services may have been omitted due to vegetation. The Ordnance Survey site is to be used as a guide only.

**OS Buildings**  Surveyed Buildings

This survey has been orientated to the Ordnance Survey (OS) National Grid (OSGB36) via Global Navigational Satellite Systems (GNSS) and the O.S. Active Network (OS AN).

A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN02 & OSGM02 transformation models.

The survey has been correlated to this point and a further one or more OSGB36 points established to create a true O.S. bearing for angle orientation.

No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the on-site grid and datum.

**Legend:**

	Boundary		Proposed Boundary
	Road		Footpath
	Drainage		Sewer
	Cable		Gas
	Water		Electricity
	Fences		Walls
	Trees		Light Poles
	Buildings		Towers
	Poles		Posts
	Markers		Pegs
	Levels		Benchmarks
	Spot Heights		Benchmarks
	Benchmarks		Spot Heights

Rev	Date	Description	Drawn	Chk
8	10/07/20	Hendon Park Added	JT	C1410
9	04/09/20	Update & Boiler Room	JT	C1410
10	08/07/21	Hendon Park Extension	JC	C1410
11	28/01/21	BH Locations	JC	GH9556

**greenhatch group**

Topographical Surveys     Measured Building Surveys  
 Site Engineering     3D Laser Scanning  
 Utility / CCTV Surveys     Revit & BIM Models

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 DE21 5DR    AL4 0LA  
 T: (01332) 830044    T: (01727) 854481    L: 0048 32 202 2292  
 F: (01332) 830055    www.greenhatch.pl

**CLIENT**  
DTA Consulting Engineers LLP

**PROJECT**  
Port of Sunderland Tyne & Wear

**TITLE**  
Topographical Survey

<b>SCALE</b> A1 @ 1:500	<b>DATE</b> 21/06/16
<b>DRAWN</b> JC	<b>QUALITY REF</b> G1174

Level datum: See notes  
 Grid orientation: See notes

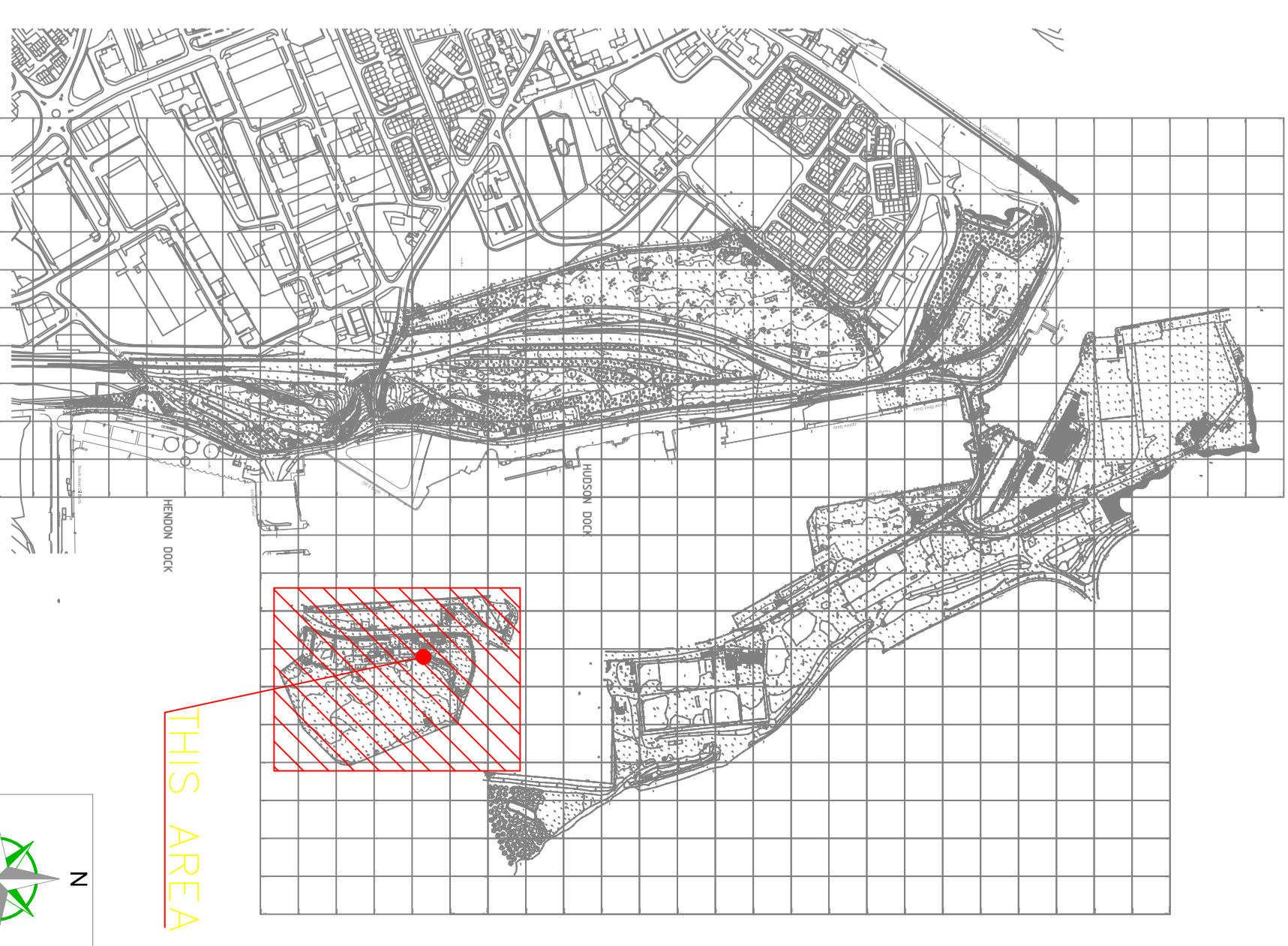
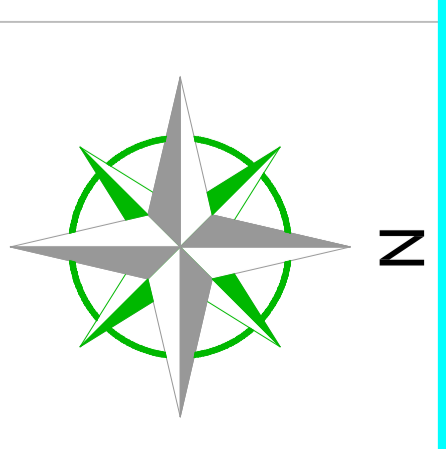
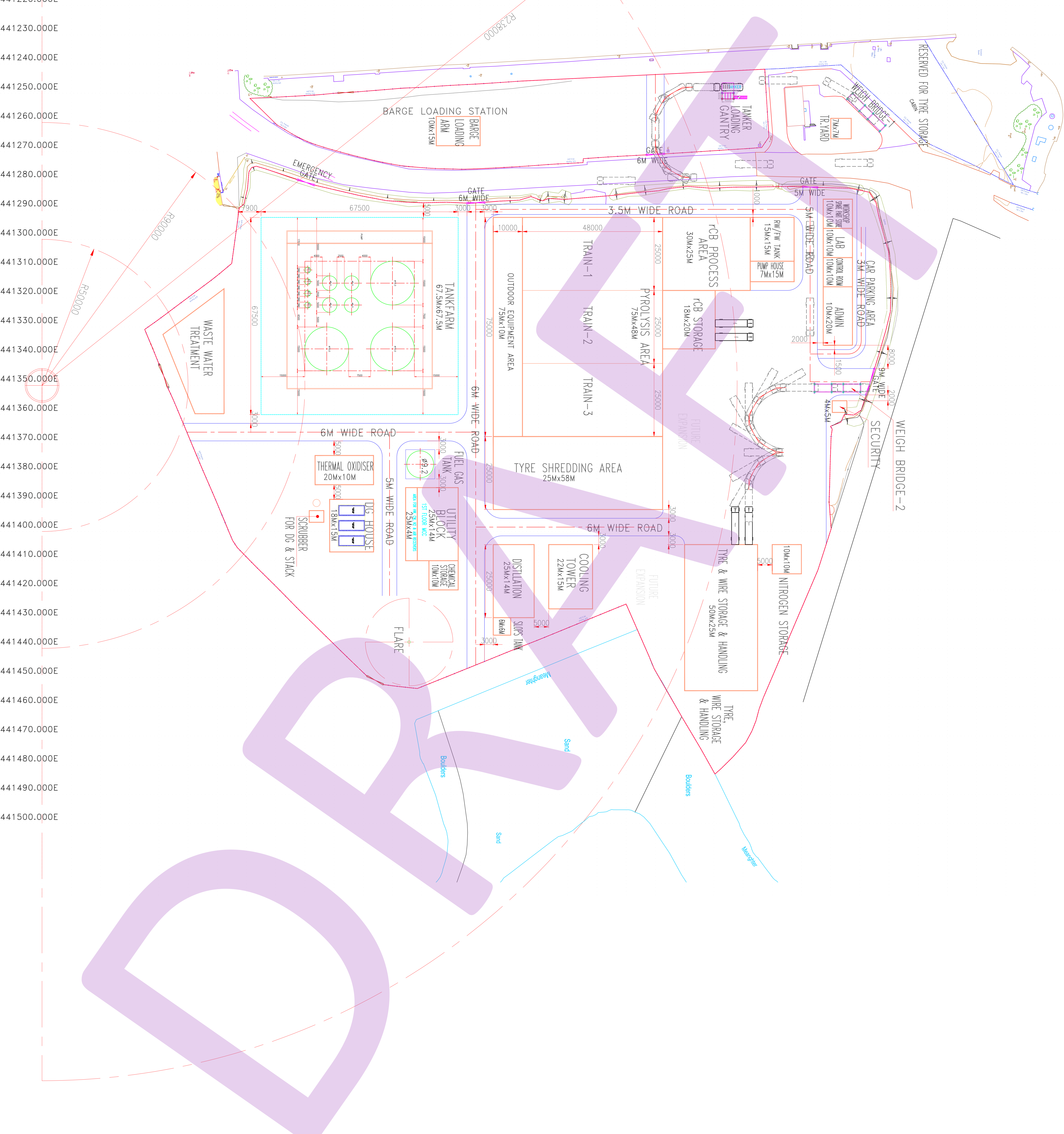
Job number: 23903

Drawing No: 23903\_T    Rev: 11

**Comments**  
 This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client.  
 All dimensions should be checked on site prior to design and construction.  
 Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.  
 Notes:  
 Survey level & position tied into previous surveys as supplied, using stations STN1 & STN2.  
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**NOTES :-**  
 1) ALL DIMENSIONS ARE IN MM. & E.L. IN METERS.

**REFERENCE DRAWING:-**

S/N	DWG NO.	TITLE
1	28001_FEB'9	TOPOGRAPHICAL SURVEY

**waste**front

Project Name: WF1  
 Location: SUNDERLAND, U.K.

Title: PLOT PLAN

Project Developer:	Dwg. No.:	WF1-0401-PLP-001
Scale:	Sheet:	1 of 1
Scale:	Rev:	00

Project Name: WF1  
 Location: SUNDERLAND, U.K.

REV	DATE	DESCRIPTION	BY	CHKD	APP'D
00	16/07/2020	ISSUED FOR COMMENTS BY STAKE HOLDERS	WJ/MS	RB	GR

This drawing is a property of Wastefront. Unauthorized to any third party or adaptation is not permitted.

Devalltec

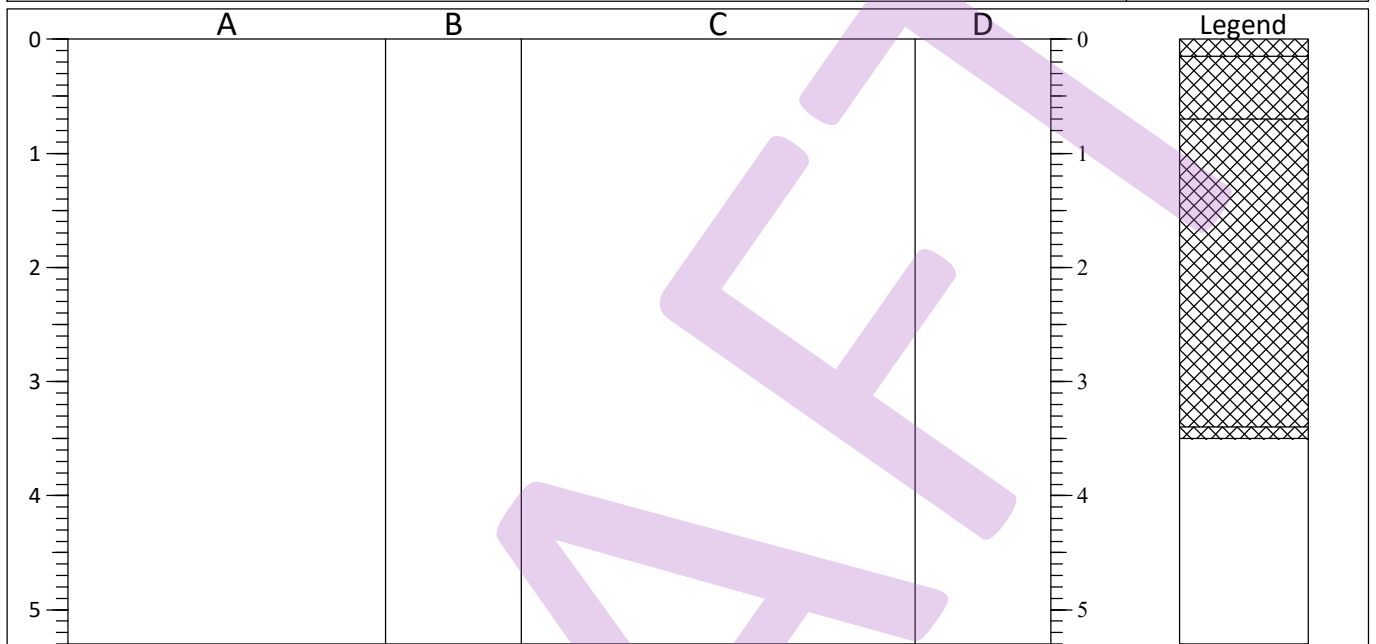
DRAFT

**APPENDIX 2**

**EXPLORATORY HOLE LOGS**



Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP01</b>
Job No 3899	Date 30-11-12	Ground Level (m) 5.40	Co-Ordinates ( ) E 441,312.7 N 556,823.6	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.15		MADE GROUND: Light brown clayey slightly gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of sandstone and concrete.	0.10	E	PID: <0.1 PID: 0.1
0.15-0.70			0.20	E	
0.70-3.40		MADE GROUND: Dark brown to black gravelly occasionally cobbly fine to coarse SAND. Gravel is fine to coarse angular to subangular of sandstone limestone chert and brick.	0.80	D	PID: <0.1 PID: <0.1
			0.85	E	
		MADE GROUND: Soft light brown to orange dark brown slightly sandy slightly gravelly CLAY. Gravel is medium to coarse angular to subangular of brick and masonry. Occasional mussel shells. 0.90 0.1 m thick fine to medium gravel of mussel shells. 1.80 Becomes sandy.	1.80	D	PID: <0.1
		2.80 - 3.20 Low cobble content of subrounded to rounded weathered of dolomite.	2.80	D	PID: <0.1
3.40-3.50		3.20 Occasional porcelain, clay becomes orange, gravel becomes angular to subangular weathered of schist.			
3.50		MADE GROUND: Light brown clayey gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular weathered schist			
		End of excavation			

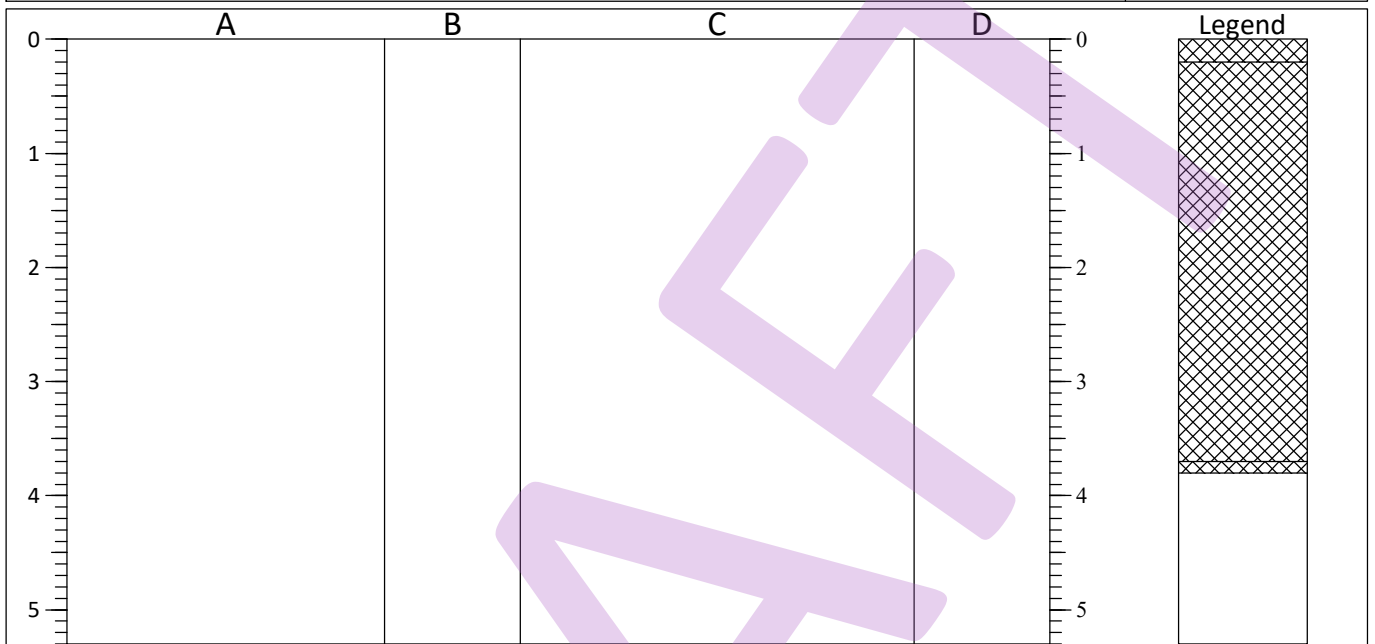
Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>
	No odours or oily stainings. No groundwater encountered. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL\_GDT 28/12/1

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP02</b>
Job No 3899	Date 30-11-12	Ground Level (m) 5.33	Co-Ordinates ( ) E 441,319.2 N 556,854.6	
Contractor Patterson Plant Hire				Sheet 1 of 1



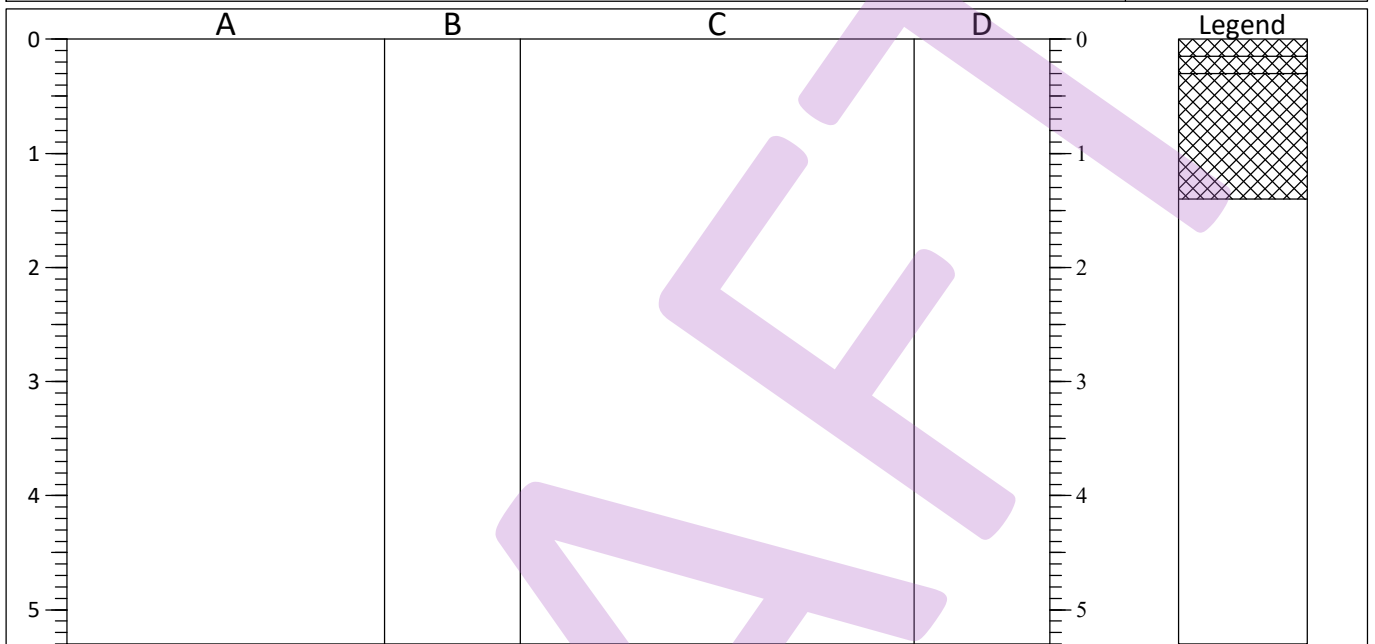
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		MADE GROUND: Light brown clayey slightly gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of sandstone clinker dolomite and concrete. Low cobble content of angular masonry.	0.10	E	PID: <0.1 PID: 0.5
0.20-3.70			MADE GROUND: Dark brown to black gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular of brick slag dolomite glass. 0.40 Low cobble content of whole bricks. 0.70 Moderate cobble content of subangular to subrounded slag. Gravels include bottles teapots wire and metallic objects.	0.25	
			1.00	E	PID: <0.1
			1.20	B	
			2.00	E	PID: 0.2
3.70-3.80		3.50 Groundwater encountered.			
3.80		MADE GROUND: Soft light brown to orange dark brown slightly sandy slightly gravelly CLAY. Gravel is medium to coarse angular to subangular of brick and masonry. Occasional mussel shells. End of excavation			

<p>Shoring/Support: Stability: Stable</p>	<p><b>GENERAL REMARKS</b></p> <p>No odours or oily stainings. Groundwater encountered at 3.5 m. PID value in ppm.</p>
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All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3\_ALL.GDT 28/1/21

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP03</b>
Job No 3899	Date 30-11-12	Ground Level (m) 5.34	Co-Ordinates ( ) E 441,300.5 N 556,895.1	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.15		MADE GROUND: Dark grey gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of concrete slag and dolomite.	0.10	E	PID: 0.1
0.15-0.30			0.35	E	PID: <0.1
0.30-1.40			0.60	E	PID: 0.1
		MADE GROUND: Grey reinforced concrete.			
		MADE GROUND: Light brown to light grey sandy gravelly COBBLES of angular concrete and masonry. Gravel is fine to coarse angular of concrete and brick.			
1.40		End of excavation on concrete obstruction.	1.20	E	PID: <0.1

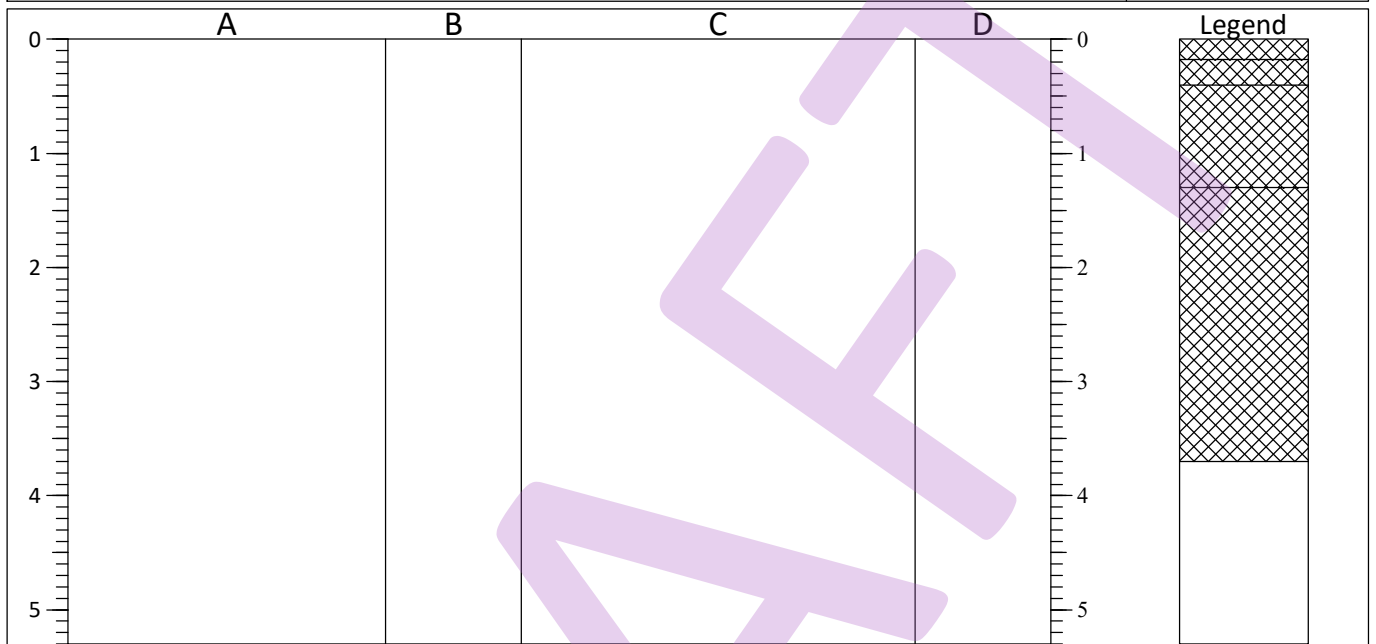
Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>
	No odours or oily stainings. No groundwater encountered. Concrete obstruction at 1.4 m. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP04</b>
Job No 3899	Date 30-11-12	Ground Level (m) 5.13	Co-Ordinates ( ) E 441,293.0 N 556,972.9	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.18		MADE GROUND: Reinforced concrete			
0.18-0.40		MADE GROUND: Light brown clayey gravelly fine to coarse SAND. Gravel is fine to medium of concrete and sandstone.	0.20	E	PID: <0.1
0.40-1.30					
1.30-3.70		MADE GROUND: Light brown to light yellow slightly gravelly fine to coarse SAND. Gravel is fine to coarse of subangular dolomite.	0.80	E	PID: <0.1
		0.60 Low cobble content of subangular dolomite. 0.80 Moderate cobble content of subangular dolomite.			
		MADE GROUND: Light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium of dolomite and occasional chert and rare shells. Moderate cobble content of angular to subrounded chert dolomite and sandstone. (Possible offshore dredged material)	1.40	B	
		2.70 Becomes dark grey with occasional cobbles of shale slate and granite.	1.80	E	PID: 0.1
3.70		End of excavation. Eastern wall of pit collapsing.			

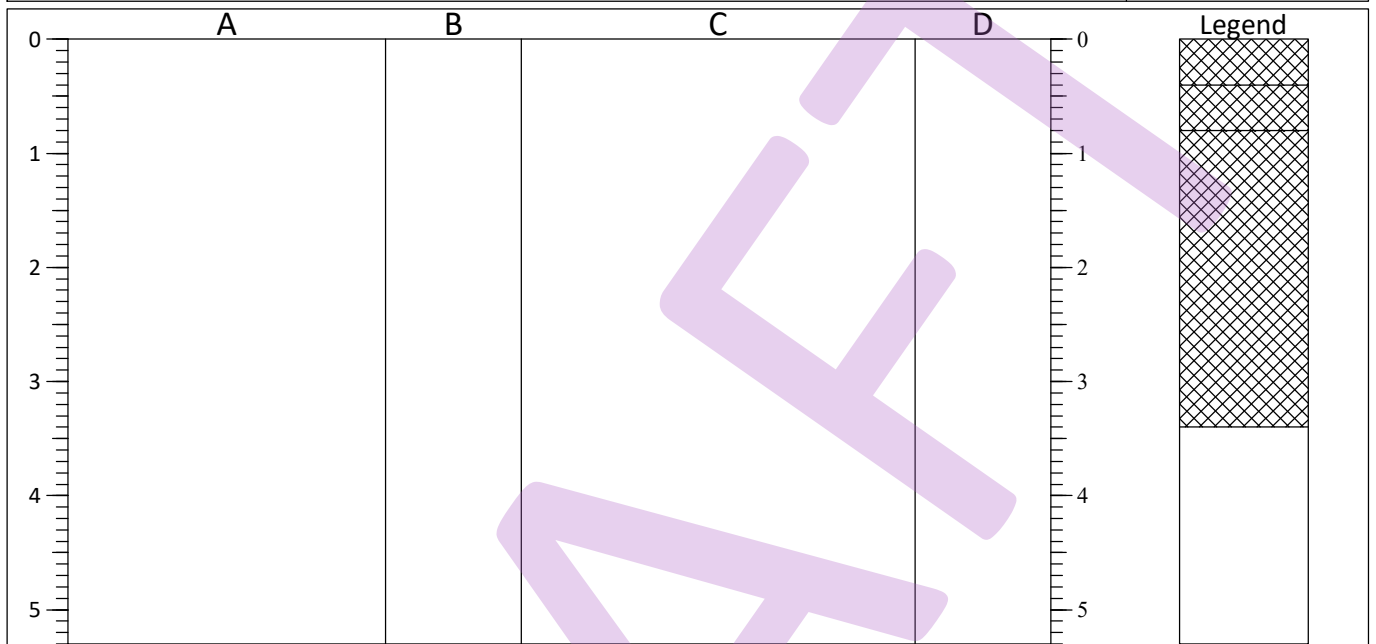
<p>Shoring/Support: Stability: Unstable</p>	<p><b>GENERAL REMARKS</b></p> <p>No odours or oily stainings. No groundwater encountered. PID value in ppm.</p>

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used JCB 3CX	Logged By JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL\_GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP05</b>
Job No 3899	Date 30-11-12	Ground Level (m) 5.19	Co-Ordinates ( ) E 441,292.1 N 557,009.5	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		MADE GROUND: Dark brown to black sandy fine to medium subangular to subrounded GRAVEL of dolomite.	0.20	E	PID: 0.1
0.40-0.80		MADE GROUND: Dark brown to black gravelly medium to coarse SAND. Gravel is fine to medium of subangular to subrounded dolomite.	0.60	E	PID: <0.1
0.80-3.40		MADE GROUND: Light brown to light yellow slightly gravelly fine to coarse SAND. Gravel is fine to coarse of subangular dolomite. Low cobble content of subangular to rounded dolomite.	0.90	E	PID: 0.1
		2.00 Occasional subangular boulders of weathered dolomite.			
		2.40 Occasional grey lenses.	1.50	D	
3.40		End of excavation. Eastern wall of pit collapsing.			

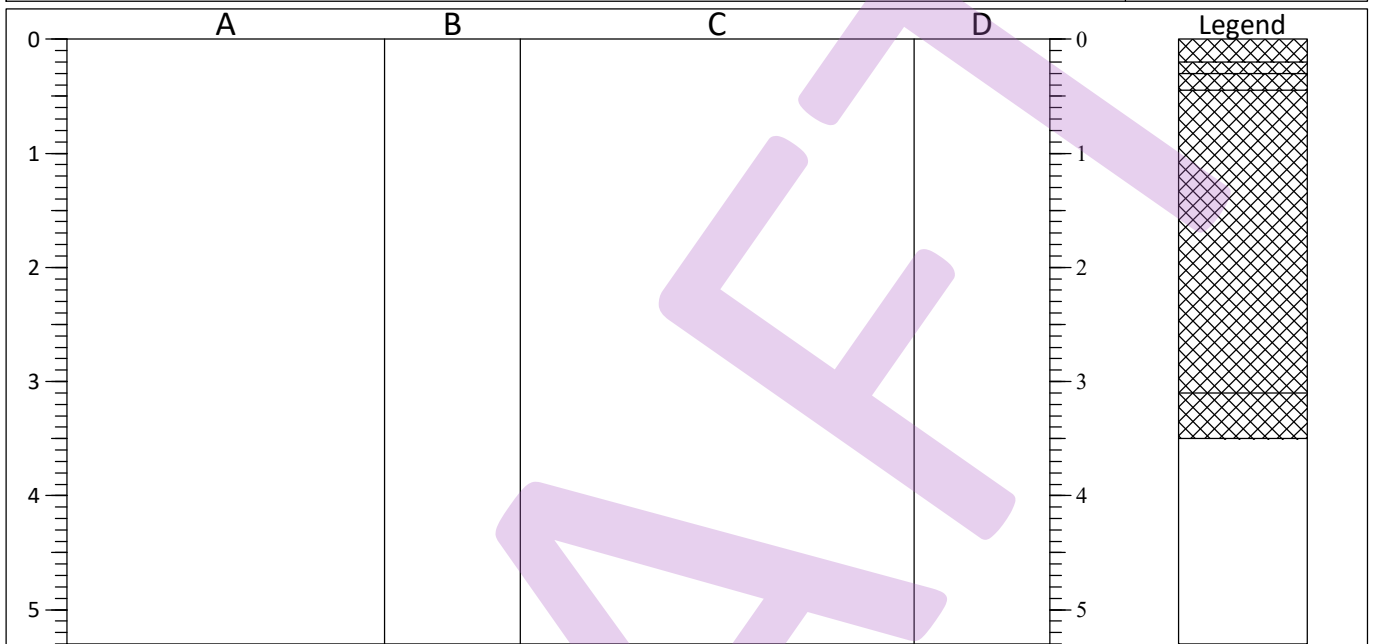
<p>Shoring/Support: Stability: Unstable</p> <p>4.25 1.5 A B C D N</p>	<p><b>GENERAL REMARKS</b></p> <p>No odours or oily stainings. No groundwater encountered. PID value in ppm.</p>
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All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used JCB 3CX	Logged By JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3\_ALL\_GDT\_28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP06</b>
Job No 3899	Date 30-11-12	Ground Level (m) 5.90	Co-Ordinates ( ) E 441,321.3 N 556,987.3	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		MADE GROUND: Reinforced Concrete.			
0.20-0.30		MADE GROUND: Dark brown to black gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of sandstone and concrete.	0.25	E	PID: 1.1
0.30-0.45			0.40	E	PID: <0.1
0.45-3.10			0.60	E	PID: 0.1
		MADE GROUND: Dark brown to black sandy fine to medium subangular GRAVEL of sandstone and concrete.			
		MADE GROUND: Light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium of dolomite and occasional chert and rare shells. Moderate cobble content of angular to subrounded chert dolomite and sandstone (possible offshore dredged material). 1.00 - 1.50 Becomes dark brown with angular gravels of schist and sandstone in the south of the pit.			
3.10-3.50		Firm dark brown slightly sandy CLAY with occasional mollusc and bivalve shells (possible offshore dredged material).	3.20	D	
3.50		End of excavation.			

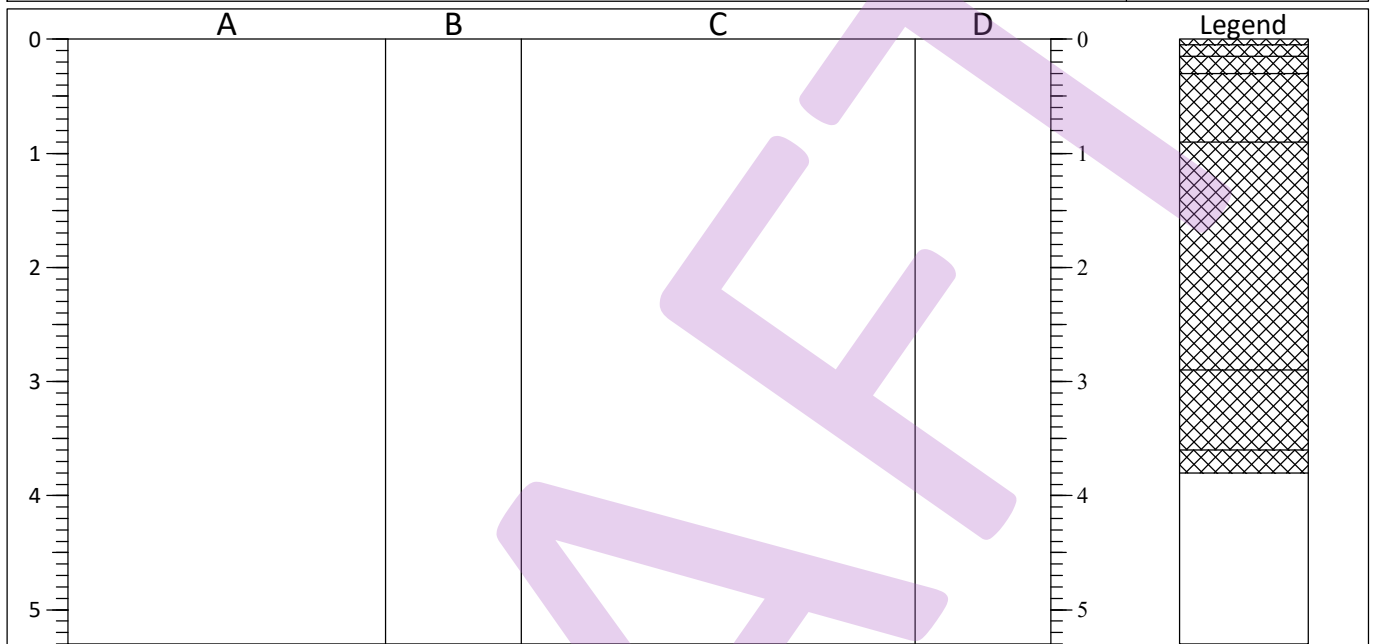
Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>
	No odours or oily stainings. No groundwater encountered. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL\_GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP07</b>
Job No 3899	Date 30-11-12	Ground Level (m) 5.75	Co-Ordinates ( ) E 441,311.9 N 556,959.1	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.05		MADE GROUND: Asphalt.	0.10	E	PID: 0.1
0.05-0.15		MADE GROUND: Black fine to medium angular to subangular GRAVEL of dolomite.	0.20	E	PID: <0.1
0.15-0.30		MADE GROUND: Dark brown to black gravelly fine to coarse SAND. Gravel is fine to medium of subangular to subrounded dolomite and sandstone.	0.40	E	PID: <0.1
0.30-0.90			1.00	E	PID: <0.1
0.90-2.90		MADE GROUND: Dark reddish brown to dark brown gravelly fine to coarse SAND. Gravel is fine to medium of subangular to subrounded dolomite brick and sandstone. Moderate cobble content of whole brick and concrete. MADE GROUND: Soft light brown sandy gravelly CLAY. Gravel is fine to medium subangular to rounded of sandstone and limestone. 1.80 Low cobble content of subrounded to rounded sandstone with dolomite and occasional whole bricks.	1.05	D	
			3.00	E	PID: 0.1
2.90-3.60		MADE GROUND: Light orangish brown very clayey slightly gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of dolomite and sandstone with occasional brick.			
3.60-3.80		MADE GROUND: Light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium of dolomite and occasional chert and rare shells. Moderate cobble content of angular to subrounded chert dolomite and sandstone. (possible offshore dredged material) End of excavation. Eastern wall of pit collapsing.			
3.80					

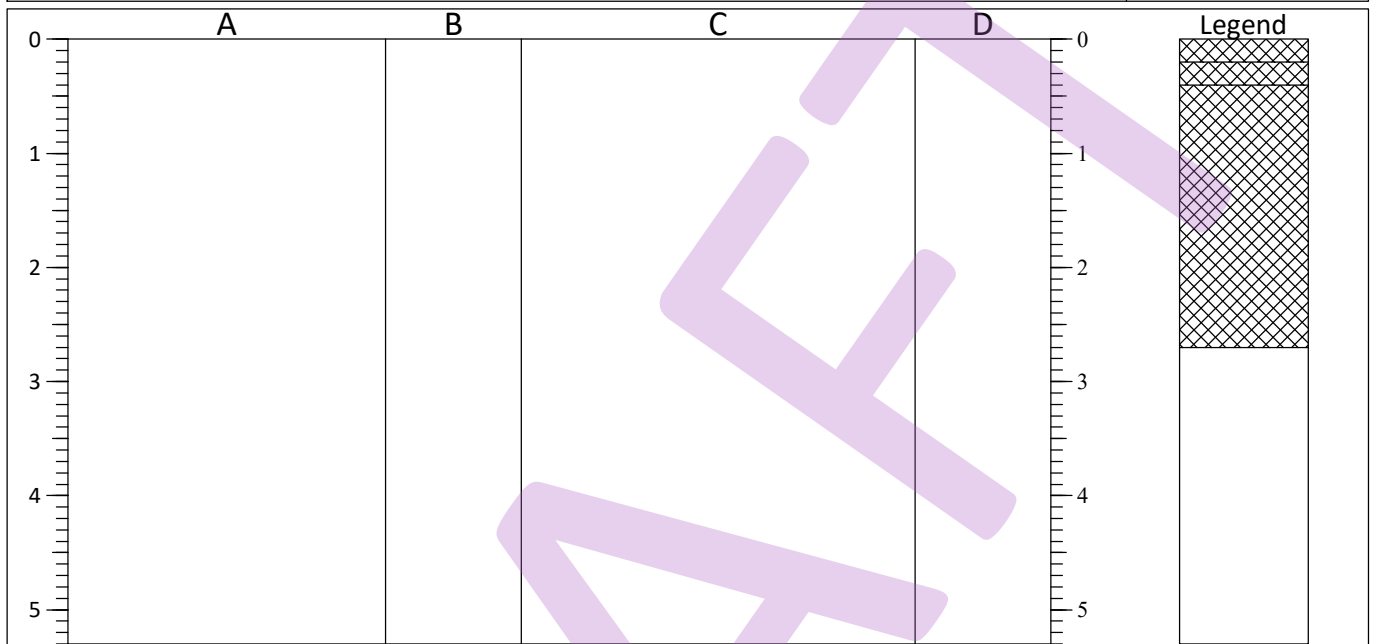
Shoring/Support: Stability: Unstable  	<b>GENERAL REMARKS</b>
	No odours or oily stainings. No groundwater encountered. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP08</b>
Job No 3899	Date 01-12-12	Ground Level (m) 4.93	Co-Ordinates ( ) E 441,430.6 N 556,862.4	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone. 0.20 Geotextile membrane. MADE GROUND: Dark grey gravelly medium to coarse SAND. Gravel is fine to medium angular to subangular of dolomite and sandstone. MADE GROUND: Light to dark grey sandy fine to coarse angular to subangular GRAVEL of brick and concrete. Moderate cobble content of whole bricks concrete and sandstone. Occasional wood and metal fragments throughout. 1.80 Low cobble content of subrounded to rounded sandstone with dolomite and occasional whole bricks.	0.10	E	PID: <0.1
0.20-0.40			0.30	E	PID: 0.1
0.40-2.70			0.60	E	PID: <0.1
			1.20	D	
			1.60	E	PID: <0.1
2.70		End of excavation. Eastern wall of pit collapsing.			

<p>Shoring/Support: Stability: Unstable</p>	<p><b>GENERAL REMARKS</b></p> <p>No odours or oily stainings. No groundwater encountered. PID value in ppm.</p>

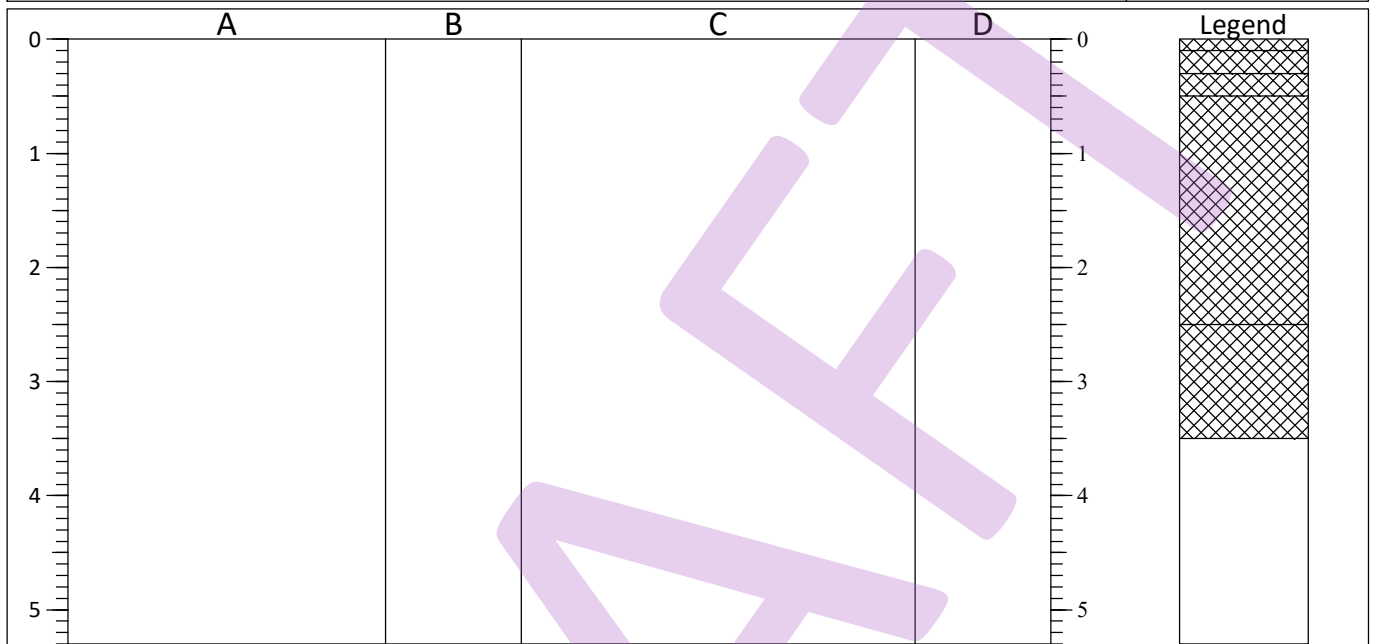
All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used JCB 3CX	Logged By JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21



**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP09</b>
Job No 3899	Date 01-12-12	Ground Level (m) 5.63	Co-Ordinates ( ) E 441,417.8 N 556,942.2	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone. 0.10 Geotextile membrane.	0.05	E	PID: <0.1
0.10-0.30			0.15	E	PID: 0.1
0.30-0.50			0.40	E	PID: <0.1
0.50-2.50			0.80	E	PID: 0.2
		MADE GROUND: Light grey to dark grey gravelly fine to coarse SAND. Gravel is fine angular to subangular of limestone concrete and occasional brick.			
		MADE GROUND: Light to dark grey sandy fine to coarse angular to subangular GRAVEL of brick and concrete. Moderate cobble content of whole bricks concrete and sandstone. Occasional wood and metal fragments throughout.	2.00	B	
2.50-3.50		MADE GROUND: Soft light brown to orange dark brown slightly sandy slightly gravelly CLAY. Gravel is medium to coarse angular to subangular of brick and masonry. Occasional mussel shells.	2.60	B	
3.50		End of excavation.			

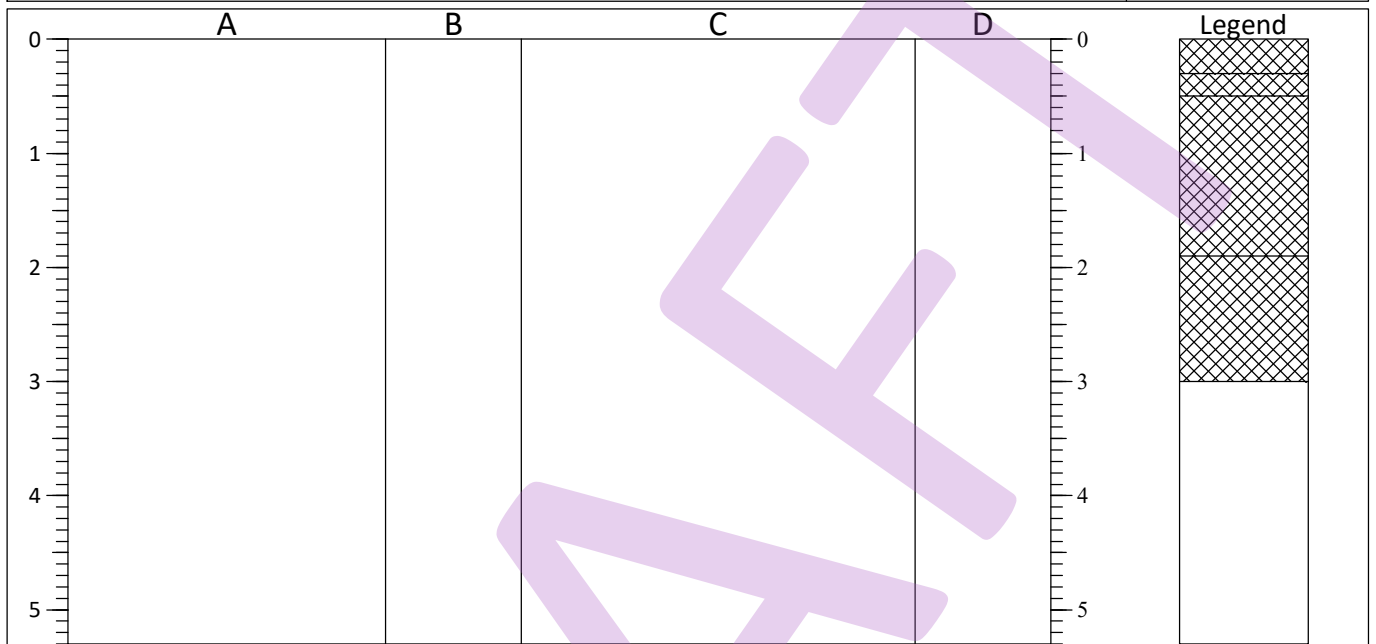
Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>  No odours or oily stainings. No groundwater encountered. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used JCB 3CX	Logged By JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP10</b>
Job No 3899	Date 01-12-12	Ground Level (m) 5.62	Co-Ordinates ( ) E 441,402.8 N 556,980.9	
Contractor Patterson Plant Hire				Sheet 1 of 1



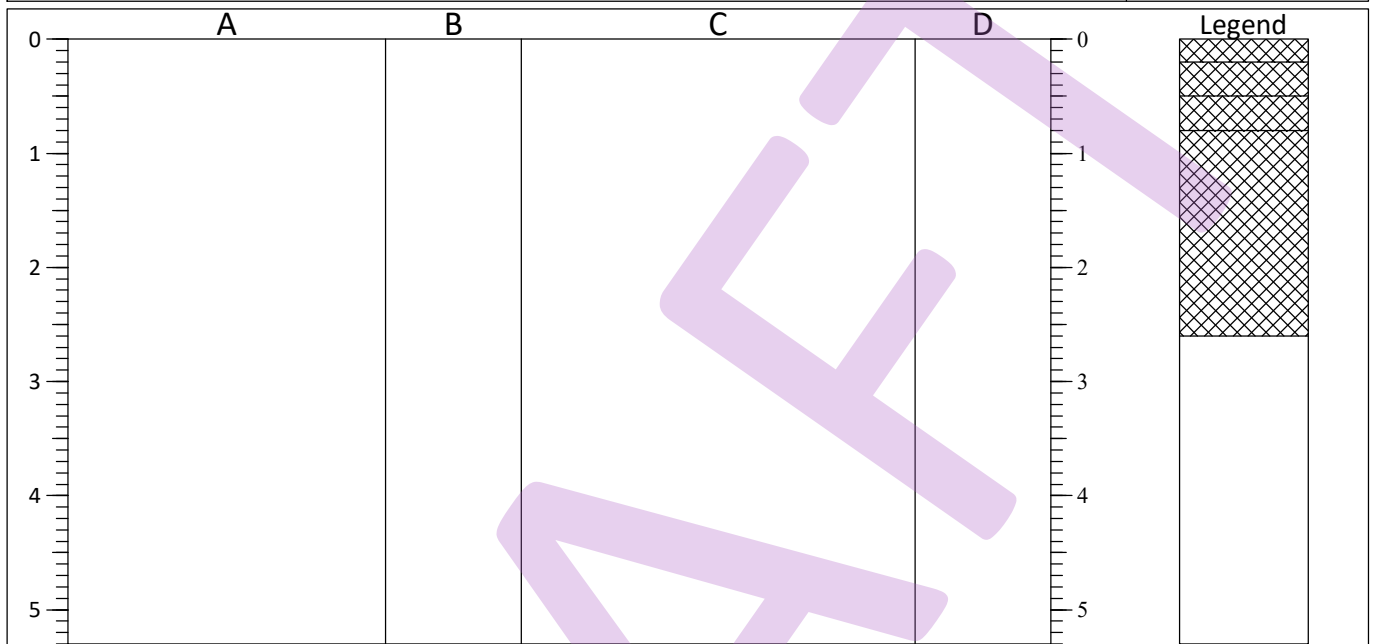
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone.	0.20	E	PID: 0.1
0.30-0.50		0.30 Geotextile membrane.	0.40	E	
0.50-1.90		MADE GROUND: Dark grey gravelly medium to coarse SAND. Gravel is fine to medium angular to subangular of dolomite and sandstone.			
		MADE GROUND: Light to dark grey sandy fine to coarse subangular GRAVEL of brick and concrete. Moderate cobble content of whole bricks concrete and sandstone.			
1.90-3.00		1.80 - 1.90 Abundant whole bricks	2.00	E	PID: 0.1
		MADE GROUND: Light to dark grey clayey sandy fine to medium angular to subangular GRAVEL of brick concrete and sandstone.			
3.00		End of excavation.			

Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>  No odours or oily stainings. No groundwater encountered. PID value in ppm.

Client DTA Engineering	Method/Plant Used JCB 3CX	Logged By JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL\_GDT 28/1/21

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP11</b>
Job No 3899	Date 01-12-12	Ground Level (m) 5.00	Co-Ordinates ( ) E 441,403.1 N 556,818.7	
Contractor Patterson Plant Hire				Sheet 1 of 1



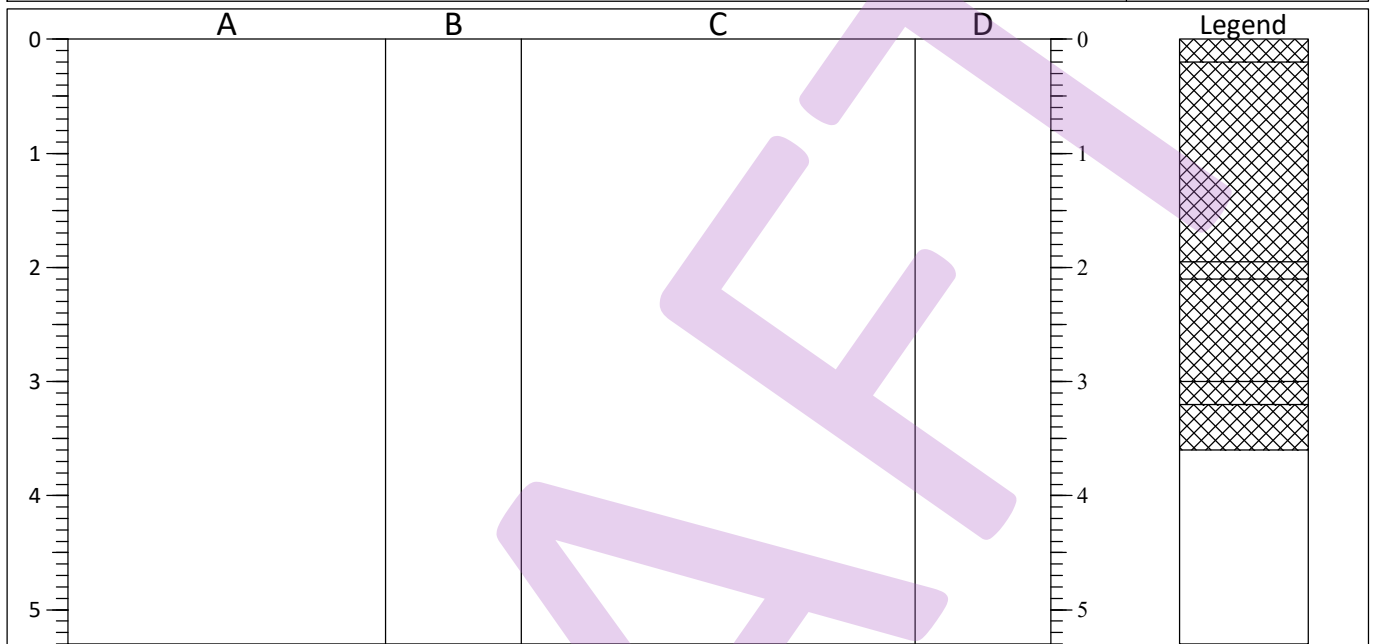
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone.	0.10	E	PID: 0.1
0.20-0.50			0.30	E	
0.50-0.80		0.20 Geotextile membrane.	0.50	E	PID: <0.1
0.80-2.60		MADE GROUND: Dark grey gravelly medium to coarse SAND. Gravel is fine to medium angular to subangular of dolomite and sandstone.	0.60	E	
		MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel is fine to medium angular to subrounded sandstone.	1.00	B	
		MADE GROUND: Light to dark grey sandy fine to coarse angular to subangular GRAVEL of brick and concrete. Moderate cobble content of whole bricks concrete and sandstone.	1.20	E	
		1.20 Low cobble content.			
		1.60 Moderate to high cobble content.			
2.60		1.80 0.1 m thick lens of fine brick gravel.			
		2.40 High cobble content of subangular brick with terracotta and metal fragments.			
		End of excavation.			

Shoring/Support: Stability: Stable  	<b>N</b>
	<b>GENERAL REMARKS</b>  No odours or oily stainings. No groundwater encountered. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP12</b>
Job No 3899	Date 01-12-12	Ground Level (m) 4.97	Co-Ordinates ( ) E 441,401.5 N 556,872.8	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL dolomite and sandstone.	0.20	E	PID: 0.1
0.20-1.95		0.20 Geotextile membrane. MADE GROUND: Dark grey gravelly medium to coarse SAND. Gravel is fine to medium angular bricks and blocks with subangular of dolomite and sandstone. 1.00 Fine to medium gravel sized fragments of porcelain and ceramics. 1.20 Low cobble content of sandstone.	0.60	E	PID: <0.1
1.95-2.10		MADE GROUND: Soft light grey to cream sandy gravelly CLAY. Gravel is fine angular to subrounded of sandstone and mudstone.	1.00	D	
2.10-3.00		MADE GROUND: Light to dark grey sandy fine to coarse angular to subangular GRAVEL of brick and concrete. Moderate cobble content of whole bricks concrete and sandstone.	1.20	E	PID: <0.1
3.00-3.20		2.10 - 2.40 Cohesive material coating on granular made ground.	2.00	E	PID: 0.1
3.20-3.60		2.40 Moderate cobble content of subrounded sandstone and angular masonry and occasional concrete.	2.60	E	
3.60		MADE GROUND: Soft light grey to cream clayey fine to coarse angular GRAVEL of brick. Moderate cobble content of whole brick. MADE GROUND: Light to dark grey sandy fine to coarse angular of GRAVEL of brick and concrete. Moderate cobble content of whole bricks concrete and sandstone. 3.20 - 3.50 Cohesive material coating on granular made ground. 3.40 Groundwater ingress from south. End of excavation.			

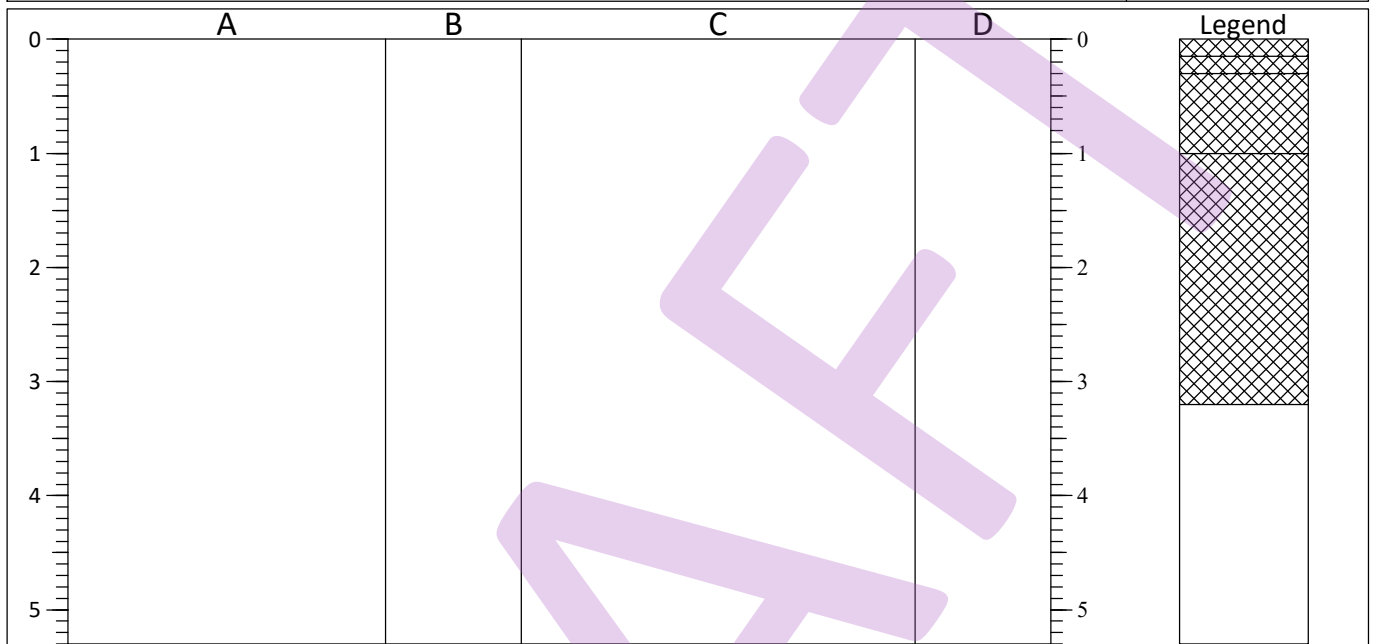
Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>
	No odours or oily stainings. Slight groundwater ingress at 3.4 m. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP13</b>
Job No 3899	Date 01-12-12	Ground Level (m) 5.33	Co-Ordinates ( ) E 441,402.7 N 556,931.3	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.15		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone. 0.15 Geotextile membrane.	0.20	E	PID: 0.1
0.15-0.30			0.40	E	PID: 0.2
0.30-1.00					
1.00-3.20		MADE GROUND: Dark grey sandy fine to medium angular GRAVEL of dolomite and sandstone. MADE GROUND: Dark grey gravelly medium to coarse SAND. Gravel is fine to medium angular bricks and blocks with subangular of dolomite and sandstone. 0.60 Metal wire in east of the pit. MADE GROUND: Brick red slightly sandy gravelly COBBLES of whole bricks. Gravels are fine to coarse angular of brick with rare asphalt.	1.20	E	PID: <0.1
3.20		End of excavation.	2.00	D	

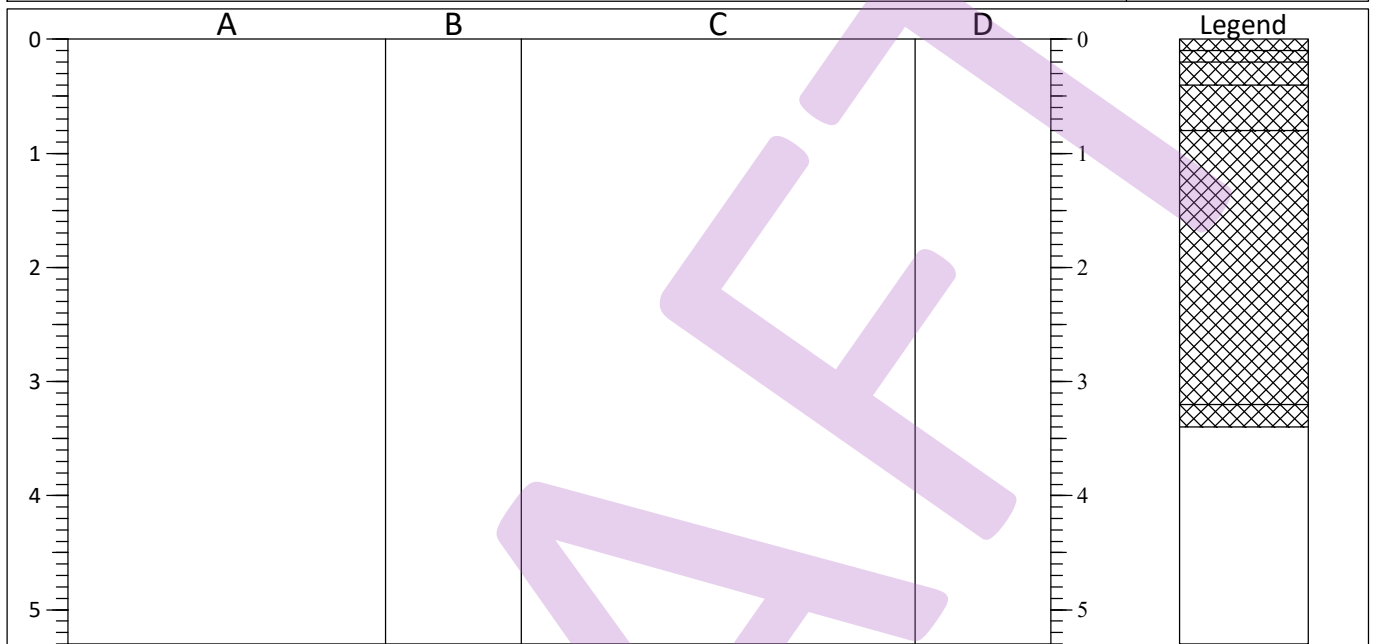
Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>
	No odours or oily stainings. No groundwater encountered. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used JCB 3CX	Logged By JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL\_GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP14</b>
Job No 3899	Date 01-12-12	Ground Level (m) 5.04	Co-Ordinates ( ) E 441,362.0 N 556,804.2	
Contractor Patterson Plant Hire				Sheet 1 of 1



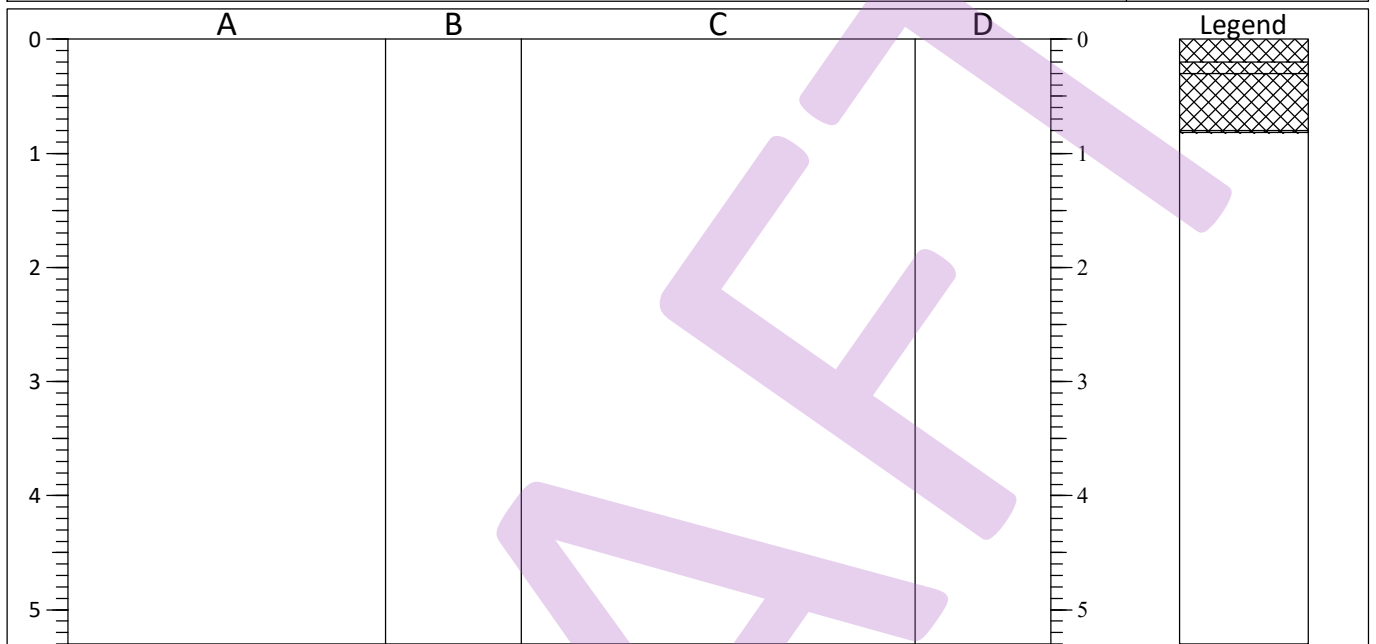
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone. 0.10 Geotextile membrane. MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of dolomite. MADE GROUND: Dark grey gravelly medium to coarse SAND. Gravel is fine to medium angular bricks and blocks with subangular of dolomite and sandstone. MADE GROUND: Light grey to dark grey gravelly fine to coarse SAND. Gravel is medium to coarse angular concrete. 0.60 Metal wire in east of the pit. MADE GROUND: Light grey to light reddish brown gravelly fine to coarse SAND. Gravel is subangular of brick. Moderate cobble content of whole brick and masonry.	0.15	E	PID: 0.1
0.10-0.20			0.30	E	PID: 0.2
0.20-0.40			0.50	E	PID: <0.1
0.40-0.80			0.85	E	PID: 0.1
0.80-3.20			2.00	E	PID: <0.1
3.20-3.40		MADE GROUND: Light brown slightly clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded of fine to medium of sandstone shale and angular brick. / End of excavation. Both side walls of pit collapsing.			
3.40					

<p>Shoring/Support: Stability: Unstable from 2.8 - 3.4 m</p>	<p><b>GENERAL REMARKS</b></p> <p>No odours or oily stainings. No groundwater encountered. PID value in ppm.</p>

Client DTA Engineering	Method/Plant Used JCB 3CX	Logged By JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP15</b>
Job No 3899	Date 02-12-20	Ground Level (m) 4.88	Co-Ordinates ( ) E 441,364.2 N 556,855.6	
Contractor Patterson Plant Hire				Sheet 1 of 1



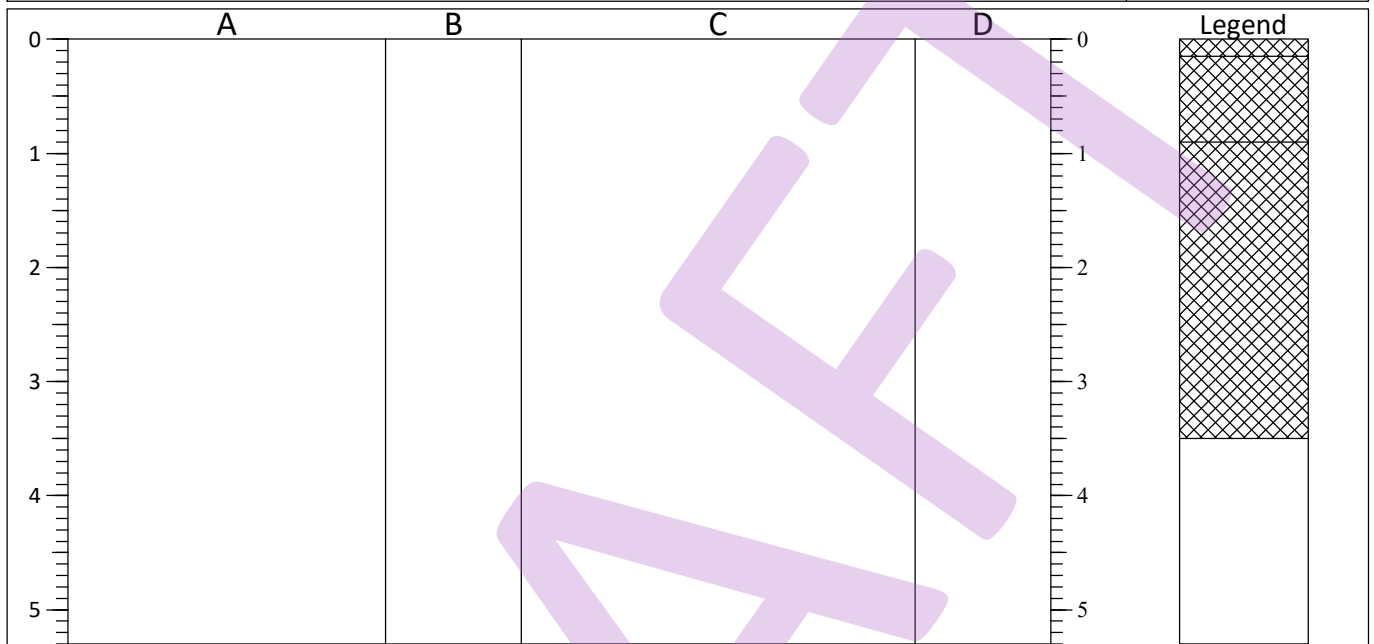
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of dolomite. 0.20 Geotextile Membrane	0.10	E	0.1
0.20-0.30			0.25	E	0.1
0.30-0.80			0.40	E	<0.1
0.80-0.82		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone.	0.80	B	
0.82		MADE GROUND: Dark brown to reddish brown sandy GRAVEL of angular to subangular brick and block work dolomite and sandstone. Low cobble content of whole bricks and occasional lenses of dolomite subbase. 0.60 Low boulder content of masonry.			
		Concrete slab			
		End of excavation on concrete slab			

<p>Shoring/Support: Stability: Stable</p>	<p><b>GENERAL REMARKS</b></p> <p>No odours or oily stainings. No groundwater encountered. PID value in ppm.</p>

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP16</b>
Job No 3899	Date 02-12-20	Ground Level (m) 4.98	Co-Ordinates ( ) E 441,341.8 N 556,865.4	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.15		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone. 0.15 Geotextile Membrane	0.10	E	0.1
0.15-0.90			0.40	E	1.5
0.90-3.50		MADE GROUND: Black fine to medium angular to subangular GRAVEL of dolomite. Slight hydrocarbon odour.  MADE GROUND: Dark grey sandy cobbly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of brick sandstone concrete ceramic and bottles. Low cobble content of whole bricks.  2.00 Hydrocarbon odour. Coarse gravel of glass and bottles.	0.90	B	27
			1.00	E	
			2.00	E	33
3.50		3.40 Very strong hydrocarbon odour with oily groundwater with slight iridescence encountered in base of hole. End of excavation on collapse of side walls	3.30	W	

Shoring/Support: Stability: Unstable from 3.4 m  	<b>GENERAL REMARKS</b>  Slight hydrocarbon odour at 0.25 - 0.9 m PID value in ppm. Hydrocarbon odour at 2 and 3.4 m. Large groundwater seepage encountered at 3.4 with slight iridescence.

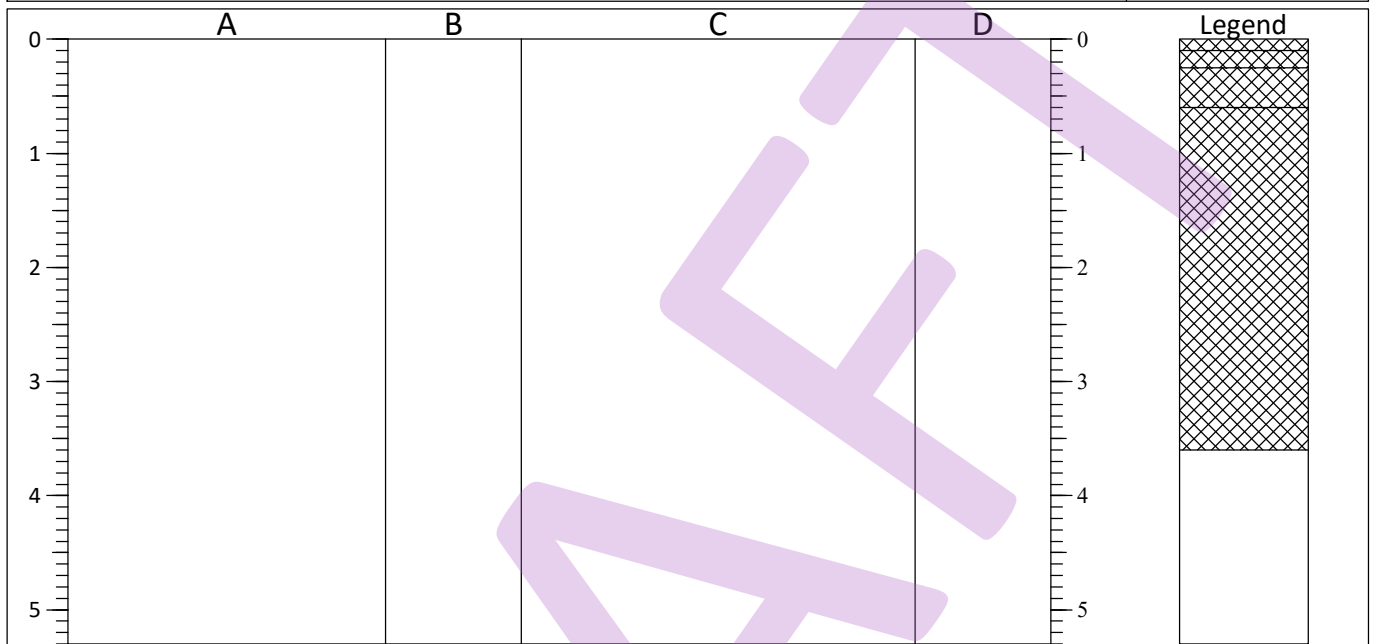
All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL\_GDT 28/1/21



**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP17</b>
Job No 3899	Date 02-12-20	Ground Level (m) 5.25	Co-Ordinates ( ) E 441,338.2 N 556,920.2	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone. 0.10 Geotextile Membrane	0.30	E	0.1
0.10-0.25			0.60	E	0.2
0.25-0.60			1.20	B	
0.60-3.60		MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of dolomite.	1.60	E	2.1
		MADE GROUND: Reddish brown gravelly medium to coarse SAND. Gravel is fine to medium angular bricks and concrete.	2.60	E	0.1
		MADE GROUND: Dark brown to black gravelly slightly cobbly medium to coarse SAND. Gravel is angular to subangular brick slag masonry and subrounded weathered dolomite. Low cobble content of brick and sandstone. 1.20 Subangular cobbles of dolomite. Rare fragments of wood and glass bottles and a slight hydrocarbon odour.	3.60	E	6.6
3.60		End of excavation on collapse of side walls Groundwater encountered. Slight hydrocarbon odour.			

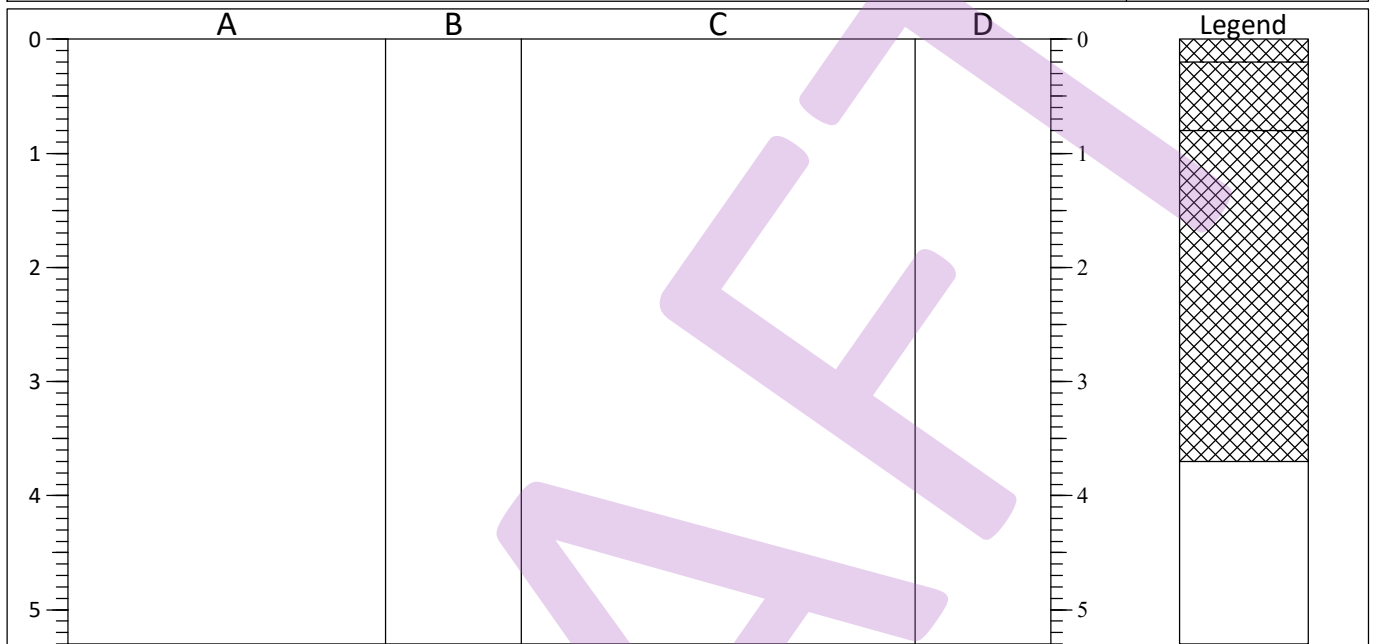
<p>Shoring/Support: Stability: Unstable from 3.0-3.5 m</p>	<p><b>GENERAL REMARKS</b></p> <p>No odours or oily stainings. Groundwater encountered at 3.6 with slight hydrocarbon odour. PID value in ppm.</p>

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3\_ALL\_GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP18</b>
Job No 3899	Date 02-12-20	Ground Level (m) 5.42	Co-Ordinates ( ) E 441,328.2 N 556,948.2	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of dolomite. 0.20 Geotextile Membrane	0.10	E	<0.1
0.20-0.80			0.40	E	0.1
0.80-3.70		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone.	0.90	E	<0.1
		MADE GROUND: Light brown to black gravelly fine to coarse SAND. Gravel is fine to coarse angular brick dolomite sandstone concrete glass bottles and occasional ceramics. 1.00 Becomes black 1.20 - 1.30 Abundant ceramics  2.40 Cobbles of subrounded to rounded weathered dolomite.  3.20 - 3.70 Abundant cobbles of brick tile slate and wood.	1.00	B	
			2.00	E	<0.1
			3.20	E	<0.1
3.70		End of excavation			

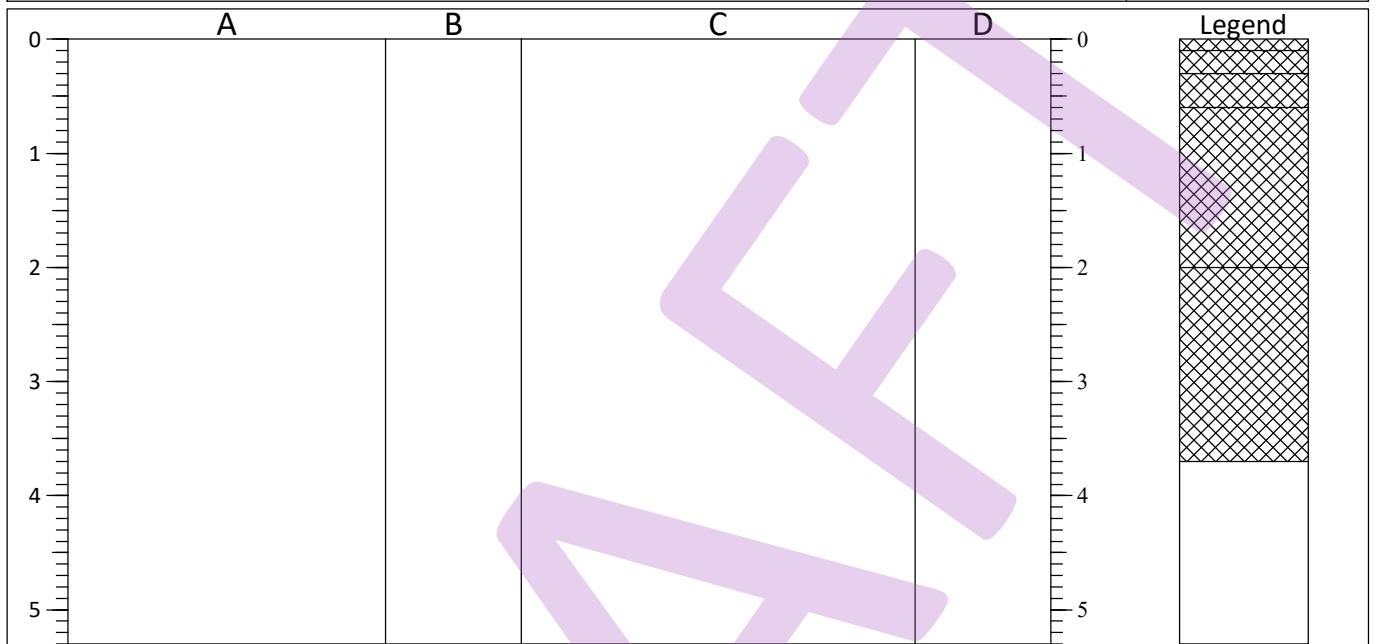
Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>
	No odours or oily stainings. No groundwater encountered. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP19</b>
Job No 3899	Date 02-12-20	Ground Level (m) 5.38	Co-Ordinates ( ) E 441,360.0 N 556,951.3	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone. 0.10 Geotextile Membrane	0.20	E	0.1
0.10-0.30			0.40	E	0.1
0.30-0.60			0.70	E	<0.1
0.60-2.00					
		MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of dolomite.			
		MADE GROUND: Dark brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular of dolomite.			
		MADE GROUND: Yellow brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular of dolomite and brick. With tiles porcelain and glass bottles.			
2.00-3.70		MADE GROUND: Light brown to light yellow slightly gravelly cobbly fine to coarse SAND. Gravel is fine to coarse of subangular dolomite and angular to subangular brick. Low cobble content of subangular to rounded dolomite and angular to subangular whole bricks.	2.20	E	<0.1
3.70		End of excavation			

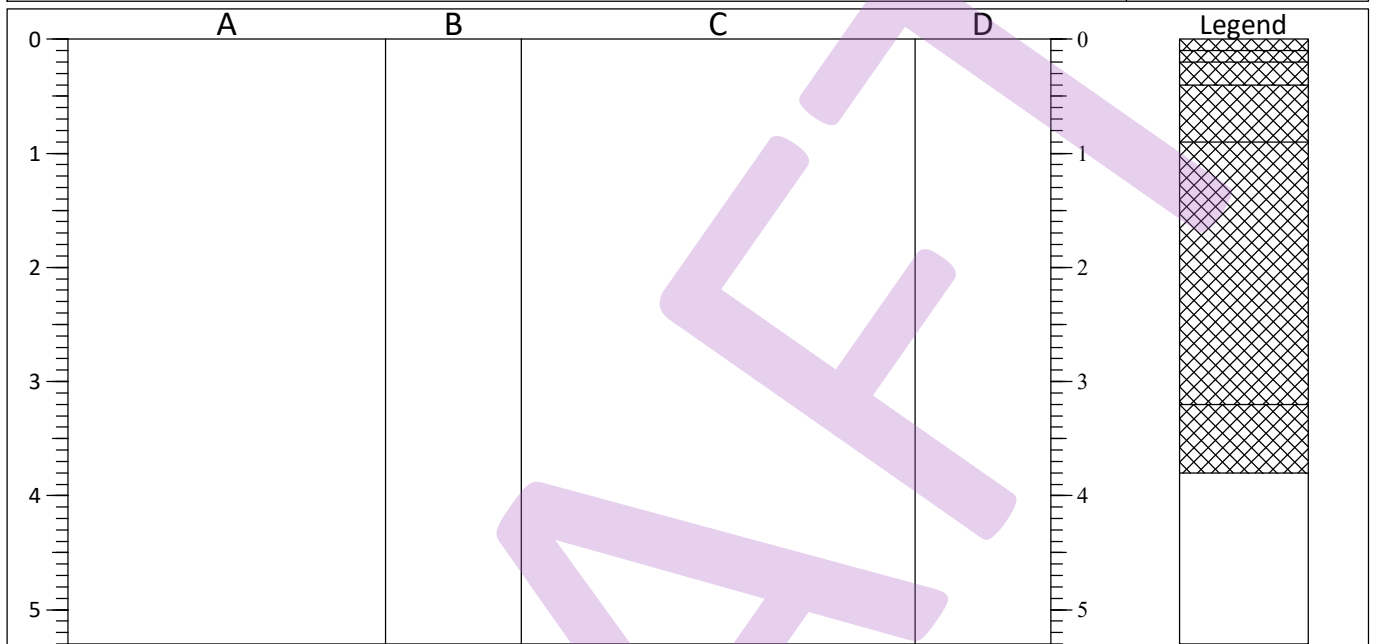
<p>Shoring/Support: Stability: Stable</p>	<p><b>GENERAL REMARKS</b></p> <p>No odours or oily stainings. No groundwater encountered. PID value in ppm.</p>

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3\_ALL\_GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP20</b>
Job No 3899	Date 02-12-20	Ground Level (m) 5.69	Co-Ordinates ( ) E 441,357.8 N 556,997.1	
Contractor Patterson Plant Hire				Sheet 1 of 1



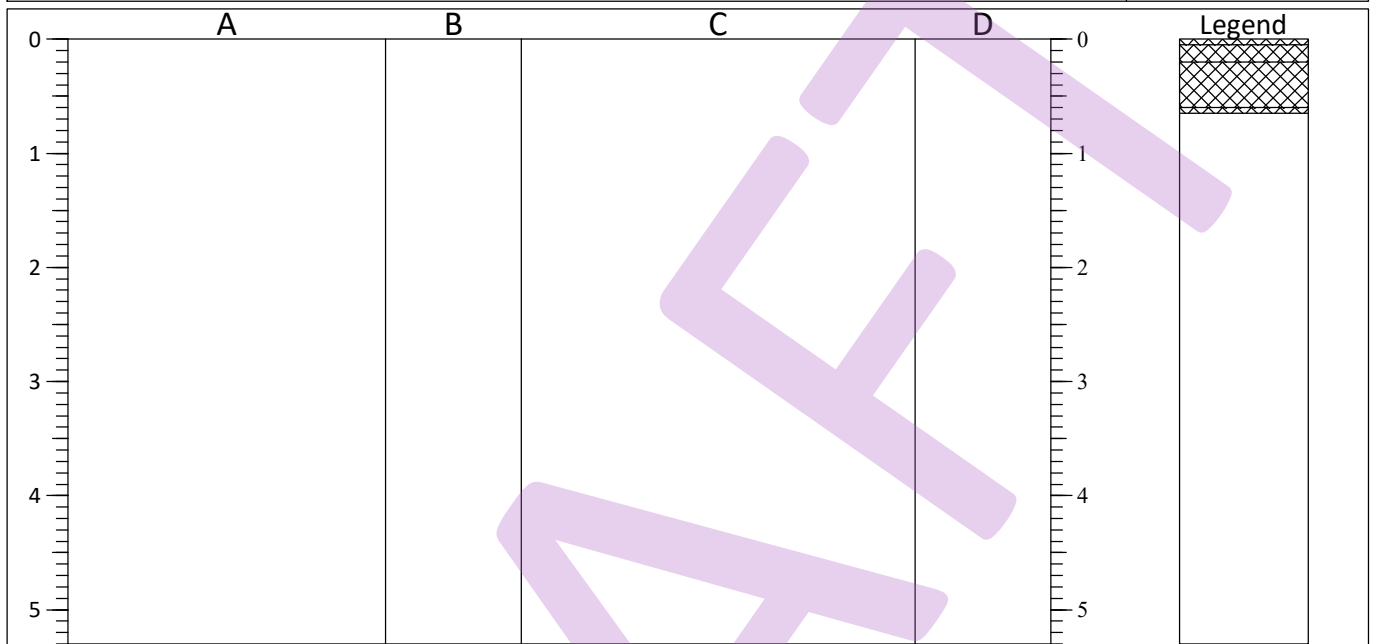
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Dark grey sandy GRAVEL of fine to medium angular to subangular of dolomite and sandstone. 0.10 Geotextile membrane.	0.20	E	0.1
0.10-0.20			0.40	E	0.1
0.20-0.40		MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of dolomite.	0.70	E	<0.1
0.40-0.90					
0.90-3.20		MADE GROUND: Grey gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular of concrete and occasional brick.			
		MADE GROUND: Dark grey gravelly moderate to coarse SAND. Gravel is fine to coarse angular to subangular of concrete brick and dolomite.			
		MADE GROUND: Reddish brown gravelly medium to coarse SAND. Gravel is fine to medium angular bricks and concrete. Low cobble content of angular whole bricks. 1.80 Ceramics and glass gravel.	2.20	E	<0.1
3.20-3.80		MADE GROUND: Light brown to light yellow slightly gravelly fine to coarse SAND. Gravel is fine to coarse of subangular dolomite. Low cobble content of subangular to rounded dolomite. 3.40 Low cobble content of subrounded to rounded weathered dolomite and subangular brick. End of excavation on collapse of side walls			
3.80					

<p>Shoring/Support: Stability: Unstable from 3.6 m</p>	<p><b>GENERAL REMARKS</b></p> <p>No odours or oily stainings. No groundwater encountered. PID value in ppm.</p>

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP21</b>
Job No 3899	Date 03-12-20	Ground Level (m) 5.63	Co-Ordinates ( ) E 441,288.3 N 556,825.2	
Contractor Patterson Plant Hire				Sheet 1 of 1



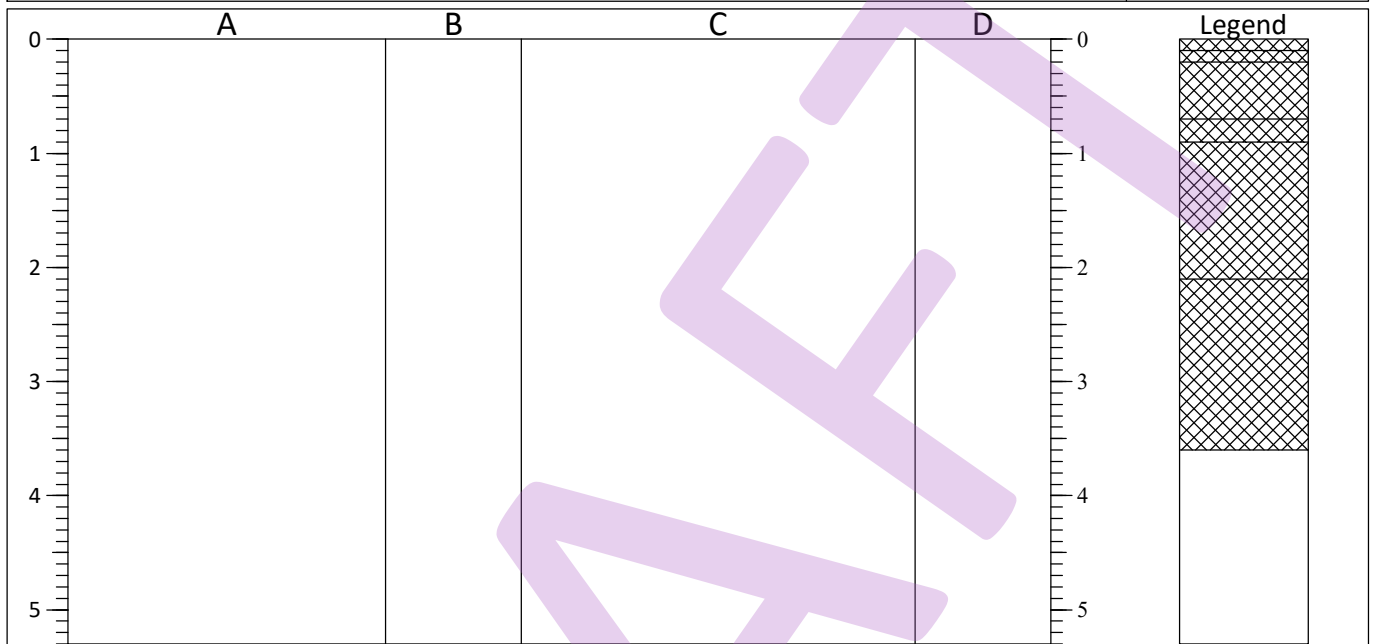
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.05		MADE GROUND: Light brown sandy GRAVEL of fine to medium subangular dolomite with rootlets.	0.10	E	<0.1
0.05-0.20		MADE GROUND: Dark grey to black gravelly cobbly fine to coarse SAND. Gravel is fine to medium angular to subangular of brick and concrete. Low cobble content of whole bricks. MADE GROUND: Dark brown to black gravelly occasionally fine to coarse SAND. Gravel is fine to coarse angular to subangular of sandstone limestone chert and brick. Low cobble content of angular sandstone. MADE GROUND: Concrete. End of excavation on concrete	0.40	E	<0.1
0.20-0.60					
0.60-0.65					
0.65					

Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>  No odours or oily stainings. No groundwater encountered. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP22</b>
Job No 3899	Date 03-12-20	Ground Level (m) 5.31	Co-Ordinates ( ) E 441,337.3 N 556,826.4	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS			
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests	
0.00-0.10		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL dolomite and sandstone. 0.10 Geotextile Membrane	0.30	E	0.2	
0.10-0.20			0.50	E	0.2	
0.20-0.70						
0.70-0.90		MADE GROUND: Dark grey gravelly medium to coarse SAND. Gravel is fine to medium angular to subangular of dolomite and sandstone.	1.00	B	0.3	
0.90-2.10		MADE GROUND: Black fine to medium angular to subangular to subrounded GRAVEL of slag chert and dolomite.	1.00	E		
		MADE GROUND: Reddish brown to dark brown gravelly fine to coarse SAND. Gravel is fine to medium of subangular to subrounded dolomite brick and sandstone.	1.80	E	1.8	
2.10-3.60		MADE GROUND: Orangey brown sandy GRAVEL of fine to coarse angular to subangular of brick concrete glass pottery ceramics and rare cloth. Moderate cobble content of whole bricks and concrete. 1.80 Slight creosote odour. Occasional wood fragments. 1.90 1.6 X 0.4 m piece of timber with creosote odour.	2.20	E	<0.1	
3.60		End of excavation				

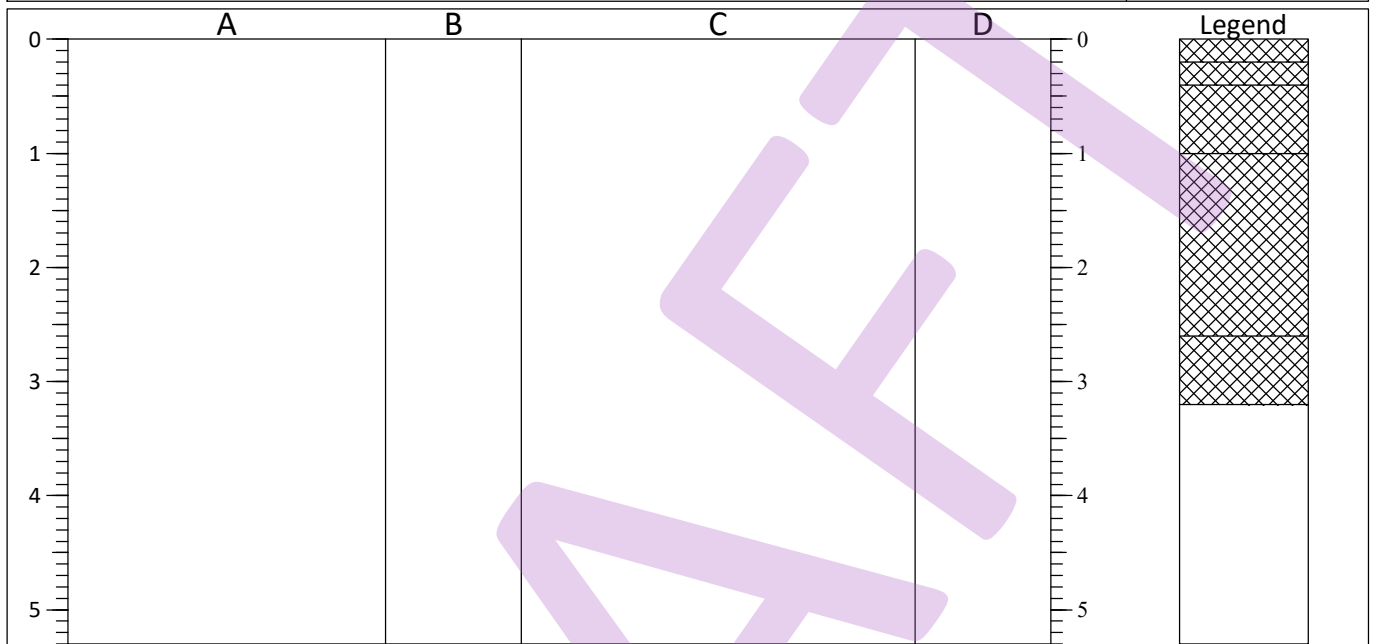
Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>  Slight creosote odour. No oily stainings. No groundwater encountered. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL\_GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP23</b>
Job No 3899	Date 03-12-20	Ground Level (m) 4.80	Co-Ordinates ( ) E 441,374.6 N 556,819.8	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone.	0.30	E	
0.20-0.40		MADE GROUND: Dark grey gravelly medium to coarse SAND. Gravel is fine to medium angular to subangular of dolomite and sandstone.	0.60	B	
0.40-1.00			0.60	E	
1.00-2.60		MADE GROUND: Grey gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular of concrete and occasional brick. Moderate cobble content of whole bricks. 0.80 High cobble content of whole bricks	1.00	E	
		MADE GROUND: Dark grey gravelly medium to coarse SAND. Gravel is fine to medium angular to subangular of dolomite and sandstone. Occasional gravelly sand lenses.	2.20	E	
2.60-3.20		MADE GROUND: Black to dark grey gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular of asphalt and brick.	2.60	E	
3.20		End of excavation due to collapse of side walls			

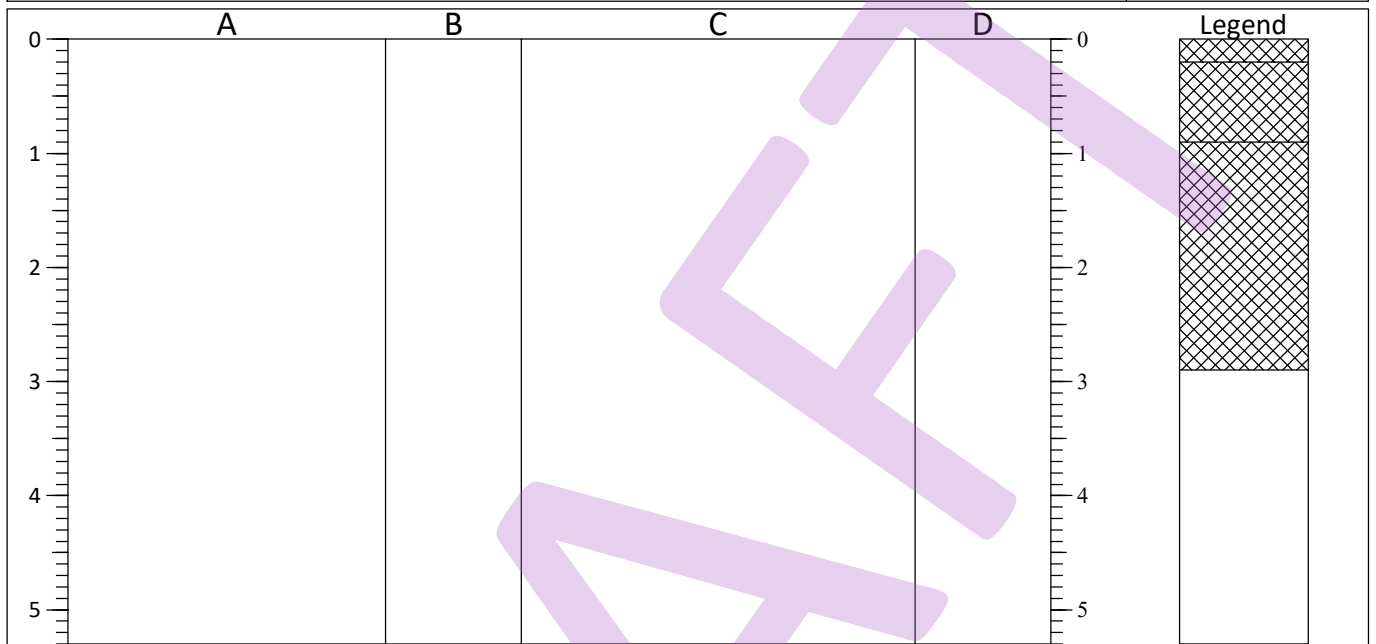
<p>Shoring/Support: Stability: Unstable from 2.7 m</p>	<p><b>GENERAL REMARKS</b></p> <p>No odours or oily stainings. No groundwater encountered. PID value in ppm.</p>

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used JCB 3CX	Logged By JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP24</b>
Job No 3899	Date 03-12-20	Ground Level (m) 4.98	Co-Ordinates ( ) E 441,336.9 N 556,851.4	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone.	0.30	E	
0.20-0.90		MADE GROUND: Grey to reddish brown gravelly medium to coarse SAND. Gravel is fine to coarse angular to subangular of brick.			
0.90-2.90		0.40 Becomes dark grey to dark brown. 0.50 Low cobble content of whole bricks and cobbles of masonry.	1.50	E	
		MADE GROUND: Black GRAVEL of fine to medium angular to subangular to subrounded slag chert and dolomite.			
		2.00 Collapse from east and west of pit.			
		2.50 Collapse from south of pit.			
2.90		End of excavation			

<p>Shoring/Support: Stability: Unstable from 2.0 - 2.9 m</p>	<p><b>GENERAL REMARKS</b></p> <p>No odours or oily stainings. No groundwater encountered. PID value in ppm.</p>
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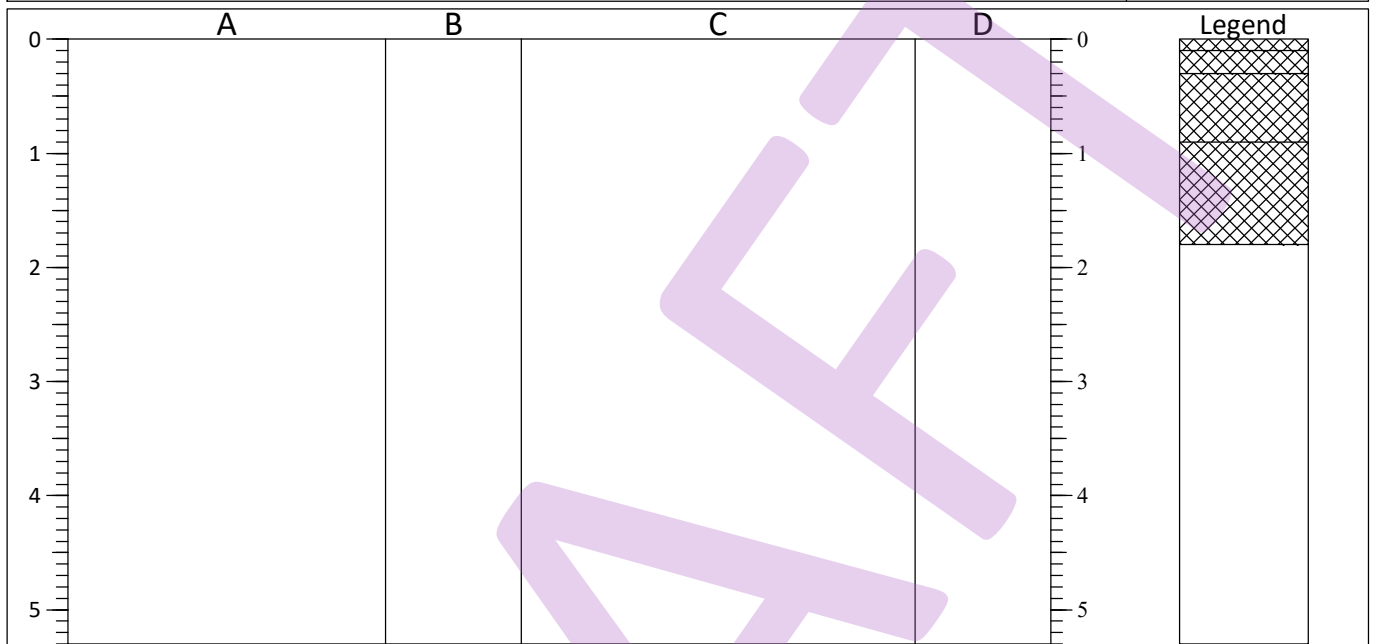
All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used JCB 3CX	Logged By JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21



**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP25</b>
Job No 3899	Date 03-12-20	Ground Level (m) 4.86	Co-Ordinates ( ) E 441,349.3 N 556,856.5	
Contractor Patterson Plant Hire				Sheet 1 of 1



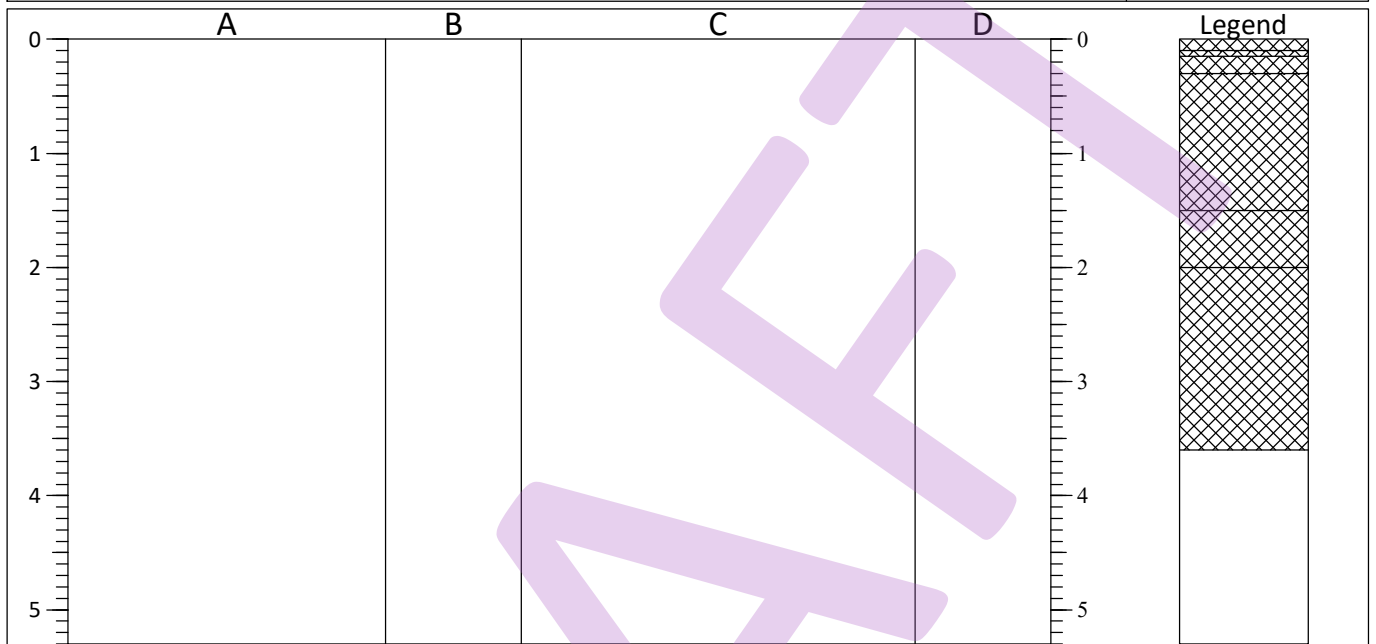
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Dark grey sandy GRAVEL of fine to medium angular to subangular of dolomite and sandstone. 0.10 Geotextile Membrane	0.20	E	<0.1
0.10-0.30			0.40	E	1.6
0.30-0.90			MADE GROUND: Dark grey gravelly medium to coarse SAND. Gravel is fine to medium angular to subangular of dolomite and sandstone.		
0.90-1.80		MADE GROUND: Black sandy fine to coarse GRAVEL. Gravel is fine to coarse of brick and concrete. Slight hydrocarbon sulphurous and 'fruity' odour (naphthalene and phenolic).			
1.80		MADE GROUND: Slight clayey gravelly cobbly fine to coarse SAND. Gravel is fine to coarse angular to subrounded of clinker brick concrete. Low cobble content of whole bricks.	1.80	B	
		End of excavation			

Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>
	No odours or oily stainings. No groundwater encountered. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP26</b>
Job No 3899	Date 15-12-20	Ground Level (m) 5.22	Co-Ordinates ( ) E 441,248.9 N 556,967.5	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Dark grey to black sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone.	0.20	E	0.1
0.10-0.15			0.40	E	2.2
0.15-0.30		MADE GROUND: Grey very gravelly medium to coarse SAND. Gravel is fine to medium of limestone and sandstone.			
0.30-1.50		MADE GROUND: Light brown very sandy fine to coarse subangular GRAVEL of dolomite.			
1.50-2.00		MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded of dolomite. Occasional fragments of wood and glass. Slight creosote odour.	1.60	E	3.8
2.00-3.60		MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded of dolomite and fine brick. Low cobble content of whole bricks.			
		MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded of dolomite. Low cobble content of subangular dolomite.			
3.60		End of excavation			

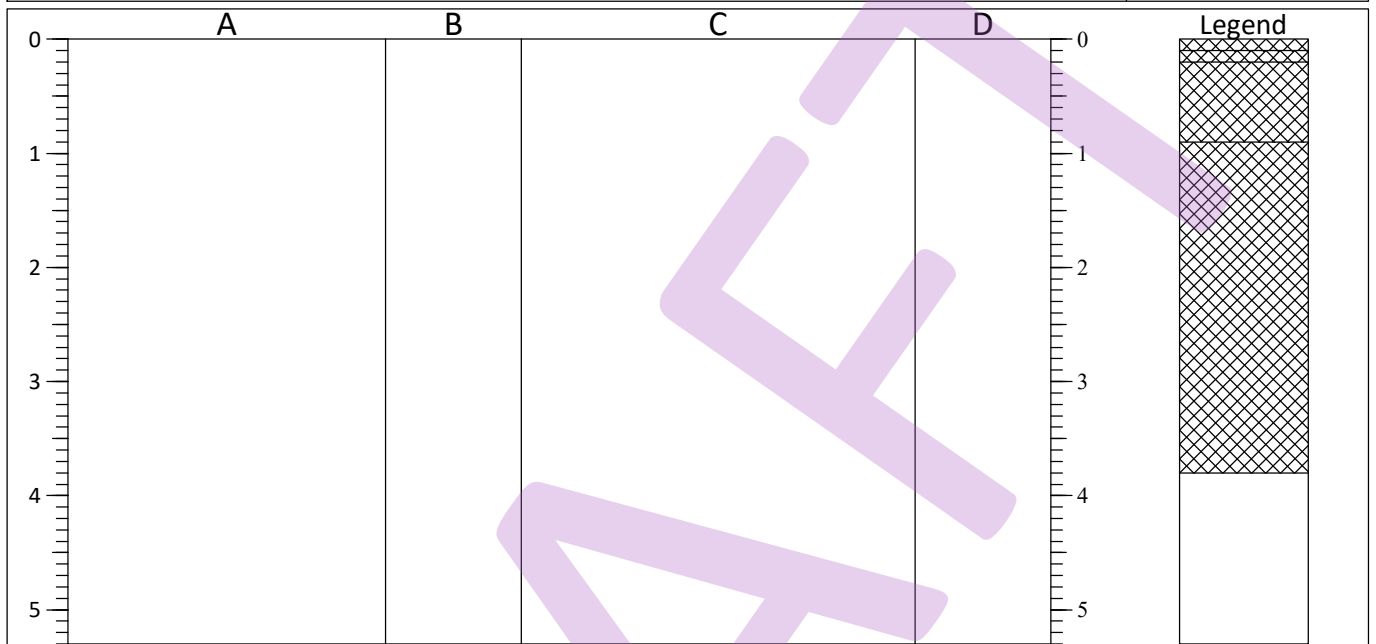
Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>  Slight creosote odour between 0.3 and 1.5 m bgl. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP27</b>
Job No 3899	Date 15-12-20	Ground Level (m) 5.28	Co-Ordinates ( ) E 441,253.5 N 556,934.0	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Light brown sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone.			
0.10-0.20					
0.20-0.90					
		MADE GROUND: Black gravelly medium to coarse SAND. Gravel is fine to medium of limestone and sandstone.	0.40	E	<0.1
		MADE GROUND: Brown gravelly medium to coarse SAND. Gravel is fine to coarse subrounded to rounded of sandstone and chert and coarse angular dolomite.	0.70	E	<0.1
			0.70	D	
0.90-3.80		MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded of dolomite. Rare fragments of wood and glass.	1.20	E	<0.1
			1.20	D	
3.80		End of excavation			

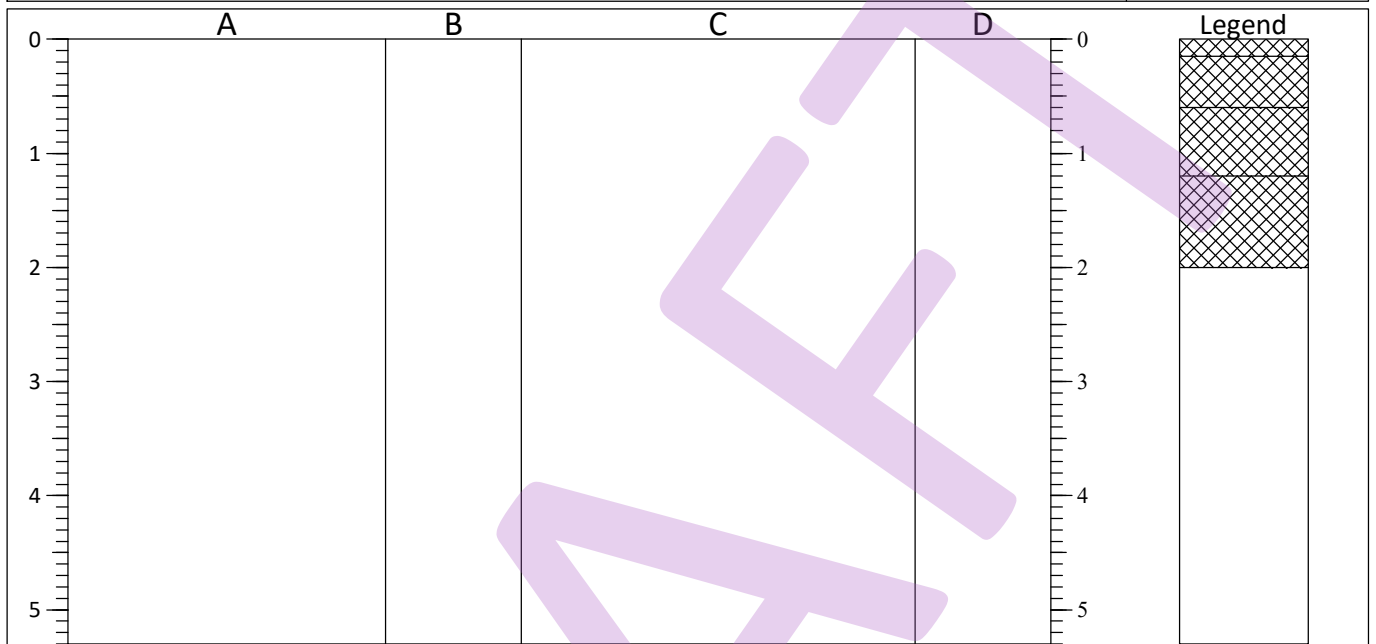
Shoring/Support: Stability: Stable  	<b>N</b>
	<b>GENERAL REMARKS</b>  No odours or oily stainings. No groundwater encountered. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3\_ALL\_GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP28</b>
Job No 3899	Date 15-12-20	Ground Level (m) 5.25	Co-Ordinates ( ) E 441,256.1 N 556,898.2	
Contractor Patterson Plant Hire				Sheet 1 of 1



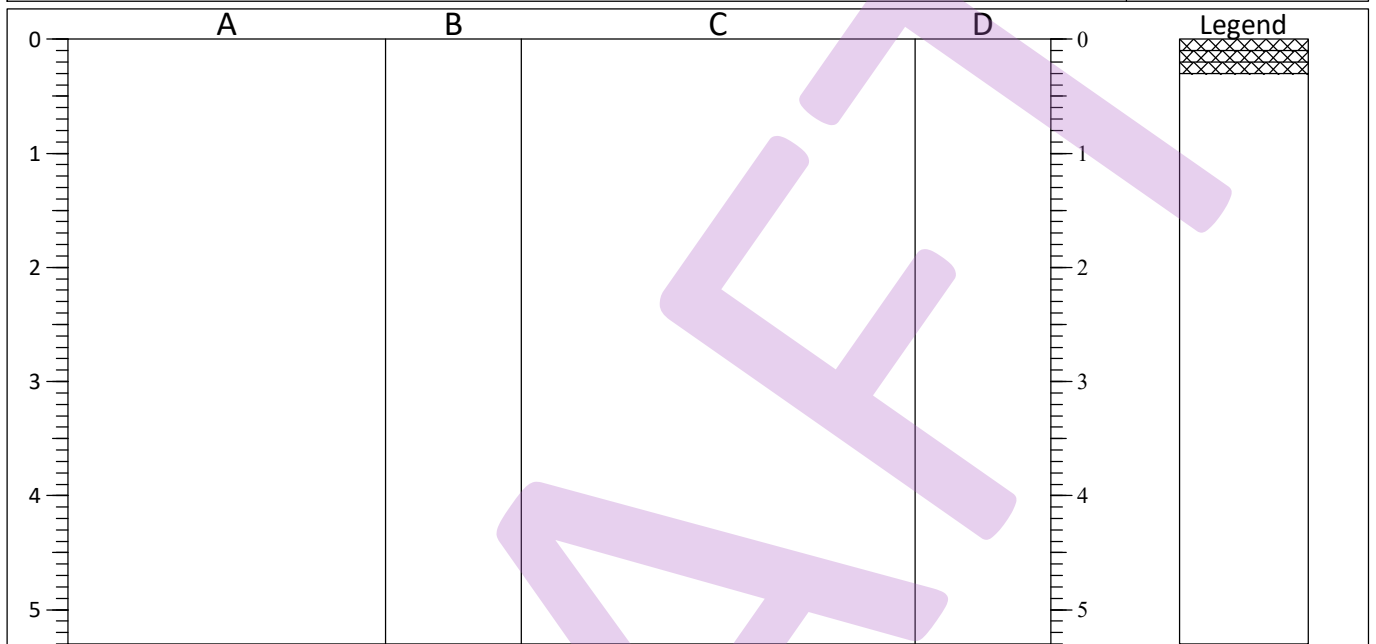
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.15		MADE GROUND: Black asphalt.			
0.15-0.60		MADE GROUND: Black gravelly medium to coarse SAND. Gravel is angular to subangular fine to medium of limestone and concrete. Low cobble content of masonry and concrete.	0.40	D	0.2
0.60-1.20			0.40	E	
1.20-2.00		MADE GROUND: Brown gravelly medium to coarse SAND. Gravel is fine to coarse subrounded to rounded of sandstone and chert.	1.00	D	0.3
		0.70 0.05 m thick concrete slab in the south of the trial pit	1.00	E	
2.00		MADE GROUND: Black gravelly medium to coarse SAND. Gravel is fine to coarse subrounded to rounded of sandstone and chert and coarse angular dolomite.	1.60	E	<0.1
		Trial Pit Terminated on concrete slab			

Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>  No odours or oily stainings. No groundwater encountered. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL\_GDT 28/1/21

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP29</b>
Job No 3899	Date 15-12-20	Ground Level (m) 5.44	Co-Ordinates ( ) E 441,268.0 N 556,876.5	
Contractor Patterson Plant Hire				Sheet 1 of 1



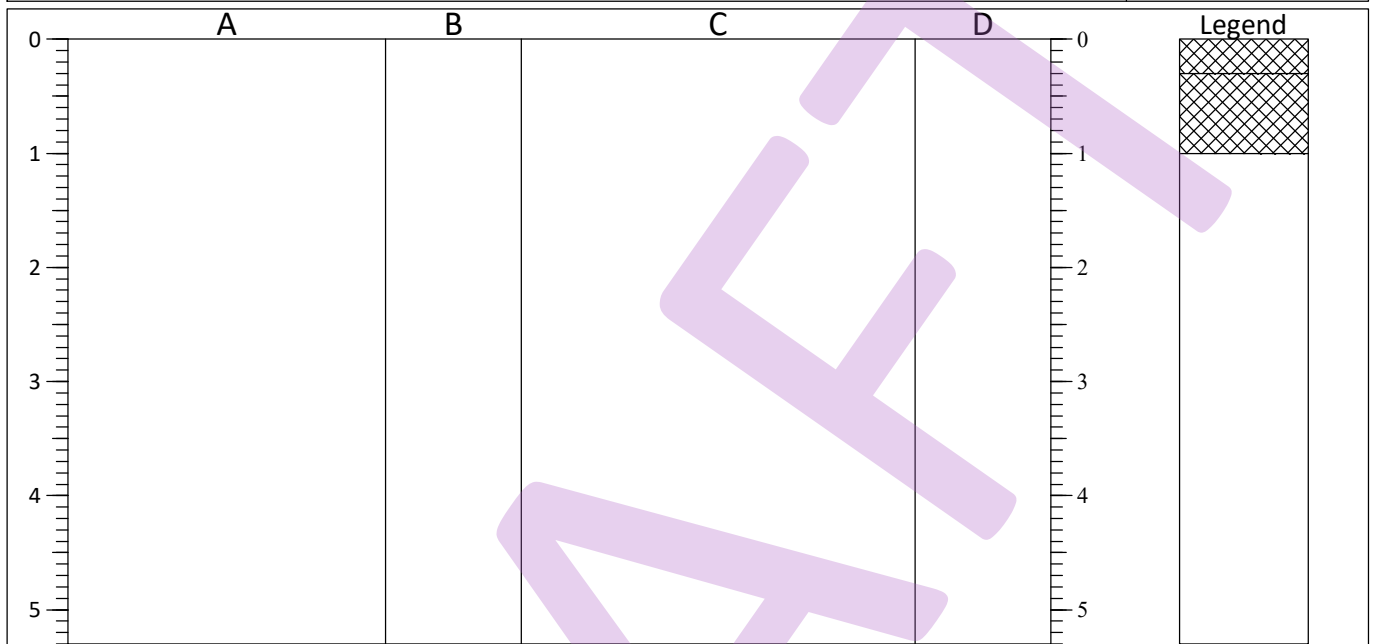
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Grey gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of dolomite and sandstone. MADE GROUND: Light brown sandy GRAVEL of fine to medium subangular dolomite. MADE GROUND: Brown gravelly medium to coarse SAND. Gravel is fine to coarse subrounded to rounded of sandstone and chert and coarse angular dolomite. 0.20 Steel rail in the north of the trial pit. Trial Pit Terminated on buried sleepers	0.15	E	0.2
0.10-0.20					
0.20-0.30					
0.30					

Shoring/Support: Stability: Stable  	<b>GENERAL REMARKS</b>  No odours or oily stainings. No groundwater encountered. PID value in ppm.
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All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP29A</b>
Job No 3899	Date 15-12-20	Ground Level (m) 5.33	Co-Ordinates ( ) E 441,259.7 N 556,877.1	
Contractor Patterson Plant Hire				Sheet 1 of 1



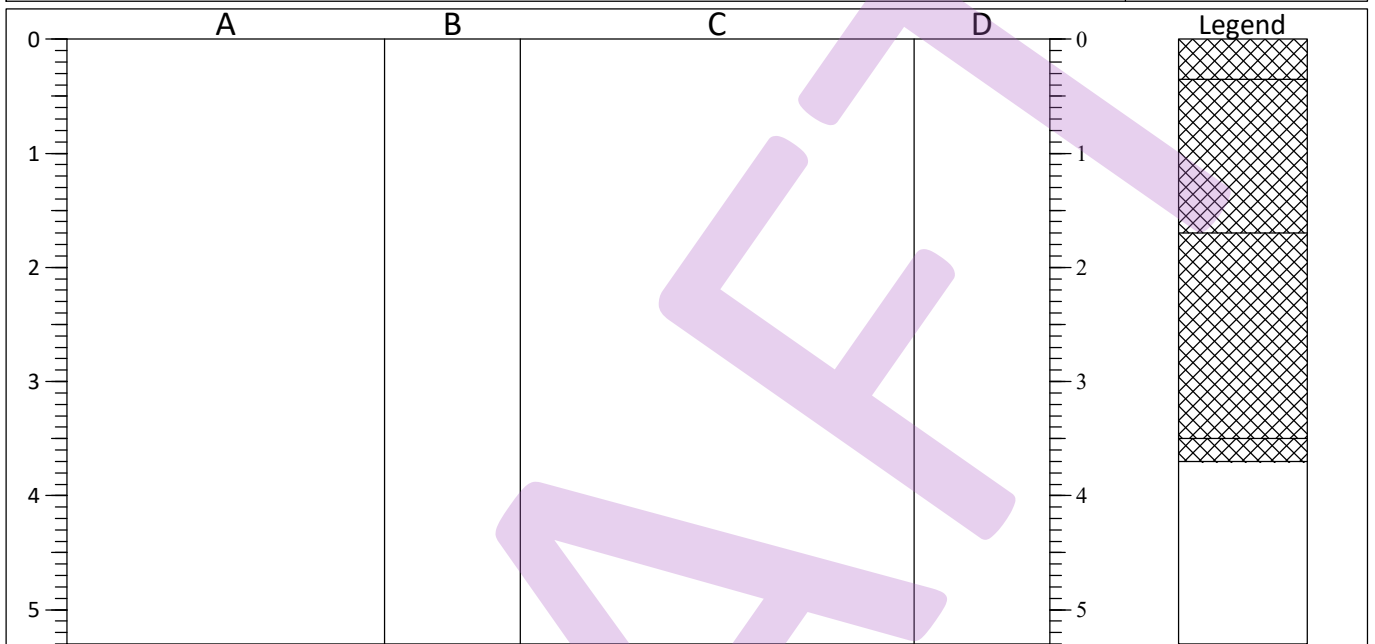
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		MADE GROUND: Grey gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of dolomite and sandstone. MADE GROUND: Brown gravelly medium to coarse SAND. Gravel is fine to coarse subrounded to rounded of sandstone and chert and coarse angular dolomite. Low cobble content of angular whole bricks. Occasional of glass and wood. 0.50 Broken lengths of steel rail in the centre of the pit. Trial Pit Terminated on concrete slab	0.20	E	<0.1
0.30-1.00			0.50	E	0.3
1.00					

<p>Shoring/Support: Stability: Stable</p>	<p><b>GENERAL REMARKS</b></p> <p>No odours or oily stainings. No groundwater encountered. PID value in ppm.</p>
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All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3\_ALL\_GDT\_28/1/21

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP30</b>
Job No 3899	Date 15-12-20	Ground Level (m) 5.30	Co-Ordinates ( ) E 441,260.5 N 556,832.2	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.35		MADE GROUND: Black to grey sandy cobbly fine to coarse GRAVEL of angular to subangular slag. Low cobble content of angular slag.	0.20	E	0.2
0.35-1.70		MADE GROUND: Light brown sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone. 0.60 Becomes light brown 0.80 Slight hydrocarbon odour	0.80 0.80	E D	0.3
1.70-3.50		MADE GROUND: Very soft brown to grey sandy gravelly CLAY. Gravel is fine to medium of sandstone.	1.70 1.70	E D	0.2
3.50-3.70		MADE GROUND: Grey very clayey slightly gravelly SAND. Gravel is fine to coarse subrounded to rounded of concrete glass and wood.	3.50	E	5.9
3.70		Excavation terminated on collapse of north and southern wall.			

Shoring/Support:  
Stability: Unstable from 3.5 m

The plan view diagram shows a rectangular trial pit with a length of 3.5 meters (labeled A), a width of 1.5 meters (labeled B), and a depth of 1.5 meters (labeled C). A north arrow is located to the right of the diagram.

**GENERAL REMARKS**

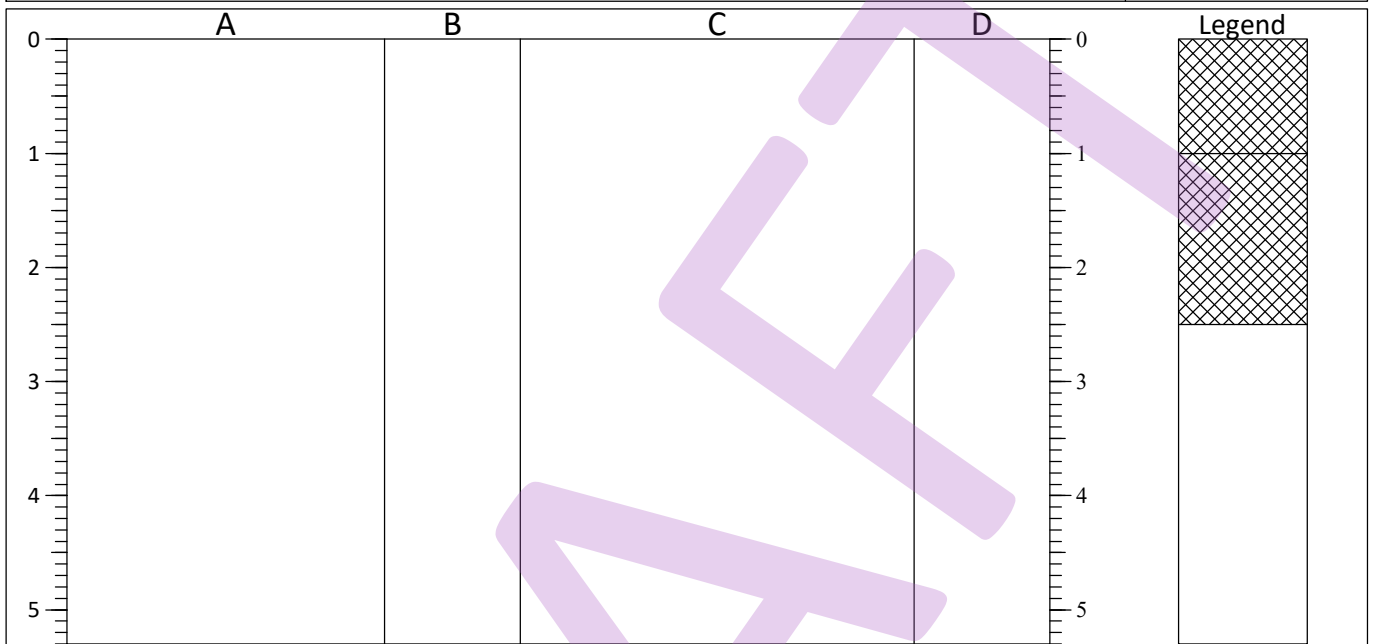
Slight hydrocarbon odour at 1.0 m bgl. No groundwater encountered. PID value in ppm.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JD
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP31</b>
Job No 3899	Date 22-12-20	Ground Level (m) 4.68	Co-Ordinates ( ) E 441,466.3 N 556,967.2	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-1.00		MADE GROUND: Grass over dark brown and black very sandy fine to coarse angular to rounded GRAVEL of concrete brick mudstone and sandstone with ashy sand and a high cobble content of concrete. With angular boulders of concrete.	0.20	E	31%
1.00-2.50		MADE GROUND: Soft to firm brown sandy very clayey GRAVEL. Gravel is fine to coarse subangular to subrounded of concrete brick sandstone mudstone and dolomite. With occasional plastic bags whole bricks and cobbles and boulders of concrete with rebar. 1.50 Metal bar 1.80 Becomes less clayey.	0.50-0.80	B	
			0.90	E	
			1.00-1.20	B	
			1.20	E	
2.00	B				
2.50		End of trial pit - instability and hard digging with concrete and rebar.			

<p>Shoring/Support: Stability: Unstable from 0.9 m</p>	<p><b>GENERAL REMARKS</b></p> <p>No staining or odours. Groundwater not encountered.</p>
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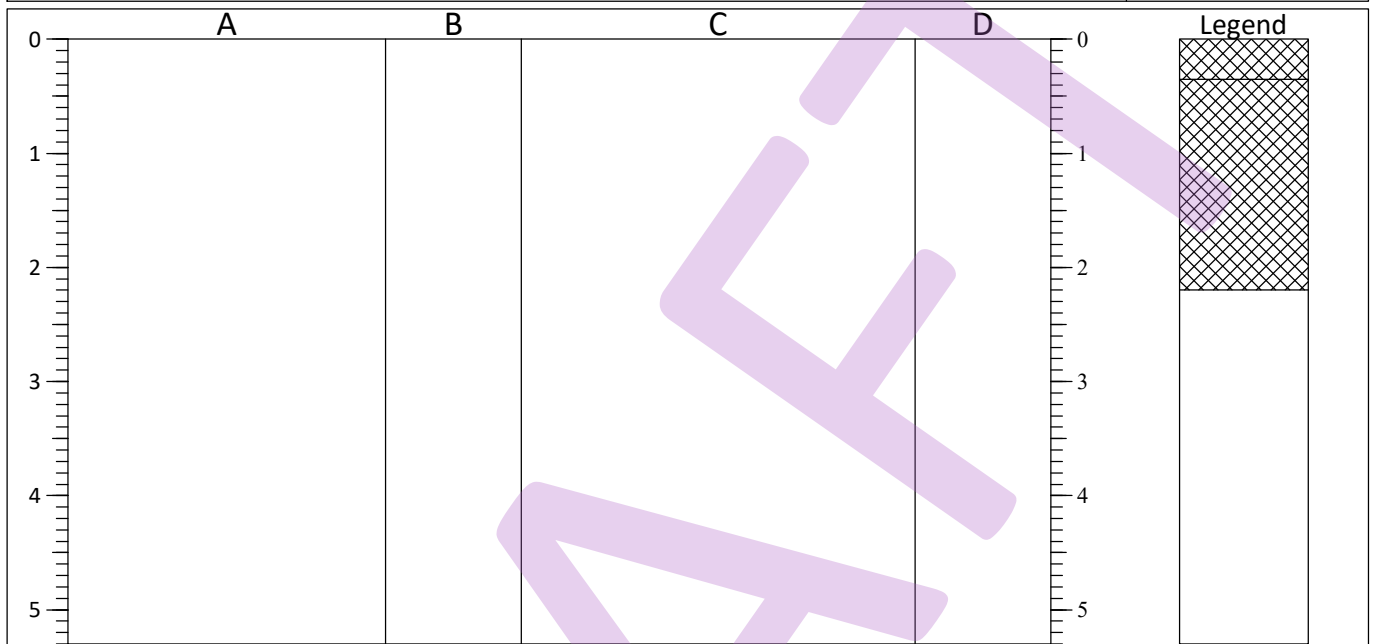
All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used JCB 3CX	Logged By JC
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AGS3 UK TP NEW TP LOGS.GPJ AGS3\_ALL\_GDT 28/1/21



**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP32</b>
Job No 3899	Date 22-12-20	Ground Level (m) 4.55	Co-Ordinates ( ) E 441,452.1 N 556,969.4	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.35		MADE GROUND: Grass over dark brown clayey sandy angular fine to coarse GRAVEL of limestone concrete and brick.	0.30	E	
0.35-2.20		MADE GROUND: Brown clayey sandy ashy fine to coarse angular to subrounded GRAVEL of limestone mudstone sandstone brick and concrete with occasional whole bricks. Occasional wire plastic glass and polystyrene.	0.40	CBR	15%
			0.50	B	
			0.60	E	
			0.80	CBR	49%
			1.00-1.20	B	
2.20		End of trial pit due to hard digging and large boulders.	2.00	B	

Shoring/Support:  
Stability: Unstable from 0.4 m

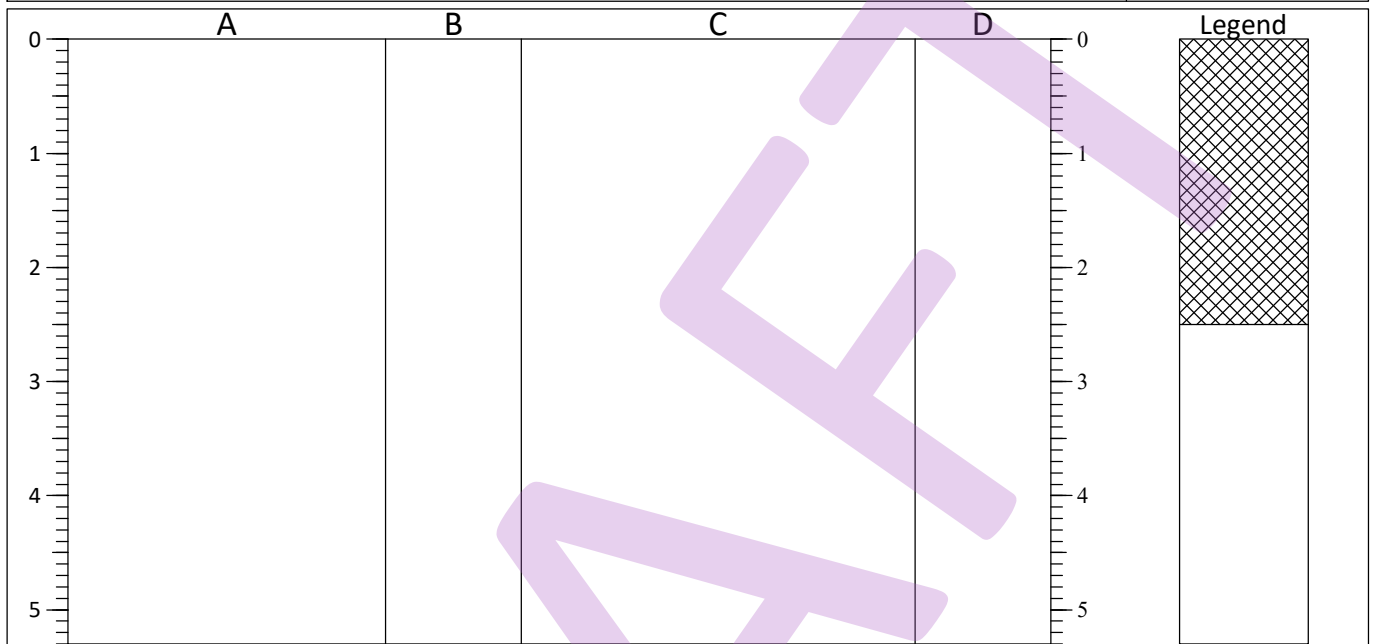
**GENERAL REMARKS**  
No staining or odours.  
Groundwater not encountered.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used JCB 3CX	Logged By JC
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP33</b>
Job No 3899	Date 22-12-20	Ground Level (m) 4.59	Co-Ordinates ( ) E 441,425.9 N 556,971.9	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-2.50		MADE GROUND: Greyish brown clayey sandy fine to coarse angular to subrounded GRAVEL of sandstone limestone brick concrete and mudstone with plastic sheeting ceramic and occasional whole bricks. 0.70 Frequent whole bricks. 1.00 Large concrete boulders. (0.8 X 1.0 m)	0.30 0.50 0.50 1.00 1.00  2.00	E CBR B E B  B	19%
2.50		End of trial pit due to collapse and hard digging.			

Shoring/Support:  
Stability: Unstable from 0.4 m

**GENERAL REMARKS**

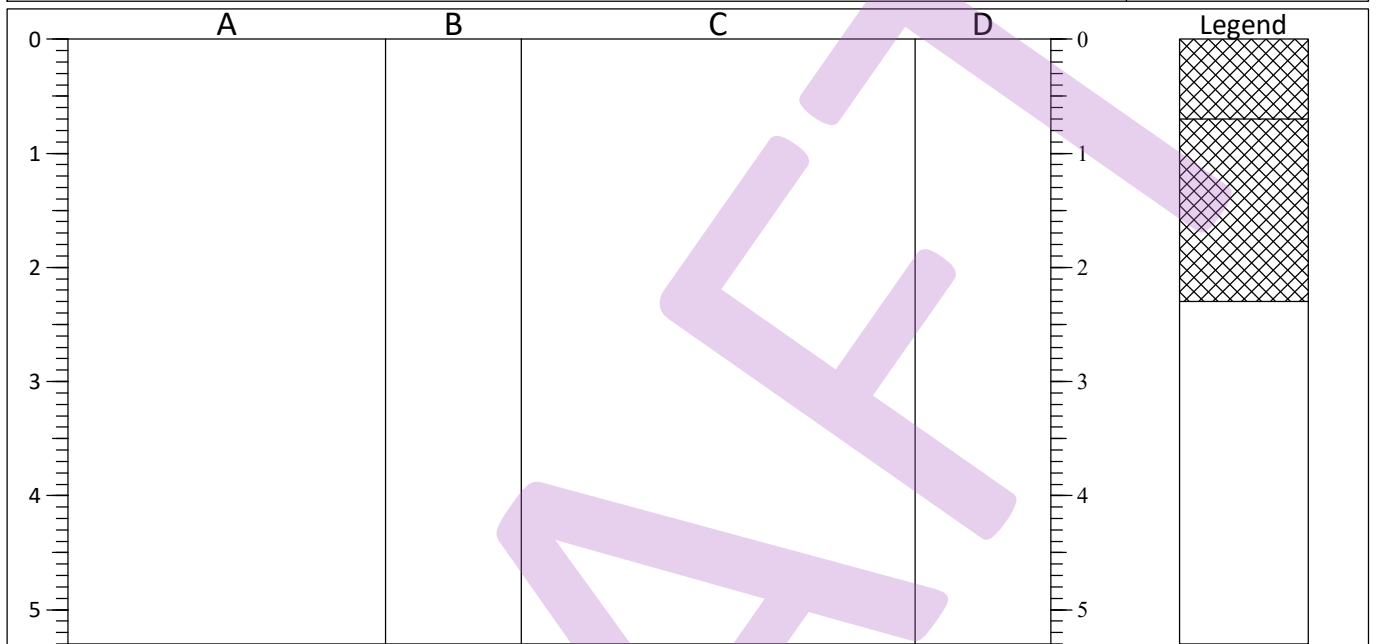
No staining or odours.  
Groundwater not encountered.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used JCB 3CX	Logged By JC
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AGS3 UK TP NEW TP LOGS.GPJ AGS3\_ALL.GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP34</b>
Job No 3899	Date 22-12-20	Ground Level (m) 4.97	Co-Ordinates ( ) E 441,411.1 N 556,985.5	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.70		MADE GROUND: Grass over dark brown gravelly medium to coarse SAND. Gravel is fine to coarse subangular to rounded of limestone dolomite sandstone brick and concrete.	0.30	E	19%
0.70-2.30		MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded of dolomite brick and sandstone with occasional whole bricks.	0.40	CBR	
			0.70	B	
			0.80	E	5%
			0.70	E	
			0.80	CBR	
2.30		End of trial pit due to instability.	2.00	B	

Shoring/Support:  
Stability: Unstable from 0.7 m

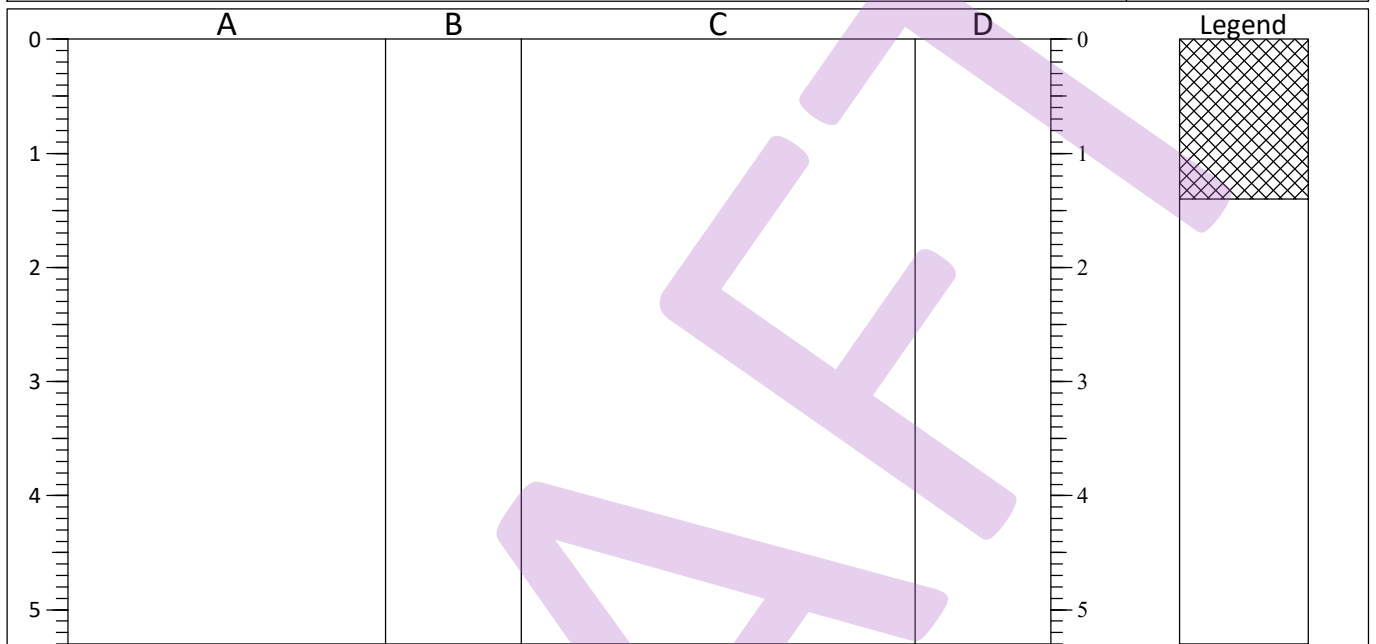
**GENERAL REMARKS**  
No staining or odours.  
Groundwater not encountered.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JC
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AGS3 UK TP NEW TP LOGS.GPJ AGS3\_ALL\_GDT 28/1/21

**TRIAL PIT LOG**

Project GESI Wastefront, Sunderland				TRIAL PIT No <b>TP35</b>
Job No 3899	Date 22-12-20	Ground Level (m) 4.52	Co-Ordinates ( ) E 441,438.9 N 556,993.8	
Contractor Patterson Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-1.40		MADE GROUND: Waterlogged grass over brown slightly ashy sandy fine to coarse angular to subangular GRAVEL of brick concrete dolomite and mudstone with a high cobble content of brick and concrete. With occasional concrete slabs/boulders max 1 x 1.5 m and 0.2 m thick.	0.50	E	
			0.50	B	
			1.00	E	
			1.00	B	
1.40		End of trial pit due to instability and many boulders.			

Shoring/Support:  
Stability: Unstable throughout

**GENERAL REMARKS**

No staining or odours.  
Groundwater not encountered.

All dimensions in metres Scale 1:66.25	Client DTA Engineering	Method/ Plant Used	JCB 3CX	Logged By	JC
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AGS3 UK TP NEW TP LOGS.GPJ AGS3 ALL.GDT 28/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH01</b>	
Job No 3899	Date 02-12-20	Ground Level (m) 5.22	Co-Ordinates ( ) E 441,329.2 N 557,016.5		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
0.50	D			4.72		(0.50) 0.50	MADE GROUND: Dark brown to black sandy gravelly fine to coarse SAND. Gravel was fine to medium angular to subrounded of brick sandstone and concrete.	
1.00	D						MADE GROUND: Medium dense light brown clayey sandy fine to coarse subangular GRAVEL of dolomite.	
1.20	SPT	N32/ 0.16				(2.50)		
1.20	B							
2.00	SPT	N17						
3.00	SPT	N35	↓	2.22		3.00	Residual weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium subangular GRAVEL.	
3.00	B							
4.00	SPT	N36	↓			(1.80)		
4.20	W							
				0.42		4.80		
5.00	SPT	N75/ 0.09		0.13		5.09	DOLOMITE (no recovery).	
							End of borehole.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
02-12-20	00.00	5.00	5.00	150	3.3	2.6	3	1			Hand Dug Pit to 1.2 m No odours or oily stainings.
						4.8	5	1			

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH02</b>	
Job No 3899	Date 03-12-20	Ground Level (m) 5.78	Co-Ordinates ( ) E 441,295.5 N 556,944.1		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
				5.68		0.10	MADE GROUND: Light brown clayey sandy angular to subangular fine to medium angular to subangular GRAVEL of dolomite (hardcore).	
				5.48		0.30		
0.50	D						MADE GROUND: Dark brown to black gravelly occasionally fine to coarse SAND. Gravel is fine to coarse angular to subangular of sandstone limestone chert and brick. Low cobble content of angular sandstone.	
1.00	D						MADE GROUND: Medium dense brown to grey very gravelly medium to coarse SAND. Gravel is fine to medium angular to subangular of dolomite and sandstone.	
1.20	SPT	N14				(2.40)		
1.30	B							
2.00	SPT	N15						
2.50	B							
3.00	SPT	N75/0					MADE GROUND: Dense dark brown to black gravelly fine to coarse SAND. Gravel is fine to medium of subangular to subrounded dolomite and sandstone. 2.70 Becoming dense.	
3.00	B					2.70		
4.00	SPT	N38						
4.00	B							
4.10	W							
5.00	SPT	N38					MADE GROUND: Medium dense light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium of dolomite and occasional chert and rare shells. Moderate cobble content of angular to subrounded chert dolomite and sandstone. (Possible beach deposits or offshore dredged material)	
5.00	B					(4.30)		
6.00	SPT	N36						
6.00	B							
7.00	SPT	N17						
7.00	B							
7.80	B							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m No odours or oily stainings.

AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH02</b>	
Job No 3899	Date 03-12-20	Ground Level (m) 5.78	Co-Ordinates ( ) E 441,295.5 N 556,944.1		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
8.30	B	N50/ 0.225				(2.20)	MADE GROUND: Medium dense light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium of dolomite and occasional chert and rare shells. Moderate cobble content of angular to subrounded chert dolomite and sandstone. (Possible beach deposits or offshore dredged material) (continued)	
8.50	SPT							
8.50	B							
9.30	B	N75/ 0.14		-3.42		9.20	Distinctly weathered weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium subangular GRAVEL.	
10.00	SPT				-4.22	(0.80)		
							Borehole continued with rotary open hole drilling.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
03-12-20	00.00	10.00	10.00	150	3.7	9.8	10.0	1			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH03</b>	
Job No 3899	Date 07-12-20	Ground Level (m) 5.44	Co-Ordinates ( ) E 441,306.8 N 556,864.5		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.50	B				(1.00)	MADE GROUND: Light to dark brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular dolomite brick and concrete.		
1.00	B		4.44		1.00			
1.20-1.65	SPT	N3				MADE GROUND: Loose dark grey to black gravelly fine to coarse SAND. Gravel is fine to medium subangular to angular of dolomite concrete and rare brick.		
1.50	B							
2.00-2.45	SPT	N7						
2.00-2.50	B							
3.00-3.45	SPT	N8						
3.00-3.50	B				(5.10)			
3.80	W							
4.00-4.45	SPT	N7						
4.00-4.50	B							
5.00	SPT	N50/ 0.105						
5.00-5.50	B							
6.00-6.50	B		-0.66		6.10	6.00 Becoming medium dense.		
6.50-6.95	SPT	N14				MADE GROUND: Light brown gravelly medium to coarse SAND. Gravel is fine to medium of dolomite and sandstone.		
6.50-7.00	B							
7.00-7.50	B				(1.90)			
					8.00			
					-2.56			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
07-12-20	00.00	2.00	2.00	150							Hand Dug Pit to 1.2 m No odours or oily stainings.
08-12-20	00.00	8.00	7.90	150	5.2						

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21



**BOREHOLE LOG**

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH03</b>	
Job No 3899	Date 07-12-20	Ground Level (m) 5.44	Co-Ordinates ( ) E 441,306.8 N 556,864.5		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
8.00-8.45	SPT	N75/ 0.14		-2.71	///	8.15	Distinctly weathered weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium GRAVEL of subangular dolomite. End of borehole.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH04</b>	
Job No 3899	Date 04-12-20 07-12-20	Ground Level (m) 5.55	Co-Ordinates ( ) E 441,313.7 N 556,828.6		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.50	J					MADE GROUND: Soft light brown to orange dark brown slightly sandy slightly gravelly CLAY. Gravel is medium to coarse angular to subangular of brick and masonry. Occasional mussel shells.		
1.00	J				(2.70)			
1.20-1.65	SPT	N2						
2.00-2.45	SPT	N5						
2.70	B			2.85	2.70	MADE GROUND: Soft light brown to orange dark brown slightly sandy slightly gravelly CLAY. Gravel is medium to coarse angular to subangular of brick and masonry. Occasional mussel shells.		
3.00-3.45	SPT	N5			(1.10)			
3.90	W			1.75	3.80	MADE GROUND: Medium dense dark brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of dolomite and occasional chert and rare shells.		
4.00-4.45	SPT	N24						
4.00-4.50	B							
5.00-5.45	SPT	N16						
5.00-5.50	B							
6.00-6.50	B							
6.50-6.95	SPT	N42			(5.20)			
7.00-7.50	B							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
						4.2	4.5	1			Hand Dug Pit to 1.2 m No odours or oily stainings.
All dimensions in metres Scale 1:50						Client DTA Consulting Engineers			Method/ Plant Used Cable Percussion		

AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH04</b>	
Job No 3899	Date 04-12-20 07-12-20	Ground Level (m) 5.55	Co-Ordinates ( ) E 441,313.7 N 556,828.6		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
8.00-8.45 8.00-8.50	SPT B	N25					MADE GROUND: Medium dense dark brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of dolomite and occasional chert and rare shells. (continued) 8.00 Occasional cobbles of subangular slag		
9.00-9.50	B		-3.45		9.00		MADE GROUND: Medium dense grey clayey gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular sandstone.		
9.50-9.95	SPT	N18			(1.00)				
10.00-10.50	B		-4.45		10.00		MADE GROUND: Firm black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subangular sandstone. Occasional white bivalve shells.		
10.50-10.95	U	100 blows	-5.25		10.80	(0.80)			
11.00-11.50	B		-5.95		(0.70)		Dark grey very clayey slightly gravelly fine to coarse SAND. Gravel is fine subangular to subrounded of sandstone and shells.		
11.50-12.00	B				(0.50)		Soft black CLAY.		
12.00-12.45 12.00-12.50	SPT B	N44	-6.45		12.00		Distinctly weathered weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium subangular GRAVEL.		
			-7.15		12.70		Borehole continued with rotary open hole drilling.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
15-12-20	00.00	12.70	12.70	150	4.9	12.5	12.7	1			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

**BOREHOLE LOG**

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH05</b>	
Job No 3899	Date 05-01-21	Ground Level (m) 5.67	Co-Ordinates ( ) E 441,324.4 N 556,960.0		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	



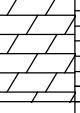

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
0.50	B			5.57		0.10	MADE GROUND: Light brown sandy cobbly fine to coarse GRAVEL of angular to subangular dolomite.	
1.00	B						MADE GROUND: Loose to medium dense light to dark grey slightly clayey sandy fine to medium subangular GRAVEL of brick and concrete. Rare pottery.	
1.20-1.65	SPT	N8						
1.50	B							
2.00-2.45	SPT	N8				(4.20)		
2.00-2.50	B							
3.00-3.45	SPT	N15						
3.00-3.50	B							
3.90	W		↓					
4.00-4.45	SPT	N13				4.30	MADE GROUND: Dense light to dark grey very sandy fine to medium subangular GRAVEL of brick sandstone and concrete.	
4.00-4.50	B			1.37				
5.00-5.45	SPT	N23				(2.70)		
5.00-5.50	B							
6.00-6.45	SPT	N17						
6.00-6.50	B							
6.50-6.50	B							
7.00-7.45	SPT	N22				7.00	MADE GROUND: Dense black slightly sandy fine to medium angular GRAVEL of concrete sandstone and dolomite.	
7.00-7.50	B			-1.33		(1.40)		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
						4.8	5.1	0100			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH05</b>	
Job No 3899	Date 05-01-21	Ground Level (m) 5.67	Co-Ordinates ( ) E 441,324.4 N 556,960.0		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
8.00-8.50	B		-2.73		8.40	MADE GROUND: Dense black slightly sandy fine to medium angular GRAVEL of concrete sandstone and dolomite. <i>(continued)</i>		
8.50-8.95	SPT	N50	-3.43		(0.70) 9.10	Distinctly weathered weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium subangular GRAVEL		
Borehole continued with rotary open hole drilling.								

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
						9.8	10	0030			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

**BOREHOLE LOG**

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH06</b>	
Job No 3899	Date 07-01-21	Ground Level (m) 5.95	Co-Ordinates ( ) E 441,335.9 N 556,978.1		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill	
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)			Description
0.50	B			5.85		0.10	MADE GROUND: Light brown sandy cobbly fine to coarse GRAVEL of angular to subangular dolomite.		
1.00	B					(1.90)	MADE GROUND: Loose to medium dense light to dark grey slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium subangular of brick and rare concrete.		
1.20-1.65	SPT	N8							
1.50	B								
2.00-2.45	SPT	N1/0.3		3.95			2.00		MADE GROUND: Loose to medium dense light to dark grey slightly clayey sandy fine to medium subangular GRAVEL of brick and concrete. Occasional wire.
2.00-2.50	B								
3.00-3.45	SPT	N3/0.375					(2.30)		
3.00-3.50	B								
4.00-4.45	SPT	N22							
4.00-4.50	B			1.65		4.30	MADE GROUND: Medium dense light to dark grey very sandy fine to medium subangular GRAVEL of brick sandstone and concrete.		
5.00-5.45	SPT	N26							
5.00-5.50	B								
5.50	W					(2.70)			
6.00-6.50	B								
6.50-6.95	SPT	N35							
7.00-7.50	B			-1.05		7.00	MADE GROUND: Dense black slightly sandy fine to medium angular GRAVEL of sandstone and dolomite.		

AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH06</b>	
Job No 3899	Date 07-01-21	Ground Level (m) 5.95	Co-Ordinates ( ) E 441,335.9 N 556,978.1		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
8.00-8.45	SPT	N50/ 0.17			(2.00)	MADE GROUND: Dense black slightly sandy fine to medium angular GRAVEL of sandstone and dolomite. <i>(continued)</i>			
8.00-8.50	B								
8.50-9.00	B								
				-3.05		9.00			
9.50-9.95	SPT	N46			(0.95)	Distinctly weathered weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium GRAVEL of subangular dolomite.			
				-4.00		9.95			
End of borehole.									

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH07</b>	
Job No 3899	Date 14-12-20	Ground Level (m) 5.33	Co-Ordinates ( ) E 441,385.9 N 556,962.7		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
0.50	B			5.23		0.10	MADE GROUND: Dark grey sandy GRAVEL of fine to medium angular to subangular of dolomite and sandstone.	
1.00	B					(1.90)	MADE GROUND: Loose light to dark grey sandy fine to medium subangular GRAVEL of brick and concrete. Low cobble content of brick.	
1.20-1.65	SPT	N3						
1.50	B							
2.00-2.45	SPT	N10		3.33		2.00	MADE GROUND: Medium dense light to dark grey clayey sandy fine to medium angular to subangular GRAVEL of brick concrete and sandstone.	
2.00-2.50	B					(1.00)		
3.00-3.45	SPT	N33		2.33		3.00	MADE GROUND: Medium dense light brown gravelly fine to coarse SAND. Gravel is fine to medium angular to subrounded sandstone.	
3.00-3.50	B					(0.40)		
3.45	W		1	1.93		3.40	MADE GROUND: Dense light to dark grey sandy fine to medium subangular GRAVEL of brick and concrete.	
4.00-4.45	SPT	N50/0.275				(1.10)		
4.00-4.50	B							
4.50-5.00	B			0.83		4.50	MADE GROUND: Dense light grey to brown very sandy fine to medium GRAVEL of angular sandstone brick and dolomite	
5.00-5.45	SPT	N50/0.15						
5.00-5.50	B					(2.60)		
6.00-6.50	B							
6.50-6.95	SPT	N35						
7.00-7.50	B			-1.77		7.10	Destructured light brown weck DOLOMITE. Recovered as slightly clayey fine to medium angular to subangular GRAVEL.	
						(1.50)		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
						4	4.5	1			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW\_BHS.GPJ AGS3\_ALL.GDT 29/1/21



Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH07</b>	
Job No 3899	Date 14-12-20	Ground Level (m) 5.33	Co-Ordinates () E 441,385.9 N 556,962.7		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
8.00-8.45	SPT	N50/ 0.16				Destructured light brown weck DOLOMITE. Recovered as slightly clayey fine to medium angular to subangular GRAVEL. (continued)		
8.00-8.50	B		-3.27		8.60			
Borehole continued with rotary open hole drilling.								

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
14-12-20	00.00	8.60	8.50	150	3.5	8.5	8.6	1			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH08</b>	
Job No 3899	Date 08-01-21 11-01-21	Ground Level (m) 5.44	Co-Ordinates ( ) E 441,396.5 N 556,944.3		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
0.50	B						MADE GROUND: Loose to medium dense dark grey slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium subangular of brick and concrete.	
1.00	B							
1.20-1.65	SPT	N9						
1.50	B							
2.00-2.45	SPT	N9				(4.00)		
2.00-2.50	B							
3.00-3.45	SPT	N9						
3.00-3.50	B							
3.90	W			1.44		4.00		
4.00-4.45	SPT	N49					MADE GROUND: Clayey gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded of brick dolomite and sandstone.	
4.00-4.50	B							
5.00-5.45	SPT	N50				(2.00)		
5.00-5.50	B							
6.00-6.50	B					6.00		
6.50-6.95	SPT	N12					Medium dense yellowish brown gravelly SAND. Gravel is fine to medium subrounded to rounded of chert and sandstone. Occasional gravels of medium angular dolomite.	
7.00-7.50	B					(2.10)		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
08-01-21	00.00	6.95	6.00	150	3.8	1.3	.8	0100			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH08</b>	
Job No 3899	Date 08-01-21 11-01-21	Ground Level (m) 5.44	Co-Ordinates () E 441,396.5 N 556,944.3		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
8.00-8.45	SPT	N50/ 0.155		-2.66		8.10	Distinctly weathered weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium subangular GRAVEL.	
8.00-8.50	B					(0.90)		
8.50-9.00	B			-3.56		9.00		
Borehole contiuned with rotary open hole drilling.								

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used Cable Percussion	Logged By JD
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AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21









Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH09</b>	
Job No 3899	Date 11-01-21 12-01-21	Ground Level (m) 5.49	Co-Ordinates ( ) E 441,432.9 N 556,890.3		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
0.50	B			5.39		0.10	MADE GROUND: Light brown sandy cobbly fine to coarse angular to subangular GRAVEL of dolomite.	
1.00	B						MADE GROUND: Loose dark grey sandy fine to medium angular to subangular GRAVEL of brick and concrete.	
1.20-1.65	SPT	N8						
1.50	B					(3.30)		
2.00-2.45	SPT	N6						
2.00-2.50	B							
3.00-3.45	SPT	N18						
3.00-3.50	B			2.09		3.40	MADE GROUND: Loose dark grey gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of brick.	
3.90	W							
4.00-4.45	SPT	N7					4.00 Abundant fine to medium angular brick gravel.	
4.00-4.50	B					(1.90)		
5.00-5.45	SPT	N50/ 0.225						
5.00-5.50	B			0.19		5.30	MADE GROUND: Medium dense grey with occasional light brown lenses very sandy fine to medium angular to subangular GRAVEL of brick sandstone and concrete.	
6.00-6.50	B					(1.00)		
6.50-6.95	SPT	N50/ 0.215					MADE GROUND: Loose grey sandy fine to medium angular GRAVEL of sandstone and dolomite.	
7.00-7.50	B			-0.81		6.30		
						(2.10)		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m No odours or oily stainings.

AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH09</b>	
Job No 3899	Date 11-01-21 12-01-21	Ground Level (m) 5.49	Co-Ordinates ( ) E 441,432.9 N 556,890.3		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
8.00-8.45	SPT	N50/ 0.17						
8.00	B		-2.91		8.40	MADE GROUND: Loose grey sandy fine to medium angular GRAVEL of sandstone and dolomite. (continued)		
9.00	B					Black slightly sandy CLAY.		
9.50-9.95	SPT	N9						
10.00	B							
11.00-11.45	SPT	N10						
11.00	B				(5.50)			
12.00	B							
12.50-12.95	SPT	N8						
13.00	B							
14.00-14.45	SPT	N30						
14.00	B		-8.41		13.90	Distinctly weathered weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium angular to subangular GRAVEL.		
			-9.01		14.50	Borehole continued with rotary open hole drilling.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW\_BHS.GPJ AGS3\_ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH10</b>	
Job No 3899	Date 06-01-21	Ground Level (m) 5.42	Co-Ordinates ( ) E 441,338.4 N 556,926.2		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	







SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
0.50	B			5.32		0.10 (0.90)	MADE GROUND: Light brown sandy clayey sandy fine to coarse angular to subangular GRAVEL of dolomite. MADE GROUND: Dark grey slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium subangular of brick and concrete.	
1.00 1.20-1.65 1.50	B SPT B	N4		4.42		1.00	MADE GROUND: Loose to medium dense grey slightly clayey sandy fine to medium subangular GRAVEL of brick and concrete.	
2.00-2.45 2.00-2.50	SPT B	N12						
3.00-3.45 3.00-3.50	SPT B	N14				(5.30)		
3.90 4.00-4.45 4.00-4.50	W SPT B	N19						
5.00-5.45 5.00-5.50	SPT B	N31						
6.00-6.50	B			-0.88		6.30		
6.50-6.95	SPT	N19					MADE GROUND: Dense black gravelly fine to coarse SAND. Gravel is fine to medium of brick. Slight hydrocarbon odour.	
7.00-7.50	B					(1.90)		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
						4.7 5.5	5 6	0045 0100			Hand Dug Pit to 1.2 m Hydrocarbon odour 6.3-8.2 m bgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH10</b>	
Job No 3899	Date 06-01-21	Ground Level (m) 5.42	Co-Ordinates ( ) E 441,338.4 N 556,926.2		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
8.00-8.45	SPT	N50		-2.78		8.20	Distinctly weathered weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium subangular GRAVEL.	
8.00-8.50	B							
8.50-9.00	B							
9.00-9.50	B					(1.80)		
9.50-9.95	SPT	N50/ 0.2						
10.00	D			-4.58		10.00	Borehole contiuned with rotary open hole drilling.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
06-01-21	00.00	10.00	9.50	150	3.8	9.8	10	0030			Hand Dug Pit to 1.2 m Hydrocarbon odour 6.3-8.2 m bgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH11</b>	
Job No 3899	Date 05-12-20 08-12-20	Ground Level (m) 5.61	Co-Ordinates ( ) E 441,347.0 N 556,946.4		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
0.50	B			5.51		0.10	MADE GROUND: Light brown sandy cobbly fine to coarse angular to subangular GRAVEL of dolomite.	
1.00	B						MADE GROUND: Loose to medium dense light to dark grey slightly clayey sandy fine to medium subangular GRAVEL of brick and concrete. Rare pottery.	
1.20-1.65	SPT	N18						
1.50	B							
2.00-2.45	SPT	N7				(4.20)	2.00 - 2.50 abundant fine to coarse gravels of brick.	
2.00-2.50	B						2.50 no longer clayey.	
3.00-3.45	SPT	N10						
3.00-3.50	B							
3.90	W							
4.00-4.45	SPT	N29						
4.00-4.50	B			1.31		4.30	MADE GROUND: Dense light to dark grey very sandy fine to medium subangular GRAVEL of brick sandstone and concrete.	
5.00-5.45	SPT	N50/ 0.255						
5.00-5.50	B					(2.70)		
6.00-6.50	B							
6.50	SPT	N32						
7.00-7.50	B			-1.39		7.00	Dense black slightly sandy fine to medium angular GRAVEL of concrete sandstone and dolomite.	
						(1.40)		






Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
						4.8	5.1	0100			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21



Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH11</b>	
Job No 3899	Date 05-12-20 08-12-20	Ground Level (m) 5.61	Co-Ordinates () E 441,347.0 N 556,946.4		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
8.00-8.45	SPT	N46					Dense black slightly sandy fine to medium angular GRAVEL of concrete sandstone and dolomite. (continued)	
8.00-8.50	B			-2.79		8.40		
8.50-9.00	B						Distinctly weathered weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium subangular GRAVEL.	
9.00-9.50	B					(1.60)		
9.50-9.95	SPT	N45						
10.00	B			-4.39		10.00	Borehole continued with rotary open hole drilling.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
						9.8	10	0030			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH12</b>	
Job No 3899	Date 08-12-20	Ground Level (m) 5.32	Co-Ordinates ( ) E 441,260.1 N 556,950.9		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.50	B		5.12		0.20	MADE GROUND: Light brown sandy cobbly fine to coarse angular to subangular GRAVEL dolomite.		
1.00-1.65	B SPT	N12	4.02		1.30	MADE GROUND: Firm light grey to dark grey very sandy gravelly CLAY. Gravel is fine subangular to subrounded of concrete and sandstone.		
1.50	B				(0.70)	MADE GROUND: Medium dense light brown clayey sandy fine to medium subangular GRAVEL of dolomite.		
2.00-2.45	SPT	N60	3.32		2.00	MADE GROUND: Dense brown gravelly medium to coarse SAND. Gravel is fine to coarse subrounded to rounded of sandstone and chert and coarse angular dolomite.		
2.00-2.50	B		2.92		(0.40)	MADE GROUND: Medium dense light grey to dark grey very sandy fine to medium GRAVEL of subangular dolomite.		
3.00-3.45	SPT	N46			(1.60)			
3.00-3.50	B							
3.90	W		1.32		4.00	MADE GROUND: Medium dense light brown clayey sandy fine to medium angular to subangular GRAVEL of dolomite.		
4.00-4.45	SPT	N23						
4.00-4.50	B							
5.00-5.45	SPT	N15		(2.50)				
5.00-5.50	B							
6.00-6.50	B							
6.30-6.50	B		-1.18	6.50	6.30 Becoming very clayey.			
6.50-6.95	SPT	N46			MADE GROUND: Dense brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of dolomite brick and concrete.			
6.50-7.00	B							
7.00-7.50	SPT			(1.50)				
			-2.68	8.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
08-12-20	00.00	5.50	5.50	150							Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH12</b>	
Job No 3899	Date 08-12-20	Ground Level (m) 5.32	Co-Ordinates ( ) E 441,260.1 N 556,950.9		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
8.00-8.45	SPT	N50/ 0.15					Distinctly weathered weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium subangular GRAVEL.		
8.00-8.50	B				(1.00)				
						9.00			
							Borehole contiuned with rotary open hole drilling.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
09-12-20	00.00	9.00	8.90	150		8.8	9	1			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH13</b>	
Job No 3899	Date 09-12-20 10-12-20	Ground Level (m) 5.35	Co-Ordinates ( ) E 441,262.5 N 556,924.0		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	




SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.50	J		5.15		0.20	MADE GROUND: Light brown sandy cobbly fine to coarse GRAVEL of angular to subangular dolomite.		
1.00	J				(1.10)	MADE GROUND: Firm light grey to dark grey very sandy gravelly CLAY. Gravel is fine subangular to subrounded of concrete and sandstone.		
1.20-1.65	SPT	N50/0.235	4.05		1.30			
1.50	B		3.65		(0.40)	MADE GROUND: Light brown sandy GRAVEL of fine to medium subangular dolomite.		
2.00-2.45	SPT	N19	3.35		1.70	MADE GROUND: Brown gravelly medium to coarse SAND. Gravel is fine to coarse subrounded to rounded of sandstone and chert and coarse angular dolomite.		
2.00-2.50	B				2.00	MADE GROUND: Medium dense light brown clayey very gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of dolomite		
3.00-3.45	SPT	N19			(2.00)			
3.00-3.50	B							
3.90	W		1.35		4.00			
4.00-4.45	SPT	N31				MADE GROUND: Dense light brown clayey sandy fine to coarse GRAVEL of angular to subangular of dolomite.		
4.00-4.50	B							
5.00-5.45	SPT	N27		(2.60)				
5.00-5.50	B							
6.50-6.95	SPT	N27	-1.25	6.60	MADE GROUND: Medium dense grey clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of dolomite and rare brick.			
6.60	B							
7.00-7.50	SPT			(1.70)				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
09-12-20	00.00	4.50	4.50		3.9	4.5	4.8	0.5			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH13</b>	
Job No 3899	Date 09-12-20 10-12-20	Ground Level (m) 5.35	Co-Ordinates ( ) E 441,262.5 N 556,924.0		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
8.00	B	N40/ 0.275		-2.95		8.30		
8.00-8.40	SPT	N75/ 0.145		-3.05		8.40	Destructured weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium subangular GRAVEL. Borehole continued with rotary open hole drilling.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
10-12-20	00.00	8.40	8.00		3.7	8.2	8.4	1			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used Cable Percussion	Logged By JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

**BOREHOLE LOG**

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH14</b>	
Job No 3899	Date 10-12-20	Ground Level (m) 5.39	Co-Ordinates ( ) E 441,263.6 N 556,877.4		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.50	B				(1.00)	MADE GROUND: Black to grey sandy cobbly fine to coarse angular to subangular GRAVEL of slag. Low cobble content.			
1.00	B		4.39		1.00	MADE GROUND: Red brick masonry (assumed wall).			
2.00	SPT	N65/ 0.145	3.39		2.00	End of borehole on exposure of chamber and unrecorded metal pipe.			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
						1	1.2	0030			Hand Dug Pit to 1.2 m No odours or oily stainings. Void at 1.3 to 2 m with large metal pipe at 1.8 m running north to south.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used Cable Percussion	Logged By JD
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AGS3 UK BH NEW\_BHS.GPJ AGS3\_ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH14A</b>	
Job No 3899	Date 11-12-20 14-12-20	Ground Level (m) 5.32	Co-Ordinates ( ) E 441,259.2 N 556,887.1		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	

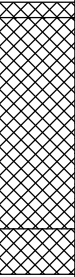

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
0.50	B			5.22		0.10	MADE GROUND: Light brown sandy cobbly fine to coarse angular to subangular GRAVEL of dolomite.	
1.00	B					(2.40)	MADE GROUND: Black to grey sandy cobbly fine to coarse angular to subangular GRAVEL of slag. Low cobble content.	
1.20-1.65	SPT	N6						
1.50	B							
2.00	SPT	N75/0						
2.00-2.50	B			2.82		2.50	MADE GROUND: Concrete hardstanding.	
				2.52		2.80	End of borehole within concrete hardstanding.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
						2	2.8	0200			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used Cable Percussion	Logged By JD
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AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH14B</b>	
Job No 3899	Date 14-12-20 15-12-20	Ground Level (m)	Co-Ordinates ( )		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
						0.10	MADE GROUND: Light brown sandy cobbly fine to coarse angular to subangular GRAVEL of dolomite.		
						(1.40)	MADE GROUND: Black to grey sandy cobbly fine to coarse angular to subangular GRAVEL of slag. Low cobble content.		
						1.50			
						1.80	MADE GROUND: Concrete hardstanding.		
							End of borehole within concrete hardstanding.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21



**BOREHOLE LOG**

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH15</b>	
Job No 3899	Date 10-12-20 11-12-20	Ground Level (m) 5.35	Co-Ordinates ( ) E 441,256.7 N 556,856.5		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.50-1.00	B				(1.40)	MADE GROUND: Loose black gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular sandstone and occasional brick.		
1.00	B							
1.20-1.65	SPT	N10	3.95		1.40			
1.50-2.00	B				(0.60)	MADE GROUND: Grey light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse angular dolomite with occasional shell fragments.		
2.00-2.45	SPT	N6	3.35		2.00			
2.00-2.50	B				(0.90)	MADE GROUND: Firm brown sandy gravelly CLAY. Gravel is subangular fine to coarse sandstone and brick.		
3.00-3.45	SPT	N4	2.45		2.90			
3.00-3.50	B				(2.10)	MADE GROUND: Soft to firm light grey sandy CLAY. Slight hydrocarbon odour.		
4.00-4.45	SPT	N15				4.00 Becomes stiff.		
4.00-4.50	B							
4.90	W		0.35		5.00			
5.00-5.45	SPT	N18				MADE GROUND: Medium dense grey clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of dolomite.		
5.00-5.50	B							
6.00-6.50	B							
6.50-6.95	SPT	N15			(3.00)			
7.00-7.50	B							
					8.00			
					-2.65			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
10-12-20	00.00	2.00	2.00	150		5.5 8	6 8.2	1 1			
All dimensions in metres Scale 1:50			Client DTA Consulting Engineers			Method/ Plant Used		Cable Percussion		Logged By JD	

AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH15</b>	
Job No 3899	Date 10-12-20 11-12-20	Ground Level (m) 5.35	Co-Ordinates ( ) E 441,256.7 N 556,856.5		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
8.00	SPT	N75/ 0.15		-2.85		8.20	Destructured weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium subangular GRAVEL.	
8.00-8.20	B						Borehole contiuned with rotary open hole drilling.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
11-12-20	00.00	8.20	8.00	150	3.7						Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH16</b>	
Job No 3899	Date 15-12-20 16-12-20	Ground Level (m) 5.23	Co-Ordinates ( ) E 441,385.1 N 556,885.8		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

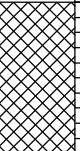

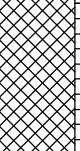

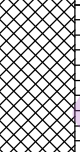

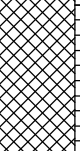




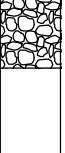


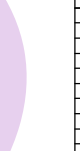

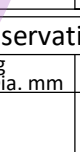
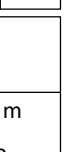
SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
0.50				5.13		0.10 (0.90)	MADE GROUND: Brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular brick and concrete. MADE GROUND: Dark grey sandy fine to medium angular to subangular GRAVEL of dolomite and sandstone.	
1.00 1.20-1.65 1.50		N3		4.23		1.00 (1.50)	MADE GROUND: Loose dark brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular of concrete brick and occasional sandstone.	
2.00-2.45		N3				2.50		
2.50-3.00				2.73		(1.70)	MADE GROUND: Dense light grey to brown sandy fine to medium angular GRAVEL of brick concrete and sandstone with occasional metal fragments.	
3.00-3.45 3.00-3.50		N39				4.20		
4.00-4.45 4.00-4.50 4.00		N50		1.03		(3.70)	MADE GROUND: Medium dense dark grey gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular of concrete and brick with rare glass. Hydrocarbon odour.	
5.00-5.45 5.00-5.50		N32/ 0.15				7.90		
6.00-6.50 6.50-6.95		N26						
7.00-7.50				-2.67				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
						3	4	2			Hand Dug Pit to 1.2 m Hydrocarbon odour between 4.2 and 7.9 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH16</b>	
Job No 3899	Date 15-12-20 16-12-20	Ground Level (m) 5.23	Co-Ordinates ( ) E 441,385.1 N 556,885.8		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
8.00-8.45 8.00-8.50		N11					MADE GROUND: Loose grey very clayey fine to medium SAND. (continued)	
9.00-9.50								
9.50-9.95		N6				(4.10)		
10.00-10.50								
11.00-11.45 11.00-11.50		N8						
12.00-12.50				-6.77		12.00	MADE GROUND: Loose grey clayey slightly gravelly fine to coarse SAND. Gravel is fine angular to subrounded of sandstone.	
12.50-12.95		N50/ 0.15		-7.27		(0.50) 12.50	Destructured weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium subangular GRAVEL.	
12.50-13.00						(0.90)		
13.00-13.40				-8.17		13.40	Borehole continued with rotary open hole drilling.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
						13.2	13.4	1			Hand Dug Pit to 1.2 m Hydrocarbon odour between 4.2 and 7.9 mbgl.
All dimensions in metres Scale 1:50						Client DTA Consulting Engineers			Method/ Plant Used Cable Percussion		

AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH17</b>	
Job No 3899	Date 14-01-21	Ground Level (m) 4.91	Co-Ordinates ( ) E 441,365.4 N 556,887.0		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

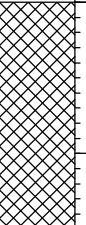
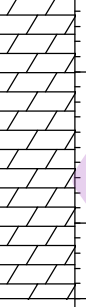
SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.50-1.00	B					MADE GROUND: Medium dense to dense light grey slightly clayey sandy fine to coarse GRAVEL of angular to subangular dolomite and brick.			
1.00	B								
1.20-1.65	SPT	N31							
1.50-2.00	B				(3.50)				
2.00-2.45	SPT	N16				2.00 Abundant brick.			
2.00-2.50	B								
3.00-3.45	SPT	N26							
3.00-3.50	B								
3.70	W		1.41		3.50	MADE GROUND: Dense dark very gravelly fine to coarse SAND. Gravel is fine to medium of brick and concrete. Strong hydrocarbon odour.			
4.00-4.45	SPT	N35	0.91		(0.50)				
4.00-4.30	B		0.61		4.00	MADE GROUND: Dense light grey slightly clayey sandy fine to medium GRAVEL of angular dolomite and occasional concrete.			
4.30-4.50	B				4.30	MADE GROUND: Dense dark grey sandy fine to medium GRAVEL of angular to subangular dolomite and sandstone. Slight hydrocarbon/fuel oil odour.			
5.00-5.45	SPT	N34	-0.09		(0.70)				
5.00-5.50	B				5.00	MADE GROUND: Medium dense to dense grey sandy fine to medium GRAVEL of angular to subangular dolomite. With occasional of subrounded fine gravels black chert.			
6.00-6.50	B				(2.00)				
6.50-6.95	SPT	N14	-2.09		7.00				
7.00-7.50	B				(1.00)	MADE GROUND: Black gravelly fine to coarse SAND. Gravel is occasional fine to medium angular to subangular dolomite			
					8.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH17</b>	
Job No 3899	Date 14-01-21	Ground Level (m) 4.91	Co-Ordinates ( ) E 441,365.4 N 556,887.0		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
8.00-8.45 8.00-8.50	SPT B	N26			(1.50)	MADE GROUND: Firm to stiff black sandy CLAY		
8.50-9.00	B							
9.00-9.50	B							
9.50-9.95	SPT	N19	-4.59		9.50	Distinctly weathered weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium GRAVEL of subangular dolomite.		
10.00-10.50	B				(2.00)			
11.00-11.45 11.00-11.50	SPT B	N50/ 0.125	-6.59		11.50			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m No odours or oily stainings.

AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH18</b>	
Job No 3899	Date 12-01-21	Ground Level (m) 4.97	Co-Ordinates ( ) E 441,378.5 N 556,831.6		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	

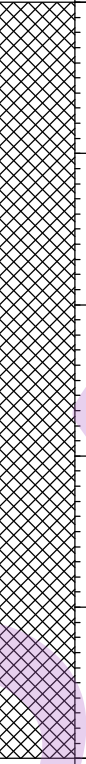

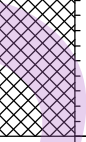
SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.50	B						MADE GROUND: Dark grey gravelly fine to coarse SAND. Gravel is fine to medium angular to subangular of brick and concrete.		
1.00	B								
1.20-1.65	SPT	N5							
1.50	B					(3.50)			
2.00-2.45	SPT	N25							
2.00-2.50	B								
3.00-3.45	SPT	N12					3.00 Becomes black with strong hydrocarbon odour		
3.00-3.50	B								
			1.47			3.50	MADE GROUND: Rubble fill (drillers description).		
			0.97			(0.50) 4.00	3.50 No samples recovered due to strong hydrocarbon odour and usage of the cutting shoe.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m Hydrocarbon odour from 3.0 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH19</b>	
Job No 3899	Date 13-01-21	Ground Level (m) 4.86	Co-Ordinates () E 441,362.2 N 556,818.0		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
						(5.00)	MADE GROUND: Dark grey gravelly fine to coarse SAND (no samples recovered due to use of the cutting tool)		
						4.00	Contaminated Groundwater - odour of fuel oil with phenolic 'greenhouse' odor		
				-0.14		5.00	End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m Hydrocarbon odour from 3.0 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21



Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH20</b>	
Job No 3899	Date 13-01-21	Ground Level (m) 4.98	Co-Ordinates () E 441,349.7 N 556,835.7		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.50	B		4.48		(0.50) 0.50	MADE GROUND: Darl grey to grey sandy fine to medium angular GRAVEL of dolomite and rare coal. 0.20 Geotextile membrane.			
1.00	B								
1.20-1.65	SPT	N5							
1.50	B								
2.00-2.45	SPT	N18							
2.00	B				(3.50)	2.00 Occasional lenses of very clayey material.			
3.00-3.45	SPT								
3.00	B					3.10 Strong odour of hydrocarbon odour.			
3.20	W								
			0.98		4.00	End of borehole.			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
13-01-21	00.00	4.00	4.00	150	3.2						Hand Dug Pit to 1.2 m Hydrocarbon odour from 3.0 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used Cable Percussion	Logged By JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH21</b>	
Job No 3899	Date 18-12-20 22-12-20	Ground Level (m) 4.54	Co-Ordinates ( ) E 441,482.0 N 556,978.8		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.50	B		3.84		(0.70)	MADE GROUND: Brown clayey sandy fine to medium angular to subangular GRAVEL of brick and concrete with occasional mudstone.			
1.00	B	N15			(1.00)	MADE GROUND: Medium dense reddish brown very gravelly medium to coarse SAND. Gravel is fine to coarse angular to subangular of brick with occasional concrete and polystyrene.			
1.20-1.65	SPT								
1.50	B		2.84		1.70				
2.00-2.45	SPT	N8				MADE GROUND: Loose becoming medium dense brown sandy fine to coarse angular to subangular GRAVEL of brick concrete ceramic tile and occasional polystyrene.			
2.00-2.50	B								
3.00-3.45	SPT	N10							
3.00-3.50	B	NR			(3.30)				
3.80	W								
4.00-4.45	SPT	N50/ 0.15 NR							
4.00-4.50	B								
5.00-5.45	SPT	N17	-0.46		5.00	MADE GROUND: Dark brown slightly clayey sandy fine to coarse angular to subrounded GRAVEL of concrete brick limestone mudstone and rare dolomite.			
5.00-5.50	B								
6.00-6.50	B				(2.00)				
6.50-6.95	SPT	N32							
6.50-7.00	B		-2.46		7.00	MADE GROUND: Medium dense brown gravelly medium to coarse SAND. Gravel is fine to coarse angular to subrounded of brick concrete limestone dolomite and mudstone.			
7.00-7.50	B								

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
18-12-20	16.00	7.00	7.00	150	3.7						

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JC
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH21</b>	
Job No 3899	Date 18-12-20 22-12-20	Ground Level (m) 4.54	Co-Ordinates ( ) E 441,482.0 N 556,978.8		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
8.00-8.45	SPT	N60/0.095				(2.00)	MADE GROUND: Medium dense brown gravelly medium to coarse SAND. Gravel is fine to coarse angular to subrounded of brick concrete limestone dolomite and mudstone. <i>(continued)</i>		
8.00-8.50	B								
9.00-9.50	B			-4.46		9.00	Partially to distinctly weathered weak light yellowish brown DOLOMITE. Recovered as slightly sandy fine to coarse angular to subangular GRAVEL.		
9.50-9.95	SPT	N50/0.15		-4.96		(0.50) 9.50			
							End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m No odours or oily stainings.

AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21



Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH22</b>	
Job No 3899	Date 17-12-20 18-12-20	Ground Level (m) 4.81	Co-Ordinates ( ) E 441,447.6 N 556,955.9		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
8.00	SPT	N50/0.11							
8.00-8.50	B				(1.10)	Partially to distinctly weathered weak light yellowish brown DOLOMITE. Recovered as slightly sandy fine to coarse angular to subangular GRAVEL. (continued)			
			-4.19		9.00	End of borehole.			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
18-12-20	12.00	9.00	8.80	150		8.5	9	0100			Hand Dug Pit to 1.2 m No odours or oily stainings.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JC
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH23</b>	
Job No 3899	Date 22-12-20 23-12-20	Ground Level (m) 4.71	Co-Ordinates ( ) E 441,422.0 N 556,995.8		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	



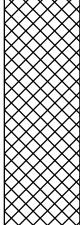
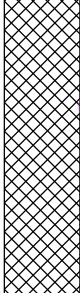
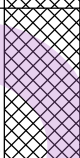
SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
						0.30	MADE GROUND: Concrete slab.		
0.50	B						MADE GROUND: Medium dense dark brown and reddish brown slightly clayey sandy fine to coarse angular to subangular GRAVEL of brick concrete and limestone.		
1.00	B								
1.20-1.65	SPT	N25/ 0.02				(2.70)			
1.50	B								
2.00-2.45	SPT	N19							
2.00-25.00	B								
3.00-3.45	SPT	N20				3.00	MADE GROUND: Medium dense brown gravelly medium to coarse SAND. Gravel is fine to coarse angular to subrounded of brick concrete limestone dolomite and mudstone.		
3.00-3.50	B								
4.00-4.45	SPT	N33				(2.20)	4.00 Becomes dense.		
4.00-4.50	B								
5.00-5.45	SPT	N26				5.20	Brown clayey slightly gravelly fine to coarse SAND. Gravel is fine to medium subrounded to rounded chert and sandstone (possible beach deposits).		
5.20	W								
6.00-6.50	B					(1.30)			
6.50-6.95	SPT	N50/ 0.145				6.50	Partially to distinctly weathered weak light yellowish brown DOLOMITE. Recovered as slightly sandy fine to coarse angular to subangular GRAVEL.		
6.50-7.00	B								
7.00-7.50	B					(1.00)			
7.50	SPT	N75/ 0				7.50	End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
						3.7	4.0	100			Hand Dug Pit to 1.2 m No odours or oily stainings.
						7	7.5	100			

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH24</b>	
Job No 3899	Date 15-01-21	Ground Level (m) 5.04	Co-Ordinates ( ) E 441,421.9 N 556,850.3		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	



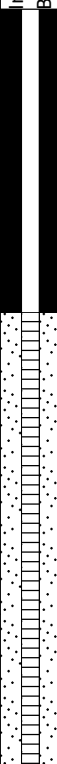
SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
4.00 4.00	D W			4.54		(0.50) 0.50	MADE GROUND: Grey sandy fine to coarse angular to subangular GRAVEL of dolomite.	
						(3.50)	MADE GROUND: Black sandy fine to medium subangular GRAVEL of brick and concrete.	
				1.04		(1.00)	MADE GROUND: Black gravelly medium to coarse SAND. Gravel is fine subangular sandstone. (saturated with oily groundwater) 4.00 Contaminated Groundwater - strong odour of fuel oil	
				0.04		5.00	End of borehole.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m Hydrocarbon odour from 3.5 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH25</b>	
Job No 3899	Date 18-01-21	Ground Level (m) 5.03	Co-Ordinates ( ) E 441,384.1 N 556,810.6		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
4.00 4.00	D W			4.53		(0.50) 0.50	MADE GROUND: Grey sandy fine to coarse angular to subangular GRAVEL of dolomite.		
						(3.50)	MADE GROUND: Black sandy fine to medium subangular GRAVEL of brick and concrete.		
				1.03		4.00	MADE GROUND: Black gravelly medium to coarse SAND. Gravel is fine subangular sandstone. (saturated with oily groundwater) 4.00 Contaminated Groundwater - strong odour of fuel oil		
				0.03		5.00	End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m Hydrocarbon odour from 3.5 mbgl.
All dimensions in metres Scale 1:50			Client DTA Consulting Engineers			Method/ Plant Used		Cable Percussion		Logged By JD	

AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21



Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH26</b>	
Job No 3899	Date 15-01-21 18-01-21	Ground Level (m) 5.61	Co-Ordinates ( ) E 441,337.2 N 556,791.8		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	


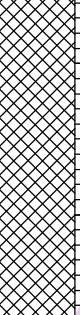


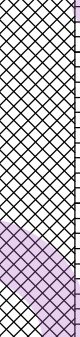
SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
				5.11		(0.50) 0.50	MADE GROUND: Grey sandy fine to coarse angular to subangular GRAVEL of angular to subangular dolomite.	
						(5.50)	MADE GROUND: Black sandy fine to medium subangular GRAVEL of brick and concrete.	
						3.50	Contaminated Groundwater - slight hydrocarbon odour	
4.50	W					4.50	Contaminated Groundwater - strong odour of fuel oil	
5.00	D							
				-0.39		6.00	End of borehole.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m Hydrocarbon odour from 3.5 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used Cable Percussion	Logged By JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH27</b>	
Job No 3899	Date 19-01-21	Ground Level (m) 5.41	Co-Ordinates ( ) E 441,335.4 N 556,833.4		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
				4.91		(0.50) 0.50	MADE GROUND: Grey sandy fine to coarse angular to subangular GRAVEL of angular to subangular dolomite.		
						(4.50)	MADE GROUND: Black sandy fine to medium subangular GRAVEL of brick and concrete.		
4.00 4.00	D W		 				4.50 Contaminated Groundwater - odour of fuel oil and tyre rubber.		
				0.41		5.00	End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m Hydrocarbon odour from 3.5 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used Cable Percussion	Logged By JD
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AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH28</b>	
Job No 3899	Date 18-01-21	Ground Level (m) 4.95	Co-Ordinates ( ) E 441,341.7 N 556,856.4		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		
				4.45		(0.50) 0.50	MADE GROUND: Grey sandy fine to coarse GRAVEL of angular to subangular dolomite.	
						(2.70)	MADE GROUND: Dark grey slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium subangular of brick and concrete.	
				1.75		3.20	MADE GROUND: Black sandy fine to medium subangular GRAVEL of brick and concrete. 3.50 Odour of fuel oil and tyre rubber.	
4.00 4.00	D W					(2.80)		
						6.00	MADE GROUND: Medium dense light brown gravelly fine to coarse SAND. Gravel is angular to subangular rarely rounded of sandstone with occasional concrete and brick.	
6.00-6.45 6.00-6.50	SPT B	N45/ 0.18		-1.05		(2.00)		
7.00-7.50 7.50-7.95	B SPT	N17		-3.05		8.00		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m Hydrocarbon odour from 3.5 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH28</b>	
Job No 3899	Date 18-01-21	Ground Level (m) 4.95	Co-Ordinates () E 441,341.7 N 556,856.4		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	



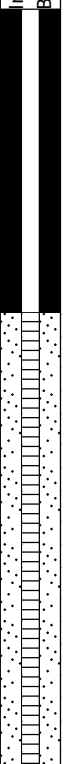
SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
8.00-8.50	B				(0.50)	MADE GROUND: Firm dark grey to black sandy CLAY.		
8.50-9.00	B		-3.55		(0.80)	MADE GROUND: Medium dense grey to dark brown sandy fine to medium GRAVEL of angular dolomite.		
9.00-9.45	SPT	N10			(1.10)	MADE GROUND: Firm light grey to greyish brown sandy slightly gravelly CLAY. Gravel is fine angular of dolomite.		
9.00-9.50	B		-4.35		(1.60)	Destructured weak yellow DOLOMITE. Recovered as light brown clayey sandy fine to medium subangular GRAVEL.		
10.00-10.50	B		-5.45		(1.60)			
10.50-10.95	SPT	N49			(1.60)			
11.00-11.50	B				(1.60)			
11.50-12.00	B				(1.60)			
12.00-12.50	SPT	N25/ 0.125	-7.05			Borehole continued with rotary open hole drilling.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
18-01-21	00.00	12.00	12.00	150	3.5						Hand Dug Pit to 1.2 m Hydrocarbon odour from 3.5 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH29</b>	
Job No 3899	Date 18-01-21	Ground Level (m) 5.09	Co-Ordinates ( ) E 441,362.4 N 556,862.0		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	


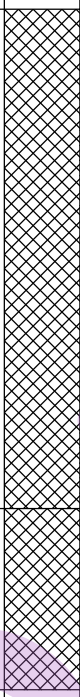
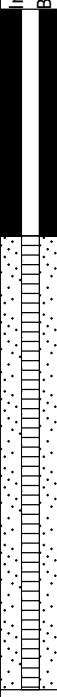
SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
4.00 4.00	D W			4.59		(0.50) 0.50	MADE GROUND: Grey sandy fine to coarse angular to subangular GRAVEL of dolomite.		
						(4.50)	MADE GROUND: Black sandy fine to medium subangular GRAVEL of brick and concrete.		
						3.50 Slight hydrocarbon odour.			
				0.09		5.00	4.50 Strong odour of fuel oil.		
							End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m Hydrocarbon odour from 3.5 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used Cable Percussion	Logged By JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH30</b>	
Job No 3899	Date 18-01-21	Ground Level (m) 5.17	Co-Ordinates ( ) E 441,393.1 N 556,863.0		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
4.00 4.00	B W		 1.87			(3.30)	MADE GROUND: Light grey slightly clayey sandy fine to coarse angular to subangular GRAVEL of dolomite.		
						3.30	(1.20)		MADE GROUND: Dark gravelly fine to coarse SAND. Gravel is fine to medium of brick and concrete. Hydrocarbon odour.
			0.67			4.50			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
18-01-21	00.00	4.50	4.50	150	3.3						Hand Dug Pit to 1.2 m Hydrocarbon odour from 3.3 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used Cable Percussion	Logged By JD
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AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH31</b>	
Job No 3899	Date 20-01-21	Ground Level (m) 4.89	Co-Ordinates ( ) E 441,400.8 N 556,828.0		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.50-1.00	B					Loose light grey slightly clayey sandy fine to coarse angular to subangular brick and concrete.		
1.00	B							
1.20-1.65	SPT	N6				(3.50)		
1.50-2.00	B							
2.00-2.45	SPT	N12						
2.00-2.50	B							
3.00-3.45	SPT	N13						
3.00-3.50	B							
3.30	W		1.39		3.50	Loose to medium dense very gravelly fine to coarse SAND. Gravel is fine to medium of brick and concrete.		
4.00-4.45	SPT	N35						
4.00	E					4.00 Strong hydrocarbon odour.		
4.00-4.50	B							
5.00-5.45	SPT	N15				(2.90)		
5.00-5.50	B							
6.00-6.50	B							
6.50-6.95	SPT	N40						
7.00-7.50	B					(1.40)		
7.80-8.00	B							
						Distinctly weathered weak yellow DOLOMITE. Recovered as light		

AGS3 UK BH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
20-01-21	00.00	8.00	8.00	150	3.5	7 7.8	7.5 8	1 .5			Hand Dug Pit to 1.2 m Hydrocarbon odour from 3.5 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used Cable Percussion	Logged By JD
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Project GESI Wastefront, Sunderland				BOREHOLE No <b>BH31</b>	
Job No 3899	Date 20-01-21	Ground Level (m) 4.89	Co-Ordinates () E 441,400.8 N 556,828.0		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
8.00-8.45	SPT	N50/ 0.225					brown clayey sandy fine to medium GRAVEL of subangular dolomite. / End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand Dug Pit to 1.2 m Hydrocarbon odour from 3.5 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Cable Percussion	Logged By	JD
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AGS3 UK BH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21



**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH01</b>	
Job No 3899	Date 17-12-20 18-12-20	Ground Level (m) 5.22	Co-Ordinates ( ) E 441,329.2 N 557,016.5		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
					(3.00)			Assumed destructured weak light yellowish brown DOLOMITE. No recovery.	
		(50/0.08)  (44)	-2.78		8.00			Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL.	

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
							5 8	8 18	Water Water	0 100	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH01</b>	
Job No 3899	Date 17-12-20 18-12-20	Ground Level (m) 5.22	Co-Ordinates ( ) E 441,329.2 N 557,016.5		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
15.00		(50/0.04)			(10.00)			Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL. (continued)	
		(50/0.02)							
		(50/0.03)							
		(50/0.04)							
16.00	45 (0) 0	AZCL							
		NI							
		(50/0.04)						End of borehole.	
		(50/0.03)							
		(70/0.225)							
		(54)							
			-12.78		18.00				

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH02</b>	
Job No 3899	Date 08-12-20	Ground Level (m) 5.78	Co-Ordinates ( ) E 441,295.5 N 556,944.1		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
13.00			-7.22		(3.00)			Assumed destructured weak light yellowish brown DOLOMITE. No recovery.	
14.00	28 (0) 0	AZCL						Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL.	
		NI							
14.50	62 (18) 0	AZCL							
		NI							
16.00	9.3 (0) 0	AZCL			(6.00)				
		NI							
		AZCL							
17.00	84 (34) 16	NI							
		NI							
18.00	77 (26) 0	AZCL NI							

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
							12	19	Water	100	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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AGS3 UK DH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH02</b>	
Job No 3899	Date 08-12-20	Ground Level (m) 5.78	Co-Ordinates ( ) E 441,295.5 N 556,944.1		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
18.50	51 (9) 0	AZCL	-13.22		19.00			Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL. (continued)	
		NI (59)							

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH04</b>	
Job No 3899	Date 22-12-20	Ground Level (m) 5.55	Co-Ordinates ( ) E 441,313.7 N 556,828.6		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
15.50		(34) (46) (52) (75/0.06) (75/0.035) (56)			(5.00)			Destructured to distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL.	
16.50	0 (0) 0	AZCL							
		(44)	-11.45		17.00			End of borehole due to hydrogen sulphide odour.	

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
											Sulphurous odour within groundwater at 15 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used Mi5 Rotary Rig	Logged By JD
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**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH05</b>	
Job No 3899	Date 08-01-21 11-01-21	Ground Level (m) 5.67	Co-Ordinates ( ) E 441,324.4 N 556,960.0		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
					(1.40)			Assumed destructured weak light yellowish brown DOLOMITE. No recovery.	
		(50/0.225)	-4.83		10.50			Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL.	
		(57/0.225)							
		(50/0.155)							
		(50/0.16)							
		(50/0.085)							
		(49/0.166)							
		(44/0.225)							
		(40/0.225)							
		(56/0.225)							
		(9/0.005)							
		(75/0.05)			(10.00)				
		(27/0.085)							
		(58/0.098)							

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH05</b>	
Job No 3899	Date 08-01-21 11-01-21	Ground Level (m) 5.67	Co-Ordinates ( ) E 441,324.4 N 556,960.0		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
		(50/0.081)						Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL. <i>(continued)</i>	
		(52/0.152)							
		(61)							
		(9/0.005)							
		(32/0.15)							
		(50/0.23)							
		(50/0.17)							
			-14.83		20.50			End of borehole.	

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used Mi5 Rotary Rig	Logged By JD
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**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH07</b>	
Job No 3899	Date 15-12-20	Ground Level (m) 5.33	Co-Ordinates ( ) E 441,385.9 N 556,962.7		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill	
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION				
						Discontinuities	Detail			Main
		(24)						Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL.		
		(72)								
		(32)								
		(42)								
		(90/0.15)								
		(55/0.225)								
		(47)								
		(54)								
		(26)								
		(35)			(10.30)					
		(60/0.225)								
		(72/0.225)								
		(71/0.225)								
		(68)								
		(65/0.225)								

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

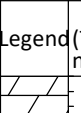

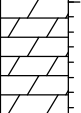
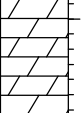


All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH07</b>	
Job No 3899	Date 15-12-20	Ground Level (m) 5.33	Co-Ordinates ( ) E 441,385.9 N 556,962.7		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
		(50/0.075)							
		(61/0.225)					Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL. (continued)		
		(56/0.225)							
		(67/0.225)							
		(66/0.225)							
			-13.57		18.90			End of borehole.	

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH12</b>	
Job No 3899	Date 10-12-20	Ground Level (m) 5.32	Co-Ordinates ( ) E 441,260.1 N 556,950.9		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
10.50								Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL. (continued)	
12.00	0.35 (0) 0	AZCL							
		NI							
13.00		(31)							
		(50/0.225)							
14.00	0.3 (0) 0	AZCL							
		NI							
16.00		(53)			(12.00)				
		(54)							
		(66/0.225)							
17.00	0 (0) 0	(93/0.225)							
		AZCL							

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Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH12</b>	
Job No 3899	Date 10-12-20	Ground Level (m) 5.32	Co-Ordinates ( ) E 441,260.1 N 556,950.9		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
		(60)							
		(70)						Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL. (continued) (continued)	
		(50/0.16)							
		(50/0.125)							
		(60/0.16)							
		(51/0.15)							
			-14.68		20.00				End of borehole.

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH13</b>	
Job No 3899	Date 14-12-20	Ground Level (m) 5.35	Co-Ordinates ( ) E 441,262.5 N 556,924.0		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	







RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
					(1.10)			Assumed destructured weak light yellowish brown DOLOMITE. No recovery.	
		(62)	-4.15		9.50			Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL.	
		(72)							
		(51/0.175)							
		(58/0.225)							
		(70/0.225)							
		(42)							
		(75/0.045)							
		(51/0.225)							
		(53/0.225)							
		(68/0.225)			(9.50)				
		(51)							
		(50)							
		(50)							
		(48)							

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH13</b>	
Job No 3899	Date 14-12-20	Ground Level (m) 5.35	Co-Ordinates ( ) E 441,262.5 N 556,924.0		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
		(50)							
		(58/0.225)						Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL. (continued)	
		(55/0.225)							
		(53/0.225)							
		(72/0.225)							
			-13.65		19.00			End of borehole.	

















Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH15</b>	
Job No 3899	Date 15-12-21	Ground Level (m) 5.35	Co-Ordinates ( ) E 441,256.7 N 556,856.5		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
		(50/0.025)	-3.25		(0.40) 8.60			Assumed destructured weak light yellowish brown DOLOMITE. No recovery.	
		(56/0.125)						Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL.	
		(55/0.1)							
		(60/0.1)							
		(91/0.245)							
		(25/0.03)							
		(50/0.01)							
		(40)							
		(25/0.02)							
		(86/0.17)							
		(50/0.03)							
		(66/0.085)							
		(100/0.235)			(11.95)				
		(25/0.03)							
		(50/0.03)							

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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AGS3 UK DH NEW\_BHS.GPJ AGS3\_ALL.GDT 29/1/21

**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH15</b>	
Job No 3899	Date 15-12-21	Ground Level (m) 5.35	Co-Ordinates ( ) E 441,256.7 N 556,856.5		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
		(93/0.245)							
		(65/0.1)					Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL. (continued)		
		(25/0.03)							
		(49)							
		(50/0.02)							
		(51)							
		(50/0.03)							
		(25/0.02)							
		(25/0.02)							
			-15.20		20.55				
							End of borehole.		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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AGS3 UK DH NEW\_BHS.GPJ AGS3\_ALL.GDT 29/1/21

**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH16</b>	
Job No 3899	Date 17-12-21	Ground Level (m) 5.23	Co-Ordinates ( ) E 441,385.1 N 556,885.8		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
		(41)							
		(46)						Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL.	
		(75/0.05)			(2.60)				
		(75/0.043)							
		(75/0.05)							
			-10.77		16.00				End of borehole due to hydrogen sulphide odour.

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
											Sulphurous odour within groundwater at 15 mbgl.

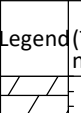
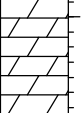
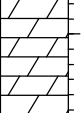
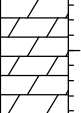

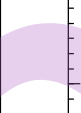
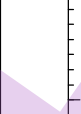
All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used Mi5 Rotary Rig	Logged By JD
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AGS3 UK DH NEW\_BHS.GPJ AGS3 ALL.GDT 29/1/21



**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH17</b>	
Job No 3899	Date 20-01-21	Ground Level (m) 4.91	Co-Ordinates ( ) E 441,365.4 N 556,887.0		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 1	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
		(56)							
		(57)							
		(62)							
		(62)			(3.00)				
		(70/0.06)							
		(65/0.07)							
			-9.59		14.50				
									End of borehole due to hydrogen sulphide odour.

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
											Sulphurous odour within groundwater at 12 mbgl.

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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AGS3 UK DH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH28</b>	
Job No 3899	Date 21-01-21	Ground Level (m) 4.95	Co-Ordinates ( ) E 441,341.7 N 556,856.4		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
		(50/0.08)						Destructured weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL.	
		(66/0.225)							
		(40/0.23)							
		(50/0.23)							
		(43)							
		(75/0.06)							
		(75/0.06)							
		(61)							
		(54/0.225)			(8.50)				
		(54/0.225)							
		(56/0.225)							
		(59/0.15)							
		(42)							
		(65)							
		(75/0.06)							
		(56/0.225)							


AGS3 UK DH NEW BHS.GPJ AGS3 ALL.GDT 29/1/21

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH28</b>	
Job No 3899	Date 21-01-21	Ground Level (m) 4.95	Co-Ordinates ( ) E 441,341.7 N 556,856.4		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N) (75/0.065)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
			-15.55		20.50				
						End of borehole.			

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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AGS3 UK DH NEW BHS.GPJ AGS3\_ALL.GDT 29/1/21

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH31</b>	
Job No 3899	Date 22-01-20	Ground Level (m) 4.89	Co-Ordinates ( ) E 441,400.8 N 556,828.0		
Contractor Allen McPhearson/ID Drilling				Sheet 1 of 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
			-4.11		(1.00)			Assumed distinctly weathered weak light yellowish brown DOLOMITE. No recovery.	
		(34)			9.00			Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL.	
		(36)							
		(25)							
		(44)							
		(50)							
		(64)							
		(68)							
		(31)							
		(41)							
		(64)							
		(44)			(10.50)				
		(75/0.04)							
		(75/0.035)							
		(69)							

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50	Client DTA Consulting Engineers	Method/ Plant Used	Mi5 Rotary Rig	Logged By	JD
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AGS3 UK DH NEW\_BHS.GPJ AGS3\_ALL.GDT 29/1/21

**DRILLHOLE LOG**

Project GESI Wastefront, Sunderland				DRILLHOLE No <b>RH31</b>	
Job No 3899	Date 22-01-20	Ground Level (m) 4.89	Co-Ordinates ( ) E 441,400.8 N 556,828.0		
Contractor Allen McPhearson/ID Drilling				Sheet 2 of 2	

RUN DETAILS			STRATA						Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION				
						Discontinuities	Detail	Main		
		(49)							Distinctly weathered weak light yellowish brown DOLOMITE. Recovered as clayey sandy fine to medium subangular GRAVEL. <i>(continued)</i>	
		(60/0.225)								
		(10/0.005)								
		(65)								
		(75/0.06)								
		(45/0.03)								
		(75)								
			-14.61		19.50				End of borehole.	

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	

All dimensions in metres Scale 1:50      Client DTA Consulting Engineers      Method/ Plant Used Mi5 Rotary Rig      Logged By JD

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**APPENDIX 3**

**MONITORING CERTIFICATES**

## GAS AND GROUNDWATER MONITORING – WASTE FRONT, PORT OF SUNDERLAND

BH	Date	Time	Tested By	Atmospheric Pressure	Flow Rate	Methane		Carbon Dioxide		Oxygen		Ground Water Level	Depth of well	Response Zone Interval	Monitored Material
				mbar	Average l/hr	Peak % V/V	Steady % V/V	Peak % V/V	Steady % V/V	Peak % V/V	Steady % V/V	m bgl	m bgl	m bgl	
BH1	28/01/2021	13:15	AF	1002	<0.1	<0.1	<0.1	1.9	1.9	19.1	19.1	3.49	3.99	1 – 4	Made Ground Sandy Gravel
BH2	28/01/2021	13:05	AF	1002	<0.1	<0.1	<0.1	0.7	0.7	18.3	18.3	Damp	3.80	3 - 5	Made Ground Gravelly Sand
BH4	28/01/2021	12:55	AF	1002	<0.1	1.7	1.7	2.6	2.6	19.6	19.6	3.68	13.48	13 - 16	Dolomite
BH5	28/01/2021	10:25	AF	1002	<0.1	<0.1	<0.1	1.0	1.0	20.9	20.9	3.76	4.21	1 – 5	Made Ground Sandy Gravel
BH6	28/01/2021	12:35	AF	1002	<0.1	<0.1	<0.1	1.5	1.5	21.0	21.0	4.05	5.80	1 – 5	Made Ground Sandy Gravel
BH7	28/01/2021	12:25	AF	1002	<0.1	<0.1	<0.1	2.6	2.6	17.3	17.3	3.47	4.12	2 – 4.5	Made Ground Sandy Gravel
BH8	28/01/2021	12:15	AF	1002	<0.1	<0.1	<0.1	0.9	0.9	20.7	20.7	3.55	3.90	1 – 4	Made Ground Gravelly Sand
BH9	28/01/2021	12:05	AF	1002	<0.1	<0.1	<0.1	1.7	1.7	19.5	19.5	3.57	3.73	1 - 4	Made Ground Sandy Gravel
BH11	28/01/2021	10:15	AF	1002	<0.1	<0.1	<0.1	2.8	2.8	17.9	17.9	3.62	3.68	1 - 6	Made Ground Sandy Gravel
BH12	28/01/2021	13:35	AF	1002	Borehole under water							3.60 <sup>7</sup>	3.96	2 - 4	Made Ground Sandy Gravel
BH13	28/01/2021	13:25	AF	1002	<0.1	<0.1	<0.1	0.3	0.3	20.4	20.4	3.70	3.96	2 – 4	Made Ground Gravelly Sand
BH17	28/01/2021	10:35	AF	1002	<0.1	3.0	3.0	1.2	1.2	19.7	19.7	3.22	12.80	10 - 14	Dolomite
BH18	28/01/2021	12:45	AF	1002	<0.1	<0.1	<0.1	4.0	4.0	16.7	16.7	3.10	5.30	1 - 4	Made Ground Gravelly Sand
BH24	28/01/2021	11:45	AF	1002	<0.1	0.1	0.1	2.0	2.0	18.4	18.4	3.14	4.59	1.5 – 4.0	Made Ground Sandy Gravel
BH25	28/01/2021	11:25	AF	1002	<0.1	0.1	0.1	11.3	11.3	4.7	4.7	3.06	4.50	2 – 5	Made Ground Sandy Gravel
BH26	28/01/2021	11:15	AF	1002	<0.1	0.1	0.1	6.5	6.5	11.8	11.8	3.61	5.45	2 – 6	Made Ground Sandy Gravel

BH	Date	Time	Tested By	Atmospheric Pressure	Flow Rate	Methane		Carbon Dioxide		Oxygen		Ground Water Level	Depth of well	Response Zone Interval	Monitored Material
				mbar	Average l/hr	Peak % V/V	Steady % V/V	Peak % V/V	Steady % V/V	Peak % V/V	Steady % V/V	m bgl	m bgl	m bgl	
BH27	28/01/2021	11:05	AF	1002	<0.1	0.1	0.1	2.3	2.3	20.8	20.8	3.40	4.46	2 – 5	Made Ground Sandy Gravel
BH28	28/01/2021	10:45	AF	1002	<0.1	<0.1	<0.1	<0.1	<0.1	22.5	22.5	3.24	20.00	11 - 20	Dolomite
BH29	28/01/2021	10:55	AF	1002	<0.1	0.1	0.1	5.1	5.1	17.9	17.9	3.18	4.80	2 – 5	Made Ground Sandy Gravel
BH30	28/01/2021	11:55	AF	1002	<0.1	<0.1	<0.1	5.8	5.8	14.6	14.6	3.20	4.42	2 – 5	Made Ground Sandy Gravel & Gravelly Sand
BH31	28/01/2021	11:35	AF	1002	<0.1	1.0	1.0	5.4	5.4	12.3	12.3	3.04	4.48	3.5 - 6	Made Ground Gravelly Sand

## WEATHER CONDITIONS

Date	Cloud	Wind	Temperature °C	Atmospheric Pressure
28/01/2021	8/8	Light breeze	3	1002 Falling

## Notes

1. Geotechnical Instruments Infra-Red Landfill Monitor (GA5000) with internal flow
2. Gas sample type – accumulated
3. Average gas flow taken of 60 Seconds
4. Weather data obtained from – <http://www.metoffice.gov.uk/weather>
5. Detection limits – 0.1% CH<sub>4</sub>, CO<sub>2</sub>, and O<sub>2</sub>, 0.1 l/hr flow rate
6. Bailed due to borehole being flooded. Remeasurements taken 30 minutes after bailing.
7. Water level likely not representative due to large surface water ingress after opening borehole.



FIELD WATER OBSERVATIONS

3899 WASTE FRONT, PORT OF SUNDERLAND

BH	Date	Time	Tides*	Water Level Dip (m below cover)	Water Level Dip (m bgl)	Total Depth (m bgl)	Water column (m)	pH	Temperature (°C)	Electrical Conductivity (ms)	Total Dissolved Solids (ppt)	3 well volume (bailers)	Bailed/ Pumped (l)	Observations	Weather	Sampled By	Notes	
BH17	28/01/2021	09:30	Low: 9:17 High: 15.17	3.22	3.22	12.8	9.58	6.12	10.30	4.10	2.05	63	4	Grey cloudy with slight hydrocarbon odour.	Overcast with rain, cloud 8/8	JD	Sampled with a low flow pump	
BH29	28/01/2021	10:25		3.31	3.31	4.8	1.49	6.75	8.60	1.95	0.98	10	3	Dark grey cloudy with slight hydrocarbon odour and slight surface iridescence.	Overcast with rain, cloud 8/8	JD	Sampled with a low flow pump	
BH28	28/01/2021	11:00		3.2	3.2	20.0	16.80	7.06	10.1	2.6	1.30	110	1.5	Dark grey cloudy with a fishy, fruity odour and slight surface iridescence.	Overcast with rain, cloud 8/8	JD	Sampled with a low flow pump.	
BH27	28/01/2021	11:45		3.3	3.3	4.5	1.20	6.51	9	2.2	1.10	8	2	Grey cloudy with a hydrocarbon odour	Overcast with heavy rain, cloud 8/8	JD	Sampled with a low flow pump	
BH26	28/01/2021	12:35		3.4	3.4	5.5	2.10	6.03	10	2.6	1.30	14	2.5	Brown grey cloudy with a hydrocarbon odour	Overcast with heavy rain, cloud 8/8	JD	Sampled with a low flow pump	
BH25	28/01/2021	13:10		3.19	3.19	4.5	1.31	6.25	12.1	2.4	1.20	9	2.5	Dark grey cloudy with a hydrocarbon odour and iridescence.	Overcast with occasional sun, cloud 6/8	JD	Sampled with a low flow pump.	
BH18	28/01/2021	14:10		3.2	3.2	5.3	2.10	6.2	10.1	2.9	1.45	14	2	Black to dark grey cloudy with a hydrocarbon odour and iridescence.	Overcast with occasional sun, cloud 6/8	JD	Sampled with a low flow pump	
BH31	28/01/2021	15:00		2.72	2.72	4.5	1.78	6.73	10.1	2.4	1.20	12	2	Light brown cloudy with a slightly sweet hydrocarbon odour and iridescence.	Overcast with occasional sun, cloud 6/8	JD	Sampled with a low flow pump	
BH24	28/01/2021	15:55		3.17	3.17	4.6	1.43	6.2	10.1	2.4	1.20	9	3	Grey cloudy with a hydrocarbon odour, initial iridescence during sampling	Overcast with rain, cloud 8/8	JD	Sampled with a low flow pump	
BH30	28/01/2021	16:45		3.3	3.3	4.4	1.05	6.4	10.1	2	1.00	7	2	Black to dark grey cloudy with a strong hydrocarbon odour and iridescence.	Overcast with rain, cloud 8/9	JD	Sampled with a low flow pump	
BH8	29/01/2021	09:00	Low: 9:56 High: 15.54	3.4	3.4	3.9	0.5	6	10.1	1.9	0.95	3	2	Brown grey cloudy	Overcast, dry 8/8	JD	Sampled with a bailer	
BH7	29/01/2021	09:30		3.5	3.5	4.1	0.6	6.5	8.8	2.2	1.10	4	3	Grey cloudy	Overcast, dry 8/8	JD	Sampled with a bailer	
BH6	29/01/2021	10:00		3.5	3.5	4.0	0.5	6.2	8.8	2.1	1.05	3	1	Grey cloudy	Overcast, dry 8/8	JD	Sampled with a bailer	
BH5	29/01/2021	10:45		3.8	3.8	4.2	0.4	6.8	9.1	2.2	1.10	3	1	Light brown cloudy	Overcast, dry 8/8	JD	Sampled with a bailer	
BH12	29/01/2021	11:10		3.1	3.1	4.0	0.86	7.2	7.8	0.5	0.25	6	5	Light brown to light grey cloudy	Overcast, dry 8/8	JD	Sampled with a bailer	
BH13	29/01/2021	11:55		3.7	3.7	4.0	0.3	6.5	9.1	2	1.00	2	1	Light brown cloudy	Overcast, dry 8/8	JD	Sampled with a bailer	
BH1	29/01/2021	12:45		3.5	3.5	4.0	0.5	6	10	NR	-	-	3	1.5	Brown grey cloudy	Overcast, dry 8/8	JD	Sampled with a bailer
BH4	29/01/2021	13:25		3.7	3.7	13.5	9.8	6.9	9.8	1.65	0.83	64	10	Light brown cloudy	Overcast, dry 8/8	JD	Sampled with a bailer	
BH2	29/01/2021	13:15		3.8	3.8	3.8	0	-	-	-	-	-	-	-	-	Overcast, dry 8/8	JD	Insufficient water to sample
BH9	29/01/2021	08:50		3.65	3.65	3.7	0.05	-	-	-	-	-	-	-	-	Overcast, dry 8/8	JD	Insufficient water to sample
BH11	29/01/2021	08:55		3.6	3.6	3.7	0.1	-	-	-	-	-	-	-	-	Overcast, dry 8/8	JD	Insufficient water to sample
BH9	29/01/2021	14:00	damp	damp	3.7	-	-	-	-	-	-	-	-	-	Overcast, dry 8/8	JD	Insufficient water to sample	
BH11	29/01/2021	14:05	3.6	3.6	3.7	0.1	-	-	-	-	-	-	-	-	Overcast, dry 8/8	JD	Insufficient water to sample	

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**APPENDIX 4**

**CHEMICAL ANALYSIS RESULTS**



## Certificate of Analysis

*Certificate Number* 20-25124-2

*Issued:* 15-Jan-21

*Client* FWS Consultants  
Unit 2 City West Business Park  
St Johns Road  
Meadowfield Industrial Estate  
Co Durham  
DH7 8ER

*Our Reference* 20-25124-2

*Client Reference* 3899

*Order No* 2020/3722

*Contract Title* Wastefront, Sunderland Docks

*Description* 50 Soil samples, 6 Leachate samples.

*Date Received* 08-Dec-20

*Date Started* 08-Dec-20

*Date Completed* 15-Jan-21

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* **This report supersedes 20-25124-1, extra testing added.**

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

*Approved By*

Adam Fenwick  
Contracts Manager



2139



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# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773816	1773817	1773818	1773819	1773820	1773821
Sample ID	TP2	TP3	TP3	TP4	TP5	TP6
Depth	0.25	0.35	0.60	0.20	0.90	0.25
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	01/12/2020	01/12/2020	01/12/2020	01/12/2020	01/12/2020	01/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%						
<b>Metals</b>									
Arsenic	DETSC 2301#	0.2	mg/kg	5.8	4.6	7.0	3.8	1.5	15
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.3	0.9	0.3	2.0	0.4	0.7
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.1	< 0.1	0.1	< 0.1	0.4
Chromium	DETSC 2301#	0.15	mg/kg	19	7.2	15	3.4	2.1	25
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	120	21	29	12	11	73
Lead	DETSC 2301#	0.3	mg/kg	24	20	63	20	13	150
Mercury	DETSC 2325#	0.05	mg/kg	0.10	< 0.05	0.06	0.08	< 0.05	0.44
Nickel	DETSC 2301#	1	mg/kg	35	8.3	15	3.6	1.7	21
Zinc	DETSC 2301#	1	mg/kg	42	69	72	24	36	130
<b>Inorganics</b>									
pH	DETSC 2008#		pH	8.1	10.2	8.9	10.7	9.1	11.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3	0.1	< 0.1	< 0.1	< 0.1	0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	3.4	2.0	1.7	0.5	4.0	3.3
Chloride Aqueous Extract	DETSC 2055	1	mg/l	11	23	20	26	62	14
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	84	150	250	33	43	67
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.11	0.28	0.28	0.05	0.05	0.15
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773816	1773817	1773818	1773819	1773820	1773821
Sample ID	TP2	TP3	TP3	TP4	TP5	TP6
Depth	0.25	0.35	0.60	0.20	0.90	0.25
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	01/12/2020	01/12/2020	01/12/2020	01/12/2020	01/12/2020	01/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
<b>PAHs</b>									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 1.0	0.3	0.2	< 0.1	0.4
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	1.7	0.4	2.0	< 0.1	0.2
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	2.5	0.4	0.4	< 0.1	0.4
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	5.3	0.5	2.4	< 0.1	0.3
Phenanthrene	DETSC 3301	0.1	mg/kg	0.3	46	1.6	21	0.4	5.4
Anthracene	DETSC 3301	0.1	mg/kg	0.1	19	0.7	4.9	< 0.1	0.5
Fluoranthene	DETSC 3301	0.1	mg/kg	0.5	92	2.0	24	0.8	8.0
Pyrene	DETSC 3301	0.1	mg/kg	0.5	76	2.0	22	0.9	6.5
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.3	53	1.2	11	0.4	2.2
Chrysene	DETSC 3301	0.1	mg/kg	0.3	50	1.3	12	0.4	3.4
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.3	33	1.1	7.0	0.2	2.6
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.1	20	1.0	4.5	0.2	1.4
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.9	34	1.4	8.4	0.4	2.7
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	20	0.6	4.5	< 0.1	2.0
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	5.8	0.1	0.9	< 0.1	0.3
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	19	1.1	3.6	< 0.1	2.0
PAH Total	DETSC 3301	1.6	mg/kg	3.3	480	16	130	3.8	38
<b>PCBs</b>									
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg				< 0.01	< 0.01	
PCB 52	DETSC 3401#	0.01	mg/kg				< 0.01	< 0.01	
PCB 101	DETSC 3401#	0.01	mg/kg				< 0.01	< 0.01	
PCB 118	DETSC 3401#	0.01	mg/kg				< 0.01	< 0.01	
PCB 153	DETSC 3401#	0.01	mg/kg				< 0.01	< 0.01	
PCB 138	DETSC 3401#	0.01	mg/kg				< 0.01	< 0.01	
PCB 180	DETSC 3401#	0.01	mg/kg				< 0.01	< 0.01	
PCB 7 Total	DETSC 3401#	0.01	mg/kg				< 0.01	< 0.01	
<b>Phenols</b>									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.5	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773822	1773823	1773824	1773825	1773826	1773827
Sample ID	TP7	TP7	TP8	TP9	TP10	TP11
Depth	0.40	1.00	0.60	0.40	0.40	0.60
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	01/12/2020	01/12/2020	01/12/2020	01/12/2020	01/12/2020	01/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%	0.008		0.097		0.003	0.002
<b>Metals</b>									
Arsenic	DETSC 2301#	0.2	mg/kg	10	5.9	4.3	25	18	25
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.2	0.6	0.8	2.4	1.3	1.0
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.1	0.2	1.1	1.4	0.3
Chromium	DETSC 2301#	0.15	mg/kg	15	27	12	24	16	28
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	76	31	40	660	98	120
Lead	DETSC 2301#	0.3	mg/kg	360	24	58	300	350	240
Mercury	DETSC 2325#	0.05	mg/kg	0.15	< 0.05	0.07	0.21	0.89	2.2
Nickel	DETSC 2301#	1	mg/kg	21	30	11	41	22	51
Zinc	DETSC 2301#	1	mg/kg	170	64	120	760	400	200
<b>Inorganics</b>									
pH	DETSC 2008#		pH	9.4	8.5	9.7	9.2	9.1	8.3
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3	< 0.1	0.3	0.3	0.8	0.2
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	4.8	0.9	1.2	6.6	2.6	3.4
Chloride Aqueous Extract	DETSC 2055	1	mg/l	20	1.3	25	13	29	39
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	99	41	79	73	69	270
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.20	0.03	0.17	0.19	0.20	0.23
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	2.3	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	25	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	150	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	170	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	170	< 10

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773822	1773823	1773824	1773825	1773826	1773827
Sample ID	TP7	TP7	TP8	TP9	TP10	TP11
Depth	0.40	1.00	0.60	0.40	0.40	0.60
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	01/12/2020	01/12/2020	01/12/2020	01/12/2020	01/12/2020	01/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
<b>PAHs</b>									
Naphthalene	DETSC 3301	0.1	mg/kg	1.0	0.3	0.6	< 0.1	1.9	0.2
Acenaphthylene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	0.3	0.2	0.8	0.2
Acenaphthene	DETSC 3301	0.1	mg/kg	1.3	0.2	0.9	0.2	2.3	0.7
Fluorene	DETSC 3301	0.1	mg/kg	1.3	0.1	1.0	< 0.1	2.1	0.7
Phenanthrene	DETSC 3301	0.1	mg/kg	8.4	0.5	8.4	0.5	20	5.1
Anthracene	DETSC 3301	0.1	mg/kg	2.0	< 0.1	2.3	0.2	4.8	1.5
Fluoranthene	DETSC 3301	0.1	mg/kg	13	0.6	13	0.9	31	7.5
Pyrene	DETSC 3301	0.1	mg/kg	11	0.8	11	1.2	27	6.2
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	4.9	0.4	6.4	0.5	15	4.3
Chrysene	DETSC 3301	0.1	mg/kg	5.6	0.5	6.6	0.7	16	4.6
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	4.7	0.3	5.6	0.6	12	3.6
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	2.6	0.2	3.1	0.3	6.8	2.0
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	5.0	0.4	6.2	0.7	13	4.0
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	3.9	0.3	4.8	0.4	2.6	2.8
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.6	< 0.1	0.7	< 0.1	< 0.1	0.5
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	3.6	0.3	4.5	0.5	11	2.9
PAH Total	DETSC 3301	1.6	mg/kg	69	5.0	76	7.1	170	47
<b>PCBs</b>									
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg						
PCB 52	DETSC 3401#	0.01	mg/kg						
PCB 101	DETSC 3401#	0.01	mg/kg						
PCB 118	DETSC 3401#	0.01	mg/kg						
PCB 153	DETSC 3401#	0.01	mg/kg						
PCB 138	DETSC 3401#	0.01	mg/kg						
PCB 180	DETSC 3401#	0.01	mg/kg						
PCB 7 Total	DETSC 3401#	0.01	mg/kg						
<b>Phenols</b>									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3



# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773828	1773829	1773830	1773831	1773832	1773833
Sample ID	TP12	TP12	TP13	TP13	TP14	TP15
Depth	0.20	2.00	0.20	1.20	0.85	0.04
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	01/12/2020	01/12/2020	01/12/2020	01/12/2020	01/12/2020	02/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%	0.002					< 0.001
<b>Metals</b>									
Arsenic	DETSC 2301#	0.2	mg/kg	4.0	7.5	6.0	9.3	14	13
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.4	2.1	0.7	0.8	0.7	0.6
Cadmium	DETSC 2301#	0.1	mg/kg	0.1	0.7	0.3	0.2	0.2	0.5
Chromium	DETSC 2301#	0.15	mg/kg	9.7	14	17	13	12	13
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	22	81	64	22	28	43
Lead	DETSC 2301#	0.3	mg/kg	21	64	70	52	720	75
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.09	0.07	0.07	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	11	37	15	8.6	8.8	14
Zinc	DETSC 2301#	1	mg/kg	57	620	240	98	75	140
<b>Inorganics</b>									
pH	DETSC 2008#		pH	11.4	8.1	10.0	11.5	8.7	11.1
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	1.5	0.5	0.4	0.5	0.2
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	3.5	1.9	3.9	1.7	0.4	0.5
Chloride Aqueous Extract	DETSC 2055	1	mg/l	50	24	15	40	21	55
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	43	560	83	48	66	65
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.30	0.29	0.23	0.29	0.25	0.29
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	67	< 3.4	88	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	68	< 10	90	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	1.7	< 0.9	< 0.9	3.7	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	3.9	< 0.5	2.1	4.2	< 0.5	3.2
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	17	< 0.6	12	26	< 0.6	6.8
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	500	< 1.4	350	130	< 1.4	140
Aromatic C5-C35	DETSC 3072*	10	mg/kg	520	< 10	370	160	< 10	150
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	590	< 10	460	160	< 10	150

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773828	1773829	1773830	1773831	1773832	1773833
Sample ID	TP12	TP12	TP13	TP13	TP14	TP15
Depth	0.20	2.00	0.20	1.20	0.85	0.04
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	01/12/2020	01/12/2020	01/12/2020	01/12/2020	01/12/2020	02/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
<b>PAHs</b>									
Naphthalene	DETSC 3301	0.1	mg/kg	1.3	< 0.1	< 1.0	1.7	0.2	0.3
Acenaphthylene	DETSC 3301	0.1	mg/kg	2.4	< 0.1	< 1.0	2.0	0.1	0.2
Acenaphthene	DETSC 3301	0.1	mg/kg	5.0	< 0.1	1.3	2.5	0.1	0.4
Fluorene	DETSC 3301	0.1	mg/kg	7.7	< 0.1	2.0	2.2	0.2	0.4
Phenanthrene	DETSC 3301	0.1	mg/kg	43	< 0.1	11	19	0.4	2.6
Anthracene	DETSC 3301	0.1	mg/kg	13	< 0.1	3.9	5.2	0.2	0.7
Fluoranthene	DETSC 3301	0.1	mg/kg	60	0.2	19	35	1.2	3.8
Pyrene	DETSC 3301	0.1	mg/kg	49	< 0.1	17	32	1.0	3.2
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	32	< 0.1	10	20	0.8	1.9
Chrysene	DETSC 3301	0.1	mg/kg	29	< 0.1	11	22	0.6	2.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	25	< 0.1	8.5	19	0.6	1.7
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	15	< 0.1	5.4	10	0.5	1.0
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	29	< 0.1	10	21	0.7	2.2
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	22	< 0.1	6.7	17	1.0	1.5
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	4.0	< 0.1	1.1	3.9	0.1	0.2
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	19	< 0.1	6.9	19	0.6	1.6
PAH Total	DETSC 3301	1.6	mg/kg	360	< 1.6	110	230	8.3	29
<b>PCBs</b>									
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg						
PCB 52	DETSC 3401#	0.01	mg/kg						
PCB 101	DETSC 3401#	0.01	mg/kg						
PCB 118	DETSC 3401#	0.01	mg/kg						
PCB 153	DETSC 3401#	0.01	mg/kg						
PCB 138	DETSC 3401#	0.01	mg/kg						
PCB 180	DETSC 3401#	0.01	mg/kg						
PCB 7 Total	DETSC 3401#	0.01	mg/kg						
<b>Phenols</b>									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773834	1773835	1773836	1773837	1773838	1773839
Sample ID	TP16	TP16	TP17	TP17	TP18	TP19
Depth	0.40	2.00	1.60	3.60	0.90	0.40
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	02/12/2020	02/12/2020	02/12/2020	02/12/2020	02/12/2020	02/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%	0.001	0.002	0.003	0.003	0.001	0.001
<b>Metals</b>									
Arsenic	DETSC 2301#	0.2	mg/kg	16	39	9.4	9.7	13	26
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.3	2.1	0.8	1.1	0.7	2.7
Cadmium	DETSC 2301#	0.1	mg/kg	0.8	1.6	0.3	0.6	0.4	0.4
Chromium	DETSC 2301#	0.15	mg/kg	23	17	8.6	8.0	15	19
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	170	470	140	43	120	140
Lead	DETSC 2301#	0.3	mg/kg	200	460	170	140	550	290
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.40	0.30	0.12	0.29	0.14
Nickel	DETSC 2301#	1	mg/kg	38	38	12	10	16	39
Zinc	DETSC 2301#	1	mg/kg	340	580	200	150	330	360
<b>Inorganics</b>									
pH	DETSC 2008#		pH	8.6	8.0	10.6	8.3	8.5	9.7
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.9	4.0	0.2	0.3	0.7	0.4
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	5.6	3.7	0.7	2.4	2.8	4.6
Chloride Aqueous Extract	DETSC 2055	1	mg/l	16	350	97	16	12	17
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	56	440	130	150	270	210
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.13	0.48	0.20	0.25	0.25	0.39
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	25	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	45	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	44	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	160	5.8	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	240	11	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	65	19	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	3.5	44	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	580	80	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	0.34	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	230	20	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	180	29	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	100	60	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	44	190	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	560	300	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	1100	380	< 10	< 10	< 10

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773834	1773835	1773836	1773837	1773838	1773839
Sample ID	TP16	TP16	TP17	TP17	TP18	TP19
Depth	0.40	2.00	1.60	3.60	0.90	0.40
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	02/12/2020	02/12/2020	02/12/2020	02/12/2020	02/12/2020	02/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	18	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
<b>PAHs</b>									
Naphthalene	DETSC 3301	0.1	mg/kg	0.5	2.8	20	0.2	0.8	0.4
Acenaphthylene	DETSC 3301	0.1	mg/kg	0.4	12	1.6	< 0.1	0.2	0.3
Acenaphthene	DETSC 3301	0.1	mg/kg	0.5	1.4	7.9	< 0.1	0.3	0.2
Fluorene	DETSC 3301	0.1	mg/kg	0.5	3.0	10	< 0.1	0.2	0.2
Phenanthrene	DETSC 3301	0.1	mg/kg	4.5	16	34	0.3	1.9	2.5
Anthracene	DETSC 3301	0.1	mg/kg	1.4	5.3	6.3	0.1	0.5	0.6
Fluoranthene	DETSC 3301	0.1	mg/kg	7.6	18	52	1.1	2.3	4.6
Pyrene	DETSC 3301	0.1	mg/kg	6.9	15	51	1.1	2.2	4.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	4.0	9.6	48	0.8	1.0	2.6
Chrysene	DETSC 3301	0.1	mg/kg	4.3	9.2	62	1.0	1.2	2.9
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	3.9	6.7	43	1.2	1.0	3.2
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	2.2	3.9	19	0.6	0.5	1.4
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	4.3	7.2	42	1.4	1.1	3.0
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	3.1	5.4	21	1.4	1.0	2.7
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.4	1.3	6.6	0.1	0.2	0.5
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	3.0	6.2	19	1.4	0.9	2.4
PAH Total	DETSC 3301	1.6	mg/kg	48	120	450	11	15	32
<b>PCBs</b>									
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg						
PCB 52	DETSC 3401#	0.01	mg/kg						
PCB 101	DETSC 3401#	0.01	mg/kg						
PCB 118	DETSC 3401#	0.01	mg/kg						
PCB 153	DETSC 3401#	0.01	mg/kg						
PCB 138	DETSC 3401#	0.01	mg/kg						
PCB 180	DETSC 3401#	0.01	mg/kg						
PCB 7 Total	DETSC 3401#	0.01	mg/kg						
<b>Phenols</b>									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773840	1773841	1773842	1773843	1773844	1773845
Sample ID	TP19	TP20	TP21	TP22	TP22	TP23
Depth	0.70	0.70	0.40	0.50	1.80	0.60
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	02/12/2020	02/12/2020	03/12/2020	03/12/2020	03/12/2020	03/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%		0.020		0.003		
<b>Metals</b>									
Arsenic	DETSC 2301#	0.2	mg/kg	37	49	5.5	23	19	18
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	2.8	2.4	0.7	0.6	1.7	1.0
Cadmium	DETSC 2301#	0.1	mg/kg	0.6	2.6	< 0.1	0.3	0.5	0.6
Chromium	DETSC 2301#	0.15	mg/kg	37	37	7.9	17	17	24
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	290	280	19	94	250	100
Lead	DETSC 2301#	0.3	mg/kg	340	370	44	85	380	1300
Mercury	DETSC 2325#	0.05	mg/kg	0.48	9.5	0.11	0.76	0.38	0.20
Nickel	DETSC 2301#	1	mg/kg	82	79	8.7	43	47	26
Zinc	DETSC 2301#	1	mg/kg	540	770	41	160	410	460
<b>Inorganics</b>									
pH	DETSC 2008#		pH	7.5	7.1	11.1	7.5	8.2	9.8
Cyanide, Total	DETSC 2130#	0.1	mg/kg	8.1	28	0.3	5.5	3.2	1.9
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	5.7	7.6	< 0.1	0.1	5.3	2.7
Chloride Aqueous Extract	DETSC 2055	1	mg/l	13	20	< 1.0	4.8	29	16
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	180	1300	43	49	140	99
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.60	0.64	0.28	0.13	0.30	0.34
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	1.8
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	17	< 1.2	< 1.2	< 1.2	2.4
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	120	< 1.5	< 1.5	< 1.5	4.9
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	89	< 3.4	160	< 3.4	64
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	230	< 10	160	< 10	73
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	18
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	12
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	26
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	130
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	190
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	230	< 10	160	< 10	260

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773840	1773841	1773842	1773843	1773844	1773845
Sample ID	TP19	TP20	TP21	TP22	TP22	TP23
Depth	0.70	0.70	0.40	0.50	1.80	0.60
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	02/12/2020	02/12/2020	03/12/2020	03/12/2020	03/12/2020	03/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
<b>PAHs</b>									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1	0.2	0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	< 0.1	< 0.1	< 0.1	0.7
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.9
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	< 0.1	< 0.1	< 0.1	1.2
Phenanthrene	DETSC 3301	0.1	mg/kg	0.2	1.7	1.3	< 0.1	0.4	15
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.6	0.3	< 0.1	< 0.1	5.4
Fluoranthene	DETSC 3301	0.1	mg/kg	0.5	5.4	1.9	< 0.1	0.4	56
Pyrene	DETSC 3301	0.1	mg/kg	0.5	5.7	1.8	< 0.1	0.5	50
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.4	3.2	0.9	< 0.1	0.3	25
Chrysene	DETSC 3301	0.1	mg/kg	0.3	3.7	1.0	< 0.1	0.3	25
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.4	4.0	0.7	< 0.1	0.3	22
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.2	1.8	0.4	< 0.1	0.1	12
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.4	3.4	0.8	< 0.1	0.3	25
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	0.3	3.4	0.6	< 0.1	0.3	20
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.6	0.1	< 0.1	< 0.1	5.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	0.3	2.7	0.5	< 0.1	0.2	15
PAH Total	DETSC 3301	1.6	mg/kg	3.7	38	11	< 1.6	3.4	280
<b>PCBs</b>									
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg						
PCB 52	DETSC 3401#	0.01	mg/kg						
PCB 101	DETSC 3401#	0.01	mg/kg						
PCB 118	DETSC 3401#	0.01	mg/kg						
PCB 153	DETSC 3401#	0.01	mg/kg						
PCB 138	DETSC 3401#	0.01	mg/kg						
PCB 180	DETSC 3401#	0.01	mg/kg						
PCB 7 Total	DETSC 3401#	0.01	mg/kg						
<b>Phenols</b>									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773846	1773855	1773856	1773859	1773861	1773864
Sample ID	TP24	TP9	TP9	TP16	TP18	TP25
Depth	0.30	2.00	2.60	0.90	1.00	1.80
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/12/2020	n/s	n/s	n/s	n/s	03/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%	0.003	0.006	< 0.001	0.004	< 0.001	0.016
<b>Metals</b>									
Arsenic	DETSC 2301#	0.2	mg/kg	10					
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.2					
Cadmium	DETSC 2301#	0.1	mg/kg	0.3					
Chromium	DETSC 2301#	0.15	mg/kg	15					
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0					
Copper	DETSC 2301#	0.2	mg/kg	82					
Lead	DETSC 2301#	0.3	mg/kg	110					
Mercury	DETSC 2325#	0.05	mg/kg	0.16					
Nickel	DETSC 2301#	1	mg/kg	13					
Zinc	DETSC 2301#	1	mg/kg	220					
<b>Inorganics</b>									
pH	DETSC 2008#		pH	10.7					
Cyanide, Total	DETSC 2130#	0.1	mg/kg	1.1					
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1					
Organic matter	DETSC 2002#	0.1	%	2.1					
Chloride Aqueous Extract	DETSC 2055	1	mg/l	34					
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	260					
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.68					
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01					
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01					
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01					
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5					
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2					
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5					
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4					
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10					
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01					
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01					
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01					
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9					
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5					
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6					
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4					
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10					
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10					

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773846	1773855	1773856	1773859	1773861	1773864
Sample ID	TP24	TP9	TP9	TP16	TP18	TP25
Depth	0.30	2.00	2.60	0.90	1.00	1.80
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/12/2020	n/s	n/s	n/s	n/s	03/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01					
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01					
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01					
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01					
MTBE	DETSC 3321	0.01	mg/kg	< 0.01					
<b>PAHs</b>									
Naphthalene	DETSC 3301	0.1	mg/kg	0.3					
Acenaphthylene	DETSC 3301	0.1	mg/kg	0.1					
Acenaphthene	DETSC 3301	0.1	mg/kg	0.2					
Fluorene	DETSC 3301	0.1	mg/kg	0.3					
Phenanthrene	DETSC 3301	0.1	mg/kg	2.5					
Anthracene	DETSC 3301	0.1	mg/kg	0.7					
Fluoranthene	DETSC 3301	0.1	mg/kg	4.3					
Pyrene	DETSC 3301	0.1	mg/kg	4.1					
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	2.4					
Chrysene	DETSC 3301	0.1	mg/kg	2.5					
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	2.2					
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	1.2					
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	2.6					
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	2.3					
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.4					
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	2.0					
PAH Total	DETSC 3301	1.6	mg/kg	28					
<b>PCBs</b>									
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg						
PCB 52	DETSC 3401#	0.01	mg/kg						
PCB 101	DETSC 3401#	0.01	mg/kg						
PCB 118	DETSC 3401#	0.01	mg/kg						
PCB 153	DETSC 3401#	0.01	mg/kg						
PCB 138	DETSC 3401#	0.01	mg/kg						
PCB 180	DETSC 3401#	0.01	mg/kg						
PCB 7 Total	DETSC 3401#	0.01	mg/kg						
<b>Phenols</b>									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3					



## Summary of Chemical Analysis Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1775503
Sample ID	TP1
Depth	0.85
Other ID	
Sample Type	SOIL
Sampling Date	01/12/2020
Sampling Time	n/s

Test	Method	LOD	Units	
Asbestos Quantification	DETSC 1102	0.001	%	
<b>Metals</b>				
Arsenic	DETSC 2301#	0.2	mg/kg	8.6
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	2.0
Cadmium	DETSC 2301#	0.1	mg/kg	0.2
Chromium	DETSC 2301#	0.15	mg/kg	34
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	32
Lead	DETSC 2301#	0.3	mg/kg	32
Mercury	DETSC 2325#	0.05	mg/kg	0.06
Nickel	DETSC 2301#	1	mg/kg	35
Zinc	DETSC 2301#	1	mg/kg	70
<b>Inorganics</b>				
pH	DETSC 2008#		pH	7.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	1.0
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1
Organic matter	DETSC 2002#	0.1	%	1.5
Chloride Aqueous Extract	DETSC 2055	1	mg/l	14
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	1500
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.57
<b>Petroleum Hydrocarbons</b>				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10

## Summary of Chemical Analysis

### Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1775503
Sample ID	TP1
Depth	0.85
Other ID	
Sample Type	SOIL
Sampling Date	01/12/2020
Sampling Time	n/s

Test	Method	LOD	Units	
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01
<b>PAHs</b>				
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6
<b>PCBs</b>				
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg	
PCB 52	DETSC 3401#	0.01	mg/kg	
PCB 101	DETSC 3401#	0.01	mg/kg	
PCB 118	DETSC 3401#	0.01	mg/kg	
PCB 153	DETSC 3401#	0.01	mg/kg	
PCB 138	DETSC 3401#	0.01	mg/kg	
PCB 180	DETSC 3401#	0.01	mg/kg	
PCB 7 Total	DETSC 3401#	0.01	mg/kg	
<b>Phenols</b>				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3

## Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773835	1773837	1773844
Sample ID	TP16	TP17	TP22
Depth	2.00	3.60	1.80
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	02/12/2020	02/12/2020	03/12/2020
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
<b>VOCs</b>						
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	0.02	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	0.02	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	0.05	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	0.01	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	0.15	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	0.01	< 0.01

## Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773835	1773837	1773844
Sample ID	TP16	TP17	TP22
Depth	2.00	3.60	1.80
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	02/12/2020	02/12/2020	03/12/2020
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	0.20	0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
<b>SVOCs</b>						
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	1.3	0.1	0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	0.5	< 0.1	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1

## Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773835	1773837	1773844
Sample ID	TP16	TP17	TP22
Depth	2.00	3.60	1.80
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	02/12/2020	02/12/2020	03/12/2020
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Di-n-octylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	0.5	< 0.1	< 0.1
<b>SVOC TICs</b>						
2,6,10-Trimethyltridecane (TIC)	DETSC 3433*		mg/kg	35931318		
Benzene, 1,2,3,5-tetramethyl- (TIC)	DETSC 3433*		mg/kg	43207366		
Benzene, 1-methyl-4-propyl- (TIC)	DETSC 3433*		mg/kg	95747369		
Benzene, 2-ethyl-1,4-dimethyl- (TIC)	DETSC 3433*		mg/kg	42844883		
Benzo[e]pyrene (TIC)	DETSC 3433*		mg/kg	92551764		
Decane, 2,3,7-trimethyl- (TIC)	DETSC 3433*		mg/kg	89314675		
Hexadecane, 2,6,10,14-tetramethyl- (TIC)	DETSC 3433*		mg/kg	45823199		
Indane (TIC)	DETSC 3433*		mg/kg	12086283		
none (TIC)					None	None
p-Cymene (TIC)	DETSC 3433*		mg/kg	45796501		
Triphenylene (TIC)	DETSC 3433*		mg/kg	95661828		

# WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Sample Id TP3 0.35

Sample Numbers 1773817 1784629 1784630

Date Analysed 13/01/2021

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	4.1	3	5	6
DETSC 2003# Loss On Ignition	%	3.1	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	1700.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	480.0	100	n/a	n/a
DETSC 2008# pH	pH Units	10.2	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
	DETSC 2306 Arsenic as As	0.62	0.25	< 0.002	< 0.01	0.5	2
DETSC 2306 Barium as Ba	10	3.4	0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	1.7	0.69	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	6.4	2.2	0.013	0.029	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	1	0.42	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.47	0.29	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	5.3	2.3	0.011	0.028	4	50	200
DETSC 2055 Chloride as Cl	4100	2100	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	11000	4500	22	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	63000	40000	126	437.8	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	3800	< 2000	< 10	< 50	500	800	1000

### Additional Information

DETSC 2008 pH	7.8	8.6
DETSC 2009 Conductivity uS/cm	89.4	57.0
* Temperature*	17.0	17.0

Mass of Sample Kg*	0.130
Mass of dry Sample Kg*	0.122

### Stage 1

Volume of Leachant L2*	0.237
Volume of Eluate VE1*	0.201

### Stage 2

Volume of Leachant L8*	0.979
Volume of Eluate VE2*	0.93

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

**Disclaimer:** The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

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# WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Sample Id TP5 0.90

Sample Numbers 1773820 1784631 1784632

Date Analysed 21/12/2020

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC2002#/DETSC2084# Total Organic Carbon	%		3	5	6
DETSC2003# Loss On Ignition	%		n/a	n/a	10
DETSC3321# BTEX	mg/kg		6	n/a	n/a
DETSC3401# PCB's (7 congeners)	mg/kg		1	n/a	n/a
DETSC3311# TPH (C10 - C40)	mg/kg		500	n/a	n/a
DETSC3301/DETSC3303 PAH's	mg/kg		100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
	DETSC 2306 Arsenic as As	0.38	0.2	< 0.002	< 0.01	0.5	2
DETSC 2306 Barium as Ba	7.5	2.8	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	1.2	0.55	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	3	1.3	0.006	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	1.5	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.33	0.24	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.22	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	1.2	0.57	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	4.5	2.8	0.009	0.031	4	50	200
DETSC 2055 Chloride as Cl	4400	2000	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	140	< 100	0.28	0.24	10	150	500
DETSC 2055 Sulphate as SO4	9000	2300	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	49000	21000	98	258.1	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	2800	< 2000	< 10	< 50	500	800	1000

### Additional Information

DETSC 2008 pH	7.8	7.6
DETSC 2009 Conductivity uS/cm	69.2	30.2
* Temperature*	17.0	17.0

Mass of Sample Kg*	0.130
Mass of dry Sample Kg*	0.119

### Stage 1

Volume of Leachant L2*	0.227
Volume of Eluate VE1*	0.204

### Stage 2

Volume of Leachant L8*	0.951
Volume of Eluate VE2*	0.91

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

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# WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Sample Id TP14 0.85

Sample Numbers 1773832 1784633 1784634

Date Analysed 13/01/2021

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.5	3	5	6
DETSC 2003# Loss On Ignition	%	2.1	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	94.0	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	8.3	100	n/a	n/a
DETSC 2008# pH	pH Units	8.7	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	1.8	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
	DETSC 2306 Arsenic as As	1.8	0.6	0.004	< 0.01	0.5	2
DETSC 2306 Barium as Ba	9.9	2.7	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	2.7	0.92	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	9.5	2.8	0.019	0.036	2	50	100
DETSC 2306 Mercury as Hg	0.2	0.087	0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.63	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	13	5.5	0.03	0.064	0.5	10	50
DETSC 2306 Antimony as Sb	0.37	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.64	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	5	2	0.01	0.024	4	50	200
DETSC 2055 Chloride as Cl	5400	2200	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	240	< 100	0.48	0.29	10	150	500
DETSC 2055 Sulphate as SO4	7600	3200	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	73000	42000	146	457.3	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	4100	< 2000	< 10	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	7.6	8.4
DETSC 2009 Conductivity uS/cm	104.0	60.4
* Temperature*	17.0	17.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.116

Stage 1	
Volume of Leachant L2*	0.209
Volume of Eluate VE1*	0.14

Stage 2	
Volume of Leachant L8*	0.93
Volume of Eluate VE2*	0.9

TBE - To Be Evaluated  
SNRHW - Stable Non-Reactive  
Hazardous Waste

**Disclaimer:** The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

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## Summary of Asbestos Analysis

### Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1773816	TP2 0.25	SOIL	NAD	none	A Christodoulou
1773817	TP3 0.35	SOIL	NAD	none	A Christodoulou
1773818	TP3 0.60	SOIL	NAD	none	A Christodoulou
1773819	TP4 0.20	SOIL	NAD	none	A Christodoulou
1773820	TP5 0.90	SOIL	NAD	none	A Christodoulou
1773821	TP6 0.25	SOIL	NAD	none	A Christodoulou
1773822	TP7 0.40	SOIL	Chrysotile Crocidolite	Chrysotile and Crocidolite Present as bundles	A Christodoulou
1773823	TP7 1.00	SOIL	NAD	none	A Christodoulou
1773824	TP8 0.60	SOIL	Amosite	Amosite present in visible loose fibrous asbestos debris	A Christodoulou
1773825	TP9 0.40	SOIL	NAD	none	A Christodoulou
1773826	TP10 0.40	SOIL	Chrysotile Amosite	Chrysotile and Amosite present as bundles	A Christodoulou
1773827	TP11 0.60	SOIL	Chrysotile	Chrysotile Present as bundles	A Christodoulou
1773828	TP12 0.20	SOIL	Chrysotile	Chrysotile Present in microscopic bitumen fragments and Bundles	A Christodoulou
1773829	TP12 2.00	SOIL	NAD	none	A Christodoulou
1773830	TP13 0.20	SOIL	NAD	none	A Christodoulou
1773831	TP13 1.20	SOIL	NAD	none	A Christodoulou
1773832	TP14 0.85	SOIL	NAD	none	A Christodoulou
1773833	TP15 0.04	SOIL	Chrysotile	Chrysotile Present as bundles	A Christodoulou
1773834	TP16 0.40	SOIL	Chrysotile	Chrysotile Present as bundles	A Christodoulou
1773835	TP16 2.00	SOIL	Chrysotile	Chrysotile Present as bundles	A Christodoulou
1773836	TP17 1.60	SOIL	Chrysotile	Chrysotile Present as bundles	A Christodoulou
1773837	TP17 3.60	SOIL	Chrysotile Crocidolite	Chrysotile and Crocidolite Present as bundles	A Christodoulou
1773838	TP18 0.90	SOIL	Amosite	Amosite Present as bundles	A Christodoulou
1773839	TP19 0.40	SOIL	Amosite	Amosite Present as bundles	A Christodoulou
1773840	TP19 0.70	SOIL	NAD	none	A Christodoulou
1773841	TP20 0.70	SOIL	Chrysotile	Chrysotile present in microscopic loose fibrous asbestos debris	A Christodoulou
1773842	TP21 0.40	SOIL	NAD	none	A Christodoulou
1773843	TP22 0.50	SOIL	Amosite	Amosite Present as bundles	A Christodoulou
1773844	TP22 1.80	SOIL	NAD	none	A Christodoulou
1773845	TP23 0.60	SOIL	NAD	none	A Christodoulou
1773846	TP24 0.30	SOIL	Chrysotile Amosite	Chrysotile and Amosite present as bundles	A Christodoulou
1773847	TP1 0.80	SOIL	NAD	none	A Christodoulou
1773848	TP1 1.80	SOIL	NAD	none	A Christodoulou
1773849	TP1 2.80	SOIL	NAD	none	A Christodoulou
1773850	TP2 1.20	SOIL	NAD	none	A Christodoulou
1773851	TP4 1.40	SOIL	NAD	none	A Christodoulou
1773852	TP5 1.50	SOIL	NAD	none	A Christodoulou

## Summary of Asbestos Analysis

### Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1773853	TP6 3.20	SOIL	NAD	none	A Christodoulou
1773854	TP7 1.05	SOIL	NAD	none	A Christodoulou
1773855	TP9 2.00	SOIL	Chrysotile	Chrysotile Present as bundles	A Christodoulou
1773856	TP9 2.60	SOIL	Amosite	Amosite Present as bundles A- 0.0003g Bag/samp- 50.37g	A Christodoulou
1773857	TP11 1.00	SOIL	NAD	none	A Christodoulou
1773858	TP15 0.80	SOIL	NAD	none	A Christodoulou
1773859	TP16 0.90	SOIL	Chrysotile	Chrysotile Present as bundles	A Christodoulou
1773860	TP17 1.20	SOIL	NAD	none	A Christodoulou
1773861	TP18 1.00	SOIL	Chrysotile	Chrysotile Present as bundles	A Christodoulou
1773862	TP22 1.00	SOIL	NAD	none	A Christodoulou
1773863	TP23 0.60	SOIL	NAD	none	A Christodoulou
1773864	TP25 1.80	SOIL	Chrysotile	Chrysotile present in loose fibrous asbestos debris	A Christodoulou
1775503	TP1 0.85	SOIL	NAD	none	A Christodoulou

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: \* -not included in laboratory scope of accreditation.

# Summary of Asbestos Quantification Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773855	1773856	1773859	1773861
Sample ID	TP9	TP9	TP16	TP18
Depth	2.00	2.60	0.90	1.00
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	n/s	n/s	n/s	n/s
Sampling Time				

Test	Method	Units				
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	0.006	< 0.001	0.004	< 0.001
Gravimetric Quantification (a)	DETSC 1102	Mass %	na	na	na	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	0.006	<0.001	0.004	<0.001
Quantification by PCOM (c)	DETSC 1102	Mass %	na	na	na	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na	na	na	na
Breakdown of Gravimetric Analysis (a)						
Mass of Sample		g	592.29	43.75	620.91	844.49
ACMs present*		type				
Mass of ACM in sample		g				
% ACM by mass		%				
% asbestos in ACM		%				
% asbestos in sample		%				
Breakdown of Detailed Gravimetric Analysis (b)						
% Amphibole bundles in sample		Mass %	na	<0.001	na	na
% Chrysotile bundles in sample		Mass %	0.006	na	0.004	<0.001
Breakdown of PCOM Analysis (c)						
% Amphibole fibres in sample		Mass %	na	na	na	na
% Chrysotile fibres in sample		Mass %	na	na	na	na
Breakdown of Potentially Respirable Fibre Analysis (d)						
Amphibole fibres		Fibres/g	na	na	na	na
Chrysotile fibres		Fibres/g	na	na	na	na

\* Denotes test or material description outside of UKAS accreditation.  
 % asbestos in Asbestos Containing Materials (ACMs) is determined by  
 by reference to HSG 264.  
 Recommended sample size for quantification is approximately 1kg  
 # denotes deviating sample

## Summary of Asbestos Quantification Analysis Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773864	1773822	1773824	1773826
Sample ID	TP25	TP7	TP8	TP10
Depth	1.80	0.40	0.60	0.40
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/12/2020	01/12/2020	01/12/2020	01/12/2020
Sampling Time				

Test	Method	Units				
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	0.016	0.008	0.097	0.003
Gravimetric Quantification (a)	DETSC 1102	Mass %	0.016	na	0.097	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	na	0.008	na	0.003
Quantification by PCOM (c)	DETSC 1102	Mass %	na	na	na	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na	na	na	na
Breakdown of Gravimetric Analysis (a)						
Mass of Sample		g	293.98	362.02	551.91	617.78
ACMs present*		type	LFAD		Insulation	
Mass of ACM in sample		g	0.06		0.63	
% ACM by mass		%	0.02		0.11	
% asbestos in ACM		%	85		85	
% asbestos in sample		%	0.016		0.097	
Breakdown of Detailed Gravimetric Analysis (b)						
% Amphibole bundles in sample		Mass %	na	0.004	na	0.002
% Chrysotile bundles in sample		Mass %	na	0.004	na	0.001
Breakdown of PCOM Analysis (c)						
% Amphibole fibres in sample		Mass %	na	na	na	na
% Chrysotile fibres in sample		Mass %	na	na	na	na
Breakdown of Potentially Respirable Fibre Analysis (d)						
Amphibole fibres		Fibres/g	na	na	na	na
Chrysotile fibres		Fibres/g	na	na	na	na

\* Denotes test or material description outside of UKAS accreditation.  
% asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264.  
Recommended sample size for quantification is approximately 1kg  
# denotes deviating sample

# Summary of Asbestos Quantification Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773827	1773828	1773833	1773834
Sample ID	TP11	TP12	TP15	TP16
Depth	0.60	0.20	0.04	0.40
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	01/12/2020	01/12/2020	02/12/2020	02/12/2020
Sampling Time				

Test	Method	Units				
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	0.002	0.002	< 0.001	0.001
Gravimetric Quantification (a)	DETSC 1102	Mass %	na	0.000	na	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	0.002	0.002	<0.001	0.001
Quantification by PCOM (c)	DETSC 1102	Mass %	na	na	na	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na	na	na	na
Breakdown of Gravimetric Analysis (a)						
Mass of Sample		g	814.62	589.99	945.04	592.01
ACMs present*		type		Bitumen		
Mass of ACM in sample		g		0.02		
% ACM by mass		%		0.00		
% asbestos in ACM		%		8		
% asbestos in sample		%		0.000		
Breakdown of Detailed Gravimetric Analysis (b)						
% Amphibole bundles in sample		Mass %	na	na	na	na
% Chrysotile bundles in sample		Mass %	0.002	0.002	<0.001	0.001
Breakdown of PCOM Analysis (c)						
% Amphibole fibres in sample		Mass %	na	na	na	na
% Chrysotile fibres in sample		Mass %	na	na	na	na
Breakdown of Potentially Respirable Fibre Analysis (d)						
Amphibole fibres		Fibres/g	na	na	na	na
Chrysotile fibres		Fibres/g	na	na	na	na

\* Denotes test or material description outside of UKAS accreditation.  
 % asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264.  
 Recommended sample size for quantification is approximately 1kg  
 # denotes deviating sample

## Summary of Asbestos Quantification Analysis Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773835	1773836	1773837	1773838
Sample ID	TP16	TP17	TP17	TP18
Depth	2.00	1.60	3.60	0.90
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	02/12/2020	02/12/2020	02/12/2020	02/12/2020
Sampling Time				

Test	Method	Units				
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	0.002	0.003	0.003	0.001
Gravimetric Quantification (a)	DETSC 1102	Mass %	na	na	na	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	0.002	0.003	0.003	0.001
Quantification by PCOM (c)	DETSC 1102	Mass %	na	na	na	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na	na	na	na
Breakdown of Gravimetric Analysis (a)						
Mass of Sample		g	760.95	715.76	37.56	639.57
ACMs present*		type				
Mass of ACM in sample		g				
% ACM by mass		%				
% asbestos in ACM		%				
% asbestos in sample		%				
Breakdown of Detailed Gravimetric Analysis (b)						
% Amphibole bundles in sample		Mass %	na	na	0.002	0.001
% Chrysotile bundles in sample		Mass %	0.002	0.003	0.001	na
Breakdown of PCOM Analysis (c)						
% Amphibole fibres in sample		Mass %	na	na	na	na
% Chrysotile fibres in sample		Mass %	na	na	na	na
Breakdown of Potentially Respirable Fibre Analysis (d)						
Amphibole fibres		Fibres/g	na	na	na	na
Chrysotile fibres		Fibres/g	na	na	na	na

\* Denotes test or material description outside of UKAS accreditation.  
% asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264.  
Recommended sample size for quantification is approximately 1kg  
# denotes deviating sample

# Summary of Asbestos Quantification Analysis

## Soil Samples

Our Ref 20-25124-2

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1773839	1773841	1773843	1773846
Sample ID	TP19	TP20	TP22	TP24
Depth	0.40	0.70	0.50	0.30
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	02/12/2020	02/12/2020	03/12/2020	03/12/2020
Sampling Time				

Test	Method	Units				
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	0.001	0.020	0.003	0.003
Gravimetric Quantification (a)	DETSC 1102	Mass %	na	0.020	na	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	0.001	na	0.003	0.003
Quantification by PCOM (c)	DETSC 1102	Mass %	na	na	na	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na	na	na	na
Breakdown of Gravimetric Analysis (a)						
Mass of Sample		g	461.60	461.33	678.83	851.45
ACMs present*		type		LFAD		
Mass of ACM in sample		g		0.11		
% ACM by mass		%		0.02		
% asbestos in ACM		%		85		
% asbestos in sample		%		0.020		
Breakdown of Detailed Gravimetric Analysis (b)						
% Amphibole bundles in sample		Mass %	0.001	na	0.003	0.001
% Chrysotile bundles in sample		Mass %	na	na	na	0.002
Breakdown of PCOM Analysis (c)						
% Amphibole fibres in sample		Mass %	na	na	na	na
% Chrysotile fibres in sample		Mass %	na	na	na	na
Breakdown of Potentially Respirable Fibre Analysis (d)						
Amphibole fibres		Fibres/g	na	na	na	na
Chrysotile fibres		Fibres/g	na	na	na	na

\* Denotes test or material description outside of UKAS accreditation.  
 % asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264.  
 Recommended sample size for quantification is approximately 1kg  
 # denotes deviating sample

## Information in Support of the Analytical Results

Our Ref 20-25124-2

Client Ref 3899

Contract Wastefront, Sunderland Docks

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1773816	TP2 0.25 SOIL	01/12/20	GJ 250ml, PT 1L		
1773817	TP3 0.35 SOIL	01/12/20	GJ 250ml, PT 1L		
1773818	TP3 0.60 SOIL	01/12/20	GJ 250ml, PT 1L		
1773819	TP4 0.20 SOIL	01/12/20	GJ 250ml, PT 1L		
1773820	TP5 0.90 SOIL	01/12/20	GJ 250ml, PT 1L		
1773821	TP6 0.25 SOIL	01/12/20	GJ 250ml, PT 1L		
1773822	TP7 0.40 SOIL	01/12/20	GJ 250ml, PT 1L		
1773823	TP7 1.00 SOIL	01/12/20	GJ 250ml, PT 1L		
1773824	TP8 0.60 SOIL	01/12/20	GJ 250ml, PT 1L		
1773825	TP9 0.40 SOIL	01/12/20	GJ 250ml, PT 1L		
1773826	TP10 0.40 SOIL	01/12/20	GJ 250ml, PT 1L		
1773827	TP11 0.60 SOIL	01/12/20	GJ 250ml, PT 1L		
1773828	TP12 0.20 SOIL	01/12/20	GJ 250ml, PT 1L		
1773829	TP12 2.00 SOIL	01/12/20	GJ 250ml, PT 1L		
1773830	TP13 0.20 SOIL	01/12/20	GJ 250ml, PT 1L		
1773831	TP13 1.20 SOIL	01/12/20	GJ 250ml, PT 1L		
1773832	TP14 0.85 SOIL	01/12/20	GJ 250ml, PT 1L		
1773833	TP15 0.04 SOIL	02/12/20	GJ 250ml, PT 1L		
1773834	TP16 0.40 SOIL	02/12/20	GJ 250ml, PT 1L		
1773835	TP16 2.00 SOIL	02/12/20	GJ 250ml, PT 1L		
1773836	TP17 1.60 SOIL	02/12/20	GJ 250ml, PT 1L		
1773837	TP17 3.60 SOIL	02/12/20	GJ 250ml, PT 1L		
1773838	TP18 0.90 SOIL	02/12/20	GJ 250ml, PT 1L		
1773839	TP19 0.40 SOIL	02/12/20	GJ 250ml, PT 1L		
1773840	TP19 0.70 SOIL	02/12/20	GJ 250ml, PT 1L		
1773841	TP20 0.70 SOIL	02/12/20	GJ 250ml x2, PT 1L x2		
1773842	TP21 0.40 SOIL	03/12/20	GJ 250ml, PT 1L		
1773843	TP22 0.50 SOIL	03/12/20	GJ 250ml, PT 1L		
1773844	TP22 1.80 SOIL	03/12/20	GJ 250ml, PT 1L		
1773845	TP23 0.60 SOIL	03/12/20	GJ 250ml, PT 1L		
1773846	TP24 0.30 SOIL	03/12/20	GJ 250ml, PT 1L		
1773847	TP1 0.80 SOIL		GJ 250ml		
1773848	TP1 1.80 SOIL		GJ 250ml		
1773849	TP1 2.80 SOIL		GJ 250ml		
1773850	TP2 1.20 SOIL		PT 1L		
1773851	TP4 1.40 SOIL		PT 1L		
1773852	TP5 1.50 SOIL		PT 1L		
1773853	TP6 3.20 SOIL		GJ 250ml		
1773854	TP7 1.05 SOIL		GJ 250ml		
1773855	TP9 2.00 SOIL		PT 1L		
1773856	TP9 2.60 SOIL		GJ 250ml		
1773857	TP11 1.00 SOIL		PT 1L		
1773858	TP15 0.80 SOIL		PT 1L		
1773859	TP16 0.90 SOIL		PT 1L		
1773860	TP17 1.20 SOIL		PT 1L		
1773861	TP18 1.00 SOIL		PT 1L		
1773862	TP22 1.00 SOIL	03/12/20	GJ 250ml, PT 1L		
1773863	TP23 0.60 SOIL	03/12/20	GJ 250ml, PT 1L		
1773864	TP25 1.80 SOIL	03/12/20	GJ 250ml, PT 1L		



## Information in Support of the Analytical Results

Our Ref 20-25124-2

Client Ref 3899

Contract Wastefront, Sunderland Docks

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
1775503	TP1 0.85 SOIL	01/12/20		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1784629	TP3 0.35 LEACHATE	01/12/20		GJ 250ml, PT 1L		
1784630	TP3 0.35 LEACHATE	01/12/20		GJ 250ml, PT 1L		
1784631	TP13 0.20 LEACHATE	01/12/20		GJ 250ml, PT 1L		
1784632	TP13 0.20 LEACHATE	01/12/20		GJ 250ml, PT 1L		
1784633	TP14 0.85 LEACHATE	01/12/20		GJ 250ml, PT 1L		
1784634	TP14 0.85 LEACHATE	01/12/20		GJ 250ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



## Certificate of Analysis

*Certificate Number* 20-25989

*Issued:* 24-Dec-20

*Client* FWS Consultants  
Unit 2 City West Business Park  
St Johns Road  
Meadowfield Industrial Estate  
Co Durham  
DH7 8ER

*Our Reference* 20-25989

*Client Reference* 3899

*Order No* 2020/3722

*Contract Title* Wastefront, Sunderland Docks

*Description* 9 Soil samples.

*Date Received* 17-Dec-20

*Date Started* 17-Dec-20

*Date Completed* 24-Dec-20

*Test Procedures* Identified by prefix DETSn (details on request).

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

*Approved By*

Adam Fenwick  
Contracts Manager



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# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-25989

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1779002	1779003	1779004	1779005	1779006	1779007	1779008
Sample ID	TP25	TP26E	TP26E	TP27E	TP27E	TP28E	TP29A
Depth	0.40	0.40	1.60	0.70	1.20	1.00	0.50
Other ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/12/2020	15/12/2020	15/12/2020	15/12/2020	15/12/2020	15/12/2020	15/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
<b>Metals</b>										
Arsenic	DETSC 2301#	0.2	mg/kg	24	17	17	230	4.9	8.5	8.5
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.0	1.4	1.5	1.1	1.0	1.2	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.7	1.3	28	0.2	0.3	0.2	0.1
Chromium	DETSC 2301#	0.15	mg/kg	22	17	42	26	3.4	7.5	8.0
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	350	120	230	28	7.4	29	23
Lead	DETSC 2301#	0.3	mg/kg	730	730	310	110	28	92	96
Mercury	DETSC 2325#	0.05	mg/kg	0.52	0.23	0.15	0.82	< 0.05	0.11	0.30
Nickel	DETSC 2301#	1	mg/kg	55	27	32	13	4.4	7.5	9.6
Zinc	DETSC 2301#	1	mg/kg	640	860	82000	130	560	74	74
<b>Inorganics</b>										
pH	DETSC 2008#		pH	8.2	9.8	8.3	8.6	8.8	10.0	8.6
Cyanide, Total	DETSC 2130#	0.1	mg/kg	2.3	0.3	0.2	0.1	< 0.1	< 0.1	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	3.3	4.6	4.2	1.1	1.0	1.2	0.2
Chloride Aqueous Extract	DETSC 2055	1	mg/l	12	110	35	9.5	15	52	41
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	64	120	59	22	24	130	28
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.17	0.13	0.11	0.03	0.04	0.15	0.09
<b>Petroleum Hydrocarbons</b>										
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

## Summary of Chemical Analysis Soil Samples

Our Ref 20-25989

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1779002	1779003	1779004	1779005	1779006	1779007	1779008
.Sample ID	TP25	TP26E	TP26E	TP27E	TP27E	TP28E	TP29A
Depth	0.40	0.40	1.60	0.70	1.20	1.00	0.50
Other ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/12/2020	15/12/2020	15/12/2020	15/12/2020	15/12/2020	15/12/2020	15/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
<b>PAHs</b>										
Naphthalene	DETSC 3301	0.1	mg/kg	1.8	0.7	0.5	0.1	< 0.1	0.3	0.2
Acenaphthylene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	1.3	0.5	0.4	0.1	< 0.1	0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	1.4	0.5	0.8	< 0.1	< 0.1	0.3	0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	11	3.5	4.3	0.2	0.1	2.4	0.7
Anthracene	DETSC 3301	0.1	mg/kg	2.7	0.6	1.0	< 0.1	< 0.1	0.4	0.2
Fluoranthene	DETSC 3301	0.1	mg/kg	16	5.9	7.8	0.3	0.2	2.6	2.6
Pyrene	DETSC 3301	0.1	mg/kg	15	5.8	6.9	0.2	0.1	2.6	2.4
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	7.5	3.0	3.6	0.1	< 0.1	1.1	1.0
Chrysene	DETSC 3301	0.1	mg/kg	7.8	3.3	3.8	0.2	< 0.1	1.2	1.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	6.5	3.1	3.1	0.2	< 0.1	1.0	0.9
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	3.8	1.8	1.8	0.2	< 0.1	0.6	0.6
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	7.8	3.4	3.5	0.2	< 0.1	1.1	0.8
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	5.4	3.0	2.5	0.3	< 0.1	0.7	0.6
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.9	0.5	0.4	0.1	< 0.1	0.2	0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	4.9	2.8	2.6	0.1	< 0.1	0.6	0.6
PAH Total	DETSC 3301	1.6	mg/kg	94	39	43	2.4	< 1.6	15	12
<b>PCBs</b>										
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg		< 0.01					
PCB 52	DETSC 3401#	0.01	mg/kg		< 0.01					
PCB 101	DETSC 3401#	0.01	mg/kg		< 0.01					
PCB 118	DETSC 3401#	0.01	mg/kg		< 0.01					
PCB 153	DETSC 3401#	0.01	mg/kg		< 0.01					
PCB 138	DETSC 3401#	0.01	mg/kg		< 0.01					
PCB 180	DETSC 3401#	0.01	mg/kg		< 0.01					
PCB 7 Total	DETSC 3401#	0.01	mg/kg		< 0.01					
<b>Phenols</b>										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

## Summary of Chemical Analysis

### Soil Samples

Our Ref 20-25989

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1779009	1779010
.Sample ID	TP30	TP30
Depth	0.80	3.50
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	15/12/2020	15/12/2020
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>Metals</b>					
Arsenic	DETSC 2301#	0.2	mg/kg	6.1	5.3
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.3	1.4
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.1
Chromium	DETSC 2301#	0.15	mg/kg	6.2	19
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	12	18
Lead	DETSC 2301#	0.3	mg/kg	24	15
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	7.6	21
Zinc	DETSC 2301#	1	mg/kg	30	49
<b>Inorganics</b>					
pH	DETSC 2008#		pH	8.5	7.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	0.9	0.2
Chloride Aqueous Extract	DETSC 2055	1	mg/l	19	780
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	21	410
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.03	0.14
<b>Petroleum Hydrocarbons</b>					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	0.14
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	0.27
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	0.25
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	0.04
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01

## Summary of Chemical Analysis

### Soil Samples

Our Ref 20-25989

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1779009	1779010
Sample ID	TP30	TP30
Depth	0.80	3.50
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	15/12/2020	15/12/2020
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>PAHs</b>					
Naphthalene	DETSC 3301	0.1	mg/kg	2.0	0.3
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	2.0	< 1.6
<b>PCBs</b>					
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg		
PCB 52	DETSC 3401#	0.01	mg/kg		
PCB 101	DETSC 3401#	0.01	mg/kg		
PCB 118	DETSC 3401#	0.01	mg/kg		
PCB 153	DETSC 3401#	0.01	mg/kg		
PCB 138	DETSC 3401#	0.01	mg/kg		
PCB 180	DETSC 3401#	0.01	mg/kg		
PCB 7 Total	DETSC 3401#	0.01	mg/kg		
<b>Phenols</b>					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3

## Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 20-25989

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1779002	1779003
Sample ID	TP25	TP26E
Depth	0.40	0.40
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	03/12/2020	15/12/2020
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>VOCs</b>					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

## Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 20-25989

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1779002	1779003
Sample ID	TP25	TP26E
Depth	0.40	0.40
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	03/12/2020	15/12/2020
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
<b>SVOCs</b>					
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	0.2	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	0.7	0.7
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	1.0	1.0
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1



## Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 20-25989

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1779002	1779003
Sample ID	TP25	TP26E
Depth	0.40	0.40
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	03/12/2020	15/12/2020
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Di-n-octylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	2.5	1.8
<b>SVOC TICs</b>					
1,1'-Biphenyl, 2-fluoro- (TIC)	DETSC 3433*		mg/kg		1.26160473768609
1H-Indene, 1-(phenylmethylene)- (TIC)	DETSC 3433*		mg/kg	0.773233582594946	
4-Azapyrene (TIC)	DETSC 3433*		mg/kg	1.09973737130001	
5H-Indeno[1,2-b]pyridine (TIC)	DETSC 3433*		mg/kg	1.97865160887303	2.74393103046789
7H-Benz[de]anthracen-7-one (TIC)	DETSC 3433*		mg/kg		2.74208930263081
9H-Xanthene (TIC)	DETSC 3433*		mg/kg	0.231564049494638	
Benzo(c)carbazole (TIC)	DETSC 3433*		mg/kg	1.21303899467517	2.55154191783142
Benzo[e]pyrene (TIC)	DETSC 3433*		mg/kg	16.0253979272487	13.5225770429684
Benzo[f]isoquinoline (TIC)	DETSC 3433*		mg/kg	0.349973398343472	
Cyclopenta(cd)pyrene, 3,4-dihydro- (TIC)	DETSC 3433*		mg/kg	1.33783688949717	
Cyclotetrasiloxane, octamethyl- (TIC)	DETSC 3433*		mg/kg		
Dibenz[a,j]anthracene (TIC)	DETSC 3433*		mg/kg		1.68046022026642
Naphthacene (TIC)	DETSC 3433*		mg/kg		
none (TIC)	DETSC 3433*		mg/kg		
Triphenylene (TIC)	DETSC 3433*		mg/kg	9.09248249977443	18.6449831439564

## Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 20-25989

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1779004	1779010
Sample ID	TP26E	TP30
Depth	1.60	3.50
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	15/12/2020	15/12/2020
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>VOCs</b>					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	0.20
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	0.04
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	0.02
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	0.03
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	0.04
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

## Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 20-25989

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1779004	1779010
Sample ID	TP26E	TP30
Depth	1.60	3.50
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	15/12/2020	15/12/2020
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	0.04
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
<b>SVOCs</b>					
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	0.2	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	0.2	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1

## Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 20-25989

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1779004	1779010
Sample ID	TP26E	TP30
Depth	1.60	3.50
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	15/12/2020	15/12/2020
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Di-n-octylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	0.4	< 0.1
<b>SVOC TICs</b>					
1,1'-Biphenyl, 2-fluoro- (TIC)	DETSC 3433*		mg/kg	1.31776262727879	
1H-Indene, 1-(phenylmethylene)- (TIC)	DETSC 3433*		mg/kg		
4-Azapyrene (TIC)	DETSC 3433*		mg/kg		
5H-Indeno[1,2-b]pyridine (TIC)	DETSC 3433*		mg/kg		
7H-Benz[de]anthracen-7-one (TIC)	DETSC 3433*		mg/kg		
9H-Xanthene (TIC)	DETSC 3433*		mg/kg		
Benzo(c)carbazole (TIC)	DETSC 3433*		mg/kg		
Benzo[e]pyrene (TIC)	DETSC 3433*		mg/kg		
Benzo[f]isoquinoline (TIC)	DETSC 3433*		mg/kg		
Cyclopenta(cd)pyrene, 3,4-dihydro- (TIC)	DETSC 3433*		mg/kg		
Cyclotetrasiloxane, octamethyl- (TIC)	DETSC 3433*		mg/kg	1.30019794994414	
Dibenz[a,j]anthracene (TIC)	DETSC 3433*		mg/kg		
Naphthacene (TIC)	DETSC 3433*		mg/kg	3.21998493109461	
none (TIC)	DETSC 3433*		mg/kg		None
Triphenylene (TIC)	DETSC 3433*		mg/kg		

## Summary of Asbestos Analysis

### Soil Samples

*Our Ref* 20-25989

*Client Ref* 3899

*Contract Title* Wastefront, Sunderland Docks

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1779002	TP25 0.40	SOIL	Chrysotile	Chrysotile Present as bundles	A Christodoulou
1779003	TP26E 0.40	SOIL	Chrysotile Amosite	Chrysotile and Amosite present as bundles	A Christodoulou
1779004	TP26E 1.60	SOIL	Chrysotile	Chrysotile present in visible insulation board	A Christodoulou
1779005	TP27E 0.70	SOIL	NAD	none	A Christodoulou
1779006	TP27E 1.20	SOIL	NAD	none	A Christodoulou
1779007	TP28E 1.00	SOIL	NAD	none	A Christodoulou
1779008	TP29A 0.50	SOIL	Chrysotile	Chrysotile Present as bundles	A Christodoulou
1779009	TP30 0.80	SOIL	NAD	none	A Christodoulou
1779010	TP30 3.50	SOIL	NAD	none	A Christodoulou

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: \* -not included in laboratory scope of accreditation.

## Information in Support of the Analytical Results

Our Ref 20-25989

Client Ref 3899

Contract Wastefront, Sunderland Docks

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1779002	TP25 0.40 SOIL	03/12/20	GJ 250ml, PT 1L	pH + Conductivity (7 days), VOC (7 days)	
1779003	TP26E 0.40 SOIL	15/12/20	GJ 250ml, PT 1L		
1779004	TP26E 1.60 SOIL	15/12/20	GJ 250ml, PT 1L		
1779005	TP27E 0.70 SOIL	15/12/20	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1779006	TP27E 1.20 SOIL	15/12/20	GJ 250ml, PT 1L		
1779007	TP28E 1.00 SOIL	15/12/20	GJ 250ml, PT 1L		
1779008	TP29A 0.50 SOIL	15/12/20	GJ 250ml, PT 1L		
1779009	TP30 0.80 SOIL	15/12/20	GJ 250ml, PT 1L		
1779010	TP30 3.50 SOIL	15/12/20	GJ 250ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



## Certificate of Analysis

*Certificate Number* 20-26500-1

*Issued:* 15-Jan-21

*Client* FWS Consultants  
Unit 2 City West Business Park  
St Johns Road  
Meadowfield Industrial Estate  
Co Durham  
DH7 8ER

*Our Reference* 20-26500-1

*Client Reference* 3899

*Order No* 20203722

*Contract Title* Wastefront, Sunderland Docks

*Description* 31 Soil samples, 2 Leachate samples, 1 Water sample.

*Date Received* 24-Dec-20

*Date Started* 24-Dec-20

*Date Completed* 15-Jan-21

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* **This report supersedes 20-26500, extra testing added.**

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

*Approved By*

Adam Fenwick  
Contracts Manager



2139



DRAFT



# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-26500-1

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1782599	1782600	1782601	1782602	1782603	1782604
Sample ID	TP31	TP32	TP33	TP34	TP34	TP35
Depth	0.20	0.60	0.30	0.30	0.70	0.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	22/12/2020	22/12/2020	22/12/2020	22/12/2020	22/12/2020	22/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic	DETSC 2301#	0.2	mg/kg	7.8	6.9	26	7.9	4.2	5.8
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.9	2.8	2.5	0.5	0.3	1.6
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.3	0.4	0.4	0.1	0.4
Chromium	DETSC 2301#	0.15	mg/kg	13	13	16	9.3	6.2	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	36	31	120	47	17	25
Lead	DETSC 2301#	0.3	mg/kg	80	48	93	47	52	31
Mercury	DETSC 2325#	0.05	mg/kg	0.29	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	14	19	27	11	7.3	11
Zinc	DETSC 2301#	1	mg/kg	270	110	160	100	50	87
<b>Inorganics</b>									
pH	DETSC 2008#		pH	10.0	10.1	9.9	9.1	8.6	10.3
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3	< 0.1	0.1	< 0.1	< 0.1	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	3.4	1.1	3.8	0.9	1.5	0.6
Chloride Aqueous Extract	DETSC 2055	1	mg/l	37	55	11	6.6	4.9	16
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	120	520	530	38	14	370
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.25	0.38	0.34	0.06	0.05	0.32
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	1.8
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	1.6	< 1.5	< 1.5	< 1.5	< 1.5	2.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	35	< 3.4	< 3.4	< 3.4	< 3.4	40
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	37	< 10	< 10	< 10	< 10	45
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	2.6	< 0.9	< 0.9	< 0.9	< 0.9	3.1
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	4.3	< 0.5	< 0.5	< 0.5	< 0.5	3.4
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	13	< 0.6	< 0.6	< 0.6	< 0.6	5.0
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	100	< 1.4	< 1.4	< 1.4	< 1.4	90
Aromatic C5-C35	DETSC 3072*	10	mg/kg	120	< 10	< 10	< 10	< 10	100
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	160	< 10	< 10	< 10	< 10	150
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

## Summary of Chemical Analysis Soil Samples

Our Ref 20-26500-1

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1782599	1782600	1782601	1782602	1782603	1782604
Sample ID	TP31	TP32	TP33	TP34	TP34	TP35
Depth	0.20	0.60	0.30	0.30	0.70	0.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	22/12/2020	22/12/2020	22/12/2020	22/12/2020	22/12/2020	22/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>PAHs</b>									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.1	0.2	< 0.1	< 1.0
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 1.0
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 1.0
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.1	0.1	0.1	< 1.0
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	0.3	0.5	0.2	0.9	1.3
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	0.2	< 0.1	0.2	< 1.0
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	1.1	0.9	0.3	1.2	2.3
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.9	0.7	0.2	0.9	2.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	1.0	0.6	0.2	0.6	< 1.0
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	1.2	0.5	0.2	0.5	< 1.0
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	1.4	0.6	0.3	0.6	< 1.0
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.7	0.5	0.3	0.4	< 1.0
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	1.5	0.6	0.2	0.6	< 1.0
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	1.2	0.8	0.5	0.8	< 1.0
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.3	0.2	0.1	0.2	< 1.0
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	1.0	1.0	0.5	0.6	< 1.0
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	11	7.5	3.6	7.8	< 16.0
<b>Phenols</b>									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-26500-1

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1782605	1782606	1782607	1782608	1782609	1782610
Sample ID	BH21	BH22	BH23	BH16	BH16	BH16
Depth	6.50	3.00	5.00	6.00	7.00	11.00-1.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	22/12/2020	22/12/2020	22/12/2020	15/12/2020	16/12/2020	16/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic	DETSC 2301#	0.2	mg/kg	7.6	4.1	8.1	10	13	
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	2.8	0.9	0.8	0.9	1.6	
Cadmium	DETSC 2301#	0.1	mg/kg	0.1	0.4	0.4	0.2	0.3	
Chromium	DETSC 2301#	0.15	mg/kg	11	11	8.7	14	11	
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Copper	DETSC 2301#	0.2	mg/kg	49	230	79	160	100	
Lead	DETSC 2301#	0.3	mg/kg	47	56	91	180	170	
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	0.25	0.21	0.16	
Nickel	DETSC 2301#	1	mg/kg	11	9.8	12	17	18	
Zinc	DETSC 2301#	1	mg/kg	93	140	130	180	150	
<b>Inorganics</b>									
pH	DETSC 2008#		pH	9.1	12.3	9.6	8.6	10.0	8.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	0.4	0.8	0.5	
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Organic matter	DETSC 2002#	0.1	%	< 0.1	1.0	0.1	0.9	0.4	
Chloride Aqueous Extract	DETSC 2055	1	mg/l	1200	160	340	280	370	
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	320	< 10	150	300	650	390
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.19	0.37	0.09	1.7	0.42	0.21
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	1.8	< 0.9	< 0.9	< 0.9	
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	6.5	< 0.5	< 0.5	< 0.5	
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	27	< 0.6	< 0.6	< 0.6	
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	110	< 1.4	< 1.4	< 1.4	
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	150	< 10	< 10	< 10	
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	150	< 10	< 10	< 10	
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	

## Summary of Chemical Analysis Soil Samples

Our Ref 20-26500-1

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1782605	1782606	1782607	1782608	1782609	1782610
Sample ID	BH21	BH22	BH23	BH16	BH16	BH16
Depth	6.50	3.00	5.00	6.00	7.00	11.00-1.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	22/12/2020	22/12/2020	22/12/2020	15/12/2020	16/12/2020	16/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>PAHs</b>									
Naphthalene	DETSC 3301	0.1	mg/kg	0.1	0.2	0.2	< 0.1	< 0.1	
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	0.5	< 0.1	< 0.1	< 0.1	
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	1.6	0.3	0.1	< 0.1	
Fluorene	DETSC 3301	0.1	mg/kg	0.1	2.4	0.3	0.1	< 0.1	
Phenanthrene	DETSC 3301	0.1	mg/kg	0.1	17	1.6	0.6	0.2	
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	3.8	0.3	0.2	< 0.1	
Fluoranthene	DETSC 3301	0.1	mg/kg	0.1	18	2.0	0.9	0.3	
Pyrene	DETSC 3301	0.1	mg/kg	0.1	14	1.8	0.6	0.2	
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	7.5	0.9	0.5	0.1	
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	6.9	0.9	0.5	0.2	
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	5.6	0.8	0.4	0.3	
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	3.4	0.6	0.3	0.3	
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	5.7	0.9	0.5	0.2	
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	4.4	0.9	0.7	0.6	
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.9	0.2	0.1	0.2	
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	3.4	0.5	0.6	0.7	
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	96	12	6.1	3.3	
<b>Phenols</b>									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	

## Summary of Chemical Analysis Soil Samples

Our Ref 20-26500-1

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1782611	1782612	1782613	1782614	1782615	1782616
Sample ID	BH15	BH15	BH13	BH1	BH12	BH2
Depth	4.00	6.50	5.00	3.00	4.00	2.00
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	16/12/2020	11/12/2020	10/12/2020	02/12/2020	n/s	03/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic	DETSC 2301#	0.2	mg/kg	2.0					
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.4					
Cadmium	DETSC 2301#	0.1	mg/kg	0.1					
Chromium	DETSC 2301#	0.15	mg/kg	3.9					
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0					
Copper	DETSC 2301#	0.2	mg/kg	9.0					
Lead	DETSC 2301#	0.3	mg/kg	20					
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05					
Nickel	DETSC 2301#	1	mg/kg	3.3					
Zinc	DETSC 2301#	1	mg/kg	40					
<b>Inorganics</b>									
pH	DETSC 2008#		pH	8.7	8.8	8.9	8.8	8.9	8.7
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2					
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1					
Organic matter	DETSC 2002#	0.1	%	< 0.1					
Chloride Aqueous Extract	DETSC 2055	1	mg/l	100					
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	91	320	190	66	180	28
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.06	0.12	0.08	0.07	0.08	0.12
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	7.2					
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	9.0					
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	6.7					
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	18					
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	24					
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5					
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	13					
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	79					
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01					
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	0.94					
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	3.5					
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9					
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5					
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6					
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4					
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10					
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	83					
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01					
Ethylbenzene	DETSC 3321#	0.01	mg/kg	0.29					
Toluene	DETSC 3321#	0.01	mg/kg	0.94					
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01					
MTBE	DETSC 3321	0.01	mg/kg	< 0.01					

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-26500-1

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1782611	1782612	1782613	1782614	1782615	1782616
Sample ID	BH15	BH15	BH13	BH1	BH12	BH2
Depth	4.00	6.50	5.00	3.00	4.00	2.00
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	16/12/2020	11/12/2020	10/12/2020	02/12/2020	n/s	03/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
<b>PAHs</b>								
Naphthalene	DETSC 3301	0.1	mg/kg	0.4				
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1				
Acenaphthene	DETSC 3301	0.1	mg/kg	0.2				
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1				
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1				
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1				
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1				
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1				
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1				
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1				
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1				
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1				
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1				
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1				
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1				
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1				
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6				
<b>Phenols</b>								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3				

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-26500-1

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1782617	1782618	1782619	1782620
Sample ID	BH2	BH3	BH4	BH4
Depth	7.00	5.00	2.00	9.50
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/12/2020	08/12/2020	04/12/2020	07/12/2020
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
<b>Metals</b>							
Arsenic	DETSC 2301#	0.2	mg/kg				
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg				
Cadmium	DETSC 2301#	0.1	mg/kg				
Chromium	DETSC 2301#	0.15	mg/kg				
Chromium, Hexavalent	DETSC 2204*	1	mg/kg				
Copper	DETSC 2301#	0.2	mg/kg				
Lead	DETSC 2301#	0.3	mg/kg				
Mercury	DETSC 2325#	0.05	mg/kg				
Nickel	DETSC 2301#	1	mg/kg				
Zinc	DETSC 2301#	1	mg/kg				
<b>Inorganics</b>							
pH	DETSC 2008#		pH	9.0	8.4	7.7	8.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg				
Cyanide, Free	DETSC 2130#	0.1	mg/kg				
Organic matter	DETSC 2002#	0.1	%				
Chloride Aqueous Extract	DETSC 2055	1	mg/l				
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	220	330	1600	540
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.08	0.53	0.97	0.17
<b>Petroleum Hydrocarbons</b>							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg				
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg				
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg				
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg				
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg				
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg				
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg				
Aliphatic C5-C35	DETSC 3072*	10	mg/kg				
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg				
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg				
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg				
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg				
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg				
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg				
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg				
Aromatic C5-C35	DETSC 3072*	10	mg/kg				
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg				
Benzene	DETSC 3321#	0.01	mg/kg				
Ethylbenzene	DETSC 3321#	0.01	mg/kg				
Toluene	DETSC 3321#	0.01	mg/kg				
Xylene	DETSC 3321#	0.01	mg/kg				
MTBE	DETSC 3321	0.01	mg/kg				

# Summary of Chemical Analysis

## Soil Samples

Our Ref 20-26500-1

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1782617	1782618	1782619	1782620
Sample ID	BH2	BH3	BH4	BH4
Depth	7.00	5.00	2.00	9.50
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/12/2020	08/12/2020	04/12/2020	07/12/2020
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
<b>PAHs</b>							
Naphthalene	DETSC 3301	0.1	mg/kg				
Acenaphthylene	DETSC 3301	0.1	mg/kg				
Acenaphthene	DETSC 3301	0.1	mg/kg				
Fluorene	DETSC 3301	0.1	mg/kg				
Phenanthrene	DETSC 3301	0.1	mg/kg				
Anthracene	DETSC 3301	0.1	mg/kg				
Fluoranthene	DETSC 3301	0.1	mg/kg				
Pyrene	DETSC 3301	0.1	mg/kg				
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg				
Chrysene	DETSC 3301	0.1	mg/kg				
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg				
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg				
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg				
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg				
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg				
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg				
PAH Total	DETSC 3301	1.6	mg/kg				
<b>Phenols</b>							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg				



# WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 20-26500-1

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Sample Id TP33 0.30

Sample Numbers 1782601 1784644 1784645

Date Analysed 13/01/2021

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	2.6	3	5	6
DETSC 2003# Loss On Ignition	%	3.5	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	7.5	100	n/a	n/a
DETSC 2008# pH	pH Units	9.9	n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1.0	n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1.0	n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
	DETSC 2306 Arsenic as As	0.94	0.42	< 0.002	< 0.01	0.5	2
DETSC 2306 Barium as Ba	4.7	1.4	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	1.5	0.72	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	6	2.3	0.012	0.028	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.6	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.42	< 0.090	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.44	0.19	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.57	0.33	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	23	3	0.046	0.056	4	50	200
DETSC 2055 Chloride as Cl	4100	2200	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	25000	12000	50	136.8	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	67000	45000	134	478.4	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	2000	< 2000	< 10	< 50	500	800	1000

### Additional Information

DETSC 2008 pH	7.8	8.7
DETSC 2009 Conductivity uS/cm	96.2	64.5
* Temperature*	17.0	16.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.108

### Stage 1

Volume of Leachant L2*	0.185
Volume of Eluate VE1*	0.14

### Stage 2

Volume of Leachant L8*	0.867
Volume of Eluate VE2*	0.83

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive Hazardous Waste

**Disclaimer:** The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

\* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

## Summary of Chemical Analysis

### Water Samples

Our Ref 20-26500-1

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1782630
Sample ID	BH16
Depth	
Other ID	
Sample Type	WATER
Sampling Date	16/12/2020
Sampling Time	n/s

Test	Method	LOD	Units	
<b>Metals</b>				
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	11
Boron, Dissolved	DETSC 2306*	12	ug/l	1000
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	1.2
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.7
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.30
Manganese, Dissolved	DETSC 2306	0.22	ug/l	180
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	1.9
Zinc, Dissolved	DETSC 2306	1.3	ug/l	2.0
<b>Inorganics</b>				
pH	DETSC 2008		pH	7.8
Cyanide, Total	DETSC 2130	40	ug/l	< 40
Cyanide, Free	DETSC 2130	0.02	mg/l	< 0.02
Hardness	DETSC 2303	0.1	mg/l	1220
Chloride	DETSC 2055	0.1	mg/l	2000
Sulphate as SO4	DETSC 2055	0.1	mg/l	220
<b>Petroleum Hydrocarbons</b>				
EPH (C10-C40)	DETSC 3311	10	ug/l	160
<b>PAHs</b>				
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	0.08
Fluorene	DETSC 3304	0.01	ug/l	0.02
Phenanthrene	DETSC 3304	0.01	ug/l	0.02
Anthracene	DETSC 3304	0.01	ug/l	0.02
Fluoranthene	DETSC 3304	0.01	ug/l	0.09
Pyrene	DETSC 3304	0.01	ug/l	0.07
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	0.02
Chrysene	DETSC 3304	0.01	ug/l	0.02
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	0.02
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	0.44
<b>Phenols</b>				
Phenol - Monohydric	DETSC 2130	0.1	mg/l	< 0.1

## Summary of Asbestos Analysis

### Soil Samples

Our Ref 20-26500-1

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1782599	TP31 0.20	SOIL	NAD	none	Rebecca Burgess
1782600	TP32 0.60	SOIL	Amosite	Amosite in microscopic loose fibrous asbestos debris	Rebecca Burgess
1782601	TP33 0.30	SOIL	NAD	none	Rebecca Burgess
1782602	TP34 0.30	SOIL	NAD	none	Rebecca Burgess
1782603	TP34 0.70	SOIL	NAD	none	Rebecca Burgess
1782604	TP35 0.50	SOIL	NAD	none	Rebecca Burgess
1782605	BH21 6.50	SOIL	NAD	none	Rebecca Burgess
1782606	BH22 3.00	SOIL	NAD	none	Rebecca Burgess
1782607	BH23 5.00	SOIL	NAD	none	Rebecca Burgess
1782608	BH16 6.00	SOIL	Chrysotile	bundle of Chrysotile fibres	Rebecca Burgess
1782609	BH16 7.00	SOIL	Crocidolite	Crocidolite in microscopic composite resin debris	Rebecca Burgess
1782611	BH15 4.00	SOIL	NAD	none	Rebecca Burgess
1782621	BH16 0.50	SOIL	NAD	none	Rebecca Burgess
1782622	BH16 1.50	SOIL	NAD	none	Rebecca Burgess
1782623	BH15 1.00	SOIL	NAD	none	Rebecca Burgess
1782624	BH2 1.30	SOIL	NAD	none	Rebecca Burgess
1782625	BH4 1.00	SOIL	NAD	none	Rebecca Burgess
1782626	BH4 2.70	SOIL	NAD	none	Rebecca Burgess
1782627	BH7 1.00	SOIL	Chrysotile	Chrysotile in microscopic loose fibrous asbestos debris	Rebecca Burgess
1782628	BH15 6.00	SOIL	NAD	none	Rebecca Burgess
1782629	BH12 5.00	SOIL	NAD	none	Rebecca Burgess

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: \* -not included in laboratory scope of accreditation.

## Information in Support of the Analytical Results

Our Ref 20-26500-1

Client Ref 3899

Contract Wastefront, Sunderland Docks

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1782599	TP31 0.20 SOIL	22/12/20	GJ 250ml, PT 1L		
1782600	TP32 0.60 SOIL	22/12/20	GJ 250ml, PT 1L		
1782601	TP33 0.30 SOIL	22/12/20	GJ 250ml, PT 1L		
1782602	TP34 0.30 SOIL	22/12/20	GJ 250ml, PT 1L		
1782603	TP34 0.70 SOIL	22/12/20	GJ 250ml, PT 1L		
1782604	TP35 0.50 SOIL	22/12/20	GJ 250ml, PT 1L		
1782605	BH21 6.50 SOIL	22/12/20	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1782606	BH22 3.00 SOIL	22/12/20	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1782607	BH23 5.00 SOIL	22/12/20	PT 1L		Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1782608	BH16 6.00 SOIL	15/12/20	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1782609	BH16 7.00 SOIL	16/12/20	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1782610	BH16 11.00-1.50 SOIL	16/12/20	PG	pH + Conductivity (7 days)	
1782611	BH15 4.00 SOIL	16/12/20	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1782612	BH15 6.50 SOIL	11/12/20	PG	pH + Conductivity (7 days)	
1782613	BH13 5.00 SOIL	10/12/20	PT 1L	pH + Conductivity (7 days)	
1782614	BH1 3.00 SOIL	02/12/20	PT 1L	pH + Conductivity (7 days)	
1782615	BH12 4.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1782616	BH2 2.00 SOIL	03/12/20	PT 1L	pH + Conductivity (7 days)	
1782617	BH2 7.00 SOIL	03/12/20	PT 1L	pH + Conductivity (7 days)	
1782618	BH3 5.00 SOIL	08/12/20	PT 1L	pH + Conductivity (7 days)	
1782619	BH4 2.00 SOIL	04/12/20	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1782620	BH4 9.50 SOIL	07/12/20	PT 1L	pH + Conductivity (7 days)	
1782621	BH16 0.50 SOIL		PT 1L		
1782622	BH16 1.50 SOIL		PT 1L		
1782623	BH15 1.00 SOIL	10/12/20	PG		
1782624	BH2 1.30 SOIL	03/12/20	PG		
1782625	BH4 1.00 SOIL	04/12/20	PG		
1782626	BH4 2.70 SOIL		PT 1L		
1782627	BH7 1.00 SOIL		PG		
1782628	BH15 6.00 SOIL		PT 1L		
1782629	BH12 5.00 SOIL		PT 1L		
1782630	BH16 WATER	16/12/20	GB 1L	Hardness (7 days), pH/Cond/TDS (1 days), PAH MS (4 days), EPH (4 days)	
1784644	TP33 0.30 LEACHATE	22/12/20	GJ 250ml, PT 1L		
1784645	TP33 0.30 LEACHATE	22/12/20	GJ 250ml, PT 1L		

## Information in Support of the Analytical Results

*Our Ref* 20-26500-1

*Client Ref* 3899

*Contract* Wastefront, Sunderland Docks

Key: G-Glass P-Plastic J-Jar T-Tub G-Bag B-Bottle

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



## Certificate of Analysis

*Certificate Number* 21-00194

*Issued:* 12-Jan-21

*Client* FWS Consultants  
Unit 2 City West Business Park  
St Johns Road  
Meadowfield Industrial Estate  
Co Durham  
DH7 8ER

*Our Reference* 21-00194

*Client Reference* 3899

*Order No* 2020/3722

*Contract Title* Wastefront, Sunderland

*Description* 7 Soil samples.

*Date Received* 07-Jan-21

*Date Started* 07-Jan-21

*Date Completed* 12-Jan-21

*Test Procedures* Identified by prefix DETSn (details on request).

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

*Approved By*

Adam Fenwick  
Contracts Manager



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## Summary of Chemical Analysis

### Soil Samples

Our Ref 21-00194

Client Ref 3899

Contract Title Wastefront, Sunderland

Lab No	1784038	1784039	1784040	1784041
Sample ID	BH16	BH13	BH12	BH7
Depth	12.50	1.00	7.00	2.00
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	16/12/2020	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
<b>Inorganics</b>							
pH	DETSC 2008#		pH	8.7	8.5	8.5	8.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	110	98	120	150
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.06	0.14	0.09	0.13

## Summary of Asbestos Analysis

### Soil Samples

*Our Ref* 21-00194

*Client Ref* 3899

*Contract Title* Wastefront, Sunderland

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1784042	BH15 1.50	SOIL	Chrysotile	bundle of Chrysotile fibres	Colin Patrick
1784043	BH13 3.00	SOIL	NAD	none	Colin Patrick
1784044	BH12 0.50	SOIL	Chrysotile	bundle of Chrysotile fibres	Colin Patrick

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: \* -not included in laboratory scope of accreditation.

DRAFT



## Information in Support of the Analytical Results

Our Ref 21-00194  
 Client Ref 3899  
 Contract Wastefront, Sunderland

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1784038	BH16 12.50 SOIL	16/12/20	PT 1L	pH + Conductivity (7 days)	
1784039	BH13 1.00 SOIL		GJ 250ml	Sample date not supplied, Anions 2:1 (30 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1784040	BH12 7.00 SOIL		GJ 250ml	Sample date not supplied, Anions 2:1 (30 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1784041	BH7 2.00 SOIL		PG	Sample date not supplied, Anions 2:1 (30 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1784042	BH15 1.50 SOIL		GJ 250ml		
1784043	BH13 3.00 SOIL	08/12/20	PT 1L		
1784044	BH12 0.50 SOIL	08/12/20	PG		

Key: P-Plastic T-Tub G-Glass J-Jar G-Bag

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### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



## Certificate of Analysis

**Certificate Number** 21-01130

**Issued:** 27-Jan-21

**Client** FWS Consultants  
Unit 2 City West Business Park  
St Johns Road  
Meadowfield Industrial Estate  
Co Durham  
DH7 8ER

**Our Reference** 21-01130

**Client Reference** 3899

**Order No** 2020/3789

**Contract Title** Wastefront, Sunderland Docks

**Description** 2 Soil samples, 2 Water samples.

**Date Received** 20-Jan-21

**Date Started** 20-Jan-21

**Date Completed** 27-Jan-21

**Test Procedures** Identified by prefix DETSn (details on request).

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

**Approved By**

Adam Fenwick  
Contracts Manager



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## Summary of Chemical Analysis

### Soil Samples

Our Ref 21-01130

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1789646	1789647
Sample ID	BH27	BH30
Depth	4.00	4.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	19/01/2021	19/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>Metals</b>					
Arsenic	DETSC 2301#	0.2	mg/kg	20	11
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.9	2.3
Cadmium	DETSC 2301#	0.1	mg/kg	1.5	0.3
Chromium	DETSC 2301#	0.15	mg/kg	20	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	240	68
Lead	DETSC 2301#	0.3	mg/kg	340	200
Mercury	DETSC 2325#	0.05	mg/kg	0.22	0.52
Nickel	DETSC 2301#	1	mg/kg	23	14
Zinc	DETSC 2301#	1	mg/kg	250	190
<b>Inorganics</b>					
pH	DETSC 2008#		pH	8.9	8.3
Cyanide, Total	DETSC 2130#	0.1	mg/kg	4.4	0.9
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	2.1	15
Chloride Aqueous Extract	DETSC 2055	1	mg/l	6.7	11
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	280	160
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.22	0.15
<b>Petroleum Hydrocarbons</b>					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	5.5
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	37
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	2.3
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	27
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	90
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	71
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	34
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	270
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	0.23
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	3.8
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	13
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	17
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	280
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	0.23
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	1.9
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	3.8
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	1.6
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01

## Summary of Chemical Analysis

### Soil Samples

Our Ref 21-01130

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1789646	1789647
Sample ID	BH27	BH30
Depth	4.00	4.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	19/01/2021	19/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>PAHs</b>					
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	1.0
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	3.0
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	0.2
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	0.4
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	1.3
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.7
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	2.5
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	1.9
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	1.3
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	1.5
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	1.4
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	1.0
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	1.8
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	1.2
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.2
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	1.4
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	21
<b>Phenols</b>					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.5	< 0.3

## Summary of Chemical Analysis

### Soil Samples

Our Ref 21-01130

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1789646	1789647
Sample ID	BH27	BH30
Depth	4.00	4.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	19/01/2021	19/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>VOCs</b>					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.10
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	0.45
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	1.1
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	1.0

## Summary of Chemical Analysis

### Soil Samples

Our Ref 21-01130

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1789646	1789647
Sample ID	BH27	BH30
Depth	4.00	4.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	19/01/2021	19/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	1.0
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	0.26
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.10
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.10
<b>SVOCs</b>					
Phenol	DETSC 3433	0.1	mg/kg	0.2	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	0.3	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	1.0	2.8
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	2.1	0.3
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1

## Summary of Chemical Analysis Soil Samples

Our Ref 21-01130

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1789646	1789647
Sample ID	BH27	BH30
Depth	4.00	4.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	19/01/2021	19/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	1.9
Di-n-octylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	1.8	0.4
<b>SVOC TICs</b>					
1H-Indene, 1-(phenylmethylene)- (TIC)	DETSC 3433*		mg/kg	25708697	
5H-Indeno[1,2-b]pyridine (TIC)	DETSC 3433*		mg/kg	22159912	
9,10-Anthracenedione (TIC)	DETSC 3433*		mg/kg	48921195	
9H-Fluoren-9-one (TIC)	DETSC 3433*		mg/kg	91530177	
Dibenzofuran (TIC)	DETSC 3433*		mg/kg	72860944	
Dodecane, 2,6,10-trimethyl- (TIC)	DETSC 3433*		mg/kg	1.22162523196995	
Heptane, 2,5-dimethyl- (TIC)	DETSC 3433*		mg/kg	1.13492004242494	
Naphtho(2,1,8-def)quinoline (TIC)	DETSC 3433*		mg/kg	03267453	
Octane, 4-methyl- (TIC)	DETSC 3433*		mg/kg	1.05767697413554	
Pentane, 2,3,4-trimethyl- (TIC)	DETSC 3433*		mg/kg	1.17764094562903	

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-01130

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1789644	1789645
Sample ID	BH27	BH30
Depth		
Other ID		
Sample Type	WATER	WATER
Sampling Date	19/01/2021	19/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>Metals</b>					
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	30	7.9
Boron, Dissolved	DETSC 2306*	12	ug/l	430	620
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	0.04
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.73	0.49
Copper, Dissolved	DETSC 2306	0.4	ug/l	3.0	1.5
Lead, Dissolved	DETSC 2306	0.09	ug/l	6.0	100
Manganese, Dissolved	DETSC 2306	0.22	ug/l	610	810
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.02	0.03
Nickel, Dissolved	DETSC 2306	0.5	ug/l	12	3.7
Zinc, Dissolved	DETSC 2306	1.3	ug/l	25	76
<b>Inorganics</b>					
pH	DETSC 2008		pH	7.2	7.3
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40
Cyanide, Free	DETSC 2130	0.02	mg/l	< 0.02	< 0.02
Hardness	DETSC 2303	0.1	mg/l	1000	1440
Chloride	DETSC 2055	0.1	mg/l	200	1400
Sulphate as SO4	DETSC 2055	0.1	mg/l	280	160
<b>Petroleum Hydrocarbons</b>					
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	170	5900
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	81	3200
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	6.7	72
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	5500
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	15000
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	12000
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	2200
Aliphatic C5-C35	DETSC 3072*	10	ug/l	260	43000
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	350
Aromatic C7-C8	DETSC 3322	0.1	ug/l	10	220
Aromatic C8-C10	DETSC 3322	0.1	ug/l	27	3400
Aromatic C10-C12	DETSC 3072*	1	ug/l	35	5300
Aromatic C12-C16	DETSC 3072*	1	ug/l	38	9200
Aromatic C16-C21	DETSC 3072*	1	ug/l	32	11000
Aromatic C21-C35	DETSC 3072*	1	ug/l	9.9	3200
Aromatic C5-C35	DETSC 3072*	10	ug/l	150	33000
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	410	76000
EPH (C10-C40)	DETSC 3311	10	ug/l	120	70000
Benzene	DETSC 3322	1	ug/l	< 1.0	350
Toluene	DETSC 3322	1	ug/l	10	220
Ethylbenzene	DETSC 3322	1	ug/l	5.2	1100
Xylene	DETSC 3322	1	ug/l	2.8	170
MTBE	DETSC 3322	1	ug/l	71	68



## Summary of Chemical Analysis

### Water Samples

Our Ref 21-01130

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1789644	1789645
Sample ID	BH27	BH30
Depth		
Other ID		
Sample Type	WATER	WATER
Sampling Date	19/01/2021	19/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>PAHs</b>					
Naphthalene	DETSC 3304	0.05	ug/l	5.2	360
Acenaphthylene	DETSC 3304	0.01	ug/l	0.38	3.0
Acenaphthene	DETSC 3304	0.01	ug/l	2.0	10
Fluorene	DETSC 3304	0.01	ug/l	1.4	16
Phenanthrene	DETSC 3304	0.01	ug/l	6.0	24
Anthracene	DETSC 3304	0.01	ug/l	1.5	8.2
Fluoranthene	DETSC 3304	0.01	ug/l	5.3	37
Pyrene	DETSC 3304	0.01	ug/l	4.5	36
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	1.8	15
Chrysene	DETSC 3304	0.01	ug/l	2.0	18
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	2.6	20
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	0.95	7.3
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	2.1	13
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	1.4	12
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	0.29	3.6
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	1.2	11
PAH Total	DETSC 3304	0.2	ug/l	39	600
<b>Phenols</b>					
Phenol - Monohydric	DETSC 2130	0.1	mg/l	< 0.1	< 0.1

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-01130

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1789644	1789645
Sample ID	BH27	BH30
Depth		
Other ID		
Sample Type	WATER	WATER
Sampling Date	19/01/2021	19/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>VOCs</b>					
Dichlorodifluoromethane	DETS 3432	1	ug/l	< 1	< 1
Chloromethane	DETS 3432	1	ug/l	< 1	< 1
Vinyl Chloride	DETS 3432	1	ug/l	< 1	< 1
Bromomethane	DETS 3432	1	ug/l	< 1	< 1
Chloroethane	DETS 3432	1	ug/l	< 1	< 1
Trichlorofluoromethane	DETS 3432*	1	ug/l	< 1	< 1
1,1-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1
Methylene Chloride	DETS 3432*	27	ug/l	< 27	< 27
Trans-1,2-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1
1,1-dichloroethane	DETS 3432	1	ug/l	< 1	< 1
Cis-1,2-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1
2,2-dichloropropane	DETS 3432	2	ug/l	< 2	< 2
Bromochloromethane	DETS 3432	4	ug/l	< 4	< 4
Chloroform	DETS 3432	1	ug/l	< 1	< 1
1,1,1-trichloroethane	DETS 3432	1	ug/l	< 1	< 1
1,1-dichloropropene	DETS 3432	1	ug/l	< 1	< 1
Carbon tetrachloride	DETS 3432	1	ug/l	< 1	< 1
Benzene	DETS 3432	1	ug/l	3	270
1,2-dichloroethane	DETS 3432	1	ug/l	< 1	16
Trichloroethylene	DETS 3432*	1	ug/l	< 1	< 1
1,2-dichloropropane	DETS 3432	1	ug/l	< 1	< 1
Dibromomethane	DETS 3432	1	ug/l	< 1	< 1
Bromodichloromethane	DETS 3432	4	ug/l	< 4	< 4
cis-1,3-dichloropropene	DETS 3432	1	ug/l	< 1	< 1
Toluene	DETS 3432	1	ug/l	1	38
trans-1,3-dichloropropene	DETS 3432	1	ug/l	< 1	< 1
1,1,2-trichloroethane	DETS 3432	1	ug/l	< 1	< 1
Tetrachloroethylene	DETS 3432	1	ug/l	< 1	< 1
1,3-dichloropropane	DETS 3432	1	ug/l	< 1	< 1
Dibromochloromethane	DETS 3432	1	ug/l	< 1	< 1
1,2-dibromoethane	DETS 3432	1	ug/l	< 1	< 1
Chlorobenzene	DETS 3432	1	ug/l	< 1	< 1
1,1,1,2-tetrachloroethane	DETS 3432	1	ug/l	< 1	< 1
Ethylbenzene	DETS 3432	1	ug/l	3	1000
m+p-Xylene	DETS 3432	2	ug/l	< 2	140
o-Xylene	DETS 3432	1	ug/l	< 1	< 1
Styrene	DETS 3432	1	ug/l	< 1	< 1
Bromoform	DETS 3432	1	ug/l	< 1	< 1
Isopropylbenzene	DETS 3432	1	ug/l	2	320
1,1,2,2-tetrachloroethane	DETS 3432	1	ug/l	< 1	< 1
Bromobenzene	DETS 3432	1	ug/l	< 1	< 1

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-01130

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1789644	1789645
Sample ID	BH27	BH30
Depth		
Other ID		
Sample Type	WATER	WATER
Sampling Date	19/01/2021	19/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	2	810
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	2	380
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	3	1300
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	40
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	11
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	72	19
<b>SVOCs</b>					
Phenol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Aniline	DETSC 3434*	1	ug/l	< 1.0	< 2.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 1.0	< 2.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 1.0	< 2.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 2.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	1.3	70
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 1.0	< 2.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 2.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 2.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 2.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 2.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0	< 2.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 2.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-01130

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1789644	1789645
Sample ID	BH27	BH30
Depth		
Other ID		
Sample Type	WATER	WATER
Sampling Date	19/01/2021	19/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 2.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 2.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0	< 2.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 2.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 2.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 2.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0	< 2.0
Carbazole	DETSC 3434*	1	ug/l	4.4	< 2.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	1.6	63
<b>VOC TICs</b>					
Butane, 2-methyl- (TIC)	DETSC 3432*		ug/l	5.252	121.1
Hexane, 3-methyl- (TIC)	DETSC 3432*		ug/l		494.8
Mesitylene (TIC)	DETSC 3432*		ug/l	24766066	55044457
<b>SVOC TICs</b>					
1H-Indene, 1-ethylidene- (TIC)	DETS 071*		ug/l	40517364	
2-Ethyl-1-hexanol (TIC)	DETS 071*		ug/l	09765429	
2-Hexene, 2,5,5-trimethyl- (TIC)	DETS 071*		ug/l	89235564	
9H-Fluorene, 9-methylene- (TIC)	DETS 071*		ug/l	48227127	
Azulene (TIC)	DETS 071*		ug/l	70.7556124506022	
Benzene, 1-ethyl-2,4-dimethyl- (TIC)	DETS 071*		ug/l	30475969	
Benzene, 1-ethyl-3,5-dimethyl- (TIC)	DETS 071*		ug/l	39.3055025552344	
Benzene, 2-ethyl-1,4-dimethyl- (TIC)	DETS 071*		ug/l	30475969	
Benzo[e]pyrene (TIC)	DETS 071*		ug/l	37385311	
Heptane, 3,5-dimethyl- (TIC)	DETS 071*		ug/l	15.4936167807447	
Hexadecane, 2,6,10,14-tetramethyl- (TIC)	DETS 071*		ug/l	20.5143351828654	
Indane (TIC)	DETS 071*		ug/l	69.9149756274098	
Naphthacene (TIC)	DETS 071*		ug/l	27993836	
Naphthalene, 1,6,7-trimethyl- (TIC)	DETS 071*		ug/l	8.10375079656844	
Naphthalene, 1,7-dimethyl- (TIC)	DETS 071*		ug/l	11.4057717877447	
Nonane, 2,6-dimethyl- (TIC)	DETS 071*		ug/l	12.7617007313771	
Octane, 3-methyl- (TIC)	DETS 071*		ug/l	22.6848853820984	

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-01130

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1789644	1789645
Sample ID	BH27	BH30
Depth		
Other ID		
Sample Type	WATER	WATER
Sampling Date	19/01/2021	19/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units
Triphenylene (TIC)	DETS 071*		ug/l

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## Information in Support of the Analytical Results

Our Ref 21-01130  
 Client Ref 3899  
 Contract Wastefront, Sunderland Docks

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1789644	BH27 WATER	19/01/21	GB 1L x2, GV		
1789645	BH30 WATER	19/01/21	GB 1L x2, GV		
1789646	BH27 4.00 SOIL	19/01/21	GJ 250ml x2, PT 1L		
1789647	BH30 4.00 SOIL	19/01/21	GJ 250ml x2, PT 1L		

Key: G-Glass B-Bottle V-Vial P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



## Certificate of Analysis

**Certificate Number** 21-00956

**Issued:** 26-Jan-21

**Client** FWS Consultants  
Unit 2 City West Business Park  
St Johns Road  
Meadowfield Industrial Estate  
Co Durham  
DH7 8ER

**Our Reference** 21-00956

**Client Reference** 3899

**Order No** 2020/3788

**Contract Title** Wastefront, Sunderland Docks

**Description** 2 Soil samples, 2 Water samples.

**Date Received** 19-Jan-21

**Date Started** 19-Jan-21

**Date Completed** 26-Jan-21

**Test Procedures** Identified by prefix DETSn (details on request).

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

**Approved By**

Adam Fenwick  
Contracts Manager



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# Summary of Chemical Analysis

## Soil Samples

Our Ref 21-00956

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788829	1788830
Sample ID	BH28	BH29
Depth	4.00	4.50
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	18/01/2021	18/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>Metals</b>					
Arsenic	DETSC 2301#	0.2	mg/kg	13	5.0
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.8	0.7
Cadmium	DETSC 2301#	0.1	mg/kg	12	0.2
Chromium	DETSC 2301#	0.15	mg/kg	18	8.8
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	56	21
Lead	DETSC 2301#	0.3	mg/kg	190	42
Mercury	DETSC 2325#	0.05	mg/kg	0.17	0.12
Nickel	DETSC 2301#	1	mg/kg	21	9.2
Zinc	DETSC 2301#	1	mg/kg	280	56
<b>Inorganics</b>					
pH	DETSC 2008#		pH	8.8	9.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg	1.0	0.2
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	0.4	0.4
Chloride Aqueous Extract	DETSC 2055	1	mg/l	94	210
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	170	130
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.16	0.28
<b>Petroleum Hydrocarbons</b>					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	0.55	0.21
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	2.0	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	0.10	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	0.10	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01



## Summary of Chemical Analysis Soil Samples

Our Ref 21-00956

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788829	1788830
Sample ID	BH28	BH29
Depth	4.00	4.50
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	18/01/2021	18/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>PAHs</b>					
Naphthalene	DETSC 3301	0.1	mg/kg	0.2	0.5
Acenaphthylene	DETSC 3301	0.1	mg/kg	0.2	0.2
Acenaphthene	DETSC 3301	0.1	mg/kg	0.3	0.3
Fluorene	DETSC 3301	0.1	mg/kg	0.4	0.7
Phenanthrene	DETSC 3301	0.1	mg/kg	1.8	3.3
Anthracene	DETSC 3301	0.1	mg/kg	0.3	0.7
Fluoranthene	DETSC 3301	0.1	mg/kg	2.0	2.9
Pyrene	DETSC 3301	0.1	mg/kg	1.6	2.6
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.9	1.2
Chrysene	DETSC 3301	0.1	mg/kg	0.7	1.2
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.6	0.8
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.4	0.5
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.9	1.0
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	0.6	0.8
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.2	0.2
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	0.6	0.7
PAH Total	DETSC 3301	1.6	mg/kg	12	18
<b>Phenols</b>					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3

## Summary of Chemical Analysis

### Soil Samples

Our Ref 21-00956

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788829	1788830
Sample ID	BH28	BH29
Depth	4.00	4.50
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	18/01/2021	18/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>VOCs</b>					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	0.28	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	0.11	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	0.05	0.01

## Summary of Chemical Analysis

### Soil Samples

Our Ref 21-00956

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788829	1788830
Sample ID	BH28	BH29
Depth	4.00	4.50
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	18/01/2021	18/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
sec-butylbenzene	DETSC 3431	0.01	mg/kg	0.05	0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	0.06	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
<b>SVOCs</b>					
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	0.1	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	0.1	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1

## Summary of Chemical Analysis

### Soil Samples

Our Ref 21-00956

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788829	1788830
Sample ID	BH28	BH29
Depth	4.00	4.50
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	18/01/2021	18/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Di-n-octylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	0.2	< 0.1
<b>SVOC TICs</b>					
Blank (TIC)	DETSC 3433*		mg/kg	None	None

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-00956

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788827	1788828
Sample ID	BH28	BH29
Depth	4.00	4.00
Other ID		
Sample Type	WATER	WATER
Sampling Date	18/01/2021	18/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>Metals</b>					
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	5.9	9.4
Boron, Dissolved	DETSC 2306*	12	ug/l	540	640
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.04	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.8	0.7
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.77	0.31
Manganese, Dissolved	DETSC 2306	0.22	ug/l	2800	1300
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	11	3.1
Zinc, Dissolved	DETSC 2306	1.3	ug/l	430	76
<b>Inorganics</b>					
pH	DETSC 2008		pH	7.4	7.5
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40
Cyanide, Free	DETSC 2130	0.02	mg/l	< 0.02	< 0.02
Hardness	DETSC 2303	0.1	mg/l	1570	1360
Chloride	DETSC 2055	0.1	mg/l	1000	1600
Sulphate as SO4	DETSC 2055	0.1	mg/l	520	360
<b>Petroleum Hydrocarbons</b>					
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	190	1300
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	1200	830
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	2100	22
Aliphatic C10-C12	DETSC 3072*	1	ug/l	1000	430
Aliphatic C12-C16	DETSC 3072*	1	ug/l	2300	880
Aliphatic C16-C21	DETSC 3072*	1	ug/l	650	310
Aliphatic C21-C35	DETSC 3072*	1	ug/l	84	42
Aliphatic C5-C35	DETSC 3072*	10	ug/l	7600	3900
Aromatic C5-C7	DETSC 3322	0.1	ug/l	16	25
Aromatic C7-C8	DETSC 3322	0.1	ug/l	180	94
Aromatic C8-C10	DETSC 3322	0.1	ug/l	680	310
Aromatic C10-C12	DETSC 3072*	1	ug/l	500	410
Aromatic C12-C16	DETSC 3072*	1	ug/l	990	400
Aromatic C16-C21	DETSC 3072*	1	ug/l	1100	450
Aromatic C21-C35	DETSC 3072*	1	ug/l	480	210
Aromatic C5-C35	DETSC 3072*	10	ug/l	3900	1900
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	12000	5800
EPH (C10-C40)	DETSC 3311	10	ug/l	8600	980
Benzene	DETSC 3322	1	ug/l	16	25
Toluene	DETSC 3322	1	ug/l	180	94
Ethylbenzene	DETSC 3322	1	ug/l	27	22
Xylene	DETSC 3322	1	ug/l	50	83
MTBE	DETSC 3322	1	ug/l	< 1.0	24

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-00956

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788827	1788828
Sample ID	BH28	BH29
Depth	4.00	4.00
Other ID		
Sample Type	WATER	WATER
Sampling Date	18/01/2021	18/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>PAHs</b>					
Naphthalene	DETSC 3304	0.05	ug/l	54	17
Acenaphthylene	DETSC 3304	0.01	ug/l	8.7	1.4
Acenaphthene	DETSC 3304	0.01	ug/l	38	6.3
Fluorene	DETSC 3304	0.01	ug/l	30	7.3
Phenanthrene	DETSC 3304	0.01	ug/l	320	24
Anthracene	DETSC 3304	0.01	ug/l	73	5.8
Fluoranthene	DETSC 3304	0.01	ug/l	520	21
Pyrene	DETSC 3304	0.01	ug/l	460	18
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	180	6.8
Chrysene	DETSC 3304	0.01	ug/l	220	6.9
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	310	9.9
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	100	3.9
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	250	8.6
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	190	5.7
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	28	1.3
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	170	4.7
PAH Total	DETSC 3304	0.2	ug/l	3000	150
<b>Phenols</b>					
Phenol - Monohydric	DETSC 2130	0.1	mg/l	< 0.1	< 0.1

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-00956

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788827	1788828
Sample ID	BH28	BH29
Depth	4.00	4.00
Other ID		
Sample Type	WATER	WATER
Sampling Date	18/01/2021	18/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>VOCs</b>					
Dichlorodifluoromethane	DETS 3432	1	ug/l	< 1	< 1
Chloromethane	DETS 3432	1	ug/l	< 1	< 1
Vinyl Chloride	DETS 3432	1	ug/l	< 1	< 1
Bromomethane	DETS 3432	1	ug/l	< 1	< 1
Chloroethane	DETS 3432	1	ug/l	< 1	< 1
Trichlorofluoromethane	DETS 3432*	1	ug/l	< 1	< 1
1,1-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1
Methylene Chloride	DETS 3432*	27	ug/l	< 27	< 27
Trans-1,2-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1
1,1-dichloroethane	DETS 3432	1	ug/l	< 1	< 1
Cis-1,2-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1
2,2-dichloropropane	DETS 3432	2	ug/l	< 2	< 2
Bromochloromethane	DETS 3432	4	ug/l	< 4	< 4
Chloroform	DETS 3432	1	ug/l	< 1	< 1
1,1,1-trichloroethane	DETS 3432	1	ug/l	< 1	< 1
1,1-dichloropropene	DETS 3432	1	ug/l	< 1	< 1
Carbon tetrachloride	DETS 3432	1	ug/l	< 1	< 1
Benzene	DETS 3432	1	ug/l	7	11
1,2-dichloroethane	DETS 3432	1	ug/l	< 1	< 1
Trichloroethylene	DETS 3432*	1	ug/l	< 1	< 1
1,2-dichloropropane	DETS 3432	1	ug/l	< 1	< 1
Dibromomethane	DETS 3432	1	ug/l	< 1	< 1
Bromodichloromethane	DETS 3432	4	ug/l	9	< 4
cis-1,3-dichloropropene	DETS 3432	1	ug/l	< 1	< 1
Toluene	DETS 3432	1	ug/l	11	16
trans-1,3-dichloropropene	DETS 3432	1	ug/l	< 1	< 1
1,1,2-trichloroethane	DETS 3432	1	ug/l	< 1	< 1
Tetrachloroethylene	DETS 3432	1	ug/l	< 1	< 1
1,3-dichloropropane	DETS 3432	1	ug/l	< 1	< 1
Dibromochloromethane	DETS 3432	1	ug/l	< 1	< 1
1,2-dibromoethane	DETS 3432	1	ug/l	< 1	< 1
Chlorobenzene	DETS 3432	1	ug/l	< 1	< 1
1,1,1,2-tetrachloroethane	DETS 3432	1	ug/l	< 1	< 1
Ethylbenzene	DETS 3432	1	ug/l	25	32
m+p-Xylene	DETS 3432	2	ug/l	25	57
o-Xylene	DETS 3432	1	ug/l	10	29
Styrene	DETS 3432	1	ug/l	< 1	1
Bromoform	DETS 3432	1	ug/l	< 1	< 1
Isopropylbenzene	DETS 3432	1	ug/l	32	45
1,1,2,2-tetrachloroethane	DETS 3432	1	ug/l	< 1	< 1
Bromobenzene	DETS 3432	1	ug/l	< 1	< 1

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-00956

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788827	1788828
Sample ID	BH28	BH29
Depth	4.00	4.00
Other ID		
Sample Type	WATER	WATER
Sampling Date	18/01/2021	18/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	19	98
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	54	11
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	110	50
sec-butylbenzene	DETSC 3432	1	ug/l	6	13
p-isopropyltoluene	DETSC 3432	1	ug/l	12	3
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	16
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	8	24
<b>SVOCs</b>					
Phenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Aniline	DETSC 3434*	1	ug/l	< 2.0	< 2.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 2.0	< 2.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 2.0	< 2.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 2.0	2.3
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 2.0	< 2.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 2.0	2.3
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 2.0	< 2.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	2.2	3.1
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 2.0	< 2.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 2.0	< 2.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 2.0	< 2.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 2.0	< 2.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 2.0	< 2.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 2.0	< 2.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 2.0	< 2.0



## Summary of Chemical Analysis

### Water Samples

Our Ref 21-00956

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788827	1788828
Sample ID	BH28	BH29
Depth	4.00	4.00
Other ID		
Sample Type	WATER	WATER
Sampling Date	18/01/2021	18/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 2.0	< 2.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 2.0	< 2.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Diphenylamine	DETSC 3434*	1	ug/l	< 2.0	< 2.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 2.0	< 2.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 2.0	< 2.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 2.0	< 2.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Azobenzene	DETSC 3434*	1	ug/l	< 2.0	< 2.0
Carbazole	DETSC 3434*	1	ug/l	2.1	3.7
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 2.0	7.9
<b>VOC TICs</b>					
Benzene, propyl- (TIC)	DETSC 3432*		ug/l	34.24	261.8
Mesitylene (TIC)	DETSC 3432*		ug/l	27.96	3.39
Pentane, 2,3-dimethyl- (TIC)	DETSC 3432*		ug/l		116.8
<b>SVOC TICs</b>					
1H-Indene, 1-ethylidene- (TIC)	DETS 071*		ug/l		2.14
2-Ethyl-1-hexanol (TIC)	DETS 071*		ug/l		2.40
2-Pentanone, 4-hydroxy-4-methyl- (TIC)	DETS 071*		ug/l	6.28	8.05
9H-Fluorene, 9-methylene- (TIC)	DETS 071*		ug/l	3.96	
Benzene, (1-methylethyl)- (TIC)	DETS 071*		ug/l		10.29
Benzene, 1,2,3,5-tetramethyl- (TIC)	DETS 071*		ug/l		20.27
Benzene, 2-ethyl-1,4-dimethyl- (TIC)	DETS 071*		ug/l		3.72
Benzo[c]phenanthrene (TIC)	DETS 071*		ug/l	0.43	
Bicyclo[3.1.1]heptane, 6,6-dimethyl-2-methylene-, (1S)- (TIC)	DETS 071*		ug/l	26.85	
Indan, 1-methyl- (TIC)	DETS 071*		ug/l		15.06
Indane (TIC)	DETS 071*		ug/l	2.31	6.95
Pentane, 2,3,4-trimethyl- (TIC)	DETS 071*		ug/l	9.80	
Tetraethyllead (TIC)	DETS 071*		ug/l	0.40	
Tricyclo[2.2.1.0(2,6)]heptane, 1,3,3-trimethyl- (TIC)	DETS 071*		ug/l	25.51	
Undecane, 3-methyl- (TIC)	DETS 071*		ug/l	6.23	

## Information in Support of the Analytical Results

Our Ref 21-00956

Client Ref 3899

Contract Wastefront, Sunderland Docks

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1788827	BH28 4.00 WATER	18/01/21	GB 1L x2, GV		
1788828	BH29 4.00 WATER	18/01/21	GB 1L, GV		
1788829	BH28 4.00 SOIL	18/01/21	GJ 250ml x2, PT 1L		
1788830	BH29 4.50 SOIL	18/01/21	GJ 250ml x2, PT 1L		

Key: G-Glass B-Bottle V-Vial P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



## Certificate of Analysis

*Certificate Number* 21-00902

*Issued:* 26-Jan-21

*Client* FWS Consultants  
Unit 2 City West Business Park  
St Johns Road  
Meadowfield Industrial Estate  
Co Durham  
DH7 8ER

*Our Reference* 21-00902

*Client Reference* 3899

*Order No* 2020/3785

*Contract Title* Wastefront, Sunderland Docks

*Description* 2 Soil samples, 2 Water samples.

*Date Received* 18-Jan-21

*Date Started* 18-Jan-21

*Date Completed* 26-Jan-21

*Test Procedures* Identified by prefix DETSn (details on request).

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

*Approved By*

Adam Fenwick  
Contracts Manager



# Summary of Chemical Analysis

## Soil Samples

Our Ref 21-00902

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788294	1788295
Sample ID	BH24	BH26
Depth	4.00	5.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	15/01/2021	15/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>Metals</b>					
Arsenic	DETSC 2301#	0.2	mg/kg	6.9	43
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.6	0.8
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.5
Chromium	DETSC 2301#	0.15	mg/kg	13	20
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	140	92
Lead	DETSC 2301#	0.3	mg/kg	120	650
Mercury	DETSC 2325#	0.05	mg/kg	1.1	14
Nickel	DETSC 2301#	1	mg/kg	19	23
Zinc	DETSC 2301#	1	mg/kg	130	190
<b>Inorganics</b>					
pH	DETSC 2008#		pH	10.4	8.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3	3.8
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	1.5	1.7
Chloride Aqueous Extract	DETSC 2055	1	mg/l	140	17
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	210	390
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.21	0.32
<b>Petroleum Hydrocarbons</b>					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	13	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	36	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	15	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	110	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	370	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	360	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	120	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	1000	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	0.32	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	5.6	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	17	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	73	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	230	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	340	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	190	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	850	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	1900	< 10
Benzene	DETSC 3321#	0.01	mg/kg	0.32	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	0.99	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	5.6	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	3.9	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01

## Summary of Chemical Analysis Soil Samples

Our Ref 21-00902

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788294	1788295
Sample ID	BH24	BH26
Depth	4.00	5.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	15/01/2021	15/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>PAHs</b>					
Naphthalene	DETSC 3301	0.1	mg/kg	1.1	0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	0.4	0.1
Fluorene	DETSC 3301	0.1	mg/kg	1.0	0.2
Phenanthrene	DETSC 3301	0.1	mg/kg	2.8	0.8
Anthracene	DETSC 3301	0.1	mg/kg	0.8	0.3
Fluoranthene	DETSC 3301	0.1	mg/kg	3.2	1.6
Pyrene	DETSC 3301	0.1	mg/kg	3.1	1.3
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	1.4	0.9
Chrysene	DETSC 3301	0.1	mg/kg	1.4	0.9
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.9	0.6
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.6	0.4
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	1.2	0.8
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	1.1	1.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.2	0.2
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	0.6	0.4
PAH Total	DETSC 3301	1.6	mg/kg	20	10
<b>Phenols</b>					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3

# Summary of Chemical Analysis

## Soil Samples

Our Ref 21-00902

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788294	1788295
Sample ID	BH24	BH26
Depth	4.00	5.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	15/01/2021	15/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>VOCs</b>					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	0.02	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	0.28	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	0.56	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

# Summary of Chemical Analysis

## Soil Samples

Our Ref 21-00902

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788294	1788295
Sample ID	BH24	BH26
Depth	4.00	5.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	15/01/2021	15/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	0.08	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	0.42	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	0.02
<b>SVOCs</b>					
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	0.7	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	0.3	0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1

## Summary of Chemical Analysis Soil Samples

Our Ref 21-00902

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

<b>Lab No</b>	1788294	1788295
<b>Sample ID</b>	BH24	BH26
<b>Depth</b>	4.00	5.00
<b>Other ID</b>		
<b>Sample Type</b>	SOIL	SOIL
<b>Sampling Date</b>	15/01/2021	15/01/2021
<b>Sampling Time</b>	n/s	n/s

Test	Method	LOD	Units		
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Di-n-octylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	0.6	0.8
<b>SVOC TICs</b>					
(TIC)	DETSC 3433*		mg/kg	None	
Blank (TIC)	DETSC 3433*		mg/kg		None



# Summary of Chemical Analysis

## Water Samples

Our Ref 21-00902

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788292	1788293
Sample ID	BH24	BH26
Depth	4.50	4.50
Other ID		
Sample Type	WATER	WATER
Sampling Date	15/01/2021	15/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>Metals</b>					
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	4.5	24
Boron, Dissolved	DETSC 2306*	12	ug/l	270	370
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.15	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	2.6	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	100	0.5
Lead, Dissolved	DETSC 2306	0.09	ug/l	200	2.3
Manganese, Dissolved	DETSC 2306	0.22	ug/l	660	1400
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.05	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	11	11
Zinc, Dissolved	DETSC 2306	1.3	ug/l	69	21
<b>Inorganics</b>					
pH	DETSC 2008		pH	7.6	7.3
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40
Cyanide, Free	DETSC 2130	0.02	mg/l	< 0.02	< 0.02
Hardness	DETSC 2303	0.1	mg/l	460	829
Chloride	DETSC 2055	0.1	mg/l	14	10
Sulphate as SO4	DETSC 2055	0.1	mg/l	12	14
<b>Petroleum Hydrocarbons</b>					
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	380	5500
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	0.2	3200
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	0.2	1400
Aliphatic C10-C12	DETSC 3072*	1	ug/l	840	37
Aliphatic C12-C16	DETSC 3072*	1	ug/l	3000	330
Aliphatic C16-C21	DETSC 3072*	1	ug/l	2800	470
Aliphatic C21-C35	DETSC 3072*	1	ug/l	830	260
Aliphatic C5-C35	DETSC 3072*	10	ug/l	7900	11000
Aromatic C5-C7	DETSC 3322	0.1	ug/l	3.2	160
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	680
Aromatic C8-C10	DETSC 3322	0.1	ug/l	4.3	1800
Aromatic C10-C12	DETSC 3072*	1	ug/l	970	90
Aromatic C12-C16	DETSC 3072*	1	ug/l	2100	340
Aromatic C16-C21	DETSC 3072*	1	ug/l	2500	460
Aromatic C21-C35	DETSC 3072*	1	ug/l	720	240
Aromatic C5-C35	DETSC 3072*	10	ug/l	6400	3700
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	14000	15000
EPH (C10-C40)	DETSC 3311	10	ug/l	32000	200
Benzene	DETSC 3322	1	ug/l	3.2	160
Toluene	DETSC 3322	1	ug/l	< 1.0	680
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	110
Xylene	DETSC 3322	1	ug/l	< 1.0	340
MTBE	DETSC 3322	1	ug/l	110	15

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-00902

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788292	1788293
Sample ID	BH24	BH26
Depth	4.50	4.50
Other ID		
Sample Type	WATER	WATER
Sampling Date	15/01/2021	15/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>PAHs</b>					
Naphthalene	DETSC 3304	0.05	ug/l	45	15
Acenaphthylene	DETSC 3304	0.01	ug/l	3.6	0.69
Acenaphthene	DETSC 3304	0.01	ug/l	11	3.6
Fluorene	DETSC 3304	0.01	ug/l	21	3.3
Phenanthrene	DETSC 3304	0.01	ug/l	33	8.5
Anthracene	DETSC 3304	0.01	ug/l	13	5.2
Fluoranthene	DETSC 3304	0.01	ug/l	40	7.6
Pyrene	DETSC 3304	0.01	ug/l	45	6.4
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	14	2.1
Chrysene	DETSC 3304	0.01	ug/l	16	2.6
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	23	2.9
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	7.9	0.98
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	18	2.4
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	13	1.7
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	2.2	0.34
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	12	1.3
PAH Total	DETSC 3304	0.2	ug/l	320	65
<b>Phenols</b>					
Phenol - Monohydric	DETSC 2130	0.1	mg/l	< 0.1	< 0.1

# Summary of Chemical Analysis

## Water Samples

Our Ref 21-00902  
 Client Ref 3899  
 Contract Title Wastefront, Sunderland Docks

Lab No	1788292	1788293
Sample ID	BH24	BH26
Depth	4.50	4.50
Other ID		
Sample Type	WATER	WATER
Sampling Date	15/01/2021	15/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>VOCs</b>					
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1
2,2-dichloropropane	DETSC 3432	2	ug/l	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1
Benzene	DETSC 3432	1	ug/l	4	72
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	4
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	2
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1
Toluene	DETSC 3432	1	ug/l	1	6
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	2
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	30
m+p-Xylene	DETSC 3432	2	ug/l	< 2	2
o-Xylene	DETSC 3432	1	ug/l	< 1	4
Styrene	DETSC 3432	1	ug/l	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	1	94
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1

# Summary of Chemical Analysis

## Water Samples

Our Ref 21-00902

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788292	1788293
Sample ID	BH24	BH26
Depth	4.50	4.50
Other ID		
Sample Type	WATER	WATER
Sampling Date	15/01/2021	15/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	1	140
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	17
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	7
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	27
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	2
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	120	7
<b>SVOCs</b>					
Phenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
Aniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 5.0	< 5.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 5.0	< 5.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	21	< 5.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 5.0	< 5.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0

## Summary of Chemical Analysis Water Samples

Our Ref 21-00902

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788292	1788293
Sample ID	BH24	BH26
Depth	4.50	4.50
Other ID		
Sample Type	WATER	WATER
Sampling Date	15/01/2021	15/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Dibenzofuran	DETS 3434*	1	ug/l	< 5.0	< 5.0
2,6-Dinitrotoluene	DETS 3434*	1	ug/l	< 5.0	< 5.0
2,3,4,6-Tetrachlorophenol	DETS 3434*	1	ug/l	< 5.0	< 5.0
Diethylphthalate	DETS 3434*	1	ug/l	< 5.0	< 5.0
4-Chlorophenylphenylether	DETS 3434*	1	ug/l	< 5.0	< 5.0
4-Nitroaniline	DETS 3434*	1	ug/l	< 5.0	< 5.0
Diphenylamine	DETS 3434*	1	ug/l	< 5.0	< 5.0
4-Bromophenylphenylether	DETS 3434*	1	ug/l	< 5.0	< 5.0
Hexachlorobenzene	DETS 3434*	1	ug/l	< 5.0	< 5.0
Bis(2-ethylhexyl)ester	DETS 3434*	1	ug/l	< 5.0	< 5.0
Pentachlorophenol	DETS 3434*	1	ug/l	< 5.0	< 5.0
Di-n-butylphthalate	DETS 3434*	1	ug/l	< 5.0	< 5.0
Butylbenzylphthalate	DETS 3434*	1	ug/l	< 5.0	< 5.0
Bis(2-ethylhexyl)phthalate	DETS 3434*	1	ug/l	6.5	< 5.0
Di-n-octylphthalate	DETS 3434*	1	ug/l	< 5.0	< 5.0
1,4-Dinitrobenzene	DETS 3434*	1	ug/l	< 5.0	< 5.0
Dimethylphthalate	DETS 3434*	1	ug/l	< 5.0	< 5.0
1,3-Dinitrobenzene	DETS 3434*	1	ug/l	< 5.0	< 5.0
2,3,5,6-Tetrachlorophenol	DETS 3434*	1	ug/l	< 5.0	< 5.0
Azobenzene	DETS 3434*	1	ug/l	< 5.0	< 5.0
Carbazole	DETS 3434*	1	ug/l	< 5.0	< 5.0
1-Methylnaphthalene	DETS 3434*	1	ug/l	22	< 5.0
<b>VOC TICs</b>					
Butane, 2,2-dimethyl- (TIC)	DETS 3432*		ug/l	9.518	98678372
Butane, 2-methyl- (TIC)	DETS 3432*		ug/l	4.902	113.6
Ethyl ether (TIC)	DETS 3432*		ug/l	1.951	
Pentane, 2,2-dimethyl- (TIC)	DETS 3432*		ug/l	0.4683	19.97
Pentane, 3-methyl- (TIC)	DETS 3432*		ug/l		396.5
<b>SVOC TICs</b>					
Benzene, 1-ethyl-2,4-dimethyl- (TIC)	DETS 071*		ug/l	34837003	
Cyclopentane, 1,2,3,4,5-pentamethyl- (TIC)			ug/l	3.44941618029293	
Dodecane, 2,6,10-trimethyl- (TIC)			ug/l	63737017	
Hexadecane, 2,6,10,14-tetramethyl- (TIC)			ug/l	14130561	
Hexane, 3,3-dimethyl- (TIC)			ug/l	0.428712811386682	
Indane (TIC)	DETS 071*		ug/l	52948247	
Octane, 3-methyl-6-methylene- (TIC)			ug/l	4.4966046109714	
Octane, 4-methyl- (TIC)			ug/l	70332714	
Pentadecane, 2,6,10,14-tetramethyl- (TIC)			ug/l	01886085	
Sulfurous acid, 2-ethylhexyl hexyl ester (TIC)			ug/l	1.15220634650661	

## Summary of Chemical Analysis Water Samples

Our Ref 21-00902

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1788292	1788293
Sample ID	BH24	BH26
Depth	4.50	4.50
Other ID		
Sample Type	WATER	WATER
Sampling Date	15/01/2021	15/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units	
Undecane, 2,6-dimethyl- (TIC)			ug/l	62463112
2,4,4-Trimethyl-1-hexene (TIC)			ug/l	4.4966046109714
2-Hexene, 2,5,5-trimethyl- (TIC)			ug/l	28454125 59296996
2-Hexene, 3,5,5-trimethyl- (TIC)			ug/l	2.01087620328272
2-Pentanone, 4-hydroxy-4-methyl- (TIC)			ug/l	10.5809202993924
4-Hexen-2-one (TIC)			ug/l	1.73882272633358
9H-Fluorene, 9-methylene- (TIC)			ug/l	34338987
Benzene, 1,2,3,5-tetramethyl- (TIC)			ug/l	73900681

## Information in Support of the Analytical Results

Our Ref 21-00902

Client Ref 3899

Contract Wastefront, Sunderland Docks

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1788292	BH24 4.50 WATER	15/01/21	GB 1L, GV	pH/Cond/TDS (1 days)	
1788293	BH26 4.50 WATER	15/01/21	GB 1L, GV	pH/Cond/TDS (1 days)	
1788294	BH24 4.00 SOIL	15/01/21	GJ 250ml, PT 1L		
1788295	BH26 5.00 SOIL	15/01/21	GJ 250ml x2, PT 1L		

Key: G-Glass B-Bottle V-Vial P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



## Certificate of Analysis

**Certificate Number** 21-00636

**Issued:** 19-Jan-21

**Client** FWS Consultants  
Unit 2 City West Business Park  
St Johns Road  
Meadowfield Industrial Estate  
Co Durham  
DH7 8ER

**Our Reference** 21-00636

**Client Reference** 3899

**Order No** 2021/3778

**Contract Title** Wastefront, Sunderland Docks

**Description** 1 Soil sample, 2 Water samples.

**Date Received** 14-Jan-21

**Date Started** 14-Jan-21

**Date Completed** 19-Jan-21

**Test Procedures** Identified by prefix DETSn (details on request).

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

**Approved By**

Adam Fenwick  
Contracts Manager



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## Summary of Chemical Analysis

### Soil Samples

Our Ref 21-00636

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1786451
Sample ID	BH18
Depth	6.00
Other ID	13
Sample Type	SOIL
Sampling Date	13/01/2021
Sampling Time	n/s

Test	Method	LOD	Units	
<b>Metals</b>				
Arsenic	DETSC 2301#	0.2	mg/kg	15
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.4
Cadmium	DETSC 2301#	0.1	mg/kg	2.2
Chromium	DETSC 2301#	0.15	mg/kg	14
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	120
Lead	DETSC 2301#	0.3	mg/kg	250
Mercury	DETSC 2325#	0.05	mg/kg	0.36
Nickel	DETSC 2301#	1	mg/kg	32
Zinc	DETSC 2301#	1	mg/kg	180
<b>Inorganics</b>				
pH	DETSC 2008#		pH	8.1
Cyanide, Total	DETSC 2130#	0.1	mg/kg	4.7
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.1
Organic matter	DETSC 2002#	0.1	%	2.4
Chloride Aqueous Extract	DETSC 2055	1	mg/l	180
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	180
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.13
<b>Petroleum Hydrocarbons</b>				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	1.2
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	1.7
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	0.22
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	0.47
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	0.08
Toluene	DETSC 3321#	0.01	mg/kg	0.22
Xylene	DETSC 3321#	0.01	mg/kg	0.05
MTBE	DETSC 3321	0.01	mg/kg	< 0.01

## Summary of Chemical Analysis

### Soil Samples

Our Ref 21-00636

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1786451
Sample ID	BH18
Depth	6.00
Other ID	13
Sample Type	SOIL
Sampling Date	13/01/2021
Sampling Time	n/s

Test	Method	LOD	Units	
<b>PAHs</b>				
Naphthalene	DETSC 3301	0.1	mg/kg	3.4
Acenaphthylene	DETSC 3301	0.1	mg/kg	0.3
Acenaphthene	DETSC 3301	0.1	mg/kg	2.9
Fluorene	DETSC 3301	0.1	mg/kg	2.7
Phenanthrene	DETSC 3301	0.1	mg/kg	21
Anthracene	DETSC 3301	0.1	mg/kg	5.5
Fluoranthene	DETSC 3301	0.1	mg/kg	30
Pyrene	DETSC 3301	0.1	mg/kg	26
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	14
Chrysene	DETSC 3301	0.1	mg/kg	14
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	9.9
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	5.8
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	13
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	9.0
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	2.9
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	7.4
PAH Total	DETSC 3301	1.6	mg/kg	170
<b>Phenols</b>				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.3

## Summary of Chemical Analysis

### Soil Samples

Our Ref 21-00636

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1786451
Sample ID	BH18
Depth	6.00
Other ID	13
Sample Type	SOIL
Sampling Date	13/01/2021
Sampling Time	n/s

Test	Method	LOD	Units	
<b>VOCs</b>				
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	0.03

## Summary of Chemical Analysis Soil Samples

Our Ref 21-00636

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1786451
Sample ID	BH18
Depth	6.00
Other ID	13
Sample Type	SOIL
Sampling Date	13/01/2021
Sampling Time	n/s

Test	Method	LOD	Units	
sec-butylbenzene	DETSC 3431	0.01	mg/kg	0.03
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	0.01
<b>SVOCs</b>				
Phenol	DETSC 3433	0.1	mg/kg	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	0.8
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	0.5
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	2.4
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	1.5
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1

## Summary of Chemical Analysis Soil Samples

Our Ref 21-00636

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1786451
Sample ID	BH18
Depth	6.00
Other ID	13
Sample Type	SOIL
Sampling Date	13/01/2021
Sampling Time	n/s

Test	Method	LOD	Units	
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1
Di-n-octylphthalate	DETSC 3433	0.1	mg/kg	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	5.5
<b>SVOC TICs</b>				
Blank (TIC)	DETSC 3433*		mg/kg	None

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-00636

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1786445	1786446
Sample ID	18	20
Depth		
Other ID		
Sample Type	WATER	WATER
Sampling Date	13/01/2021	13/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>Inorganics</b>					
Hardness	DETSC 2303	0.1	mg/l	944	903
<b>Petroleum Hydrocarbons</b>					
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	220
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	2900	370
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	360	17
Aliphatic C10-C12	DETSC 3072*	1	ug/l	1200	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	2800	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	1800	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	240	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	9400	610
Aromatic C5-C7	DETSC 3322	0.1	ug/l	110	12
Aromatic C7-C8	DETSC 3322	0.1	ug/l	150	60
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	930	65
Aromatic C12-C16	DETSC 3072*	1	ug/l	1300	36
Aromatic C16-C21	DETSC 3072*	1	ug/l	1800	1.2
Aromatic C21-C35	DETSC 3072*	1	ug/l	940	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	5100	180
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	15000	780
Benzene	DETSC 3322	1	ug/l	110	12
Toluene	DETSC 3322	1	ug/l	150	60
Ethylbenzene	DETSC 3322	1	ug/l	330	16
Xylene	DETSC 3322	1	ug/l	180	9.4
MTBE	DETSC 3322	1	ug/l	150	18
<b>PAHs</b>					
Naphthalene	DETSC 3304	0.05	ug/l	42	1.1
Acenaphthylene	DETSC 3304	0.01	ug/l	1.8	0.08
Acenaphthene	DETSC 3304	0.01	ug/l	2.9	0.71
Fluorene	DETSC 3304	0.01	ug/l	4.1	0.31
Phenanthrene	DETSC 3304	0.01	ug/l	19	1.9
Anthracene	DETSC 3304	0.01	ug/l	7.8	0.46
Fluoranthene	DETSC 3304	0.01	ug/l	24	1.9
Pyrene	DETSC 3304	0.01	ug/l	23	1.7
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	15	0.81
Chrysene	DETSC 3304	0.01	ug/l	15	0.69
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	19	0.91
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	7.0	0.40
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	16	0.87
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	15	0.64
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	3.5	0.18
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	11	0.57

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-00636

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1786445	1786446
Sample ID	18	20
Depth		
Other ID		
Sample Type	WATER	WATER
Sampling Date	13/01/2021	13/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
PAH Total	DETSC 3304	0.2	ug/l	230	13

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-00636

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1786445	1786446
Sample ID	18	20
Depth		
Other ID		
Sample Type	WATER	WATER
Sampling Date	13/01/2021	13/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>VOCs</b>					
Dichlorodifluoromethane	DETS 3432	1	ug/l	< 1	< 1
Chloromethane	DETS 3432	1	ug/l	< 1	< 1
Vinyl Chloride	DETS 3432	1	ug/l	< 1	< 1
Bromomethane	DETS 3432	1	ug/l	< 1	< 1
Chloroethane	DETS 3432	1	ug/l	< 1	< 1
Trichlorofluoromethane	DETS 3432*	1	ug/l	< 1	< 1
1,1-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1
Methylene Chloride	DETS 3432*	27	ug/l	< 27	< 27
Trans-1,2-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1
1,1-dichloroethane	DETS 3432	1	ug/l	< 1	< 1
Cis-1,2-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1
2,2-dichloropropane	DETS 3432	2	ug/l	< 2	< 2
Bromochloromethane	DETS 3432	4	ug/l	< 4	< 4
Chloroform	DETS 3432	1	ug/l	< 1	< 1
1,1,1-trichloroethane	DETS 3432	1	ug/l	< 1	< 1
1,1-dichloropropene	DETS 3432	1	ug/l	< 1	< 1
Carbon tetrachloride	DETS 3432	1	ug/l	< 1	< 1
Benzene	DETS 3432	1	ug/l	76	7
1,2-dichloroethane	DETS 3432	1	ug/l	< 1	< 1
Trichloroethylene	DETS 3432*	1	ug/l	< 1	< 1
1,2-dichloropropane	DETS 3432	1	ug/l	< 1	< 1
Dibromomethane	DETS 3432	1	ug/l	< 1	< 1
Bromodichloromethane	DETS 3432	4	ug/l	< 4	< 4
cis-1,3-dichloropropene	DETS 3432	1	ug/l	< 1	< 1
Toluene	DETS 3432	1	ug/l	44	7
trans-1,3-dichloropropene	DETS 3432	1	ug/l	< 1	< 1
1,1,2-trichloroethane	DETS 3432	1	ug/l	< 1	< 1
Tetrachloroethylene	DETS 3432	1	ug/l	< 1	< 1
1,3-dichloropropane	DETS 3432	1	ug/l	< 1	< 1
Dibromochloromethane	DETS 3432	1	ug/l	< 1	< 1
1,2-dibromoethane	DETS 3432	1	ug/l	< 1	< 1
Chlorobenzene	DETS 3432	1	ug/l	< 1	< 1
1,1,1,2-tetrachloroethane	DETS 3432	1	ug/l	< 1	< 1
Ethylbenzene	DETS 3432	1	ug/l	260	6
m+p-Xylene	DETS 3432	2	ug/l	130	6
o-Xylene	DETS 3432	1	ug/l	< 1	2
Styrene	DETS 3432	1	ug/l	< 1	< 1
Bromoform	DETS 3432	1	ug/l	< 1	< 1
Isopropylbenzene	DETS 3432	1	ug/l	56	2
1,1,2,2-tetrachloroethane	DETS 3432	1	ug/l	< 1	< 1
Bromobenzene	DETS 3432	1	ug/l	< 1	< 1



## Summary of Chemical Analysis

### Water Samples

Our Ref 21-00636

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1786445	1786446
Sample ID	18	20
Depth		
Other ID		
Sample Type	WATER	WATER
Sampling Date	13/01/2021	13/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	110	2
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	41	2
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	350	11
sec-butylbenzene	DETSC 3432	1	ug/l	11	4
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	17	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	160	12
<b>SVOCs</b>					
Phenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Aniline	DETSC 3434*	1	ug/l	< 10.0	< 10.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 10.0	< 10.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 10.0	< 10.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 10.0	< 10.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 10.0	< 10.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 10.0	< 10.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 10.0	< 10.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 10.0	< 10.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 10.0	< 10.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 10.0	< 10.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-00636

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1786445	1786446
Sample ID	18	20
Depth		
Other ID		
Sample Type	WATER	WATER
Sampling Date	13/01/2021	13/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 10.0	< 10.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Diphenylamine	DETSC 3434*	1	ug/l	< 10.0	< 10.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Azobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0
Carbazole	DETSC 3434*	1	ug/l	< 10.0	< 10.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 10.0	< 10.0
<b>VOC TICs</b>					
Butane, 2,2-dimethyl- (TIC)	DETSC 3432*		ug/l	97.31	10.48
Nonadecane (TIC)	DETSC 3432*		ug/l		65.75
Pentane, 2,3,4-trimethyl- (TIC)	DETSC 3432*		ug/l	158.4	
Pentane, 2,3-dimethyl- (TIC)	DETSC 3432*		ug/l		28.28
Pentane, 3-methyl- (TIC)	DETSC 3432*		ug/l	216.1	

## Information in Support of the Analytical Results

Our Ref 21-00636  
 Client Ref 3899  
 Contract Wastefront, Sunderland Docks

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1786445	18 WATER	13/01/21	GJ 250ml x4, GV		
1786446	20 WATER	13/01/21	GJ 250ml x4, GB 1L, GV		
1786447	18 WATER	13/01/21	GJ 250ml x4, GV		
1786451	BH18 6.00 SOIL	13/01/21	GJ 250ml, PT 1L		

Key: G-Glass J-Jar V-Vial B-Bottle P-Plastic T-Tub  
 DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.  
 Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.  
 The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-  
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



## Certificate of Analysis

*Certificate Number* 21-00648

*Issued:* 19-Jan-21

*Client* FWS Consultants  
Unit 2 City West Business Park  
St Johns Road  
Meadowfield Industrial Estate  
Co Durham  
DH7 8ER

*Our Reference* 21-00648

*Client Reference* 3899

*Order No* 2021/3779

*Contract Title* Wastefront, Sunderland Docks

*Description* 10 Soil samples.

*Date Received* 14-Jan-21

*Date Started* 14-Jan-21

*Date Completed* 19-Jan-21

*Test Procedures* Identified by prefix DETSn (details on request).

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

*Approved By*

Adam Fenwick  
Contracts Manager



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## Summary of Chemical Analysis Soil Samples

Our Ref 21-00648

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1786531	1786532	1786533	1786534	1786535	1786536	1786537	1786538	1786539	1786540
Sample ID	BH4	BH4	BH12	BH12	BH12	BH4	BH12	BH12	BH12	BH4
Depth	4.00	12.00	19.50-19.95	12.00-12.45	4.00	8.00	2.00	15.50-15.95	6.50	6.00-6.50
Other ID	7	22	12	1	9	15	5	6	14	12
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	04/12/2020	07/12/2020	11/12/2020	10/12/2020	08/12/2020	07/12/2020	08/12/2020	10/12/2020	09/12/2020	07/12/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units										
<b>Inorganics</b>													
pH	DETSC 2008#		pH	8.8	8.9	8.8	9.0	8.5	8.7	8.7	8.2	7.9	8.1
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	590	210	150	320	130	38	81	350	540	460

## Information in Support of the Analytical Results

Our Ref 21-00648  
 Client Ref 3899  
 Contract Wastefront, Sunderland Docks

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1786531	BH4 4.00 SOIL	04/12/20	PT 1L	Anions 2:1 (30 days), pH + Conductivity (7 days)	
1786532	BH4 12.00 SOIL	07/12/20	PT 1L	Anions 2:1 (30 days), pH + Conductivity (7 days)	
1786533	BH12 19.50-19.95 SOIL	11/12/20	PT 1L	Anions 2:1 (30 days), pH + Conductivity (7 days)	
1786534	BH12 12.00-12.45 SOIL	10/12/20	PT 1L	Anions 2:1 (30 days), pH + Conductivity (7 days)	
1786535	BH12 4.00 SOIL	08/12/20	PT 1L	Anions 2:1 (30 days), pH + Conductivity (7 days)	
1786536	BH4 8.00 SOIL	07/12/20	PT 1L	Anions 2:1 (30 days), pH + Conductivity (7 days)	
1786537	BH12 2.00 SOIL	08/12/20	PT 1L	Anions 2:1 (30 days), pH + Conductivity (7 days)	
1786538	BH12 15.50-15.95 SOIL	10/12/20	PT 1L	Anions 2:1 (30 days), pH + Conductivity (7 days)	
1786539	BH12 6.50 SOIL	09/12/20	PT 1L	Anions 2:1 (30 days), pH + Conductivity (7 days)	
1786540	BH4 6.00-6.50 SOIL	07/12/20	PG	Anions 2:1 (30 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub G-Bag

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



## Certificate of Analysis

*Certificate Number* 21-01241

*Issued:* 28-Jan-21

*Client* FWS Consultants  
Unit 2 City West Business Park  
St Johns Road  
Meadowfield Industrial Estate  
Co Durham  
DH7 8ER

*Our Reference* 21-01241

*Client Reference* 3899

*Order No* 2020/3793

*Contract Title* Wastefront, Sunderland Docks

*Description* 11 Soil samples, 2 Water samples.

*Date Received* 21-Jan-21

*Date Started* 21-Jan-21

*Date Completed* 28-Jan-21

*Test Procedures* Identified by prefix DETSn (details on request).

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

*Approved By*

Adam Fenwick  
Contracts Manager



# Summary of Chemical Analysis

## Soil Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790321	1790322	1790323	1790324	1790325	1790326
Sample ID	BH25	BH31	BH31	BH31	BH31	BH28
Depth	4.00	4.00	1.00-2.00	3.00-4.00	5.00-6.00	6.00
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	20/01/2021	20/01/2021	20/01/2021	20/01/2021	20/01/2021	20/01/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic	DETSC 2301#	0.2	mg/kg	19	11				
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	6.7	6.3				
Cadmium	DETSC 2301#	0.1	mg/kg	2.9	0.2				
Chromium	DETSC 2301#	0.15	mg/kg	9.9	12				
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0				
Copper	DETSC 2301#	0.2	mg/kg	100	67				
Lead	DETSC 2301#	0.3	mg/kg	270	220				
Mercury	DETSC 2325#	0.05	mg/kg	21	0.73				
Nickel	DETSC 2301#	1	mg/kg	22	20				
Zinc	DETSC 2301#	1	mg/kg	370	170				
<b>Inorganics</b>									
pH	DETSC 2008#		pH	8.0	8.0	7.1	8.5	7.7	10.6
Cyanide, Total	DETSC 2130#	0.1	mg/kg	8.4	1.0				
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.2	< 0.1				
Organic matter	DETSC 2002#	0.1	%	2.8	0.3				
Chloride Aqueous Extract	DETSC 2055	1	mg/l	< 1.0	87				
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	120	230	210	110	110	470
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.20	0.30	0.36	0.16	0.10	0.69
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.10				
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	36				
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	61	15				
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	64	59				
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	90	89				
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	16	49				
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	5.0				
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	230	250				
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	0.61	< 0.10				
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	25	7.4				
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	130	29				
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	47	53				
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	22	18				
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	8.6	3.2				
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	11	< 1.4				
Aromatic C5-C35	DETSC 3072*	10	mg/kg	240	110				
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	470	360				
Benzene	DETSC 3321#	0.01	mg/kg	0.61	< 0.10				
Ethylbenzene	DETSC 3321#	0.01	mg/kg	23	1.4				
Toluene	DETSC 3321#	0.01	mg/kg	25	7.4				
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	2.0				
MTBE	DETSC 3321	0.01	mg/kg	< 0.10	< 0.10				



# Summary of Chemical Analysis

## Soil Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

<b>Lab No</b>	1790321	1790322	1790323	1790324	1790325	1790326
<b>Sample ID</b>	BH25	BH31	BH31	BH31	BH31	BH28
<b>Depth</b>	4.00	4.00	1.00-2.00	3.00-4.00	5.00-6.00	6.00
<b>Other ID</b>						
<b>Sample Type</b>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
<b>Sampling Date</b>	20/01/2021	20/01/2021	20/01/2021	20/01/2021	20/01/2021	20/01/2021
<b>Sampling Time</b>	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
<b>PAHs</b>								
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	8.2			
Acenaphthylene	DETSC 3301	0.1	mg/kg	0.6	0.9			
Acenaphthene	DETSC 3301	0.1	mg/kg	0.9	0.9			
Fluorene	DETSC 3301	0.1	mg/kg	1.1	0.9			
Phenanthrene	DETSC 3301	0.1	mg/kg	8.2	1.8			
Anthracene	DETSC 3301	0.1	mg/kg	3.0	0.6			
Fluoranthene	DETSC 3301	0.1	mg/kg	11	3.0			
Pyrene	DETSC 3301	0.1	mg/kg	9.8	2.3			
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	5.5	1.3			
Chrysene	DETSC 3301	0.1	mg/kg	6.3	1.4			
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	4.9	1.0			
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	2.7	0.6			
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	6.3	1.5			
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	4.5	1.1			
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	1.2	0.3			
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	3.0	0.9			
PAH Total	DETSC 3301	1.6	mg/kg	69	27			
<b>Phenols</b>								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.4	< 0.3			

# Summary of Chemical Analysis

## Soil Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790327	1790328	1790329	1790330	1790331
Sample ID	BH28	BH28	BH17	BH10	BH19
Depth	8.00	4.30	1.20	4.00	3.00
Other ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	20/01/2021	20/01/2021	20/01/2021	20/01/2021	20/01/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic	DETC 2301#	0.2	mg/kg						
Boron, Water Soluble	DETC 2311#	0.2	mg/kg						
Cadmium	DETC 2301#	0.1	mg/kg						
Chromium	DETC 2301#	0.15	mg/kg						
Chromium, Hexavalent	DETC 2204*	1	mg/kg						
Copper	DETC 2301#	0.2	mg/kg						
Lead	DETC 2301#	0.3	mg/kg						
Mercury	DETC 2325#	0.05	mg/kg						
Nickel	DETC 2301#	1	mg/kg						
Zinc	DETC 2301#	1	mg/kg						
<b>Inorganics</b>									
pH	DETC 2008#		pH	5.6	6.4	9.5	8.4	8.6	
Cyanide, Total	DETC 2130#	0.1	mg/kg						
Cyanide, Free	DETC 2130#	0.1	mg/kg						
Organic matter	DETC 2002#	0.1	%						
Chloride Aqueous Extract	DETC 2055	1	mg/l						
Sulphate Aqueous Extract as SO4	DETC 2076#	10	mg/l	290	130	130	84	620	
Sulphate as SO4, Total	DETC 2321#	0.01	%	0.21	0.12	0.20	0.11	0.46	
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETC 3321*	0.01	mg/kg						
Aliphatic C6-C8	DETC 3321*	0.01	mg/kg						
Aliphatic C8-C10	DETC 3321*	0.01	mg/kg						
Aliphatic C10-C12	DETC 3072#	1.5	mg/kg						
Aliphatic C12-C16	DETC 3072#	1.2	mg/kg						
Aliphatic C16-C21	DETC 3072#	1.5	mg/kg						
Aliphatic C21-C35	DETC 3072#	3.4	mg/kg						
Aliphatic C5-C35	DETC 3072*	10	mg/kg						
Aromatic C5-C7	DETC 3321*	0.01	mg/kg						
Aromatic C7-C8	DETC 3321*	0.01	mg/kg						
Aromatic C8-C10	DETC 3321*	0.01	mg/kg						
Aromatic C10-C12	DETC 3072#	0.9	mg/kg						
Aromatic C12-C16	DETC 3072#	0.5	mg/kg						
Aromatic C16-C21	DETC 3072#	0.6	mg/kg						
Aromatic C21-C35	DETC 3072#	1.4	mg/kg						
Aromatic C5-C35	DETC 3072*	10	mg/kg						
TPH Ali/Aro Total C5-C35	DETC 3072*	10	mg/kg						
Benzene	DETC 3321#	0.01	mg/kg						
Ethylbenzene	DETC 3321#	0.01	mg/kg						
Toluene	DETC 3321#	0.01	mg/kg						
Xylene	DETC 3321#	0.01	mg/kg						
MTBE	DETC 3321	0.01	mg/kg						

## Summary of Chemical Analysis Soil Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

<b>Lab No</b>	1790327	1790328	1790329	1790330	1790331
<b>Sample ID</b>	BH28	BH28	BH17	BH10	BH19
<b>Depth</b>	8.00	4.30	1.20	4.00	3.00
<b>Other ID</b>					
<b>Sample Type</b>	SOIL	SOIL	SOIL	SOIL	SOIL
<b>Sampling Date</b>	20/01/2021	20/01/2021	20/01/2021	20/01/2021	20/01/2021
<b>Sampling Time</b>	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
<b>PAHs</b>								
Naphthalene	DETSC 3301	0.1	mg/kg					
Acenaphthylene	DETSC 3301	0.1	mg/kg					
Acenaphthene	DETSC 3301	0.1	mg/kg					
Fluorene	DETSC 3301	0.1	mg/kg					
Phenanthrene	DETSC 3301	0.1	mg/kg					
Anthracene	DETSC 3301	0.1	mg/kg					
Fluoranthene	DETSC 3301	0.1	mg/kg					
Pyrene	DETSC 3301	0.1	mg/kg					
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg					
Chrysene	DETSC 3301	0.1	mg/kg					
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg					
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg					
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg					
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg					
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg					
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg					
PAH Total	DETSC 3301	1.6	mg/kg					
<b>Phenols</b>								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg					

# Summary of Chemical Analysis

## Soil VOC/SVOC Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790321	1790322
Sample ID	BH25	BH31
Depth	4.00	4.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	20/01/2021	20/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>VOCs</b>					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	0.03	0.22
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	0.04	0.37
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	0.50	0.12
m+p-Xylene	DETSC 3431	0.01	mg/kg	0.33	0.09
o-Xylene	DETSC 3431	0.01	mg/kg	0.10	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	0.03
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	0.39	0.77
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	0.63	0.19
2-chlorotoluene	DETSC 3431	0.01	mg/kg	0.22	0.44
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	0.91
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

# Summary of Chemical Analysis

## Soil VOC/SVOC Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790321	1790322
Sample ID	BH25	BH31
Depth	4.00	4.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	20/01/2021	20/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	1.2	0.29
sec-butylbenzene	DETSC 3431	0.01	mg/kg	1.2	0.29
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	0.26	0.24
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	0.08
<b>SVOCs</b>					
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	0.3	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	7.1	6.4
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	1.8	0.4
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1

# Summary of Chemical Analysis

## Soil VOC/SVOC Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790321	1790322
Sample ID	BH25	BH31
Depth	4.00	4.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	20/01/2021	20/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Di-n-octylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	4.6	0.7
<b>VOC TICs</b>					
Mesitylene (TIC)	DETSC 3432*		ug/l	95341828	20537291
<b>SVOC TICs</b>					
Benzene, 1,2,3,5-tetramethyl- (TIC)	DETSC 3433*		mg/kg	15954704	82710047
Benzene, 2-ethyl-1,4-dimethyl- (TIC)	DETS 071*		ug/l	70640155	18487053
Benzo[c]phenanthrene (TIC)	DETSC 3433*		mg/kg	44953873	
Benzo[e]pyrene (TIC)	DETSC 3433*		mg/kg	78105033	80209883
Heptane, 3,5-dimethyl- (TIC)	DETSC 3433*		mg/kg	1.18033703412102	
Hexadecane, 2,6,10,14-tetramethyl- (TIC)	DETS 071*		ug/l	1.6293596035188	
Indan, 1-methyl- (TIC)	DETS 071*		ug/l	61488639	
Indane (TIC)	DETS 071*		ug/l	25173647	66775668
Pentadecane, 2,6,10,14-tetramethyl- (TIC)	DETS 071*		ug/l	03418476	28982694
Pentane, 2,3,4-trimethyl- (TIC)	DETSC 3433*		mg/kg	55650596	19600141
Triphenylene (TIC)	DETSC 3433*		mg/kg	79582026	93520836

## Summary of Chemical Analysis Water Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790319	1790320
Sample ID	BH25	BH31
Depth	4.00	3.30
Other ID		
Sample Type	WATER	WATER
Sampling Date	20/01/2021	20/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>Metals</b>					
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	24	8.1
Boron, Dissolved	DETSC 2306*	12	ug/l	440	700
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.05	0.11
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.45	1.5
Copper, Dissolved	DETSC 2306	0.4	ug/l	3.4	5.7
Lead, Dissolved	DETSC 2306	0.09	ug/l	15	42
Manganese, Dissolved	DETSC 2306	0.22	ug/l	1800	1200
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.05	0.05
Nickel, Dissolved	DETSC 2306	0.5	ug/l	7.7	7.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	29	36
<b>Inorganics</b>					
pH	DETSC 2008		pH	7.1	7.2
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40
Cyanide, Free	DETSC 2130	0.02	mg/l	< 0.02	< 0.02
Hardness	DETSC 2303	0.1	mg/l	642	1010
Chloride	DETSC 2055	0.1	mg/l	390	320
Sulphate as SO4	DETSC 2055	0.1	mg/l	75	350
<b>Petroleum Hydrocarbons</b>					
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	10000
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	5900	13000
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	1800
Aliphatic C10-C12	DETSC 3072*	1	ug/l	320	15000
Aliphatic C12-C16	DETSC 3072*	1	ug/l	680	31000
Aliphatic C16-C21	DETSC 3072*	1	ug/l	160	24000
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	8100
Aliphatic C5-C35	DETSC 3072*	10	ug/l	7000	100000
Aromatic C5-C7	DETSC 3322	0.1	ug/l	820	320
Aromatic C7-C8	DETSC 3322	0.1	ug/l	540	1700
Aromatic C8-C10	DETSC 3322	0.1	ug/l	11000	11000
Aromatic C10-C12	DETSC 3072*	1	ug/l	420	4100
Aromatic C12-C16	DETSC 3072*	1	ug/l	46	4000
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	4100
Aromatic C21-C35	DETSC 3072*	1	ug/l	3.2	1500
Aromatic C5-C35	DETSC 3072*	10	ug/l	12000	27000
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	19000	130000
EPH (C10-C40)	DETSC 3311	10	ug/l	1000	18000
Benzene	DETSC 3322	1	ug/l	820	320
Toluene	DETSC 3322	1	ug/l	540	1700
Ethylbenzene	DETSC 3322	1	ug/l	3100	1300
Xylene	DETSC 3322	1	ug/l	2400	940
MTBE	DETSC 3322	1	ug/l	340	95

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790319	1790320
Sample ID	BH25	BH31
Depth	4.00	3.30
Other ID		
Sample Type	WATER	WATER
Sampling Date	20/01/2021	20/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>PAHs</b>					
Naphthalene	DETSC 3304	0.05	ug/l	250	340
Acenaphthylene	DETSC 3304	0.01	ug/l	1.2	2.8
Acenaphthene	DETSC 3304	0.01	ug/l	6.5	13
Fluorene	DETSC 3304	0.01	ug/l	7.0	15
Phenanthrene	DETSC 3304	0.01	ug/l	23	38
Anthracene	DETSC 3304	0.01	ug/l	4.4	9.3
Fluoranthene	DETSC 3304	0.01	ug/l	23	39
Pyrene	DETSC 3304	0.01	ug/l	20	34
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	8.8	14
Chrysene	DETSC 3304	0.01	ug/l	7.7	16
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	9.9	16
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	3.6	5.9
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	8.3	12
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	7.4	8.9
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	1.9	1.9
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	6.5	9.3
PAH Total	DETSC 3304	0.2	ug/l	390	570
<b>Phenols</b>					
Phenol - Monohydric	DETSC 2130	0.1	mg/l	< 0.1	< 0.1



## Summary of Chemical Analysis Water Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790319	1790320
Sample ID	BH25	BH31
Depth	4.00	3.30
Other ID		
Sample Type	WATER	WATER
Sampling Date	20/01/2021	20/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>VOCs</b>					
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1
2,2-dichloropropane	DETSC 3432	2	ug/l	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1
Benzene	DETSC 3432	1	ug/l	150	180
1,2-dichloroethane	DETSC 3432	1	ug/l	13	10
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1
Toluene	DETSC 3432	1	ug/l	120	77
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	2	2
Chlorobenzene	DETSC 3432	1	ug/l	6	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	1100	920
m+p-Xylene	DETSC 3432	2	ug/l	710	330
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1
Styrene	DETSC 3432	1	ug/l	3	2
Bromoform	DETSC 3432	1	ug/l	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	85	370
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1

# Summary of Chemical Analysis

## Water Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790319	1790320
Sample ID	BH25	BH31
Depth	4.00	3.30
Other ID		
Sample Type	WATER	WATER
Sampling Date	20/01/2021	20/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	240	590
2-chlorotoluene	DETSC 3432	1	ug/l	98	32
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	160	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	1000	2800
sec-butylbenzene	DETSC 3432	1	ug/l	21	28
p-isopropyltoluene	DETSC 3432	1	ug/l	12	12
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	170	75
<b>SVOCs</b>					
Phenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
Aniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 5.0	< 5.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	9.3	< 5.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 5.0	< 5.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	66	34
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 5.0	< 5.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0

## Summary of Chemical Analysis Water Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790319	1790320
Sample ID	BH25	BH31
Depth	4.00	3.30
Other ID		
Sample Type	WATER	WATER
Sampling Date	20/01/2021	20/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Dibenzofuran	DETS 3434*	1	ug/l	< 5.0	< 5.0
2,6-Dinitrotoluene	DETS 3434*	1	ug/l	< 5.0	< 5.0
2,3,4,6-Tetrachlorophenol	DETS 3434*	1	ug/l	< 5.0	< 5.0
Diethylphthalate	DETS 3434*	1	ug/l	< 5.0	< 5.0
4-Chlorophenylphenylether	DETS 3434*	1	ug/l	< 5.0	< 5.0
4-Nitroaniline	DETS 3434*	1	ug/l	< 5.0	< 5.0
Diphenylamine	DETS 3434*	1	ug/l	< 5.0	< 5.0
4-Bromophenylphenylether	DETS 3434*	1	ug/l	< 5.0	< 5.0
Hexachlorobenzene	DETS 3434*	1	ug/l	< 5.0	< 5.0
Bis(2-ethylhexyl)ester	DETS 3434*	1	ug/l	< 5.0	< 5.0
Pentachlorophenol	DETS 3434*	1	ug/l	< 5.0	< 5.0
Di-n-butylphthalate	DETS 3434*	1	ug/l	< 5.0	< 5.0
Butylbenzylphthalate	DETS 3434*	1	ug/l	< 5.0	< 5.0
Bis(2-ethylhexyl)phthalate	DETS 3434*	1	ug/l	< 5.0	5.0
Di-n-octylphthalate	DETS 3434*	1	ug/l	< 5.0	< 5.0
1,4-Dinitrobenzene	DETS 3434*	1	ug/l	< 5.0	< 5.0
Dimethylphthalate	DETS 3434*	1	ug/l	< 5.0	< 5.0
1,3-Dinitrobenzene	DETS 3434*	1	ug/l	< 5.0	< 5.0
2,3,5,6-Tetrachlorophenol	DETS 3434*	1	ug/l	< 5.0	< 5.0
Azobenzene	DETS 3434*	1	ug/l	< 5.0	< 5.0
Carbazole	DETS 3434*	1	ug/l	< 5.0	< 5.0
1-Methylnaphthalene	DETS 3434*	1	ug/l	48	110
<b>VOC TICs</b>					
2-Butene, 2,3-dimethyl- (TIC)	DETS 3432*		ug/l	902.2	
Butane, 2-methyl- (TIC)	DETS 3432*		ug/l		190.4
Cyclopropane, 1,2-dimethyl-, cis- (TIC)	DETS 3432*		ug/l	312.9	
Hexane, 2-methyl- (TIC)	DETS 3432*		ug/l		193
Hexane, 3-methyl- (TIC)	DETS 3432*		ug/l	115.1	
Mesitylene (TIC)	DETS 3432*		ug/l	47467837	47773079
<b>SVOC TICs</b>					
1H-Indene, 2,3-dihydro-5-methyl- (TIC)	DETS 071*		ug/l	67452118	
3-Octanol, 3,7-dimethyl- (TIC)	DETS 071*		ug/l	08952983	
Benzene, (1-methylethyl)- (TIC)	DETS 071*		ug/l	97.308687	3237473
Benzene, 1,2,4,5-tetramethyl- (TIC)	DETS 071*		ug/l	39305249	35685881
Benzene, 1-ethyl-2-methyl- (TIC)	DETS 071*		ug/l	40371051	08966223
Benzene, 2-ethyl-1,4-dimethyl- (TIC)	DETS 071*		ug/l	73684689	
Decane, 2,3,7-trimethyl- (TIC)	DETS 071*		ug/l	9.0166060	4656105
Hexadecane, 2,6,10,14-tetramethyl- (TIC)	DETS 071*		ug/l	79588291	06565146
Indan, 1-methyl- (TIC)	DETS 071*		ug/l	95379256	56704872
Indane (TIC)	DETS 071*		ug/l	38497843	70182085
p-Cymene (TIC)	DETS 071*		ug/l	44.432172	7171188

## Summary of Chemical Analysis Water Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790319	1790320
Sample ID	BH25	BH31
Depth	4.00	3.30
Other ID		
Sample Type	WATER	WATER
Sampling Date	20/01/2021	20/01/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units
Pentadecane, 2,6,10,14-tetramethyl- (TIC)	DETS 071*		ug/l

40015138	49944372
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## Summary of Asbestos Analysis Soil Samples

Our Ref 21-01241

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1790323	BH31 1.00-2.00	SOIL	NAD	none	Michael Kay
1790324	BH31 3.00-4.00	SOIL	NAD	none	Michael Kay
1790325	BH31 5.00-6.00	SOIL	NAD	none	Michael Kay
1790326	BH28 6.00	SOIL	NAD	none	Michael Kay
1790327	BH28 8.00	SOIL	NAD	none	Michael Kay
1790328	BH28 4.30	SOIL	NAD	none	Michael Kay
1790329	BH17 1.20	SOIL	NAD	none	Michael Kay
1790330	BH10 4.00	SOIL	NAD	none	Michael Kay
1790331	BH19 3.00	SOIL	NAD	none	Michael Kay

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: \* - not included in laboratory scope of accreditation.

## Information in Support of the Analytical Results

Our Ref 21-01241

Client Ref 3899

Contract Wastefront, Sunderland Docks

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1790319	BH25 4.00 WATER	20/01/21	GB 1L x2, GV		
1790320	BH31 3.30 WATER	20/01/21	GB 1L, GV		
1790321	BH25 4.00 SOIL	20/01/21	GJ 250ml x2, PT 1L		
1790322	BH31 4.00 SOIL	20/01/21	GJ 250ml x2, PT 1L		
1790323	BH31 1.00-2.00 SOIL	20/01/21	PT 1L		
1790324	BH31 3.00-4.00 SOIL	20/01/21	PT 1L		
1790325	BH31 5.00-6.00 SOIL	20/01/21	PT 1L		
1790326	BH28 6.00 SOIL	20/01/21	PT 1L		
1790327	BH28 8.00 SOIL	20/01/21	PT 1L		
1790328	BH28 4.30 SOIL	20/01/21	PT 1L		
1790329	BH17 1.20 SOIL	20/01/21	PT 1L		
1790330	BH10 4.00 SOIL	20/01/21	PT 1L		
1790331	BH19 3.00 SOIL	20/01/21	PT 1L		

Key: G-Glass B-Bottle V-Vial P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



## Certificate of Analysis

*Certificate Number* 21-01251

*Issued:* 29-Jan-21

*Client* FWS Consultants  
Unit 2 City West Business Park  
St Johns Road  
Meadowfield Industrial Estate  
Co Durham  
DH7 8ER

*Our Reference* 21-01251

*Client Reference* 3899

*Order No* 2020/3806

*Contract Title* Wastefront, Sunderland Docks

*Description* One Water sample.

*Date Received* 22-Jan-21

*Date Started* 22-Jan-21

*Date Completed* 29-Jan-21

*Test Procedures* Identified by prefix DETSn (details on request).

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

*Approved By*

A handwritten signature in black ink, appearing to read 'A. Fenwick', written over a large, light purple watermark that says 'DRAFT'.

Adam Fenwick  
Contracts Manager



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## Summary of Chemical Analysis

### Water Samples

Our Ref 21-01251

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790360
Sample ID	BH28
Depth	18.00
Other ID	
Sample Type	WATER
Sampling Date	21/01/2021
Sampling Time	n/s

Test	Method	LOD	Units	
<b>Metals</b>				
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	8.3
Boron, Dissolved	DETSC 2306*	12	ug/l	490
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.05
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.52
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.6
Lead, Dissolved	DETSC 2306	0.09	ug/l	1.6
Manganese, Dissolved	DETSC 2306	0.22	ug/l	110
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.02
Nickel, Dissolved	DETSC 2306	0.5	ug/l	4.0
Zinc, Dissolved	DETSC 2306	1.3	ug/l	4.1
<b>Inorganics</b>				
pH	DETSC 2008		pH	7.6
Cyanide, Total	DETSC 2130	40	ug/l	< 40
Cyanide, Free	DETSC 2130	0.02	mg/l	< 0.02
Hardness	DETSC 2303	0.1	mg/l	1770
Chloride	DETSC 2055	0.1	mg/l	3000
Sulphate as SO4	DETSC 2055	0.1	mg/l	300



## Summary of Chemical Analysis

### Water Samples

Our Ref 21-01251

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790360
Sample ID	BH28
Depth	18.00
Other ID	
Sample Type	WATER
Sampling Date	21/01/2021
Sampling Time	n/s

Test	Method	LOD	Units	
<b>Petroleum Hydrocarbons</b>				
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	26
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	26
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	26
EPH (C10-C40)	DETSC 3311	10	ug/l	100
Benzene	DETSC 3322	1	ug/l	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0
<b>PAHs</b>				
Naphthalene	DETSC 3304	0.05	ug/l	0.10
Acenaphthylene	DETSC 3304	0.01	ug/l	0.06
Acenaphthene	DETSC 3304	0.01	ug/l	0.12
Fluorene	DETSC 3304	0.01	ug/l	0.05
Phenanthrene	DETSC 3304	0.01	ug/l	0.20
Anthracene	DETSC 3304	0.01	ug/l	0.11
Fluoranthene	DETSC 3304	0.01	ug/l	0.34
Pyrene	DETSC 3304	0.01	ug/l	0.35
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	0.23
Chrysene	DETSC 3304	0.01	ug/l	0.32
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	0.53
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	0.18
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	0.31
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	0.20
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	0.04

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-01251

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790360
Sample ID	BH28
Depth	18.00
Other ID	
Sample Type	WATER
Sampling Date	21/01/2021
Sampling Time	n/s

Test	Method	LOD	Units	
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	0.17
PAH Total	DETSC 3304	0.2	ug/l	3.3
<b>Phenols</b>				
Phenol - Monohydric	DETSC 2130	0.1	mg/l	< 0.1

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-01251

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790360
Sample ID	BH28
Depth	18.00
Other ID	
Sample Type	WATER
Sampling Date	21/01/2021
Sampling Time	n/s

Test	Method	LOD	Units	
<b>VOCs</b>				
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1
2,2-dichloropropane	DETSC 3432	2	ug/l	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4
Chloroform	DETSC 3432	1	ug/l	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1
Benzene	DETSC 3432	1	ug/l	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1
Toluene	DETSC 3432	1	ug/l	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1
Styrene	DETSC 3432	1	ug/l	< 1
Bromoform	DETSC 3432	1	ug/l	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-01251

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790360
Sample ID	BH28
Depth	18.00
Other ID	
Sample Type	WATER
Sampling Date	21/01/2021
Sampling Time	n/s

Test	Method	LOD	Units	
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1
MTBE	DETSC 3432*	1	ug/l	< 1
<b>SVOCs</b>				
Phenol	DETSC 3434*	1	ug/l	< 2.5
Aniline	DETSC 3434*	1	ug/l	< 2.5
2-Chlorophenol	DETSC 3434*	1	ug/l	< 2.5
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 2.5
2-Methylphenol	DETSC 3434*	1	ug/l	< 2.5
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 2.5
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 2.5
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 2.5
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 2.5
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 2.5
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 2.5
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 2.5
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 2.5
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 2.5
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 2.5
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 2.5
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 2.5
2-Nitroaniline	DETSC 3434*	1	ug/l	< 2.5
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 2.5

## Summary of Chemical Analysis

### Water Samples

Our Ref 21-01251

Client Ref 3899

Contract Title Wastefront, Sunderland Docks

Lab No	1790360
Sample ID	BH28
Depth	18.00
Other ID	
Sample Type	WATER
Sampling Date	21/01/2021
Sampling Time	n/s

Test	Method	LOD	Units	
3-Nitroaniline	DETSC 3434*	1	ug/l	< 2.5
4-Nitrophenol	DETSC 3434*	1	ug/l	< 2.5
Dibenzofuran	DETSC 3434*	1	ug/l	< 2.5
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 2.5
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 2.5
Diethylphthalate	DETSC 3434*	1	ug/l	< 2.5
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 2.5
4-Nitroaniline	DETSC 3434*	1	ug/l	< 2.5
Diphenylamine	DETSC 3434*	1	ug/l	< 2.5
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 2.5
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 2.5
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 2.5
Pentachlorophenol	DETSC 3434*	1	ug/l	< 2.5
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 2.5
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 2.5
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 2.5
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 2.5
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 2.5
Dimethylphthalate	DETSC 3434*	1	ug/l	< 2.5
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 2.5
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 2.5
Azobenzene	DETSC 3434*	1	ug/l	< 2.5
Carbazole	DETSC 3434*	1	ug/l	< 2.5
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 2.5
<b>SVOC TICs</b>				
Blank (TIC)	DETS 071*		ug/l	None

## Information in Support of the Analytical Results

Our Ref 21-01251  
 Client Ref 3899  
 Contract Wastefront, Sunderland Docks

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1790360	BH28 18.00 WATER	21/01/21	GB 1L x2, GV		
<p>Key: G-Glass B-Bottle V-Vial</p> <p>DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.</p>					

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-  
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

**APPENDIX 5**

**CHEMICAL STATISTICAL ANALYSIS**

DRAFT

Landuse	SOM%		3899	Wastefront, Sunderland				
Commercial	1							
Determinand	Units	Assessment Value (AV)	No. Samples	Samples Exceeding AV	Max	Min	Mean	Upper 95%ile
Organic matter	%		60	0	15.00	0.05	2.42	3.80
<b>HUMAN HEALTH</b>								
Inorganic Arsenic	mg/kg	640	60	0	230	1.50	16.69	33.46
Boron	mg/kg	240000	60	0	2.80	0.30	1.22	1.62
Cadmium	mg/kg	190	60	0	28	0.05	1.12	3.29
Chromium III	mg/kg	8600	60	0	42	2.10	15.60	20.38
Chromium VI	mg/kg	33	60	0	0.50	0.50	0.50	0.50
Copper	mg/kg	68000	60	0	660	7.40	103.97	170.73
Lead	mg/kg	2300	60	0	1300	13.00	107.49	242.09
Elemental Mercury	mg/kg	58	60	0	14.0	0.025	0.622	1.834
Nickel	mg/kg	980	60	0	82	1.70	22.01	31.46
Selenium	mg/kg	12000	0	0	0.00	0.00	-	-
Zinc	mg/kg	730000	60	0	82000	24.00	1585.85	7529.45
Cyanide Total	mg/kg		60	0	28	0.050	1.376	3.535
Inorganic Cyanide	mg/kg	16000	60	0	0.10	0.05	0.05	0.05
Thiocyanate	mg/kg		0	0	0.00	0.00	-	-
Aliphatic EC 5-6	mg/kg	3200	60	0	25	0.01	0.87	2.98
Aliphatic EC >6-8	mg/kg	7800	60	0	45	0.01	2.16	7.08
Aliphatic EC >8-10	mg/kg	2000	60	0	44	0.01	1.18	4.56
Aliphatic EC >10-12	mg/kg	9700	60	0	160	0.75	6.05	20.08
Aliphatic EC >12-16	mg/kg	59000	60	0	370	0.60	13.12	45.34
Aliphatic C16-C21	mg/kg		60	0	360	0.75	11.38	39.38
Aliphatic C21-C35	mg/kg		60	0	160	1.70	13.99	31.75
Aliphatic EC >16-35	mg/kg	1600000	60	0	480	2.45	25.37	65.63
Aliphatic C5-C35	mg/kg		60	0	1000	5.00	49.20	135.22
Aromatic EC 5-7 (benzene)	mg/kg	26000	60	0	0.32	0.01	0.01	0.04
Aromatic EC >7-8 (toluene)	mg/kg	56000	60	0	5.60	0.01	0.18	0.67
Aromatic EC >8-10	mg/kg	3500	60	0	17.00	0.01	0.58	2.14
Aromatic EC >10-12	mg/kg	16000	60	0	230	0.45	6.28	23.72
Aromatic EC >12-16	mg/kg	36000	60	0	230	0.25	8.22	29.25
Aromatic EC >16-21	mg/kg	28000	60	0	340	0.30	11.20	37.12
Aromatic EC >21-35	mg/kg	28000	60	0	500	0.70	35.96	86.47
Aromatic C5-C35	mg/kg		60	0	850	5.00	64.87	152.88
TPH Ali/Aro	mg/kg		60	0	1900	5.00	110.05	276.79
EPH (C10-C40)	mg/kg		0	0	0.00	0.00	-	-
Benzene	mg/kg	27	60	0	0.32	0.01	0.01	0.04
Ethylbenzene	mg/kg	5700	60	0	1.90	0.01	0.06	0.21
Toluene	mg/kg	56000	60	0	18	0.01	0.48	1.87
Xylenes	mg/kg	5900	60	0	3.90	0.01	0.10	0.40
MTBE	mg/kg		60	0	0.01	0.01	0.01	0.01
<b>PAHs</b>								
Naphthalene	mg/kg	190	60	0	20	0.05	0.82	2.29
Acenaphthylene	mg/kg	83000	60	0	12	0.05	0.56	1.47
Acenaphthene	mg/kg	84000	60	0	7.9	0.05	0.67	1.41
Fluorene	mg/kg	63000	60	0	10	0.05	0.92	1.92
Phenanthrene	mg/kg	22000	60	0	46	0.05	5.84	11.54
Anthracene	mg/kg	520000	60	0	19	0.05	1.66	3.49
Fluoranthene	mg/kg	23000	60	0	92	0.05	9.53	19.40
Pyrene	mg/kg	54000	60	0	76	0.05	8.36	16.88
Benzo(a)anthracene	mg/kg	170	60	0	53	0.05	5.18	11.12
Chrysene	mg/kg	350	60	0	62	0.05	5.48	11.87
Benzo(b)fluoranthene	mg/kg	44	60	0	43	0.05	4.24	8.86
Benzo(k)fluoranthene	mg/kg	1200	60	0	20	0.05	2.37	4.82
Benzo(a)pyrene	mg/kg	35	60	1	42	0.05	4.64	9.48
Indeno(1,2,3-c,d)pyrene	mg/kg	500	60	0	22	0.05	3.15	6.23
Dibenzo(a,h)anthracene	mg/kg	3.5	60	5	6.6	0.05	0.72	1.52
Benzo(g,h,i)perylene	mg/kg	3900	60	0	19	0.05	3.02	5.89
PAH	mg/kg		60	0	480	0.80	57.39	116.13
Phenol	mg/kg	440	60	0	0.5	0.15	0.16	0.20



Landuse	SOM%		3899	Wastefront, Sunderland				
Commercial	1							
Determinand	Units	Assessment Value (AV)	No. Samples	Samples Exceeding AV	Max	Min	Mean	Upper 95%ile
<b>BUILDINGS AND SERVICES</b>								
pH		5	74	0	12.30	7.10	9.10	9.63
Chloride Aqueous Extract	mg/l	100	60	11	1200	0.50	90.67	199.46
Sulphate Aqueous Extract as SO4	mg/l	500	74	8	1600	5.00	227.00	378.01
Sulphur (free)	mg/kg		0	0	0.00	0.00	-	-
Total Sulphate as SO4	%		74	0	1.70	0.03	0.25	0.37
<b>PLANTS</b>								
Copper	mg/kg	600	60	1	660	7.40	103.97	170.73
Nickel	mg/kg	250	60	0	82	1.70	22.01	31.46
Zinc	mg/kg	3000	60	1	82000	24.00	1585.85	7529.45
Boron	mg/kg	30	60	0	2.8	0.30	1.22	1.62
Cadmium	mg/kg	15	60	1	28	0.05	1.12	3.29
Chromium VI	mg/kg	600	60	0	1	1	1	1
Total Chromium	mg/kg	1000	60	0	42	2.10	15.60	20.38
Mercury	mg/kg	20	60	0	14	0.025	0.622	1.834
Lead	mg/kg	2000	60	0	1300	13.00	107.49	242.09
Arsenic	mg/kg	80	60	1	230	1.50	16.69	33.46
Selenium	mg/kg	50	0	0	0.00	0.00	-	-

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**APPENDIX 6**

**GENERIC ASSESSMENT CRITERIA**

# GENERIC ASSESSMENT CRITERIA AND THEIR DERIVATION

## INTRODUCTION

Following the identification of potential pollution linkages specific to this development, a preliminary screen of the chemical data has been undertaken to identify contamination hazards on the site, using Generic Assessment Criteria developed for the specific receptors and conditions. The “criteria” used in this screening process, as presented in the report, have been derived for soils and waters in accordance with current Environment Agency/DEFRA guidance. The hierarchy of sources used in deriving these criteria are presented in the Table overleaf.

The generic assessment values for soil and water have been compiled in order to identify concentrations of contaminants that could potentially pose a significant risk of harm or pollution to the receptors specific to this site. These criteria have been developed as follows:-

**Human Health** - The proposed development is to be commercial and the LQM S4ULs has been assessed as appropriate for the site and, appropriately conservative values for organic matter content have been adopted to select generic assessment values. Where LQM S4ULs are not available CLEA 1.06 values or LQM Generic Human Health Assessment Criteria have been adopted as appropriate.

**Property and Services** - BRE Special Digest 1 has been used to assess the potential for chemical attack of buried concrete. For buried services (particularly potable water supplies) guidance from the Water Regulations Advisory Scheme has been used for soils. For waters, a conservative approach is used which assumes a human health receptor. Therefore, UK drinking water guidelines have been used.

**Surface Waters** - UK guidance has been utilised where available to develop screening values for surface waters (i.e. UK drinking water guidelines and Environment Agency EQS). Where guidance for specific determinands is not available the hierarchy of sources listed in the Table overleaf have been used. No UK guidance is currently available for screening contaminant concentrations in soils in relation to protection of surface waters.

**Groundwaters** - UK guidance (e.g. UK drinking water guidelines) has been utilised in the first instance for screening values for groundwaters and where these do not give screening values the hierarchies listed in the Table overleaf, have been used.

**Ecology** - Dutch guidelines are generally used to assess whether contaminants are a potential hazard to ecology. Guidelines from Dickinson et.al. 2000, have been used to assess the level of phytotoxicity from copper, nickel and zinc.

## HIERARCHY OF SOURCES USED IN DERIVATION OF GENERIC ASSESSMENT CRITERIA

Receptor		Hierarchy
Human Health		<p><b><u>Soils</u></b></p> <ol style="list-style-type: none"> <li>1 LQM S4ULs</li> <li>2 CLEA SGV values</li> <li>3 LQM Generic Human Health Assessment Criteria</li> <li>4 ICRCL Guidance of Fire Hazards</li> <li>5 Dutch Guideline Values</li> <li>6 USEPA Screening Values</li> </ol> <p><b><u>Water</u></b></p> <ol style="list-style-type: none"> <li>1 UK Drinking Water Guideline</li> <li>2 Private Water Supplies Regulations</li> </ol> <p><b><u>Soil Gas</u></b></p> <ol style="list-style-type: none"> <li>1 CIRIA Guidance</li> </ol> <p><b><u>Soil Vapours</u></b></p> <ol style="list-style-type: none"> <li>1 CIRIA Guidance</li> </ol>
Property	Buried Concrete	<p><b><u>Soils and Water</u></b></p> <ol style="list-style-type: none"> <li>1 BRE Special Digest 1</li> </ol>
	Potable Water	<p><b><u>Soils</u></b></p> <ol style="list-style-type: none"> <li>1 Water Regulations Advisory Scheme Guidance</li> <li>2 USEPA Screening Values</li> <li>3 Dutch Guideline</li> </ol> <p><b><u>Water</u></b></p> <ol style="list-style-type: none"> <li>1 UK Drinking Water Guideline</li> <li>2 Private Water Supplies Regulations</li> </ol> <p><b><u>Soil Gas</u></b></p> <ol style="list-style-type: none"> <li>1 CIRIA Guidance</li> </ol> <p><b><u>Soil Vapours</u></b></p> <ol style="list-style-type: none"> <li>1 CIRIA Guidance</li> </ol>
Controlled Waters	Surface Watercourses	<p><b><u>Soils</u></b></p> <ol style="list-style-type: none"> <li>1 USEPA Screening Values</li> <li>2 Dutch Guideline Values</li> </ol> <p><b><u>Water</u></b></p> <ol style="list-style-type: none"> <li>1 Environment Agency EQS</li> <li>2 Environment Agency Advice on MTBE</li> <li>3 Dutch Guideline Values</li> </ol>
	Groundwater	<p><b><u>Soils</u></b></p> <ol style="list-style-type: none"> <li>1 USEPA Screening Values</li> <li>2 Dutch Guideline Values</li> </ol> <p><b><u>Water</u></b></p> <ol style="list-style-type: none"> <li>1 UK Drinking Water Guideline</li> <li>2 Private Water Supplies Regulations</li> <li>3 Environment Agency Advice on MTBE</li> <li>4 Dutch Guideline Values</li> </ol>
Landscaping		<p><b><u>Soils</u></b></p> <ol style="list-style-type: none"> <li>1 ICRCL 59/83</li> </ol> <p><b><u>Water</u></b></p> <ol style="list-style-type: none"> <li>1 None</li> </ol>

**GENERICA ASSESSMENT CRITERIA - SOILS**

Site Name	WASTE FRONT, PORT OF SUNDERLAND		
Project Number	3899		
Development Type	Commercial	Soil Organic Matter %	1
<b>Human Health</b>			
Determinand	Assessment Level	Unit	Source
Inorganic Arsenic	640	mg/kg	S4ULs (LQM)
Beryllium	12	mg/kg	S4ULs (LQM)
Boron	240000	mg/kg	S4ULs (LQM)
Cadmium	190	mg/kg	S4ULs (LQM)
Chromium III	8600	mg/kg	S4ULs (LQM)
Chromium VI	33	mg/kg	S4ULs (LQM)
Copper	68000	mg/kg	S4ULs (LQM)
Elemental Mercury	58vap(25.8)	mg/kg	S4ULs (LQM)
Inorganic Mercury	#N/A	#N/A	S4ULs (LQM)
Methylmercury	320	mg/kg	S4ULs (LQM)
Nickel	980	mg/kg	S4ULs (LQM)
Selenium	12000	mg/kg	S4ULs (LQM)
Vanadium	9000	mg/kg	S4ULs (LQM)
Zinc	730000	mg/kg	S4ULs (LQM)
Lead	2300	mg/kg	SGV
Inorganic Cyanide	16000	mg/kg	CLEA 1.06
Benzene	27	mg/kg	S4ULs (LQM)
Toluene	5600vap(869)	mg/kg	S4ULs (LQM)
Ethylbenzene	5700vap(518)	mg/kg	S4ULs (LQM)
o-Xylenes	6600sol(478)	mg/kg	S4ULs (LQM)
m-Xylenes	6200sol(625)	mg/kg	S4ULs (LQM)
p-Xylenes	5900sol(576)	mg/kg	S4ULs (LQM)
Aliphatic EC 5-6	3200sol(304)	mg/kg	S4ULs (LQM)
Aliphatic EC >6-8	7800sol(144)	mg/kg	S4ULs (LQM)
Aliphatic EC >8-10	2000sol(78)	mg/kg	S4ULs (LQM)
Aliphatic EC >10-12	9700sol(48)	mg/kg	S4ULs (LQM)
Aliphatic EC >12-16	59000sol(24)	mg/kg	S4ULs (LQM)
Aliphatic EC >16-35	1600000	mg/kg	S4ULs (LQM)
Aliphatic EC >35-44	1600000	mg/kg	S4ULs (LQM)
Aromatic EC 5-7 (benzene)	26000sol(1220)	mg/kg	S4ULs (LQM)
Aromatic EC >7-8 (toluene)	56000vap(869)	mg/kg	S4ULs (LQM)
Aromatic EC >8-10	3500vap(613)	mg/kg	S4ULs (LQM)
Aromatic EC >10-12	16000sol(364)	mg/kg	S4ULs (LQM)
Aromatic EC >12-16	36000sol(169)	mg/kg	S4ULs (LQM)
Aromatic EC >16-21	28000	mg/kg	S4ULs (LQM)
Aromatic EC >21-35	28000	mg/kg	S4ULs (LQM)
Aromatic EC >35-44	28000	mg/kg	S4ULs (LQM)
Aliphatic + Aromatic EC <44-70	28000	mg/kg	S4ULs (LQM)
Acenaphthene	84000sol(57)	mg/kg	S4ULs (LQM)
Acenaphthylene	83000sol(86.1)	mg/kg	S4ULs (LQM)
Anthracene	520000	mg/kg	S4ULs (LQM)
Benzo(a)anthracene	170	mg/kg	S4ULs (LQM)
Benzo(a)pyrene	35	mg/kg	S4ULs (LQM)
Benzo(b)fluoranthene	44	mg/kg	S4ULs (LQM)
Benzo(ghi)perylene	3900	mg/kg	S4ULs (LQM)
Benzo(k)fluoranthene	1200	mg/kg	S4ULs (LQM)
Chrysene	350	mg/kg	S4ULs (LQM)
Dibenz(ah)anthracene	3.5	mg/kg	S4ULs (LQM)
Fluoranthene	23000	mg/kg	S4ULs (LQM)
Fluorene	63000sol(30.9)	mg/kg	S4ULs (LQM)
Indeno(123-cd)pyrene	500	mg/kg	S4ULs (LQM)
Naphthalene	190sol(76.4)	mg/kg	S4ULs (LQM)
Phenanthrene	22000	mg/kg	S4ULs (LQM)
Pyrene	54000	mg/kg	S4ULs (LQM)
Phenol	440dir(26000)	mg/kg	S4ULs (LQM)
<b>Plants</b>			
Determinand	Assessment Level	Unit	Source
Copper	600	mg/kg	Dickinson et al
Nickel	250	mg/kg	Dickinson et al
Zinc	3000	mg/kg	Dickinson et al
Boron	30	mg/kg	Dickinson et al
Cadmium	15	mg/kg	Dickinson et al
Chromium VI	600	mg/kg	Dickinson et al
Total Chromium	1000	mg/kg	Dickinson et al
Mercury	20	mg/kg	Dickinson et al
Lead	2000	mg/kg	Dickinson et al
Arsenic	80	mg/kg	Dickinson et al
Cobalt	240	mg/kg	Dickinson et al
Molybdenum	200	mg/kg	Dickinson et al
Selenium	50	mg/kg	Dickinson et al
<b>Buildings and Services</b>			
Determinand	Assessment Level	Unit	Source
pH	<5		BRE SD1:2005
Sulphate 2:1 water/soil leachate	500	mg/l	BRE SD1:2005
Chloride	100	mg/kg	WRc Environment 1987 PRD 1452M/1

<b>GROUNDWATER</b>		
Determinands	Quality Standard	Provenance
Alkalinity		
Aluminium	200 µg/l	UK DWS
Antimony	5 µg/l	UK DWS
Arsenic	50 µg/l	UK WFD
Barium	1 mg/l	UK DWS
Boron	1mg/l (Potable Supply) 2 mg/l (Aquatic Life)	76/464/EEC
Cadmium	< /= 0.08 µg/l (<40 mg CaCO3/l) 0.08 µg/l (40 to <50 mg CaCO3/l) 0.09 µg/l (50 to <100 mg CaCO3/l) 0.15 µg/l (100 to <200 mg CaCO3/l) 0.25 µg/l (> /= 200 mg CaCO3/l) MAC < /= 0.45 µg/l (<40 mg CaCO3/l) 0.45 µg/l (40 to <50 mg CaCO3/l) 0.6 µg/l (50 to <100 mg CaCO3/l) 0.9 µg/l (100 to <200 mg CaCO3/l) 1.5 µg/l (> /= 200 mg CaCO3/l)	UK WFD
Calcium	250 mg/l	UK DWS
Chloride	250 mg/l	76/464/EEC
Chromium	50 µg/l	UK DWS
Chromium VI	3.4 µg/l	UK WFD
Chromium III	4.7 µg/l	UK WFD
Cobalt	AA 3.0 µg/l MAC 100 µg/l	76/464/EEC
Conductivity	2500 uS/cm at 20°C	UK DWS
Copper	0-50 mg CaCO3/l: 1 µg/l 50-100 CaCO3/l: 6 µg/l 100-250 mg CaCO3/l: 10 µg/l >250 mg CaCO3/l: 28 µg/l	UK WFD
Ferric Iron (FE 3+)		
Iron (total)	A1: 300 µg/l (Potable Supply) A2: 2000 µg/l (Potable Supply) 1 mg/l (Aquatic Life)	UK WFD / 76/464/EEC
Lead	7.2 µg/l	UK WFD
Magnesium	50mg/l	UK DWS
Manganese	AA 30.0 µg/l MAC 300 µg/l	76/464/EEC
Mercury	AA-EQS: 0.05 µg/l MAC-EQS: 0.07 µg/l	UK WFD
Molybdenum	0.07 mg/l	WHO DWS
Nickel	AA-EQS: 20 µg/l	UK WFD
pH	> /= 6.5 and < /= 9.5	UK DWS
Phosphorus	2200µg/l	UK DWS
Potassium	12mg/l	UK DWS
Selenium	10 µg/l	UK DWS
Sodium	200 mg/l	UK DWS
Strontium		
Sulphate	400 000 µg/l	76/464/EEC
Sulphide	0.25 µg/l	EQS
Tungsten		
Vanadium	0-200 mg CaCO3/l: 20 µg/l 200+ mg CaCO3/l: 60 µg/l	76/464/EEC
Zinc	0-50 mg CaCO3/l: 8 µg/l 50-100 CaCO3/l: 50 µg/l 100-250 mg CaCO3/l: 75 µg/l >250 mg CaCO3/l: 125 µg/l	UK WFD
Total TPH	10µg/l	UK DWS
Speciated PAH	0.10 µg/l	UK DWS
Acenaphthene		
Acenaphthylene		
Anthracene	AA-EQS: 0.1 µg/l MAC-EQS: 0.4 µg/l	UK WFD
Benzo(a)anthracene		
Benzo(a)pyrene	AA-EQS: 0.05 µg/l MAC-EQS: 0.1 µg/l	UK WFD
Benzo(b)fluoranthene	AA-EQS: 0.03 µg/l (1)	UK WFD
Benzo(k)fluoranthene	AA-EQS: 0.03 µg/l	UK WFD
Benzo(ghi)perylene	AA-EQS: 0.002 µg/l	UK WFD
Indeno(123-cd)pyrene	AA-EQS: 0.002 µg/l	UK WFD
Chrysene		
Dibenzo(ah)anthracene		
Fluoranthene	AA-EQS: 0.1 µg/l MAC-EQS: 1 µg/l	UK WFD
Fluorene		
Naphthalene	AA-EQS: 2.4 µg/l	UK WFD
Phenanthrene		
Pyrene		

**Concrete**

Sulphate	400 mg/l	BRE SD1:2005
pH		5.5 BRE SD1:2005
Chloride	2000 mg/l	BRE 255

**APPENDIX 7**

**PRINCIPLES OF CONTAMINATION RISK ASSESSMENT**

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## PRINCIPLES OF CONTAMINATION RISK ASSESSMENT

The Environmental Protection Act 1990, Part II A Contaminated Land (Section 57 of the Environment Act 1995) and the Contaminated Land Regulations 1999 provide a basis on which to determine the unacceptable risks and liabilities presented by a contaminated site. Contaminated Land is defined within Section 78A(2) and in all those Sections mentioned as:-

“Any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that-

- a) **SIGNIFICANT HARM** is being caused, or there is significant possibility of such harm being caused; or
- b) **SIGNIFICANT POLLUTION OF CONTROLLED WATERS** is being caused, or there is a significant possibility of such pollution being caused.”

Section 57 of the Environment Act 1995 requires that any site identified as being “contaminated” by the Local Authority will be registered by them and remediation will be required to render the site fit for use.

The presence of contamination is not the sole factor for deciding whether a site is contaminated. Relevant parties should identify site-specific unacceptable risks and provide objective, cost-effective methods to manage the contamination in a manner which satisfies the proposed end-use.

The guidance defines “risk” as the combination of:-

**PROBABILITY OF RISK:** or frequency, of occurrence of a defined hazard; and

**MAGNITUDE/POTENTIAL SEVERITY:** (including the seriousness) of the consequences.

A risk-based approach, which takes both technical and non-technical aspects into consideration when making decisions on contamination resulting from past, present or future human activities, is advocated.

The assessment of unacceptable risks generally relies on the identification of three principal elements forming a ‘contaminant linkage’:-

**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 to controlled waters

**RECEPTOR:** something that could be adversely affected by a contaminant eg. a person, an organism, and ecosystem, property or controlled waters

**PATHWAY:** a route through which the contaminant can migrate, and by which a receptor is, or might be, affected by a contaminant

In the absence of any one of these elements, on any given site, there is no risk. Where all three elements are present, a risk assessment is required to determine the significance of the harm or pollution that is being or may be caused. As outlined above, the terms of the Contaminated Land regime specify that remediation need only be implemented where a site is causing, or there is a significant possibility that it will cause, significant harm, or that pollution of controlled waters is being, or is likely to be caused.

Development of contaminated land is usually addressed through the application of planning and development legislation and guidance (i.e. Planning Guidance Note PPS23 Planning and Pollution Control in England). The suitable for use approach is seen as the most appropriate basis to deal with contaminated land, taking account of environmental, social and economic objectives. The assessment is made in the context of the proposed land use (e.g. residential, commercial, industrial and public open-space).



### Definition of Severity of Consequence

The risk assessment has been undertaken by assessing the severity of the potential consequence, taking into account both the potential severity of the hazard and the sensitivity of the target, based on the categories given below.

Category	Definition
Severe	Acute risks to human health, catastrophic damage to buildings/property, major pollution of controlled waters
Medium	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures
Mild	Pollution of non-sensitive waters, minor damage to buildings or structures
Minor	Requirements for protective equipment during site works to mitigate health effects, damage to non-sensitive ecosystems or species

### Definition of Probability of Occurrence

The likelihood of an event (probability) takes into account the linkage between a hazard and target and the integrity of this pathway, and has been assessed based on the categories given below.

Category	Definition
High Likelihood	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term
Low Likelihood	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so
Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable

### Risk Matrix

The potential severity of the consequence and the probability of the occurrence have been combined in accordance with the following matrix in order to give a level of risk for each potential hazard.

		Severity of Consequence			
		Severe	Medium	Mild	Minor
Probability of Occurrence	High Likelihood	Very high	High	Moderate	Low
	Likely	High	Moderate	Low	Very Low
	Low Likelihood	Moderate	Low	Very Low	Negligible
	Unlikely	Low	Very Low	Negligible	Negligible

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**APPENDIX 8**

**GEOTECHNICAL ANALYSIS RESULTS**

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**APPENDIX 9**

**NOTES ON LIMITATIONS**

## NOTES ON LIMITATIONS

- 1 FWS Consultants Ltd (“FWS”) has prepared this report solely for the use of the client and/or his agent (the “Client”) on the basis of exchange(s) of written proposals and instructions, and FWS accepts no responsibility or liability:-
- a) for use of this report by any party other than the person for whom it was commissioned, or;
  - b) for the consequences of the report being used for any purpose other than that for which FWS was instructed to prepare it.

Should any third party wish to use or rely upon the contents of the report, written approval from FWS must be sought.

- 2 All information supplied by the Client, the Client’s staff and professional advisers, local authorities, other statutory bodies, investigation agencies and publicly accessible databases, shall be provided to FWS in writing, and is accepted as being correct unless otherwise specified in writing by the discloser of the information.
- 3 The conclusions and recommendations in this report represent the professional opinions of FWS derived from currently accepted industry practices, and through the exercising of reasonable skill and care to be expected of a professional geosciences and environmental consultancy of similar size and experience. The assessments and judgments given in this report are directed by and limited to both the finite data on which they are based and the proposed works to which they are addressed.
- 4 Environmental and geotechnical desk studies comprise a study of available information obtained from various identified sources, authorities and parties. The information reviewed cannot be exhaustive and has been accepted in good faith as providing representative and true data pertaining to site conditions. For clarity, no independent verification of this data is carried out by FWS and it is accepted at face value. Any identified risks in desk study reports are perceived risks based on the information available at the time. Actual risks can only be assessed after carrying out a thorough physical investigation of the site that serves to validate such identified risks.
- 5 Data acquisition during site investigations is subject to the limitations of the methods of investigation used, site conditions and access constraints. Exploratory holes undertaken during fieldwork, particularly boreholes and/or trial pits, investigate a small volume of ground in relation to the size of the site and thus can only provide an indication of site conditions. The opinions provided and recommendations given in this report are based on the desk study information and ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions elsewhere onsite that have not been disclosed by the investigation and which therefore have not been taken into account in this report. FWS will take all due care and make commentary on the adequacy of data collection and therefore the ability to highlight the presence or otherwise of exceptional conditions.
- 6 Owing to the natural variation of the systems that are being investigated, and the anthropological impact similarly changing through time, the findings and opinions in this report are relevant to the dates of the site works and should not be relied upon to represent conditions after a reasonable passing of time. Site conditions will change over time due to natural variations and human activities. The comments made on groundwater, surface water and soil gas conditions are based on observations made at the time that the site work was carried out. It should be noted that these conditions will vary owing to seasonal, tidal and meteorological effects. Variation in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time, or subsequent developments or activities on the site or adjacent area.
- 7 The scope of the investigation, as agreed between FWS and the Client, was undertaken based on the specific development proposals of the Client and may be inappropriate to another form of development or scheme.
- 8 The opinions expressed in this report regarding contamination, geotechnical and/or waste assessments are based on simple statistical analysis and comparison with available guidance values. No liability can be accepted for the retrospective effects of any changes or amendments to these values.

