

# **GEO-ENVIRONMENTAL PHASE 2 SITE** INVESTIGATION

Land at Pioneer Park

Exploration Drive, Leicester

FEBRUARY 2018







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# Land at Pioneer Park

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Report No	1001675005
Date	FEBRUARY 2018

# **VERSION CONTROL**

Version	Date	Author	Changes
01	February 2018	JH	n/a – First issue

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# **1** Introduction

Arcadis was commissioned by Leicester City Council (LCC) to complete a "Phase 2" geo-environmental site investigation for land off Exploration Drive, Leicester within Pioneer Park. LCC intend to acquire the site with a view to it be developed as a future employment site, in line with the LCC Economic Action Plan and the Pioneer Park masterplan.

A site location plan is presented within Appendix A.

## **1.1 Previous Reports**

Arcadis have undertaken the following previous reports in relation to the site:

• Geo-Environmental Phase 1 Desk Study, Land at Pioneer Park. Ref. 1001675001. Dated January 2018

This report should be read in conjunction with the desk study report as the information presented provides the basis for the conceptual understanding of the site.

## 1.2 Aims & Objectives

The overall aim of the previous phase 1 and this phase 2 site assessment was to provide LCC with an understanding of the ground related potential issues associated with the site and understanding of implications to potential development prior to site acquisition.

The objectives of the phase 2 site investigation were to:

- assess the environmental condition of the site in line with UK regulatory guidance, developing upon the phase 1 conceptual site model (CSM);
- Assess potential environmental or geotechnical constraints which could affect the proposed development; and
- Provide recommendations (including associated high-level cost estimates) to conduct further assessment and/or address constraints as part of the proposed development.

### 1.3 Proposed Redevelopment

It is understood that should LCC acquire the site the plan is for the site to be developed for light commercial / office use comprising two storey buildings. At the time of writing, LCC provided Arcadis with a section from the DOCK 3 Feasibility Summary report. Within this, document, several design options were presented for the proposed development at the site. Arcadis were advised that the preferred design option was "Scenario 02B – 5 Blocks" as shown below. More detailed plans are provided in Appendix B.

Proposed Development: Scenario 02B - 5 Blocks

Indicative plan removed - feasibility study use only. Not for the purposes of design.

#### 1.4 Scope of Works

To achieve the objectives the following scope of work was defined:

- Undertake utility avoidance works prior to breaking ground;
- Undertake 6no. window sample boreholes up to 5m depth (including *in situ* testing and installation of gas and groundwater monitoring wells);
- Undertake 13no. machine excavated trial pits up to 3.5m depth;
- Laboratory testing (chemical and geotechnical);
- Single round of groundwater and ground gas monitoring; and
- Factual and interpretative geo-environmental report.

#### 1.5 Reliability of Information / Limitations

Arcadis warrants that the services performed were conducted in a competent and professional manner in accordance with sound consulting practices and procedures.

Arcadis cannot warrant the actual property conditions described in this report beyond matters amenable to confirmation within the limits of this report. It should be noted that ground conditions between exploratory holes may vary from those identified during this ground investigation; any design should take this into consideration. It should also be noted that groundwater levels may be subject to diurnal, tidal, seasonal, climatic variations and those recorded in this report are solely dependent on the time the ground investigation was carried out and the weather before and during the investigation.

The reader is referred to the Study Limitations, presented in Appendix C.

# 2 Site Setting

## 2.1 Site Location

Item	Details
Site Status	Unused brownfield land
Intended end use	Commercial development
OS National Grid Coordinates	158550, 306500
Elevation	Approximately 55m above ordnance datum (AOD)
Site Size	Approximately 1.17ha

# 2.2 Investigation Rationale

Based on the findings of the Phase 1 desk study and in the context of the proposed redevelopment, the Phase 2 site investigation was designed in order to develop the understanding of the CSM and potential geoenvironmental constraints. The key potential environmental and geotechnical constraints and contaminants identified following the Phase 1 were associated with:

- Historical landfill and made ground material (may include sewage sludge);
- Above ground storage tank (AST) and underground storage tank (UST) of unknown contents, located both on site and adjacent to site;
- Historical vehicle testing centre;
- Potential presence of free phase hydrocarbon;
- Piles may be required if a substantial thickness of made ground or Alluvium is encountered;
- Ground improvement or deepened foundations may be required due to settlement of made ground/Alluvium;
- Potential for historical relict structures which would require breaking up and grubbing out; and
- Ground gases generated within the made ground and/or Alluvium.

The intrusive locations were positioned in order to target these areas of concern. An exploratory hole location plan is shown below and presented in Appendix A.

## Exploratory Hole Location Plan



# **3 Site Investigation Findings**

## 3.1 Methodologies

The site investigation methodologies and details of the laboratory testing are presented in Appendix D.

### 3.2 Ground Conditions

Full details of the ground conditions encountered are included in the exploratory hole logs presented as Appendix E and are summarised below. General photographs of the recovered soils are presented in Appendix F.

#### Made Ground

Made Ground was encountered in all exploratory locations across site comprising a mix of granular and cohesive units (ranging from sandy gravelly clay, clayey gravelly sand to clayey sandy gravel). The made ground is typical of demolition waste which included rebar, roof tiles, brick, concrete and granite. Cobbles were common across site comprising brick, granite and concrete, in addition, TP111 encountered boulders (300mm) of granite.

TP109 encountered a concrete obstruction at 0.8m depth which is assumed to be an historic foundation related to previous filter beds associated with the former sewage works (of note, no other foundations were encountered in the locations targeting the previous bakery and vehicle testing centre (TP101, TP102, TP104, TP105, TP110 and TP111)).

In general, the depth of made ground varied between 0.90m to 2.70m, however, the base of the made ground was not proven in TP112 (the trial pit terminated in made ground at 4.2m)

Window sample locations WS106, WS106a and WS106b all refused on obstructions (likely to be compacted cobbles within the made ground material) at between approximately 1.5m and 1.6m below ground level (bgl). Trial pits TP109 and TP110 which were located in the same area encountered made ground to between 1.70m and 1.90m bgl which included much demolition rubble including cobbles of granite and rebar material.

#### **Superficial Deposits**

#### <u>Alluvium</u>

Exploratory holes TP111, TP113, WS104 and WS105 (located in the east of site) encountered soft and soft to firm friable clays and silts which are considered to represent Alluvium.

#### **River Terrace Deposits**

The majority of exploratory holes (excluding TP112, WS106, WS106a and WS106b) encountered River Terrace Deposits which generally comprised gravelly sand, however, also included sand, silty sand, sandy gravelly clay, sandy clay, and sandy gravel.

The results of the standard penetration tests (SPT) undertaken in the window sample boreholes indicate that the granular portion comprised medium dense to dense material which became very dense at approximately 4.0m bgl (however, WS101 refused in these deposits at 2.4m bgl).

The River Terrace deposits were encountered to a maximum depth of 4.40m bgl.

#### Bedrock

Bedrock was not encountered.

# 3.3 On-Site Environmental Screening, Visual and Olfactory Observations

The photo ionisation detector (PID) was used to screen the soils at regular (typically <1m) intervals. No elevated readings were recorded.

A slight "chemical" type odour was noted in the made ground material in WS103 at 0.60m bgl. A "rotten/sulphur" type odour was noted in TP112 at 2.10m bgl (the material which is potentially made ground).

Black staining (with no odour) was noted in made ground soils in TP101 at 0.20-0.90m bgl and TP102 at 0.30-0.50m bgl

#### 3.4 Groundwater

Details of groundwater strikes are presented on the relevant exploratory hole log. A summary of strikes and resting levels (measured during the groundwater monitoring visit undertaken on 5 February 2018) are presented in the table below.

Location	Groundwater Strike (m bgl)	Groundwater Rest Level (m bgl)	Comments
WS101	1.9	n/a	No obvious strike, natural ground slightly saturated from 1.9m bgl.
WS103	2.7	n/a	No obvious strike, natural ground slightly saturated from 2.7m bgl.
WS104	n/a	3.76	No strike noted during drilling, water resting at 3.76m during monitoring. Well purged dry with minimal recharge noted, assumed perched groundwater from made ground resting at base of monitoring well.
WS105	1.8	n/a	No obvious strike, natural ground slightly saturated from 1.8m bgl.
TP104	1.6	n/a	Seepage noted within natural ground from 1.6m bgl.
TP112	1.4 2.1	n/a	Two separate seepages within made ground noted.

Non-aqueous phase liquid (NAPL) was not observed and no olfactory evidence was noted in the monitoring wells.

### 3.5 Laboratory Analysis Results

The results of the analysis of the soil obtained during the investigation are presented in Appendices G and H.

### 3.6 Ground Gas Monitoring

All wells were monitored for permanent ground gas and the results of the monitoring are presented as Appendix I.

# **4** Contamination Assessment

The following subsections describe the risk assessment that has been undertaken to assess the concentrations of CoC and discuss the potential implications these have on the proposed redevelopment. The interpretation has been based on the findings of the desk study and preliminary site investigation data.

## 4.1 Comparison to Generic Assessment Criteria

In line with CLR11 (DEFRA & EA, 2004), a Generic Quantitative Risk Assessment (GQRA) has been undertaken to determine the significance of the concentrations measured through chemical analysis.

The GQRA comprises the comparison of the measured concentrations with Arcadis in-house Generic Assessment Criteria (GACs) for the protection of human health and water resource receptors associated with the site.

The Alluvium and River Terrace Deposits have been classified as Secondary A Aquifers (it is worth noting that the Alluvial deposits encountered were cohesive and as such, unlikely to be used as a water resource). The bedrock has been classified as a Secondary B Aquifer. Therefore, concentrations of CoC have been compared with the Aquifer GAC. The nearest watercourse is the River Soar, located 125m to the east. It is considered that this watercourse is sufficiently distant from the site and therefore has been discounted as a potential receptor.

The proposed end-use for the Site is for commercial end use which includes pavements, car park, access roads and limited soft landscaping areas. As such, the commercial end use GAC has been selected.

The derivation of the GAC is presented in Appendix J and the GAC are presented in Appendix K.

#### 4.1.1 Human Health Risk Assessment – Soil

There were no human health exceedances in relation to the applicable GAC protective of human health receptors.

#### 4.1.2 Human Health Risk Assessment – Groundwater

There were no exceedances of the GAC protective of human health receptors from the groundwater sample.

#### 4.1.3 Water Resource Risk Assessment – Soil

The table below shows the comparison of soil concentrations to the GAC protective of the water resource receptors associated with the site:

Receptor	Location	Depth (m bgl)	Contaminant exceeding GAC
	TP102	0.30	
	TP104	0.30	
	TP105	0.10	
	TP107	0.50	Various PAH
Secondary A / R Aquifor	TP108	0.60	
Secondary A / B Aquiler	TP109	0.50	
	TP111	0.30	
	TP112	2.10	
	WS101	0.30-0.40	
	WS106	0.45-0.60	

It should be noted that there are no GAC derived for the protection of water resources for the different hydrocarbon fractions in soil, noting detections of (predominantly) heavy end hydrocarbons were identified.

There were also detections of other CoC for which no GAC has been derived. The implications of these are discussed in the following contamination assessment.

#### 4.1.4 Water Resource Risk Assessment – Groundwater

The table below shows the comparison of groundwater concentrations to the GAC protective of the underlying water resource receptors (Secondary A Aquifer (superficial deposit) and Superficial B Aquifer (bedrock)):

Receptor	Location	Contaminant exceeding GAC
Secondary A / B Aquifer	WS104	Various PAH Total TPH

There are no GAC derived for the protection of water resources for the different hydrocarbon fractions in groundwater, noting low concentrations of light end aliphatic hydrocarbons (aliphatic C5-C6 and C8-C10) were identified in the groundwater sample. The implications of these are discussed in the following contamination assessment.

## 4.2 No Applicable GAC

There were a number of detections of other CoC for which no GAC has been derived.

#### 4.2.1 Soil

From the 21 samples analysed for asbestos, four (TP102 at 0.3m, TP111 at 0.3m, WS101 at 0.3-.4m and WS106 at 0.5-0.6m) had detections of asbestos containing material / asbestos fibres. Two of these samples (TP102 and TP111) had asbestos quantification undertaken which indicated that the concentration was <0.001%.

Contaminant	Limit of Detection	Measured Concentration	Location	Depth (m bgl)
Total Cyanide	0.5mg/kg	4.7mg/kg	TP112	2.10
1,2,4- Trimethylbenzene	0.006mg/kg	0.008mg/kg	WS106	0.50-0.60
2-Methylnaphthalene	0.01mg/kg	0.04mg/kg 0.02mg/kg	TP109 WS106	0.50 0.50-0.60
Carbazole	0.01mg/kg	0.04mg/kg 0.26mg/kg 0.1mg/kg	TP108 TP109 WS106	0.60 0.50 0.50-0.60
Dibenzofuran	0.01mg/kg	0.07mg/kg 0.06mg/kg	TP109 WS106	0.50 0.50-0.60

Notable detections have been highlighted in the table below:

#### 4.2.2 Groundwater

Notable detections have been highlighted in the table below:

Contaminant	Limit of Detection	Measured Concentration	Location
1,3,5-Trimethylbenzene	3 µg/l	13 µg/l	WS104

Contaminant	Limit of Detection	Measured Concentration	Location
Di-n-butyl phthalate	1.5 µg/l	5.3 μg/l	
Diethyl phthalate	1 µg/l	59 µg/l	

## 4.3 Contamination assessment

#### 4.3.1 Human Health Receptors

The site soils have been assessed for a "commercial" end-use. No exceedances of GAC have been identified within the soil and groundwater samples analysed.

Although concentrations of asbestos were low in the samples tested, the nature of asbestos could mean that it is distributed in much higher quantities elsewhere on site. Given that much of the made ground contained demolition rubble, there is the possibility that asbestos is present. However, the pathway for asbestos fibres to future site users would be broken by hardstanding (i.e. the proposed roads and buildings) and if a capping layer was installed for areas of soft landscaping (assumed 300mm thick). A capping layer is likely to be used as the current surfacing is unlikely to be suitable as a growing medium.

In one sample (TP112 at 2.10m), a concentration of total cyanide was detected above the detection limit. The same sample was also tested for free cyanide which was not detected. For cyanide, the pathway for this to affect human health is through direct contact, given the proposed development (where the direct contact pathway is likely to be broken by hardstanding/capping of soft landscaping), the depth of the sample and lack of other elevated concentrations elsewhere on site, and that the cyanide was not detected in its free form, the risk from total cyanide is not considered significant.

The concentrations of the other identified contaminants (without an applicable GAC) are relatively minor and are not considered to present a significant risk to the proposed end users.

Generic Assessment Criteria are not designed to assess the acute risk posed to groundworkers, the public etc. which may arise during redevelopment works. It is recommended that the contractor conducts a risk assessment and employs suitable mitigation measures such as hygiene facilities and mitigation of dust emissions from the site during redevelopment works.

#### 4.3.2 Water Resource Receptors

Concentrations of PAH compounds were detected in soil samples from many of the investigation locations in excess of the GAC protective of controlled waters, with highest total PAH concentrations reported within the made ground samples. PAH compounds were also detected in the groundwater sample obtained during the post investigation monitoring. Given the general low level of the concentrations reported, that PAHs tend to have low solubility and mobility in groundwater and leaching of PAH from within the made ground into the groundwater will be greatly reduced by the presence of buildings/hardstanding; it is considered that there is not a significant risk to the identified water resource receptors.

Exceedances of GAC of other CoC within the soil samples were encountered in samples of made ground at shallow depths (i.e. below 1.0m bgl) with the exception of one sample in deep made ground (TP112 at 2.10m). The concentrations of the other identified CoC (without an applicable GAC) are relatively minor in the soil samples (predominantly within made ground) and groundwater sample.

There was no obvious water body within the underlying superficial deposits. The Alluvium was cohesive and unlikely to contain any significant water body. As identified within the desk study, logs obtained from the BGS and planning portal surrounding the site indicate that a shallow groundwater body within the superficial deposits was not present.

Given the general low level of exceedances and concentrations reported, that a significant groundwater body does not appear to be present across site (or within the wider area), given the limited potential resource value of the various aquifers and leaching of CoC from within the made ground into the groundwater will be greatly

reduced by the presence of buildings/hardstanding; it is considered that there is not a significant risk to the identified water resource receptors.

# 4.4 Updated Conceptual Site Model

The following table presents the updated CSM with pollutant linkages considered remaining as potentially active based on the findings of the investigation

Receptor	Source	Pathway	Risk	Justification
Future Site Users	Ground Gas	Migration through future site structures	Medium	Some form of protection measures will be required. Additional investigation will be required to confirm the extent and exact requirements of the protection measures.
	Asbestos fibres within made ground material	Particulate inhalation / dermal contact / ingestion	Low	This Source-Pathway-Receptor is potentially active. However, the concentrations are very low and unlikely to pose a significant risk given the proposed end use. However, given that demolition rubble was encountered across site, the presence of asbestos cannot be ruled out Assuming a capping layer is installed in areas of soft landscaping as part of the redevelopment and hard standing would cover the remainder of site, the pathway would be broken.
Future Construction Worker	Asbestos fibres within made ground material	Particulate inhalation / dermal contact / ingestion /	Low	This Source-Pathway-Receptor is potentially active, however, concentrations are very low. Nevertheless, a safe system of working should be used to protect construction workers (such as dust suppression, suitable PPE and decontamination units)

# **5** Implications for Proposed Development

The following subsections describe the assessment that has been undertaken to discuss the potential implications the ground conditions have on the proposed redevelopment. The interpretation has been based on the findings of the desk study and preliminary site investigation data.

## 5.1 Foundations

Ground conditions comprised a thickness of made ground which generally varied between 0.9m and 2.7m thick (with an average thickness of approximately 1.5m). In the location of TP112, the base of the made ground was not proven (at 4.2m bgl). The made ground is variable in nature and strength/degree of compaction and is not considered to represent a suitable founding medium in its current condition. Foundations will therefore need to fully penetrate the made ground.

In the east of site, Alluvium was encountered (proven in locations TP111, TP113, WS104 and WS105) comprising soft cohesive deposits proven to depths of between 2.0m and 3.8m bgl (with an average thickness of approximately 2.8m). Due to the potential for significant total and differential settlements, it is considered that foundations will likely need to fully penetrate these deposits, however, ground improvement techniques may be feasible subject to detailed design.

Underlying the made ground / Alluvium (where present) were the River Terrace Deposits, which broadly comprised medium dense becoming very dense granular material. It is considered that this unit will form a suitable bearing stratum for the proposed development. There were some units within the Terrace Deposits which included firm sandy gravelly clay. There was no obvious correlation across site to the lateral extent of these cohesive units.

Traditional shallow foundations, such as strip or pad foundations, formed within the medium dense to dense granular or firm to stiff cohesive River Terrace Deposits at between 1.5m and 2.0m depth are likely to be suitable. Where deep made ground or Alluvium is present, foundations will need to be deepened. It is likely that piled foundations would be required to achieve this. Alternatively, some form of ground improvement technique (such as vibro-compaction) may be suitable, however further advice form a specialist ground improvement contractor will be required prior to finalising the foundation option. For piled foundations or ground improve the depth to rock.

In the western area of the site, where the River Terrace Deposits are shallow enough to support spread foundations, preliminary foundation calculations have been undertaken. These indicate that for a traditional pad (up to 2m square) at a minimum of 2.0m depth, bearing within the medium dense granular materials or firm cohesive materials, a design bearing resistance of 110kN/m<sup>2</sup> will be appropriate in order to satisfy the ultimate and serviceable limit states in accordance with Eurocode 7 - Geotechnical Design. This is only applicable for foundations with loads that are applied vertically and centrally. To satisfy the serviceable limit state settlement has been limited to 25mm.

In the absence of design loads the bearing capacity assessment has been undertaken for Design Approach 1, Combination 2 only, and a further assessment taking account of anticipated loadings will be required during detailed design in order to confirm the limit states are satisfied. All foundations will need to fully penetrate any made ground (including earthworks materials placed as general fill) and soft or loose natural soils and be founded a minimum of 150mm into the founding stratum. The foundation excavation should then be blinded.

If strip foundations are adopted, they are likely to be supported by soils of variable compressibility, and as such it is recommended that mesh reinforcement be incorporated in the strip foundation to help limit differential settlement.

# 5.2 Floor slab

Given the thickness of made ground material, it is recommended that fully suspended floor slab is adopted.

### 5.3 Buried Concrete

Based on the laboratory test data, subsurface ground conditions appear to be consistent with ACEC Class AC-2 with respect to buried concrete (BRE Special Digest 1: 2005 "Concrete in aggressive ground"). The Design Sulphate Class is DS-2.

### 5.4 Roads and Hardstanding

The road pavement is likely to be constructed on a subgrade of made ground. The made ground on site is likely to be variable and for preliminary design purposes is considered to have a CBR of 2%.

It is recommended that once the site has been graded to the appropriate pavement formation level, it is inspected and, if necessary, in situ CBR testing be conducted on the subgrade to confirm the appropriate pavement design (i.e. to determine the subbase and capping thickness). In addition, the formation should be proof-rolled and any soft/loose pockets encountered should be excavated and replaced with well compacted granular fill prior to pavement construction. Requirements for the design of road pavements are given in the Highways Agency, 'Design Manual for Roads and Bridges, Volume 7. Pavement Design and Maintenance: Foundations HD 25/94'.

It should also be noted that cohesive material could be susceptible to changes in moisture content due to prevailing weather conditions, trafficking by construction plant etc. Care should be taken to ensure the formation is protected from such changes.

#### 5.5 Groundwater Control

The investigation identified that the ground conditions beneath the site were variable, however, several seepages were identified which could affect shallow excavations. During the construction phase, groundwater could be encountered in excavations and therefore groundwater control measures, such as sump pumping, should be accounted for.

#### 5.6 Ground Gas

Following a review of the information obtained within this ground investigation, it is considered that there are two potential sources to generate permanent ground gas at the Site; made ground and Alluvium. The made ground did not contain any obvious signs of material that would generate ground gas (such as evidence of organic or ashy material, or evidence of sewage sludge), however, this does not mean that it is not present within the site. As such, as per the guidance set out in BS 8576:2013 *Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)*, it is now considered to be a "low to very low" gas generation potential.

Notwithstanding the above, any potentially generated gas does have some potential to migrate laterally due to the granular units identified, however, this may be limited due to the heterogeneous nature of the deposits. As the generation potential is very low the risk to Site users is considered to be relatively low.

A single ground gas monitoring visit was undertaken, and due to the limited data set the following should be considered as preliminary only, further testing will be required to fully characterise the site. The data indicates that elevated levels of carbon dioxide are present at the Site (maximum value of 8.1% in WS104). Of particular note is that the recorded concentrations were sustained over time with similar peak and steady recorded values. Flow rates were not particularly high with a maximum recorded flow rate of 0.3l/hr (WS106). The monitoring visit was undertaken during a period of relatively high atmospheric pressure (1029mbar).

Due to the low flow rates the Gas Screening Value for carbon dioxide is <0.001 l/hr which would place the site into Characteristic Situation (CS) 1. If using the worst-case values across the site, the GSV would be 0.002l/hr, which would also place the site into CS1. However, due to the high recorded carbon dioxide it is considered likely that the CS will need to be increased to CS2 which would include installing some form of basic gas protection measures.

However, further assessment would be required to fully determine the ground gas risk and to allow appropriate gas protection measures to be designed.

### 5.7 Waste Management

At this stage it is not known whether there will be scope to reuse excavated materials within the proposed redevelopment. However, careful management of soils during excavation works will ensure optimum utilisation of soil resources.

Natural soils that are excavated and reused on the same site are not classified as waste and therefore can be reused. If these soils were to be transferred directly to another site, they would require a Materials Management Plan (MMP)/ Design Statement in line with CL:AIRE document 'Definition of Waste: Development Industry Code of Practice'. Alternatively, they could be taken to a facility with an Environmental Permit that enables reuse.

The investigation has indicated that there was a significant thickness (average 1.5m thick) of made ground. Waste classification of the made ground soil arisings has been undertaken as part of the preliminary assessment and has indicated that the made ground soils (assessed as a whole) would be classified as non-hazardous.

Should the made ground materials be reused on site as part of the development, it is considered that the material could be suitable to be reused under a MMP providing it meets the "four factors test" (protection of human health and the environment, suitability for use (without further treatment), certainty of use and quantity of material). Excess material or material that does not comply with the "four factors test" would need to be removed as waste.

Waste Acceptance Criteria (WAC) testing was not undertaken as part of the investigation and would be required to assess if the materials can be accepted at an inert waste landfill.

Results of the waste classification is presented in Appendix L.

#### 5.8 Earthworks

Significant earthworks are not likely to be required as part of the development, however, should foundation arisings or other materials be considered for reuse, these should be classified and compacted in accordance with the Highways Agency Manual of Contract for Highways Work, Volume 1: Specification for Highway Works, Series 600, Earthworks (SHW) (available at www.standardsforhighways.co.uk).

#### 5.9 Other Development Constraints

#### 5.9.1 Soakaways

The site investigation has confirmed the presence of a predominantly granular material present below the made ground. As such, subject to detailed design and further investigation, soakaway systems could be potentially utilised.

#### 5.9.2 Historical Foundations

The investigation targeted specific areas (such as historical bakery and vehicle testing centre) and from the exploratory locations undertaken, no evidence of historical foundations was identified. However, at location TP109, a concrete obstruction (assumed to represent an old foundation to the historical filter beds related to the sewage works) was identified.

It should be assumed that further historical foundations do remain within parts of the site, and these will need to be grubbed out and removed prior to development.





<ul> <li>Window S</li> <li>Trial Pits</li> <li>Site Bound</li> </ul>	ample dary							
Notes: SYMBOLS FOR BOREHOLES, SPECIFIC FEATURES ARE REA LOCATION ONLYAND UNLESS NOT REPRESENT THE TRUE S	TRIAL PITS AND OTHER PRESENTATIONS OF OTHERWISE SPECIFIED, DO IZE OF THE FEATURE.							
Title: Exploratory Hole Location Plan								
Site: LCC_Pinoeer Park_HCA Assessment	Land Due Diligence							
Project:	Figure 2							
Date: 23/02/20118 Drawn By: JJH DRG No: 1001675006								
DRG No: 1001675006  Pesign & Consultancy for natural and mild score								



**IMPORTANT**: This section should be read before reliance is placed on any of the information, opinions, advice, recommendations or conclusions contained in this report.

- This report has been prepared by Arcadis UK Ltd (Arcadis), with all reasonable skill, care and diligence within the terms of the Appointment and with the resources and manpower agreed with Leicester City Council (the 'Client'). Arcadis does not accept responsibility for any matters outside the agreed scope.
- 2. This report has been prepared for the sole benefit of the Client unless agreed otherwise in writing.
- 3. Unless stated otherwise, no consultations with authorities or funders or other interested third parties have been carried out. Arcadis are unable to give categorical assurance that the findings will be accepted by these third parties as such bodies may have unpublished, more stringent objectives. Further work may be required by these parties.
- 4. All work carried out in preparing this report has used, and is based on, Arcadis' professional knowledge and understanding of current relevant legislation. Changes in legislation or regulatory guidance may cause the opinion or advice contained in this report to become inappropriate or incorrect. In giving opinions and advice, pending changes in legislation, of which Arcadis is aware, have been considered. Following delivery of the report, Arcadis have no obligation to advise the Client or any other party of such changes or their repercussions.
- This report is only valid when used in its entirety. Any information or advice included in the report should not be relied upon until considered in the context of the whole report.
- Whilst this report and the opinions made are correct to the best of Arcadis' belief, Arcadis cannot guarantee the accuracy or completeness of any information provided by third parties.

- This report has been prepared based on the information reasonably available during the project programme. All information relevant to the scope may not have been received.
- This report refers, within the limitations stated, to the condition of the Site at the time of the inspections. No warranty is given as to the possibility of changes in the condition of the Site since the time of the investigation.
- The content of this report represents the professional opinion of experienced environmental consultants. Arcadis does not provide specialist legal or other professional advice. The advice of other professionals may be required.
- 10. Where intrusive investigation techniques have been employed they have been designed to provide a reasonable level of assurance on the conditions. Given the discrete nature of sampling, no investigation technique is capable of identifying all conditions present in all areas. In some cases the investigation is further limited by site operations, underground obstructions and above ground structures. Unless otherwise stated, areas beyond the boundary of the site have not been investigated.
- 11.If below ground intrusive investigations have been conducted as part of the scope, service tracing for safe location of exploratory holes has been carried out. The location of underground services shown on any drawing in this report has been determined by visual observations and electromagnetic techniques. No guarantee can be given that all services have been identified. Additional services, structures or other below ground obstructions, not indicated on the drawing, may be present on Site.
- 12.Unless otherwise stated the report provides no comment on the nature of building materials, operational integrity of the facility or on any regulatory compliance issue

# APPENDIX D Site Investigation Methodologies / Laboratory Testing

# **METHODOLOGIES**

#### **Borehole Formation**

#### **Investigation Locations**

The following methods and techniques were undertaken to construct the exploratory holes at the site:

- 6no. window sample boreholes were progressed by dynamic sampling techniques using a Dando Terrier drilling rig to a maximum depth of 4.4m bgl
- 13no. trial pits were progressed using a JCB-3CX mechanical backhoe excavator to a maximum depth of 4.3m bgl.

All of the window sample holes were commenced with a hand excavated trial pit for utility avoidance purposes

### **Dynamic Sampling**

Dynamic sampling (Window sampling) was completed using a track-mounted sampling rig capable of driving windowless sampling tubes using a mechanical hammer dropped repeatedly from a self-governed height.

A description of the recovered materials was recorded by the supervising engineer.

Sub-samples of the material recovered in the liners were taken to enable representative laboratory testing. Generally small disturbed samples were taken at each change in stratum and at 0.5 m intervals thereafter in clay soils; and small bulk samples were taken at 1 m intervals where the sand and gravel content of the soil was significant.

Standard penetration tests (SPT) were undertaken using the track mounted rig at 1.0m centres.

#### **Trial Pitting**

Trial pitting was undertaken using a JCB-3CX mechanical backhoe excavator.

The soil was placed at the side of the excavation where the recovered materials were recorded by the supervising engineer. Inspection and photographs of the excavation were undertaken at ground level, entry into the exaction was not permitted.

Samples of the material recovered were taken to enable representative laboratory testing. Generally small disturbed samples were taken at each change in stratum and at 0.5 m intervals thereafter in clay soils; and small bulk samples were taken at 1 m intervals where the sand and gravel content of the soil was significant.

#### In situ and ex situ Testing

#### General

*In situ* testing was carried out within the relevant exploratory hole. Where tests were undertaken within or associated with a specific borehole, the test data is presented within the relevant exploratory hole log. As such, the location details will be the same as the associated hole and its position will be the same as the exploratory hole with which it is associated.

#### **Standard Penetration Tests**

Standard penetration tests (SPT) were carried out at 1m intervals throughout the borehole to provide a profile of the soil's resistance with depth and a disturbed soil samples was recovered from the SPT split-spoon tool or a disturbed sample was taken over the range of the test interval.

The N-values as determined in the field are presented on the borehole logs as uncorrected values that do not take into account the energy losses or efficiency of the automatic trip hammer used to drive the test tool into the ground.

#### Determination of undrained shear strength using Hand Vane apparatus

Hand shear vane tests were carried out using a Controls hand shear vane with a cruciform vane of 20mm diameter. The tests were made in samples taken from trial pits and placed beside the exaction for testing.

The test was performed in general accordance with the manufacturer's instructions and the vane was inserted a minimum distance of 70 mm below the surface tested. The vane head was rotated slowly at a speed not greater than 1 revolution per minute until the soil has failed in shear or the maximum reading of the device was achieved.

The undrained soil strength was calculated by comparing the reading taken against the calibration graph provided with the shear vane in kPa.

Where possible, three tests were made to provide an average value, however, it should be noted that where natural fissures or discontinuities are present the minimum values may provide a better representation of the mass consistency of the soil and may be significant.

Due to the nature of the samples tested, the results are indicative for assistance in determining soil consistency for logging purposes only and should not be used to classify soil strength. The results are presented within Appendix E.

## **Consistency Determination Using Pocket Penetrometer**

Pocket penetrometer tests were carried out at selected depths within clay soils. The tests were carried out on a fresh surface after the core had been split lengthways. Where possible, three tests were made to provide an average value.

Due to the small amount of soil that the pocket penetrometer applies force to it is considered that the results only provide an indication of soil consistency and are have been used to assistance in determining soil consistency for logging purposes only and should not be used to classify soil strength. The results are presented on the exploratory hole logs within Appendix E.

## **VOC Head Space Screening**

The presence of Volatile Organic Compounds (VOC) within the ground was determined using a photoionization detector (PID) to detect the 'headspace' vapours emitted by the compounds. The method is applicable to a wide range of compounds that have sufficiently high volatility to be effectively liberated from the soil or water matrix in normal temperature and pressure ranges.

The headspace test was undertaken on the freshly extracted soil sample at regular intervals of 0.5m (or every change in lithology) by placing a small amount of material into a dedicated sample bag, which was then tied trapping air. The sample was then shaken for about 15 seconds to break-up and disperse the soil before resting the sample for about 5 minutes.

To assess the headspace vapour, the PID probe was inserted through the side of the plastic sample bag into the headspace area. The PID reading recorded was the highest response observed in the first 10 seconds. The screening results are presented on the relevant exploratory holes logs within Appendix E.

The testing was undertaken using a RAE Systems MiniRAE 2000 with a 10.6 eV lamp.

The PID instrument was calibrated regularly throughout the day using isobutylene reference gas concentrations.

### **Installations and Post-Fieldwork Monitoring**

Installations to enable long term monitoring of the site were made in all boreholes, the details of which are summarised in below and are also provided on the relevant borehole logs.

### **Post-fieldwork Monitoring**

Post-field work monitoring was undertaken on one visits on 5<sup>th</sup> February 2018 to record permanent ground gas emissions, groundwater levels and obtain a groundwater sample.

During the monitoring visit, after completion of the ground gas emission monitoring, there was one well which contained water (WS104) which was purged by removing three well volumes of groundwater and sampling was then undertaken. It was purged dry, and so sampling was conducted on the purged groundwater.

# LABORATORY TESTING

Geotechnical and geo-environmental chemical testing was undertaken on selected samples obtained from the exploratory holes. The testing was scheduled by the geotechnical and/or geo-environmental engineer and the testing was undertaken by an Arcadis approved testing laboratory.

## **Geotechnical Laboratory Testing**

The geotechnical tests detailed in the table below were carried out in accordance with either BS1377:1990: Parts 1 to 8; BS EN ISO 17892: Parts 1 to 12; BRE SD 1:2005; or other methods as listed.

Test	Method	No of Determinations
Moisture content	BS1377 Pt2-3.2	14
1-point liquid and plastic limit	BS 1377 Pt2-4.3 & 5.3	11
Particle size distribution	BS1377 Pt2 – 9.2	10
Sedimentation	BS1377 Pt2 – 9.4/9.5	4

## **Geo-Environmental Laboratory Testing**

Geo-environmental tests were undertaken on soil and groundwater specimens obtained from the samples collected from the Site. Testing was carried out for the contaminants detailed in the tables below.

Data	Information
Chemical laboratory	Exova Jones Laboratorios Ltd. (Jones)
Accreditation	Jones are United Kingdom Accreditation Service (UKAS) & monitoring Certification Scheme (MCertS) accredited (for selected chemical analysis).

Data	Information						
	Asbestos Identification;						
	Asbestos Quantification;						
	Metals by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES);						
	Polycyclic Aromatic Hydrocarbons (PAH) by Gas Chromatography-Mass Spectrometry (GC-MS);						
	TPH CWG by GC-MS and GC-FID;						
	VOC by GC-MS;						
	SVOC by GC-MS;						
	Total and free cyanide;						
Chemical analyses (soil)	Phenols Index;						
	Nitrate;						
	Nitrite;						
	Fluoride;						
	Total Organic Carbon;						
	Total sulphate;						
	Water soluble sulphate;						
	Sulphur;						
	Sulphide;						
	pH;						
	Faecal and total coliforms; and						
	Glycols						
	Dissolved Metals by Inductively Coupled Plasma Mass Spectrometry (ICP-MS);						
	Speciated PAH;						
	TPH CWG;						
	SVOC;						
	VOC;						
	Total and free cyanide;						
	Nitrate;						
Chemical analyses	Nitrite;						
(gloundwator)	Fluoride;						
	Total Organic Carbon;						
	Total sulphate;						
	Water soluble sulphate;						
	Sulphur;						
	Sulphide; and						
	Glycols						

# APPENDIX E Exploratory Hole Logs

ARC	ADIS Design & Consulta for natural and built assets	Arcad CB2 1	Arcadis, Part 3rd Floor, Charter House, 62-68 Hills Road, Cambridge CB2 1LA								
Site:	Location:		44(0)122	(			Lata Dian		<u>}</u>	Scale	·
Land at Pioneer Park	Land off Exploration Drive,	Grour	ia Level	(maod)	•	,	Hole Diameter (mm):			1:25	
Client:	Leicester, LE4 5NU	Eastir	ng:	ıg:				neter (mm)	: 50	Logged by:	
		Northing:					-ilter Mat	erial: grave	U. Cox		
Project: 10016750	Date: 30/01/2018	Metho	od: Han perc	d dug in cussive o	spection	pit to 1.2 2.43m ba	bgl. Dyna I	amic		Checkec JJH	l by:
	STRATA RECORD	I			I	N SITU TE	STS / SAM	MPLES		Sheet 1 of	1
Des	cription	Legend	Depth (m bgl)	Level (mAOD)	Sample Type	Sample Depth (m	PID ) (ppm)	PPT (kPa)	SPT N Value	Well Details	Water Level
MADE GROUND: Grass ov clayey slightly gravelly sligh to coarse SAND. Gravel is fine to coarse of brick, flint Cobble is SA of brick and c	er dark brown slightly ntly cobbly medium angular to subangular and concrete. concrete.				L	0.30-0.40	) <1				-
Coarse GRAVEL of brick an to medium.	d concrete. Sand is fine								N=10 (6,3/2,2,3 ,3)		- - 1_ - - -
Soft to firm brown sandy si Sand is medium, gravel is a medium of flint, chalk and o	gnity gravely CLAY. subangular fine to quartz.				D	1.60-1.70	) <1	32			-
Very dense orange slightly gravelly medium to coarse to subangular fine to mediu quartz. slightly saturated from	clayey slightly SAND. Gravel is angular Im of flint and 1.9m bgl onwards.		1.90		J SPT	1.90-2.00 2.00-2.43	) <1		50/275mr (4,3/5,5,1 8,22 for 50mm)	n	2
End of Borehole at 2.43 m			2.43	ks: Refr	usal at 2.	43m bgl o	n very de	nse grave	lly sand. S	Slightly	3
D Disturbed Sample B Bulk Sample U Undisturbed Sample J Jar Sample ✓ Water Strike ▼ Standing Water Level	PPT Pocket Penetrometer T PID Photoionisation Detect SPT Standard Penetration T (Uncorrected)	est or est		satu	irated fro	m 1.90m.					

ARC	ADIS Design & Consultar for natural and built assets	Arcad CB2 1	lis, Part 3 LA	Borehole Number								
Citor	Lagation	Tel: +								WS10	Socia	
Land at Pioneer Park	Location: Land off Exploration Drive,	Grour	nd Level	(mAOD)	:		Hole Diar	neter (mm	1:25			
Client:	Leicester, LE4 5NU	Eastir	ng:				Well Dian	neter (mm	): 50	Logged by:		
Leicester City Council		North	Northing:					erial: grav	0. Cox			
Project: 10016750	Date: 30/01/2018	Metho	od: Han perc	d dug ir cussive o	spection	pit to 1.2 4.00m b	2 bgl. Dyn gl	amic		Checke JJH	d by:	
	STRATA RECORD		1			IN SITU T	ESTS / SA	MPLES	1	Sheet 1 o	f 1	
Description			Depth (m bgl)	Level (mAOD)	Sample Type	Sample Depth (r	€ PID m) (ppm)	PPT (kPa)	SPT N Value	Well Details	Water Level	
MADE GROUND: Grass ov sandy gravelly CLAY. Sanc gravel is subangular to sub of flint, brick and concrete.	er soft dark brown slightly I is fine to medium, prounded fine to coarse											
MADE GROUND: Dark bro subangular fine to coarse ( and concrete. Sand is mec	wn slightly clayey sandy GRAVEL of flint, brick lium.										- - - - - - - - - - - - - - -	
loose rebar noted to 1	.20m/				SPT	1.20-1.6	65		N=22 (6,6/5,5,5 ,7)			
Soft orangish brown sandy Sand is fine to medium, gra subrounded fine to mediur	r slightly gravelly CLAY. avel is subangular to n of flint.				J D	1.60-1.7 1.70-1.8	70 <1 30 <1	35				
Firm to stiff orangish brown gravelly CLAY. Sand is fine subangular fine of flint and	n sandy slightly to medium, gravel is quartz.		2.00		SPT	2.00-2.4	15	54	N=10 (3,2/2,3,2 ,3)		2	
Stiff orangish brown sandy CLAY. Sand is fine to medi subangular fine of flint and	slightly gravelly um, gravel is quartz.		2.50					125				
Dense becoming very dens gravelly medium to coarse subangular fine of flint and Quartz cobble noted a	se orange slightly SAND. Gravel is quartz. at 3.1 - 3.3m bgl.		3.00		SPT B	3.00-3.4 3.00-3.5	45 <1 50		N=32 (7,5/7,9,8 ,8)		3	
Sand becoming very or refusal at 4.0m bgl.	dense at the base upon				SPT	3.70-4.0	00		50/150mr (8,13/21,2 3,6 for 0mm)	n		
End of Borehole at 4.00 m			4.00			00					4	
Rey:       D       Disturbed Sample         B       Bulk Sample         U       Undisturbed Sample         J       Jar Sample         ✓       Water Strike         ✓       Standing Water Level	PPT Pocket Penetrometer Te PID Photoionisation Detecto SPT Standard Penetration Te (Uncorrected)	est or est	Remar	κs: Ref gro	usal at 4. undwatei	uum bgl r strikes r	on very de noted.	ense grave	buy sand. I	NO		

	Design & Consulta for natural and with consultand	Arcad CB2 1	is, Part 3 LA	Brd Floor	, Charter	House, 6	2-68 Hills	Road, Cai	mbridge	Borehole Number		
	built assets	Tel: +	44(0)122	23 9350 <sup>-</sup>	11					WS10	3	
Site: Land at Pioneer Park	Location: Land off Exploration Drive.	Grour	nd Level	(mAOD)	nAOD): Hole Dia			ole Diameter (mm):			Scale 1:25	
Client:	Leicester, LE4 5NU	Eastir	ng:				Well Dian	neter (mm)	: 50	Logged by:		
Leicester City Council		North	ing:	Filte				Filter Material: gravel			O. Cox	
Project: 10016750	Date: 30/01/2018	Metho	od: Han perc	d dug ir cussive o	spection	pit to 1.2 4.38m bg	bgl. Dyna I	amic		Checkeo JJH	d by:	
	STRATA RECORD	1				N SITU TE	STS / SAM	MPLES		Sheet 1 of	f 1	
Des	cription	Legend	Depth (m bgl)	Level (mAOD)	Sample Type	Sample Depth (m	PID (ppm)	PPT (kPa)	SPT N Value	Well Details	Water Level	
sandy gravelly CLAY. Sand gravel is subangular fine of	er soft dark brown slightly I is fine to medium, flint and brick.		0.20 -	-							-	
MADE GROUND: Dark bro sandy subangular fine to c brick and concrete. Sand is	wn slightly clayey slightly oarse GRAVEL of flint, s medium to coarse.			-							-	
Slight odour (chemica 0.6m bgl.	l) noted on sample at/				J	0.60-0.70	0 1.2				-	
				-							- 1	
				-	SPT	1.20-1.65	5		N=7 (2,2/1,1,3 ,2)		-	
Soft to firm brown sandy sl Sand is medium, gravel is a medium of flint, chalk and o	ightly gravelly CLAY. subangular fine to quartz.		1.60		J	1.60-1.70	) <1					
Occasional black organic lenses not between 1.6 - 2.7m bgl.	nic lenses noted			- - - - - -	SPT	2.00-2.45	5	44	N=8 (1,2/2,2,2 ,2)		2	
					D	2.30-2.40	) <1					
Stiff orangish brown sandy CLAY. Sand is medium, gra of flint. slightly saturated from	slightly gravelly avel is subangular fine 2.7m bgl onwards.		2.70 -		SPT	3.00-3.45	5 <1	97	N=27		3-	
Medium dense becoming v orange slightly gravelly me subangular fine of flint.	rery dense with depth dium SAND. Gravel is				в	3.00-4.00			(9,11/8,6, 7,6)			
	,				SPT	4 00-4 38	3		50/005			
Sand becoming very o refusal at 4.0m bgl.	dense at the base upon/								50/225mn (7,7/13,19 ,4,14 for 0mm)			
End of Borehole at 4.38 m			1 4.38								- - - - - -	
Key:         D       Disturbed Sample         B       Bulk Sample         U       Undisturbed Sample         J       Jar Sample         ✓       Water Strike         ✓       Standing Water Level	PPT Pocket Penetrometer T PID Photoionisation Detect SPT Standard Penetration T (Uncorrected)	est or est	Remar	ks: Refi satu	usal at 4. urated fro	38m bgl o m 2.70m.	n very de	ense grave	lly sand. S	Slightly		

ARC	ADIS Design & Consulta for natural and built assets	Arcad CB2 1	is, Part 3 LA	rd Floo	r, Charter	House, 6	62-68 Hills	Road, Ca	mbridge	Borehole Number			
		Tel: +	44(0)122	23 9350	11					ws	5104		
Land at Pioneer Park	Location: Land off Exploration Drive,	Grou	Ground Level (mAOD):					Hole Diameter (mm):				1:25	
Client:	Leicester, LE4 5NU	Eastir	ting:				Well Dian	Logged by:					
		North	Northing:					Filter Material: gravel				U. Cox	
Project: 10016750	Date: 31/01/2018	Metho	od: Han perc	d dug ir cussive o	spection	4.40m bg	2 bgl. Dyn: gl	amic		Chec J	ked I JH	by:	
STRATA RECORD							ESTS / SAI	MPLES		Sheet 1	1 of 1		
Des	cription	Legend	(m bgl)	Level (mAOD)	Sample Type	Depth (n	ə PID n) (ppm)	PPT (kPa)	SPT N Value	Well Detai	ils	Water Level	
MADE GROUND: Grass ov sandy slightly gravelly CLA medium, gravel is subangu brick.	er soft dark brown slightly Y. Sand is fine to Ilar fine of flint and		0.20 -									-	
MADE GROUND: Grass ov gravelly CLAY. Sand is me is subangular to rounded fi concrete and brick.	er soft dark brown sandy dium to coarse, gravel ne to coarse of flint,		-   		D	0.40-0.5	50 <1					-	
MADE GROUND: Light bro subangular to subrounded brick concrete and flint. Sa coarse.	wn slightly clayey sandy fine to medium GRAVEL of nd is fine to											- - 1	
		Marches	- - - 1.45 -	-	SPT	1.20-1.6	65		N=21 (10,12/11, 4,3,3)	,		-	
(friable). Sand is fine.	dy CLAY/SILT	$\frac{1}{2} \frac{1}{2} \frac{1}$		-	D	1.60-1.8	80 <1	50				_	
		$= \frac{M^2}{M^2} + \frac{M^2}{M^2} $		-				50				-	
		$\frac{M_{C}^{2}}{2} \approx \frac{M_{C}^{2}}{2} \approx \frac{M_{C}^{2}}{2} \approx \frac{M_{C}}{2} \approx $		-				50				_	
Firm dark grey slightly silty	slightly sandy		2.00	-	SPT D	2.00-2.4	15 30 <1		N=8 (1.1/2.1.2			2	
CLAY. Sand is line.				-					,3)			_	
				-	J	2.30-2.4	10 <1					-	
		××		-								-	
		$\times - \times -$										_	
		$\times$ $\times$ $\times$ $\longrightarrow$	200 -	-								-	
Firm to stiff orange sandy g medium to coarse, gravel i flint	gravelly CLAY. Sand is s subangular medium of			-	SPT	3.00-3.4	15		N=12 (2.2/2.3.3			3—	
				-					,4)			-	
				-	D	3.40-3.5	50 <1	27				-	
				-								-	
				-								-	
				-								_	
Very dense orange clayey	gravelly medium to		3.95		SPT	4.00-4.4	10		50/245mn	n 📑		4	
coarse very dense SAND. of flint.	Gravel is subangular fine		9	-					(4,4/11,16 ,9,14 for			-	
				-					20mm)			-	
End of Borehole at 4.40 m		<u></u>	4.40	-								-	
				-								-	
				-								-	
Key: D Disturbed Sample	PPT Pocket Penetrometer T	est	Remar	ks: Ref gro	usal at 4. undwate	38m bgl o r strikes n	on very de noted.	ense grave	lly sand. N	lo			
B Bulk Sample U Undisturbed Sample J Jar Sample ∑ Water Strike	PID Photoionisation Detect SPT Standard Penetration T (Uncorrected)	or est		5 -									
Standing Water Level													

	Design & Consultar for natural and	Arcad CB2 1	is, Part 3 LA	rd Floor	, Charter	House,	62-68 Hills	Road, Ca	mbridge	Borehole Number		
	built assets	Tel: +	44(0)122	23 9350 <sup>-</sup>	11					WS10	5	
Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Grour	round Level (mAOD):					Hole Diameter (mm):			Scale 1:25	
Client:	Leicester, LE4 5NU	Eastir	ng:				Well Dian	neter (mm)	Logged by: O. Cox			
		North	ing:	d dua in		pit to 1 (	Filter Mat	erial: grav	el	O. Cox		
Project: 10016750	Date: 31/01/2018	weind	perc	ussive o	drilling to	4.38m b	gl			JJH	i by.	
Description			Depth	Level	Sample	N SITU T Sample		MPLES PPT	SPT N	Sheet 1 of 1 Well Water		
MADE GROUND: Grass ov	er soft to firm brown	, 	(m bgl) 	(mAOD)	Туре	Depth (r	m) (ppm)	(kPa)	Value	Details	Level	
slightly sandy slightly grave fine to medium, gravel is su subrounded fine to coarse concrete.	elly CLAY. Sand is ubangular to of brick, flint and										- - - - - - - - - - - - - - - - - - -	
red brick cobble noted	d at 1.15 - 1.2m bgl.		 1.20 -	-	в	1.20-1.6	50 <1		50/190mr	n	-	
MADE GROUND: Orangish sandy subangular to subro GRAVEL of brick, flint and o	brown slightly clayey bunded fine to medium concrete.		- - - - 		SPT	1.20-1.5	54		(7,13/24,2 0,6 for 40mm)		-	
MADE GROUND: Red suba GRAVEL of red brick.	angular fine to coarse		1.60 - - -									
slightly saturated betw bgl.	veen 1.8m and 2.10m/			-	SPT	2.00-2.4	15		N=6		2	
Soft to firm black slightly cl SILT. Sand is fine to mediu	ayey slightly sandy m.	X X X X X X X X X X X X X X X X X X X X	2.10 -		D	2.20-2.3	30 <1	44	(3,2/1,1,2 ,2)			
Soft to firm brown sandy sl Sand is fine to medium, gra of flint, chalk and quartz.	ightly gravelly CLAY. avel is subangular fine		2.70		J SPT D	3.00-3.1 3.00-3.4 3.50-3.8	10 <1 15 30 <1	47	N=21 (2,2/3,5,7 ,6)		- - - - - - -	
											_	
Very dense brown slightly o	clayey sandy subangular		3.80 -		D	3.80-4.0	00 <1				_	
to subrounded fine to medi quartz.	ium GRAVEL of flint and				SPT	4.00-4.3	38		50/225mr	n	4	
				-					(7,7/17,16 ,2,15 for	6	-	
				-					0mm)		_	
End of Borehole at 4.38 m			4.30 -								-	
Key:       D       Disturbed Sample         B       Bulk Sample         U       Undisturbed Sample         J       Jar Sample         ✓       Water Strike         ✓       Standing Water Level	PPT Pocket Penetrometer Te PID Photoionisation Detecto SPT Standard Penetration Te (Uncorrected)	est or est	Remar	ks: Refi satu	usal at 4. urated be	38m bgl tween 1.	on very de 80-2.10m.	ense grave	elly sand. S	lightly		

	Design & Consultar for natural and	Arcad CB2 1	is, Part 3 LA	rd Floor	, Charter	House,	62-68 Hill	s Road, Ca	ambridge	Borehole Number	
	built assets	Tel: +	44(0)122	23 9350 <sup>.</sup>	11					WS10	6
Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Grour	nd Level	(mAOD)	:		Hole Dia	imeter (mm	ı):	Scale 1:25	
Client: Leicester City Council	Leicester, LE4 5NU	Eastir	ng:				Well Diameter (mm): 50			Logged	by:
		North	ing:	Chaoka	dbu						
Project: 10016750	Date: 31/01/2018	wetho	perc	a aug ir cussive a	drilling to	1.59m b	z bgi. Dyi gl	amic		JJH	u by:
	STRATA RECORD		Danth		Commis	IN SITU T		MPLES		Sheet 1 o	f1
Des	cription	Legena	(m bgl)	Level (mAOD)	Type	Depth (r	n) (ppm)	PPT (kPa)	Value	Details	vvater Level
MADE GROUND: Grass over slightly gravelly CLAY. Sand gravel is subangular to sub of flint and brick.	er soft brown slightly sandy d is fine to medium, rounded fine to medium			- - - -							
MADE GROUND: Dark brow sandy very dense subangu of flint, brick and quartz. Sa coarse.	wn slightly clayey slightly Iar fine to coarse GRAVEL and is medium to				J	0.50-0.6	50 <1				
red brick cobble noted	d at 0.8 - 1.0m bgl/			-							1
			-		SPT	1.20-1.5	59		50/235mr	n H	_
			-	-	D	1.40-1.6	50 <1		,10,11 for		-
			 1.59 -	-							-
End of Borenole at 1.59 m				-							-
			-								-
				-							2
				-							-
				-							-
											-
				-							-
				-							-
											3
			-	-							
				-							-
				-							-
											-
				-							-
				-							4
				- - -							-
				-							-
				-							-
			-	-							-
						6m had		/obot			
Rey: D Disturbed Sample	PPT Pocket Penetrometer To	est	неmar	ks: Refi gro	usai at 1. und. No g	om bgl o groundw	n cobble ater strike	es noted.	n within the	e made	
<ul> <li>D DUIK Sample</li> <li>U Undisturbed Sample</li> <li>J Jar Sample</li> <li>∑ Water Strike</li> </ul>	אטריד Priotoionisation Detector SPT Standard Penetration T (Uncorrected)	est									
Standing Water Level											
	Design & Consultant for natural and	Arcadi	is, Part 3 LA	rd Floor	, Charter	House, 62	2-68 Hills	Road, Ca	mbridge	Boreho Numb	ole er
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	built assets	Tel: +	44(0)122	23 9350 <sup>.</sup>	11					WS106	A
Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Groun	id Level	(mAOD)	:	ŀ	lole Dian	neter (mm	):	Scale 1:25	
Client:	Leicester, LE4 5NU	Eastin	g:			v	Vell Dian	neter (mm)	):	Logged	by:
		Northi	ng:			F	ilter Mat	erial:		U. Cox	
Project: 10016750	Date: 31/01/2018	Metho	d: Han perc	d dug in cussive c	spection	pit to 1.2 l 1.51m bgl	ogl. Dyna	amic		Checkeo JJH	l by:
	STRATA RECORD	-				N SITU TES	STS / SAN	<b>IPLES</b>		Sheet 1 of	1
Des	cription	Legend	Depth (m bgl)	Level (mAOD)	Sample Type	Sample Depth (m)	PID (ppm)	PPT (kPa)	SPT N Value	Well Details	Water Level
MADE GROUND: Grass ov slightly gravelly CLAY. San gravel is subangular fine of	er soft brown slightly sandy d is fine to medium, flint and brick.		- - 0.20 -	-							
MADE GROUND: Dark bro dense subangular fine to ca and quartz. Sand is mediur End of Borehole at 1.51 m	wn clayey sandy very barse GRAVEL of flint, brick n to coarse.		1.51		SPT	1.20-1.51			50/160mn (12,6/26,1 7,7 for 10mm)		
Key				ks: Pof		fim hal on			within the s	made	
D Disturbed Sample B Bulk Sample U Undisturbed Sample J Jar Sample ∑ Water Strike Standing Water Level	PPT Pocket Penetrometer Te PID Photoionisation Detector SPT Standard Penetration Te (Uncorrected)	st st	nernar	rs. Hefi groi	usarat 1. und. No g	groundwat	er strikes	noted.	wiu in ne f	naue	

	Design & Consultan for natural and with reserved	CB2 1	is, Part 3 LA	rd Floor	, Charter	House, 62	-68 Hills	Road, Ca	mbridge	Boreho Numb	ole er
	built assets	Tel: +	44(0)122	23 9350 <sup>-</sup>	11					WS106	B
Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Grour	id Level	(mAOD)	:	н	lole Diar	neter (mm	):	Scale 1:25	
Client:	Leicester, LE4 5NU	Eastin	g:			v	Vell Dian	neter (mm)	):	Logged	by:
		Northi	ng:			F	ilter Mat	erial:		U. Cox	
Project: 10016750	Date: 31/01/2018	Metho	d: Han perc	d dug in cussive c	spection	pit to 1.2 k 1.58m bgl	ogl. Dyna	amic		Checkeo JJH	l by:
	STRATA RECORD					N SITU TES	STS / SAN	<b>IPLES</b>		Sheet 1 of	1
Des	cription	Legend	Depth (m bgl)	Level (mAOD)	Sample Type	Sample Depth (m)	PID (ppm)	PPT (kPa)	SPT N Value	Well Details	Water Level
MADE GROUND: Grass ov slightly gravelly CLAY. San gravel is subangular fine of	er soft brown slightly sandy d is fine to medium, flint and brick.		- - 0.20 -	-							
MADE GROUND: Dark bro dense subangular fine to c and quartz. Sand is mediur	wn clayey sandy very oarse GRAVEL of flint, brick n to coarse.		1.58		SPT	1.20-1.58			50/225mn (6,9/13,21 ,1,15 for 0mm)		- - - - 1 - - - - - - - - - - - - - - -
End of borenole at 1.36 m											
				-							
											2 1 1 1 1
											- 4 -
											-
Key:   D   Disturbed Sample   B   Bulk Sample   U   Undisturbed Sample   J   Jar Sample   ✓   Water Strike   ✓   Standing Water Level	PPT Pocket Penetrometer Te PID Photoionisation Detecto SPT Standard Penetration Te (Uncorrected)	est r est	Remar	ks: Refi grou	usal at 1. und. No g	6m bgl on groundwate	cobble/c er strikes	bstructior noted.	n within the	made	

ARCA	Design & Consultanc for natural and built assets	Arcac CB2 <sup>-</sup> Tel: +	lis, Part 3r 1LA -44(0)1223	d Floor, 8 935011	Charter Hou 1	ise, 62-68 Hill	s Road, Ca	mbridge		Trial Pit Number <b>TP101</b>
Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Groun	d Level (m	AOD):	Trial pit widt Trial pit leng	h (m): 0.80 th (m): 4.50				Scale 1:25
Client: Leicester City Council	Leicester, LE4 5NU	Eastin	g:		Support Me Pit Stability:	thod: Not us Stable during	ed g excavatior	ı	L	ogged By:
Project No: 10016750	Date: 24/01/2018	Northi	ng: ation Meth	od: Bac	ckhoe excav	ator			c	JK hecked By:
S1	RATA RECORD	Execution		ou. Du	IN SITU T	ESTS / SAMP	LES		She	JJH et 1 of 1
Desc	ription	Legend	Depth (m bgl)	Level (mAOE	Sample D) Type	Sample Depth (m)	PID (ppm)	PPT (kPa)		Water Level
MADE GROUND: Greyish SAND. Gravel is angular t concrete and granite.	brown gravelly fine to coarse o sub-rounded of brick,		0.20 -		PID	0.10-0.20	<1			-
MADE GROUND: (Firm) g slightly sandy slightly grav fine to medium. Gravel is subrounded of flint.	rey and light brown mottled elly CLAY. Sand is fine, subangular to				D PID	0.30-0.40	<1	117		- - - -
minor black staining from noted) Orange slightly gravelly ve	m 0.2-0.9m (no odour/		1.10		В	1.10-1.40				۔ 1 -
medium SĂND / slightly sa CLAY. Gravel is fine, suba flint.	andy slightly gravelly ingular to subrounded of				J	1.20-1.30	<1			
Orange slightly silty slightl SAND.	y gravelly medium				PID	2.10-2.20	<1			- - - - - - - - - - - - - - - - - - -
					PID	3.50-3.60	<1			-
					В	3.00-4.10				
End of Trial Pit at 4.20 m			4.20 -		PID	4.10-4.20	<1			
Kerr										
Key: D Disturbed Sample B Bulk Sample J Jar Sample ✓ Water Strike ▼ Standing Water Level	PPT Pocket Penetrometer Tes PID Photoionisation Detector SPT Standard Penetration Tes (Uncorrected)	t	Ground Remark	water: N s:	ot encounte	rea				

ARCA	Design & Consultant for natural and built assets	Arcac CB2 - Tel: +	lis, Part 3r 1LA -44(0)1223	d Floor, 3 93501	Charter Hou 1	ise, 62-68 Hill	s Road, Can	nbridge	ר א <b>ד</b>	rial Pit lumber <b>P102</b>
Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Groun	d Level (m	AOD):	Trial pit widt Trial pit leng	h (m): 0.80 hth (m): 4.50	red			Scale 1:25
Client: Leicester City Council	Leicester, LE4 5NO	Eastin	g:		Pit Stability:	Stable during	excavation		Lo	gged By:
		Northi	ng:						Cł	JK necked Bv:
Project No: 10016750	Date: 24/01/2018	Excav	ation Meth	od: Ba	ckhoe excav	ator	. 50		01	JJH
Desc	ription	Legend	Depth	Level	Sample	Sample	PID	PPT	Snee	Water Level
MADE GROUND: (Firm) g slightly sandy slightly grav fine to medium. Gravel is subrounded of flint. minor black staining fro	rey and light brown mottled velly CLAY. Sand is fine, subangular to m 0.3-0.5m (no odour/		(m bgl)      	(mAOI	D) Type D J	Depth (m) 0.30-0.40	(ppm) <1	(kPa)		
MADE GROUND: Brownis Gravel is fine to coarse, s brick and concrete.	h black gravelly SAND. ubangular to subrounded of		0.50		PID	0.60-0.70	<1			-
Orange slightly gravelly cl Gravel is fine, subangular	ayey medium SAND. to subrounded of flint.		0.80		PID	0.90-1.00	<1			- 1
					PID	1.50-1.60	<1			-
Orange slightly silty grave Gravel is fine to medium, s flint.	lly medium SAND. subangular to rounded of		1.90		В	2.00-2.30				2-
					PID	2.50-2.60	<1			3-
										-
Find of Trial Pit at 4.10 m			4.10							4-
										-
Key: D Disturbed Sample B Bulk Sample J Jar Sample ∑ Water Strike ▼ Standing Water Level	PPT Pocket Penetrometer Tes PID Photoionisation Detector SPT Standard Penetration Tes (Uncorrected)	t st	Groundy Remarks	water: N s:	lot encounte	red				

ARCA	DIS Design & Consultance for natural and built assets	Arcad CB2 Tel: -	dis, Part 3ro 1LA ⊦44(0)1223	d Floor, 3 93501	Charter Hou	ise, 62-68 Hill	s Road, Ca	mbridge	1 -	Trial Pit Number <b>TP103</b>
Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Groun	id Level (m	AOD):	Trial pit widt Trial pit leng	h (m): 0.80 th (m): 5.50				Scale 1:25
Client:	Leicester, LE4 5NU	Eastin	g:		Support Me Pit Stability:	thod: Not us Stable during	ed g excavatior	ı	L	ogged By:
		Northi	ng:							JK
Project No: 10016750	Date: 24/01/2018	Excav	ation Meth	od: Ba	ckhoe excav	ator				JJH
S		Legend	Depth		IN SITU T	ESTS / SAMP		PPT	She	et 1 of 1 Water Level
MADE GROUND: (Firm) g slightly sandy slightly grav fine to medium. Gravel is subrounded of flint.	rey and light brown mottled relly CLAY. Sand is fine, subangular to		(m bgl) (m bgl) – – – –	(mAOI	PID D	0.20-0.30 0.20-0.40	(ppm) <1	(kPa)		
MADE GROUND: Greyish SAND with medium cobbl granite. Gravel is fine to c subrounded of brick, cond	black gravelly fine to coarse e content of up to 300mm oarse, subangular to crete and granite.		0.40		PID	0.50-0.60	<1			-
MADE GROUND: Blackish is fine to coarse, angular t roofing tile and brick.	n red gravelly SAND. Gravel o subangular of				PID	0.80-0.90	<1			- 
Orange gravelly very clave is fine, subangular to subr	ey medium SAND. Gravel ounded of flint.		1.40		B	1.40-1.50 1.60-1.90	<1			-
Orange slightly gravelly m fine to medium, subangul	edium SAND. Gravel is ar to rounded of flint.				PID	2.50-2.60	<1			2- - - - - - - - - - - - - - - - - - -
End of Trial Pit at 4.20 m			4.20		PID	4.10-4.20	<1			4-
Key:   D   Disturbed Sample   B   Bulk Sample   J   Jar Sample   ✓   Water Strike   ▼   Standing Water Level	PPT Pocket Penetrometer Tes PID Photoionisation Detector SPT Standard Penetration Tes (Uncorrected)	t	Groundy Remarks	water: N s:	lot encounte	red	1	I		

ARCA	Design & Consultanc for natural and built assets	Arcad CB2	lis, Part 3r 1LA -44(0)1223	d Floor, 3 93501 <sup>-</sup>	Charter Hou	ıse, 62-68 Hill	s Road, Car	mbridge	Trial Pit Number <b>TP104</b>
Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Groun	d Level (m	AOD):	Trial pit widt Trial pit leng	h (m): 0.80 th (m): 4.50			Scale
Client:	Leicester, LE4 5NU	Eastin	g:		Support Me Pit Stability:	thod: Not us Stable during	sed g excavatior	ı	Logged By:
		Northi	ng:						JK
Project No: 10016750	Date: 24/01/2018	Excav	ation Meth	od: Bad	ckhoe excav	ator			Checked By: JJH
ST						ESTS / SAMP			Sheet 1 of 1
Desc	ription	Legend	(m bgl)	Level (mAOE	D) Type	Depth (m)	PID (ppm)	(kPa)	Water Level
MADE GROUND: Greyish SAND. Gravel is angular t concrete and granite.	brown gravelly fine to coarse to sub-rounded of brick,				PID	0.20-0.30	<1		
MADE GROUND: (Firm) g slightly sandy slightly grav fine to medium. Gravel is subrounded of flint.	rey and light brown mottled relly CLAY. Sand is fine, subangular to		0.30 - - - - - - - - - - - - - - - - - - -		J	0.30-0.40	<1		
					PID D	0.80-0.90 0.90-1.00	<1	144	- - 1-
SAND. Gravel is fine to co subangular of roof tile.	barse, angular to				PID	1.50-1.60	<1		
Firm orange with black sp	ecks silty very sandy	X	1.60 -		PID	1.70-1.80	<1		-
					PID	2.50-2.60	<1	117	2-
					D	3.00-3.10			3-
		××			PID	3.20-3.30	<1		-
Soft to firm 3.3-4.2m. Sa across depth.	and content varies/				PID	4.00-4.10	<1	77	4-
End of Trial Pit at 4.20 m		X	4.20 -						
			-						
Key:   D   Disturbed Sample   B Bulk Sample   J Jar Sample   ✓ Water Strike   ▼ Standing Water Level	PPT Pocket Penetrometer Tes PID Photoionisation Detector SPT Standard Penetration Tes (Uncorrected)	st	Ground Remark	water: S s:	eepage at 1	.60m		1	

ARCA	Design & Consultan for natural and built assets	Cy Arcac CB2 Tel: +	dis, Part 3r 1LA -44(0)1223	d Floor, 3 93501 <sup>-</sup>	Charter Hou	ıse, 62-68 Hill	s Road, Ca	mbridge	Trial Pit Number <b>TP105</b>
Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Groun	d Level (m	AOD):	Trial pit widt Trial pit leng	h (m): 0.80 jth (m): 4.50	sed		Scale 1:25
Client: Leicester City Council		Eastin	g:		Pit Stability:	Stable during	g excavatior	ı	Logged By:
Project No: 10016750	Date: 24/01/2018	Northi	ng: ation Math	od: Ba		ator			JK Checked By:
S	TRATA RECORD	LACav		OU. Dat	IN SITU T	ESTS / SAMF	LES		JJH Sheet 1 of 1
Desc	ription	Legend	Depth (m bgl)	Level (mAOI	Sample D) Type	Sample Depth (m)	PID (ppm)	PPT (kPa)	Water Level
MADE GROUND: Light gu fine to coarse SAND. Gra concrete.	eyish cream very gravelly avel is medium of		0.20		J	0.10-0.20	<1		
MADE GROUND: (Firm) g slightly sandy slightly gra fine to medium. Gravel is subrounded of flint.	grey and light brown mottled velly CLAY. Sand is fine, subangular to				PID	0.50-0.60	<1	135	
MADE GROUND: Greyish coarse GRAVEL of concre	brown clayey sandy fine to ete and brick. Sand is fine		1.10 - 	•	PID	1.10-1.20	<1		
Firm orange with black sp becoming clayey SAND v	becks very sandy CLAY vith depth.		1.40		PID	1.30-1.40	<1		
5 , , ,	·								
Orange slightly gravelly s	ilty medium SAND.		1.90 -		PID	1.90-2.00	<1		2-
					В	2.50-2.80			3-
End of Trial Pit at 4.30 m			4.30 -						
Key: D Disturbed Sample B Bulk Sample J Jar Sample ∑ Water Strike	PPT Pocket Penetrometer Ter PID Photoionisation Detector SPT Standard Penetration Te (Uncorrected)	st	Ground Remark	water: N s:	lot encounte	red			
Standing Water Leve									

ARCA	Design & Consultant for natural and built assets	Arcac CB2 - Tel: +	lis, Part 3r ILA -44(0)1223	d Floor, 3 93501 <sup>-</sup>	Charter Hou 1	ise, 62-68 Hill	ls Road, Cai	mbridge	Trial Pit Number <b>TP106</b>	
Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Groun	d Level (m	AOD):	Trial pit widt Trial pit leng	h (m): 0.80 th (m): 4.00			Scale	
Client:	Leicester, LE4 5NU	Eastin	g:		Support Met Pit Stability:	thod: Not us Stable during	sed g excavatior	ı	Logged By:	
		Northi	ng:						JK Charked Bir	
Project No: 10016750	Date: 25/01/2018	Excav	ation Meth	od: Bad	ckhoe excav	ator			JJH	
S		Logond	Dopth		IN SITU T	ESTS / SAMP		ррт	Sheet 1 of 1	
MADE GROUND: (Soft to	firm) grey and brown mottled		(m bgl)	(mAOE	D) Type	Depth (m)	(ppm)	(kPa)		
sandy gravelly CLÀY. Sar Gravel is fine, subangular and brick.	nd is fine to coarse. to subrounded of flint		0.20		PID	0.10-0.20	<1			-
MADE GROUND: Greyish Gravel is fine to coarse, su of flint, brick and concrete	black gravelly clayey SAND. ubangular to subrounded				PID	0.50-0.60	<1			-
					B PID	1.00-1.30 1.00-1.10	<1		1	۔ ا -
Soft greyish brown slightly gravelly CLAY. Gravel is r subrounded of flint.	/ sandy slightly nedium, subangular to		1.40 <u>-</u> 1.50 <u>-</u>		D	1.50-1.60		42		-
Orange slightly gravelly ve slightly sandy slightly grav	/ ery clayey medium SAND / /elly CLAY.				PID	1.70-1.80	<1			
					PID	2.00-2.10	<1		2	<u>2</u> –
					J	2.50-2.60				
					PID	3.00-3.10	<1		5	8  -
End of Trial Pit at 4.00 m			4.00							4- -
										-
Key: D Disturbed Sample B Bulk Sample J Jar Sample ∑ Water Strike ▼ Standing Water Level	PPT Pocket Penetrometer Tes PID Photoionisation Detector SPT Standard Penetration Tes (Uncorrected)	st st	Ground Remark	water: N s:	ot encounte	red				

ARCA	Design & Consultan for natural and built assets	cy Arcac CB2 - Tel: +	dis, Part 3r 1LA -44(0)1223	d Floor, 3 93501 <sup>-</sup>	Charter Hou	ıse, 62-68 Hill	s Road, Car	nbridge	ר א <b>ד</b>	Γrial Pit Jumber Γ <b>Ρ107</b>
Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Groun	d Level (m	AOD):	Trial pit widt Trial pit leng	h (m): 0.80 jth (m): 4.00				Scale 1:25
Client:	Leicester, LE4 5NU	Eastin	g:		Support Me Pit Stability:	thod: Not us Stable during	sed g excavatior	1	Lo	gged By:
		Northi	ng:							JK
Project No: 10016750	Date: 25/01/2018	Excav	ation Meth	od: Bad	ckhoe excav	ator			Cr	JJH
S		Logond	Dopth		IN SITU T	ESTS / SAMP		ррт	Shee	t 1 of 1
	figure) and the second second second		(m bgl)	(mAOE	D) Type	Depth (m)	(ppm)	(kPa)		
MADE GROUND: (Soft to sandy gravelly CLAY. San Gravel is fine, subangular and brick.	firm) grey and brown mottled nd is fine to coarse. to subrounded of flint		0.20							-
MADE GROUND: Brownis medium SAND with mediu bricks. Gravel is fine to co concrete.	h grey gravelly clayey um cobble content of whole arse, subangular of brick and				J B	0.50-0.60 0.60-0.90	<1			- - - -
MADE GROUND: Light br medium SAND. Gravel is to subrounded of flint.	own slightly gravelly clayey fine to medium, subangular		0.90		PID	1.00-1.10	<1			1
MADE GORUND: Greyish is fine to medium, subang concrete.	black gravelly SAND. Gravel ular of flint and				PID	1 50-1 60	<i>c</i> 1			
Orange slightly clayey gra Gravel is medium, subang flint.	welly medium SAND. gular to subrounded of		1.60		PID	1.60-1.70	<1			-
End of Trial Pit at 4.20 m			4.20		PID	2.00-2.30	<1			2-
Key: D Disturbed Sample B Bulk Sample J Jar Sample ∑ Water Strike ▼ Standing Water Level	PPT Pocket Penetrometer Te PID Photoionisation Detector SPT Standard Penetration Te (Uncorrected)	st st	Ground	water: N s:	ot encounte	red				- - -

	ARCA	Design & Consultan for natural and built assets	cy CB2 Tel: -	dis, Part 3r 1LA ⊦44(0)1223	d Floor, 3 93501	Charter Hou	use, 62-68 Hill	s Road, Ca	mbridge		Trial Pit Number <b>TP108</b>
ŀ	Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Grour	nd Level (m	nAOD):	Trial pit widt Trial pit leng	h (m): 0.80 hth (m): 6.50				Scale 1:25
ſ	Client: Leicester City Council	Leicester, LE4 5NU	Eastir	ıg:		Support Me Pit Stability:	thod: Not us Stable during	sed g excavatior	ı	L	.ogged By:
┝	,		North	ing:							JK
L	Project No: 10016750	Date: 25/01/2018	Excav	ation Meth	od: Ba	ckhoe excav	ator				JJH
╞	Desc		Legend	Depth	Level	Sample	Sample	PID	РРТ	Sne	Water Level
	MADE GROUND: (Soft to sandy gravelly CLAY. Sar Gravel is fine, subangular	firm) grey and brown mottled Id is fine to coarse. to subrounded of flint		(m bgl) 0.10 - -	(mAO	D) Type	Depth (m)	(ppm)	(kPa)		
Ì	and brick. MADE GROUND: Brownis medium SAND with mediu bricks. Gravel is fine to co	h grey gravelly clayey Im cobble content of whole arse, subangular of brick and				PID	0.30-0.40	-1			- - -
$\langle \rangle$	concrete. MADE GROUND: Orange Gravel is fine to medium, s of flint.	slightly clayey gravelly SAND. subangular to rounded		0.80 -			0.00-0.70				-
	MADE GROUND: Grey sa subrounded GRAVEL of n medium.	ndy fine to medium nudstone. Sand is fine to							57		1-
Ĺ	MADE GROUND: Soft bro gravelly CLAY. Sand is me	wn slightly sandy slightly edium. Gravel is medium,		- - 1.40 -	-	D	1.30-1.40	<1			-
Ì	MADE GROUND: Brown c SAND. Gravel subangualr rarely brick and asphalt.	flint. layey silty gravelly medium to subrounded of flint,				B PID	1.50-1.80 1.50-1.60	<1			-
	rarely brick and asphalt. Orange slightly clayey gra Gravel is fine to medium, s flint.	velly medium SAND. subangular to rounded of		4.20		PID	2.00-2.10 3.00-3.10 4.00-4.10	<1			2-
	Key: D Disturbed Sample B Bulk Sample J Jar Sample Water Strike Standing Water Level	PPT Pocket Penetrometer Te PID Photoionisation Detecto SPT Standard Penetration Te (Uncorrected)	st	Ground Remark	water: N s:	lot encounte	red				

ARCA	Design & Consultance for natural and built assets	Arcac CB2 1 Tel: +	lis, Part 3rd ILA -44(0)1223	d Floor, 8 93501	Charter Hou 1	ise, 62-68 Hill	s Road, Car	nbridge		Trial Pit Number <b>TP109</b>
Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Groun	d Level (m	AOD):	Trial pit widt Trial pit leng	h (m): 0.80 th (m): 6.00				Scale 1:25
Client: Leicester City Council	Leicester, LE4 5NU	Eastin	g:		Support Met Pit Stability:	thod: Not us Stable during	ed g excavation		L	ogged By:
		Northi	ng:							JK
Project No: 10016750	Date: 25/01/2018	Excava	ation Meth	od: Bad	ckhoe excava	ator				JJH
S			Denth	1		ESTS / SAMP		DDT	She	et 1 of 1
Desc	πρτιοπ	Legena	(m bgl)	(mAOI	D) Type	Depth (m)	(ppm)	(kPa)		water Level
MADE GROUND: Brownis medium SAND with mediu bricks. Gravel is fine to co subrounded of brick and	h grey gravelly clayey Im cobble content of whole arse, subangular to concrete.				J	0.50-0.60	<1			-
MADE GROUND: Greyish	pink gravelly medium SAND.		0.70 -		PID	0.70-0.80	<1			-
Gravel is fine to medium, s concrete foundation end 0.90m wide MADE GROUND: Brown of SAND. Gravel is fine to me subrounded of flint, brick	subangular of granite. countered at 0.80m and		0.90		В	1.00-1.30				1
					PID	1.50-1.60	<1			-
					В	1.70-2.00				-
			-		PID	1.90-2.00	<1			-
Brown gravelly very silty n Orange clayey medium S/	nedium SAND. AND.		2.00							2
			3,90		PID	2.50-2.60	<1			3-
End of Trial Pit at 3.90 m			- 3.90							4
Key:   D   Disturbed Sample   B Bulk Sample   J Jar Sample   ✓ Water Strike   ▼ Standing Water Level	PPT Pocket Penetrometer Tes PID Photoionisation Detector SPT Standard Penetration Tes (Uncorrected)	t t	Groundy Remarks	water: N s: Conci	lot encounter rete foundati	red on at 0.8m ru	nning east-v	vest, 0.9n	n wide	3

ARCA	Design & Consultance for natural and built assets	Arcac CB2 - Tel: +	dis, Part 3rd 1LA - 44(0) 1223	d Floor, 3 93501	Charter Hou 1	ise, 62-68 Hill	s Road, Car	nbridge	Trial Pit Number <b>TP110</b>
Site:	Location:	Groun	d Level (m	AOD):	Trial pit widt	h (m): 0.80			Scale
Client:	Land off Exploration Drive, Leicester, LE4 5NU	Eastin	a.		Support Me	thod: Not us	ed	-	1:25
Leicester City Council		Northi	y. ng:		Fit Stability.	Stable duning	excavation		Logged by. JK
Project No: 10016750	Date: 25/01/2018	Excav	ation Meth	od: Ba	ckhoe excav	ator			Checked By:
ST	RATA RECORD				IN SITU T	ESTS / SAMP	LES		Sheet 1 of 1
Desc	ription	Legend	Depth (m bgl)	Level (mAOI	Sample D) Type	Sample Depth (m)	PID (ppm)	PPT (kPa)	Water Level
MADE GROUND: (Firm) g slightly sandy slightly grav fine to medium. Gravel is subrounded of flint.	rey and light brown mottled relly CLAY. Sand is fine, subangular to		0.20		PID	0.20-0.30	<1		-
MADE GROUND: Greyish SAND. Gravel is fine to co subrounded of brick and	brown clayey gravelly arse, subangular to concrete.								
rebar in material at 1.0m	/								1
granite cobbles from 1.4	ŀm/				J	1.60-1.70	<1		-
MADE GORUND: Light bro SAND.	ownish grey clayey medium		1.90						2-
MADE GROUND: Orange SAND. Gravel is fine, sub flint, asphalt and granite ra	clayey silty gravelly medium angular to subrounded of arely brick and slag.				PID	2.40-2.70 2.40-2.50	<1		
Orange clayey silty gravel is fine, subangular to subr	ly medium SAND. Gravel ounded of flint.								3-
					PID	3.40-3.50	<1		
End of Trial Pit at 3.90 m									4-
Key: D Disturbed Sample B Bulk Sample J Jar Sample ∑ Water Strike ▼ Standing Water Level	PPT Pocket Penetrometer Tes PID Photoionisation Detector SPT Standard Penetration Tes (Uncorrected)	t	Ground Remarks	water: N s:	ot encounte	red			

ARCA	Arcad CB2	Arcadis, Part 3rd Floor, Charter House, 62-68 Hills Road, Cambridge CB2 1LA Tel: +44(0)1223 935011						Trial Pit Number <b>TP111</b>	
Site: Land at Pioneer Park	Location: Land off Exploration Drive,	Groun	Ground Level (mAOD): Trial pit width (m): 0.80 Trial pit length (m): 4.50				Scale 1:25		
Client: Leicester City Council	Leicester, LE4 5NU	Eastin	Easting: Support Method: Not used Fit Stability: Stable during excavation					Logged By:	
		Northi	ng:						JK Checked Bv:
Project No: 10016750	Excav	ation Meth	od: Bad		ator	1 50		JJH Shoot 1 of 1	
Desc	ription	Legend	Depth (m bgl)	Level (mAO[	Sample ) Type	Sample Depth (m)	PID (ppm)	PPT (kPa)	Water Level
MADE GROUND: (Firm) grey and light brown mottled slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine, subangular to subrounded of flint.			0.20	· ·	PID	0.10-0.20	<1		
MADE GROUND: Brownis medium SAND with medi bricks. Gravel is fine to co subrounded of brick and cobbles and boulders ( between 1.0-1.50m	th grey gravelly clayey um cobble content of whole arse, subangular to concrete. up to 300mm) of granite/								- - - - - - - - - - - - - -
Soft slightly friable grey slightly sandy slightly					PID	1.50-1.60	<1	22	-
			2.60		PID	2.00-2.10	<1		2-
Orange slightly gravelly n fine to medium, subangul	edium SAND. Gravel is ar to rounded of flint.								3-
End of Trial Pit at 3.80 m				Nator: N		red			4
D Disturbed Sample B Bulk Sample J Jar Sample ∑ Water Strike ▼ Standing Water Level	PPT Pocket Penetrometer Tes PID Photoionisation Detector SPT Standard Penetration Tes (Uncorrected)	st	Remark	S:					

ARCA	Disign & Consultance for natural and built assets	Arcac CB2 - Tel: +	lis, Part 3r ILA -44(0)1223	d Floor, 3 935011	Charter Hou	ise, 62-68 Hill	s Road, Ca	mbridge		Trial Pit Number <b>TP112</b>
Site: Land at Pioneer Park	Location: C Land off Exploration Drive,		d Level (m	AOD):	Trial pit widt Trial pit leng	h (m): 0.80 th (m): 4.50				Scale
Client:	Leicester, LE4 5NU	Eastin	Support Method:   Not used     Easting:   Pit Stability:   Slight collapse at 2.0m					L	.ogged By:	
		Northi	Northing:						JK	
Project No: 10016750	Date: 25/01/2018	Excav	ation Meth	od: Bac	khoe excav	ator				JJH
Desc		Legend	Depth	l evel	IN SITU I Sample	Sample		РРТ	She	Water Level
MADE GROUND: Greyish SAND. Gravel is fine to co	brown clayey gravelly arse, subangular to		(m bgl)	(mAOE	) Type	Depth (m)	(ppm)	(kPa)		
subrounded of brick and	concrete.				PID	0.50-0.60	<1			- - - - - - - - - - - - - - -
MADE GROUND: Greyish medium SAND with mediu bricks. Gravel is fine to co subrounded brick.	red slightly clayey gravelly um cobble content of whole barse, subangular to		1.10		PID	1.50-1.60	<1			2-
MADE GROUND: Soft to f CLAY. Slight rotten/sulphu	irm greyish black friable ır type odour.		2.10		J	2.10-2.20	<1	67		
MADE GROUND: Orange SAND. Gravel is fine, sub flint occasionally brick, co granite.	clayey very gravelly medium angular to subrounded of ncrete, wood and				В	3.50-3.80				
End of Trial Pit at 4.10 m			4.10	Nater: St	eepage at 1	4m and 2.1m				4 -
Key: D Disturbed Sample PPT Pocket Penetrometer Test   B Bulk Sample PID Photoionisation Detector   J Jar Sample SPT Standard Penetration Test   ✓ Water Strike (Uncorrected)   ✓ Standing Water Level				S:	copayo at 1.	and 2.111				

ARCA	Design & Consultan for natural and built assets	cy Arcac CB2 Tel: +	lis, Part 3r ILA -44(0)1223	d Floor, 3 935011	Charter Hou	ise, 62-68 Hill	s Road, Ca	mbridge	Trial Pit Number <b>TP113</b>	
Site: Land at Pioneer Park	Location:	Groun	d Level (m	AOD):	Trial pit widt Trial pit leng	h (m): 0.80 th (m): 4.50			Scale	
Client:	Leicester, LE4 5NU	Eastin	Support Method:   Not used     Easting:   Pit Stability:   Stable during excavation						Logged By:	
Leicester City Council		Northi	ning:				JK			
Project No: 10016750	Date: 25/01/2018	Excav	ation Meth	od: Bac	khoe excav	ator			Checked By: JJH	
ST	TRATA RECORD	1	[		IN SITU T	ESTS / SAMP	LES		Sheet 1 of 1	
Description		Legend	Depth (m bgl)	Level (mAOD	Sample )) Type	Sample Depth (m)	PID (ppm)	PPT (kPa)	Water Level	
MADE GROUND: Brownis medium SAND with mediu bricks. Gravel is fine to co subrounded of brick and	h grey gravelly clayey um cobble content of whole arse, subangular to concrete.				PID	0.50-0.60	<1			
Orange clayey gravelly SAND. Gravel is fine to medium, subangular to subrounded of flint. (Possible made ground).			0.90		J	0.90-1.00	<1		1-	
Soft friable grey slightly sa rare orange medium sand pockets and roots.	andy clayey SILT with I lenses, black organic					0.00.0.10		47		
						2.00-2.10				
Orange slightly gravelly cl Gravel is fine, subangular	ayey medium SAND. to subrounded of flint.		2.80		PID	2.80-2.90	<1		3-	
End of Trial Pit at 4.00 m			4.00						4-	
Key: D Disturbed Sample PPT Pocket Penetrometer Test   B Bulk Sample PID Photoionisation Detector   J Jar Sample SPT Standard Penetration Test   ✓ Water Strike (Uncorrected)   ✓ Standing Water Level				water: No s:	ot encounte	red				

Geo-Environmental Phase 2 Site Investigation

### **Results of Hand Vane tests**

Location ID	Test depth (m)	Average Shear Strength c₀ (kPa)	Undrained strength classification
TP101	1.0	37	Low
TP102	0.4	40	Medium
TP104	0.7	39	Low
	2.0	36	Low
	3.0	40	Medium
	0.4	42	Medium
TP105	1.7	35	Low
	1.9	5	Extremely low
TP113	2.0	12	Very low

Geo-Environmental Phase 2 Site Investigation



CLIENT:	Leicester City	y Council		ARCADIS Design & Consultancy for natural and built assets			
REFERENCE:	10016750	SITE NAME:	Land at Pioneer Park	1 Whitehall Riverside Leeds LS1 4BN	T: 0113 284	5300	
Plate 1							
General view looking east	of the site						
Plate 2							
General view looking west	of the site						



CLIENT:	Leicester Cit	y Council		ARCADIS Design & Consulta for natural and built assets		
REFERENCE:	10016750	SITE NAME:	Land at Pioneer Park	1 Whitehall Riverside Leeds LS1 4BN	T: 0113 284 5300	
CLIENT: REFERENCE: Plate 5 View of TP10 stained made over natural of gravelly sand	Leicester Cit 10016750 2 showing ground clayey	y Council		<image/> <text></text>	<text><text><text></text></text></text>	

CLIENT:	Leicester City	y Council		ARCADIS Design & Consultancy for natural and built assets			
REFERENCE:	10016750	SITE NAME:	Land at Pioneer Park	1 Whitehall Riverside Leeds T: 0113 28 LS1 4BN	4 5300		
Plate 6 TP103 spoil r showing natu granular mate and made gro (including gra cobbles and g brick and roo	nound ral erial on left ound inite gravel of f tile)						
Plate 7 TP104 showi reworked sar gravelly clay	ng idy						

CLIENT:	Leicester Cit	y Council		ARCADIS Design & Consulta for natural and built assets			
REFERENCE:	10016750	SITE NAME:	Land at Pioneer Park	1 Whitehall Riverside Leeds LS1 4BN	T: 0113 284 5300		
REFERENCE: Plate 8 Water seepag granular units TP104	10016750		<section-header></section-header>	<text></text>	<text></text>		

CLIENT:	Leicester City	y Council		ARCADIS Design & Consultancy for natural and built assets		
REFERENCE:	10016750	SITE NAME:	Land at Pioneer Park	1 Whitehall Riverside Leeds LS1 4BN	T: 0113 284 5300	
Plate 9 Alluvial claye TP113	y silt in					
Plate 10 Granular mat TP113	erial from					

CLIENT:	Leicester City	/ Council		ARCADIS Design & Consultancy for natural and built assets		
REFERENCE:	10016750	SITE NAME:	Land at Pioneer Park	1 Whitehall Riverside Leeds LS1 4BN	T: 0113 284 5300	
CLIENT: REFERENCE: Plate 11 TP109, concr obstruction ru east-west acr Approximatel wide and enc at 0.8m depth Assume relat historical four	Leicester City 10016750 rete unning ross pit. y 0.9m ountered n. ed to ndation.	Council	Land at Pioneer Park			

CLIENT:	Leicester City	y Council		ARCADIS Design & Consultancy for natural and built assets		
REFERENCE:	10016750	SITE NAME:	Land at Pioneer Park	1 Whitehall Riverside Leeds T: 0 LS1 4BN	113 284 5300	
Plate 12 WS103 1.2-2.0m Natural sandy clay from 1.60	y gravelly 0m.		ARCADIS BHID_WS(03) WON 1001675	Depth 1-2 - 2.0 m 20 Date 30/01/18		
Plate 13 WS103 2.0-3.0m Sandy gravel grading into s 2.70m.	ly clay and from			epth <u>2.0</u> <u>3.0</u> m 2 Date <u>30/0 /18</u>		



CLIENT:	Leicester City	y Council		ARCADIS Design & Consultancy for natural and built assets			
REFERENCE:	10016750	SITE NAME:	Land at Pioneer Park	1 Whitehall Riverside Leeds LS1 4BN	T: 0113 284 5300		
Plate 16 WS104 2.0-3.0m Firm sandy g to 2.90m. Fir below 2.90m.	ravelly clay m to stiff			алана Арарт <u>20.3.0</u> т 7 <u>50</u> Расе <u>31/21/13</u>			
Plate 17 WS104 3.0-4.0m Gravelly sand 2.90m	l from			4 Dopth <u>3 9 4 0 m</u> <u>750 Date 31/91/43</u>			



CLIENT:	Leicester City	y Council		ARCA	DIS Design & Consultancy for natural and built assets		
REFERENCE:	10016750	SITE NAME:	Land at Pioneer Park	1 Whitehall Riverside Leeds LS1 4BN	T: 0113 284 5300		
Plate 20 WS105 3.0-4.0m Clayey sandy from 3.80m.	gravel		ARCADIS EX BHID_USICS WON_ICOIC	LS1 4BN			

Geo-Environmental Phase 2 Site Investigation

# APPENDIX G

**Environmental Laboratory Test Data** 

## JONES JONES ENVIRONMENTAL

Arcadis

Leeds

LS1 4BN

1 Whitehall Riverside

## Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point Zone 3 Deeside Industrial Park Deeside CH5 2UA

#### Tel: +44 (0) 1244 833780 Fax: +44 (0) 1244 833781



Attention :	Jonathan Harris
Date :	6th February, 2018
Your reference :	10016750
Our reference :	Test Report 18/1227 Batch 1
Location :	Pioneer Park
Date samples received :	27th January, 2018
Status :	Final report
Issue :	1

Thirteen samples were received for analysis on 27th January, 2018 of which thirteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

**Compiled By:** 

Baler

Paul Boden BSc Project Manager

#### Exova Jones Environmental

Client Name: Reference: Location: Contact: JE Job No.:

10016750 Pioneer Park Jonathan Harris

Arcadis

18/1227

#### Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No	<b>b.</b> 1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50			
Sample I	D TP104240118 SO0030	TP105240118 SO0010	TP101240118 SO0120	TP102240118 SO0030	TP103240118 SO0140	TP106250118 SO0250	TP107250118 SO0050	TP108250118 SO0060	TP109250118 SO0050	TP113250118 SO0090			
Dept	h 0.30	0.10	1.20	0.30	1.40	2.50	0.50	0.60	0.50	0.90	Disease		
COC No / mis	c										abbrevi	e attached n ations and a	otes for all cronyms
Container	s VJT												
Sample Dat	e 24/01/2018	24/01/2018	24/01/2018	24/01/2018	24/01/2018	25/01/2018	25/01/2018	25/01/2018	25/01/2018	25/01/2018			
Sample Typ	e Soil												
Batch Numbe	<b>r</b> 1	1	1	1	1	1	1	1	1	1			Method
Date of Receip	t 27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	LOD/LOR	Units	No.
Arsenic <sup>#</sup>	12.7	8.4	18.0	NDP	20.5	16.6	22.4	33.7	18.4	14.8	<0.5	mg/kg	TM30/PM15
Barium <sup>#</sup>	123	113	98	NDP	162	60	180	117	211	175	<1	mg/kg	TM30/PM15
Beryllium	1.2	0.8	1.0	NDP	1.4	0.8	1.4	1.4	2.0	1.0	<0.5	mg/kg	TM30/PM15
Cadmium <sup>#</sup>	0.1	0.3	0.2	NDP	<0.1	<0.1	0.3	<0.1	0.2	<0.1	<0.1	mg/kg	TM30/PM15
Chromium <sup>#</sup>	38.5	39.8	49.5	NDP	46.9	40.9	52.1	57.3	60.0	47.0	<0.5	mg/kg	TM30/PM15
Copper <sup>#</sup>	33	34	11	NDP	16	10	23	<1	36	10	<1	mg/kg	TM30/PM15
Lead <sup>#</sup>	18	25	15	NDP	36	8	39	18	56	35	<5	mg/kg	TM30/PM15
Mercury <sup>#</sup>	<0.1	<0.1	<0.1	NDP	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel <sup>#</sup>	28.0	18.7	30.7	NDP	32.4	21.1	22.1	25.6	25.2	22.2	<0.7	mg/kg	TM30/PM15
Selenium <sup>#</sup>	<1	<1	<1	NDP	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM30/PM15
Vanadium	48	43	37	NDP	54	34	49	64	50	29	<1	mg/kg	TM30/PM15
Water Soluble Boron #	1.5	1.9	1.0	NDP	3.6	1.4	2.0	0.6	1.3	1.6	<0.1	mg/kg	TM74/PM32
Zinc*	74	110	51	NDP	67	43	126	79	100	46	<5	mg/kg	TM30/PM15
Arsenic	-	-	-	15.1	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM62
Barium	-	-	-	163	-	-	-	-	-	-	<1	mg/kg	TM30/PM62
Cadmium				0.5	_	-		-	-	-	<0.5	mg/kg	TM30/PM62
Chromium	_	_	_	56.8	_	-	-	_	-	-	<0.1	mg/kg	TM30/PM62
	-	-	-	43	-	-	-	-	-	-	<1	ma/ka	TM30/PM62
Lead	-	-	-	137	-	-	-	-	-	-	<5	mg/kg	TM30/PM62
Mercury	-	-	-	0.1	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM62
Nickel	-	-	-	20.5	-	-	-	-	-	-	<0.7	mg/kg	TM30/PM62
Selenium	-	-	-	<1	-	-	-	-	-	-	<1	mg/kg	TM30/PM62
Vanadium	-	-	-	31	-	-	-	-	-	-	<1	mg/kg	TM30/PM62
Water Soluble Boron	-	-	-	5.6	-	-	-	-	-	-	<0.1	mg/kg	TM74/PM61
Zinc	-	-	-	143	-	-	-	-	-	-	<5	mg/kg	TM30/PM62
		1	1	1	1	1	1	1	1	1		1	1

#### Exova Jones Environmental

Client Name: Reference: Location: Contact: JE Job No.:

10016750 Pioneer Park Jonathan Harris

Arcadis

18/1227

#### Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	1				
Sample ID	TP104240118 SO0030	TP105240118 SO0010	TP101240118 SO0120	TP102240118 SO0030	TP103240118 SO0140	TP106250118 SO0250	TP107250118 SO0050	TP108250118 SO0060	TP109250118 SO0050	TP113250118 SO0090					
Depth	0.30	0.10	1.20	0.30	1.40	2.50	0.50	0.60	0.50	0.90	Please see attached notes for a abbreviations and acronyms				
COC No/misc															
COC NO7 misc															
Containers	VJT	1													
Sample Date	24/01/2018	24/01/2018	24/01/2018	24/01/2018	24/01/2018	25/01/2018	25/01/2018	25/01/2018	25/01/2018	25/01/2018	1				
Sample Type	Soil														
Batch Number	1	1	1	1	1	1	1	1	1	1			Mothod		
Date of Receipt	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	LOD/LOR	Units	No.		
	2110112010	21/01/2010	21/01/2010	21/01/2010	2110112010	2110112010	21/01/2010	21/01/2010	21/01/2010	2110112010					
PAR MS	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	0.56	-0.04	-0.04	-0.04	-0.04	ma/ka			
	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.03	0.04	0.14	<0.04	<0.04	mg/kg			
Aconaphthono#	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.34	<0.04	0.14	<0.05	<0.05	mg/kg			
Eluorene #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.34	<0.03	0.20	<0.03	<0.03	mg/kg	TM4/PM8		
Phenanthrene <sup>#</sup>	0.08	0.12	<0.04	<0.04	<0.04	<0.04	1.67	0.26	2.78	<0.04	<0.04	mg/kg	TM4/PM8		
Anthracene #	<0.00	0.05	<0.00	<0.00	<0.00	<0.00	0.42	0.16	1 40	<0.00	<0.00	ma/ka	TM4/PM8		
Fluoranthene <sup>#</sup>	0.14	0.33	<0.03	0.10	<0.03	<0.03	2.22	0.86	7.60	0.03	<0.03	ma/ka	TM4/PM8		
Pyrene <sup>#</sup>	0.13	0.32	<0.03	0.10	<0.03	<0.03	2.10	0.87	6.49	0.05	<0.03	ma/ka	TM4/PM8		
Benzo(a)anthracene #	0.13	0.31	<0.06	0.07	<0.06	<0.06	1.13	0.53	4.16	0.08	<0.06	ma/ka	TM4/PM8		
Chrysene <sup>#</sup>	0.07	0.21	<0.02	0.07	<0.02	<0.02	1.18	0.49	3.36	0.02	<0.02	mg/kg	TM4/PM8		
Benzo(bk)fluoranthene <sup>#</sup>	0.13	0.45	<0.07	0.11	<0.07	<0.07	2.00	1.18	5.93	<0.07	<0.07	mg/kg	TM4/PM8		
Benzo(a)pyrene #	0.07	0.26	<0.04	0.06	< 0.04	< 0.04	1.08	0.64	3.39	<0.04	< 0.04	mg/kg	TM4/PM8		
Indeno(123cd)pyrene #	0.05	0.20	<0.04	<0.04	<0.04	<0.04	0.75	0.46	2.38	<0.04	<0.04	mg/kg	TM4/PM8		
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.17	0.09	0.44	<0.04	<0.04	mg/kg	TM4/PM8		
Benzo(ghi)perylene #	0.05	0.20	<0.04	<0.04	<0.04	<0.04	0.84	0.43	2.22	<0.04	<0.04	mg/kg	TM4/PM8		
PAH 16 Total	0.9	2.5	<0.6	<0.6	<0.6	<0.6	14.7	6.0	40.8	<0.6	<0.6	mg/kg	TM4/PM8		
Benzo(b)fluoranthene	0.09	0.32	<0.05	0.08	<0.05	<0.05	1.44	0.85	4.27	<0.05	<0.05	mg/kg	TM4/PM8		
Benzo(k)fluoranthene	0.04	0.13	<0.02	0.03	<0.02	<0.02	0.56	0.33	1.66	<0.02	<0.02	mg/kg	TM4/PM8		
PAH Surrogate % Recovery	93	83	94	85	96	94	97	93	98	99	<0	%	TM4/PM8		
Methyl Tertiary Butyl Ether #	-	-	-	-	<0.002	-	-	<0.002	<0.002	-	<0.002	mg/kg	TM15/PM10		
Benzene <sup>#</sup>	-	-	-	-	<0.003	-	-	<0.003	<0.003	-	<0.003	mg/kg	TM15/PM10		
Toluene #	-	-	-	-	<0.003	-	-	<0.003	<0.003	-	<0.003	mg/kg	TM15/PM10		
Ethylbenzene #	-	-	-	-	<0.003	-	-	<0.003	<0.003	-	<0.003	mg/kg	TM15/PM10		
p/m-Xylene <sup>#</sup>	-	-	-	-	<0.005	-	-	<0.005	<0.005	-	<0.005	mg/kg	TM15/PM10		
o-Xylene <sup>#</sup>	-	-	-	-	<0.003	-	-	<0.003	<0.003	-	<0.003	mg/kg	TM15/PM10		
Surrogate Recovery Toluene D8	-	-	-	-	113	-	-	108	99	-	<0	%	TM15/PM10		
Surrogate Recovery 4-Bromofluorobenzene	-	-	-	-	147	-	-	125	101	-	<0	%	TM15/PM10		
TPH CWG															
Aliphatics			sv			sv		sv		sv					
>C5-C6"	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1 sv	<0.1	mg/kg	TM36/PM12		
>C6-C8"	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1 sv	<0.1	mg/kg	TM36/PM12		
>08-010	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12		
>C10-C12"	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM16		
>012-016	<4	/ 97	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg			
>C10-C21	<7	22	<7	14	<7	<7	17	~7	~7	~7	~7	mg/kg	TM5/DM16		
Total alighatics C5-35	<10	107	<10	-10	<10	<10	~10	<10	~10	<10	<10	mg/kg	TM5/TM36/PM12/PM16		
	~13	121	~13	~13	~13	~13	~13	~13	~13	~13	~13	iiig/kg			

#### Exova Jones Environmental

Client Name: Reference: Location: Contact: JE Job No.:

10016750 Pioneer Park Jonathan Harris

Arcadis

18/1227

#### Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	1			
Sample ID	TP104240118 SO0030	TP105240118 SO0010	TP101240118 SO0120	TP102240118 SO0030	TP103240118 SO0140	TP106250118 SO0250	TP107250118 SO0050	TP108250118 SO0060	TP109250118 SO0050	TP113250118 SO0090				
Depth	0.30	0.10	1.20	0.30	1.40	2.50	0.50	0.60	0.50	0.90	Please see attached notes for all			
COC No / misc											abbrevi	cronyms		
Containors	VIT	1												
Containers	VJI													
Sample Date	24/01/2018	24/01/2018	24/01/2018	24/01/2018	24/01/2018	25/01/2018	25/01/2018	25/01/2018	25/01/2018	25/01/2018	1			
Sample Type	Soil													
Batch Number	1	1	1	1	1	1	1	1	1	1		Units	Method	
Date of Receipt	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	27/01/2018	LODIEOIT	Onito	No.	
TPH CWG														
Aromatics														
>C5-EC7 #	<0.1	<0.1	<0.1 <sup>SV</sup>	<0.1	<0.1	<0.1 <sup>SV</sup>	<0.1	<0.1 <sup>SV</sup>	<0.1	<0.1 <sup>SV</sup>	<0.1	mg/kg	TM36/PM12	
>EC7-EC8 <sup>#</sup>	<0.1	<0.1	<0.1 <sup>SV</sup>	<0.1	<0.1	<0.1 <sup>SV</sup>	<0.1	<0.1 <sup>SV</sup>	<0.1	<0.1 <sup>SV</sup>	<0.1	mg/kg	TM36/PM12	
>EC8-EC10 <sup>#</sup>	<0.1	<0.1	<0.1 <sup>SV</sup>	<0.1	<0.1	<0.1 <sup>SV</sup>	<0.1	<0.1 <sup>SV</sup>	<0.1	<0.1 <sup>SV</sup>	<0.1	mg/kg	TM36/PM12	
>EC10-EC12#	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM16	
>EC12-EC16 <sup>#</sup>	<4	<4	<4	<4	<4	<4	7	<4	<4	<4	<4	mg/kg	TM5/PM16	
>EC16-EC21 #	<7	<7	<7	<7	<7	<7	30	<7	23	<7	<7	mg/kg	TM5/PM16	
>EC21-EC35#	<7	61	<7	49	<7	<7	162	<7	108	<7	<7	mg/kg	TM5/PM16	
Total aromatics C5-35 *	<19	61	<19	49	<19	<19	199	<19	131	<19	<19	mg/kg	TM5/TM36/PM12/PM16	
Total aliphatics and aromatics(CS-35)	<38	188	<38	49	<38	<38	199	<38	131	<38	<38	rng/kg	1Mb/1M3b/PM12/PM16	
MTBE#	<0.005	<0.005	<0.005 <sup>SV</sup>	<0.005	-	<0.005 <sup>SV</sup>	<0.005	-	-	<0.005 <sup>SV</sup>	<0.005	ma/ka	TM31/PM12	
Benzene <sup>#</sup>	< 0.005	< 0.005	<0.005 <sup>SV</sup>	< 0.005	-	<0.005 <sup>SV</sup>	< 0.005	-	-	<0.005 <sup>SV</sup>	< 0.005	mg/kg	TM31/PM12	
Toluene <sup>#</sup>	<0.005	< 0.005	<0.005 <sup>SV</sup>	<0.005	-	<0.005 <sup>SV</sup>	<0.005	-	-	<0.005 <sup>SV</sup>	<0.005	mg/kg	TM31/PM12	
Ethylbenzene #	<0.005	<0.005	<0.005 <sup>SV</sup>	<0.005	-	<0.005 <sup>SV</sup>	<0.005	-	-	<0.005 <sup>SV</sup>	<0.005	mg/kg	TM31/PM12	
m/p-Xylene #	<0.005	<0.005	<0.005 <sup>SV</sup>	<0.005	-	<0.005 <sup>SV</sup>	<0.005	-	-	<0.005 <sup>SV</sup>	<0.005	mg/kg	TM31/PM12	
o-Xylene <sup>#</sup>	<0.005	<0.005	<0.005 <sup>SV</sup>	<0.005	-	<0.005 <sup>SV</sup>	<0.005	-	-	<0.005 <sup>SV</sup>	<0.005	mg/kg	TM31/PM12	
Total Phenols HPLC	-	-	-	-	<0.15	-	-	<0.15	<0.15	-	<0.15	mg/kg	TM26/PM21	
Natural Moisture Content	17.0	20.4	9.6	NDP	14.3	11.0	15.7	6.2	10.9	11.1	<0.1	%	PM4/PM0	
		2011	0.0	1101	1110	1110	10.1	0.2	10.0			70		
Fluoride	-	-	-	-	-	-	-	-	-	-	<0.3	mg/kg	TM173/PM20	
Hexavalent Chromium#	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20	
Nitrate as NO3	-	-	-	-	-	-	-	-	-	-	<2.5	mg/kg	TM38/PM20	
Nitrite as NO2	-	-	-	-	-	-	-	-	-	-	<0.05	mg/kg	TM38/PM20	
Sulphate as SO4 (2:1 Ext) #	0.645	0.183	0.0201	NDP	0.0919	0.0873	0.0504	0.0321	0.205	0.0163	<0.0015	g/l	TM38/PM20	
Sulphate as SO4 (2:1 Ext)	-	-	-	0.148	-	-	-	-	-	-	<0.0015	g/l	TM38/PM60	
Chromium III	38.5	39.8	49.5	NDP	46.9	40.9	52.1	57.3	60.0	47.0	<0.5	mg/kg	NONE/NONE	
Free Cvanide	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ma/ka	TM89/PM45	
Total Cvanide #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ma/ka	TM89/PM45	
Total Oyanide	4010	1010	40.0	40.0	40.0	40.0	40.0	40.0	4010	10.0	10.0	g, ng		
Total Organic Carbon #	-	-	-	-	-	-	-	-	-	-	<0.02	%	TM21/PM24	
Sulphide	-	-	-	-	-	-	-	-	-	-	<10	mg/kg	TM106/PM119	
Easaal Caliform=*												ot-/-	Subcontract-	
	- 8 15	10.6	- 8.25	- 8.06	- 8 10	7 01	- 8.40	9.76	- 8 62	-	<0.01	ciu/g	TM73/DM11	
Total Coliforms*	-	-	-	-	-	-	-	-	-	-	<b>\U.U1</b>	cfu/a	Subcontracted	
	-	_	-	-	_	-	-	-	-	-		ord/g	Suscentiaoleu	

Exova Jones Envir	onmento	ıl										
Client Name: Reference: Location: Contact:	Arcadis 10016750 Pioneer P Jonathan	) 'ark Harris			Report : Solid Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub							
JE Job No.:	18/1227											
J E Sample No.	51-55	56-60	61-65									
Sample ID	TP112250118 SO0210	TP111250118 SO0030	TP110250118 SO0160									
Depth	2.10	0.30	1.60						Blooso so	o attached n	otos for all	
COC No / misc									abbrevi	ations and a	cronyms	
Containers	ТГЛ	ТГЛ	ТГА									
Sample Date	25/01/2018	25/01/2018	25/01/2018									
Sample Type	Soil	Soil	Soil									
Betch Number	3011	3011	3011									
Batch Number	1	1	1						LOD/LOR	Units	Method No.	
Date of Receipt	27/01/2018	27/01/2018	27/01/2018							-		
Arsenic"	116 867	NDP	19.2						<0.5	mg/kg	TM30/PM1	
Beryllium	1.7	NDP	1.2						<0.5	mg/kg	TM30/PM1	
Cadmium <sup>#</sup>	5.3	NDP	0.1						<0.1	mg/kg	TM30/PM1	
Chromium <sup>#</sup>	1160 <sub>AA</sub>	NDP	50.8						<0.5	mg/kg	TM30/PM1	
Copper <sup>#</sup>	464 <sub>AA</sub>	NDP	14						<1	mg/kg	TM30/PM1	
Lead <sup>#</sup>	559	NDP	14						<5	mg/kg	TM30/PM1	
Mercury <sup>#</sup>	10.2	NDP	<0.1						<0.1	mg/kg	TM30/PM1	
Nickel <sup>#</sup>	17.1	NDP	32.5						<0.7	mg/kg	TM30/PM1	
Selenium <sup>#</sup>	<1	NDP	<1						<1	mg/kg	TM30/PM1	
Vanadium	29	NDP	47						<1	mg/kg	TM30/PM1	
Water Soluble Boron "	8.3		1.0						<0.1	mg/kg	TM74/PM3	
Arsenic		20.4	-						<0.5	ma/ka	TM30/PM62	
Barium	-	93	-						<1	ma/ka	TM30/PM62	
Beryllium	-	1.3	-						<0.5	mg/kg	TM30/PM62	
Cadmium	-	0.1	-						<0.1	mg/kg	TM30/PM62	
Chromium	-	31.7	-						<0.5	mg/kg	TM30/PM62	
Copper	-	17	-						<1	mg/kg	TM30/PM62	
Lead	-	28	-						<5	mg/kg	TM30/PM62	
Mercury	-	<0.1	-						<0.1	mg/kg	TM30/PM62	
Nickel	-	29.9	-						<0.7	mg/kg	TM30/PM62	
Vanadium	-	<1	-						<1	mg/kg	TM30/PM6	
Water Soluble Boron	-	1.2	-						<0.1	ma/ka	TM74/PM6	
Zinc	-	91	-						<5	mg/kg	TM30/PM62	
										5 5	_	

Exova Jones Envir	onmente	al													
Client Name: Reference: Location:	Arcadis 10016750 Pioneer Park							Report : Solid Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub							
Contact: JE Job No.:	Jonathan 18/1227	Harris													
J E Sample No.	51-55	56-60	61-65								1				
Sample ID	TP112250118 SO0210	TP111250118 SO0030	TP110250118 SO0160												
Depth	2.10	0.30	1.60								Diagon an	a attached r	otoo for all		
COC No / misc	;										abbrevi	ations and a	cronyms		
Containers	VJT	VJT	VJT								1				
Sample Date	25/01/2018	25/01/2018	25/01/2018								1				
Sample Type	Soil	Soil	Soil								1				
Batch Number		1	1								ļ				
Date of Descint	1	1	1								LOD/LOR	Units	Method No.		
Date of Receipt	27/01/2018	27/01/2018	27/01/2018												
PAH MS	1.3840	<0.04	<0.04								<0.04	ma/ka	TM4/PM8		
Acenaphthylene	<0.30 <sub>AB</sub>	<0.03	<0.03								<0.03	mg/kg	TM4/PM8		
Acenaphthene #	<0.50 <sub>AB</sub>	<0.05	<0.05								<0.05	mg/kg	TM4/PM8		
Fluorene <sup>#</sup>	<0.40 <sub>AB</sub>	<0.04	<0.04								<0.04	mg/kg	TM4/PM8		
Phenanthrene #	1.99 <sub>AB</sub>	0.03	<0.03								<0.03	mg/kg	TM4/PM8		
Anthracene <sup>#</sup>	<0.40 <sub>AB</sub>	<0.04	<0.04								<0.04	mg/kg	TM4/PM8		
Fluoranthene <sup>#</sup>	2.72 <sub>AB</sub>	0.10	<0.03								<0.03	mg/kg	TM4/PM8		
Pyrene *	2.44 <sub>AB</sub>	0.09	<0.03								<0.03	mg/kg	TM4/PM8		
Benzo(a)anthracene	2.60 <sub>AB</sub>	0.08	<0.06								<0.06	mg/kg	TM4/PM8		
Benzo(bk)fluoranthene <sup>#</sup>	3.11AB	0.10	<0.02								<0.02	ma/ka	TM4/PM8		
Benzo(a)pyrene #	1.66 <sub>AB</sub>	0.06	<0.04								<0.04	mg/kg	TM4/PM8		
Indeno(123cd)pyrene #	1.38 <sub>AB</sub>	<0.04	<0.04								<0.04	mg/kg	TM4/PM8		
Dibenzo(ah)anthracene #	<0.40 <sub>AB</sub>	<0.04	<0.04								<0.04	mg/kg	TM4/PM8		
Benzo(ghi)perylene #	1.80 <sub>AB</sub>	<0.04	<0.04								<0.04	mg/kg	TM4/PM8		
PAH 16 Total	21.0 <sub>AB</sub>	<0.6	<0.6								<0.6	mg/kg	TM4/PM8		
Benzo(b)fluoranthene	2.24 <sub>AB</sub>	0.07	<0.05								<0.05	mg/kg	TM4/PM8		
Benzo(k)fluoranthene	0.87 <sub>AB</sub>	0.03	<0.02								<0.02	mg/kg	TM4/PM8		
PAH Surrogate % Recovery	99 <b>AB</b>	94	95								<0	%	TM4/PM8		
Methyl Tertiary Butyl Ether #	-	-	-								<0.002	ma/ka	TM15/PM1		
Benzene <sup>#</sup>	-	-	-								<0.003	mg/kg	TM15/PM1		
Toluene <sup>#</sup>	-	-	-								<0.003	mg/kg	TM15/PM1		
Ethylbenzene #	-	-	-								<0.003	mg/kg	TM15/PM1		
p/m-Xylene <sup>#</sup>	-	-	-								<0.005	mg/kg	TM15/PM1		
o-Xylene <sup>#</sup>	-	-	-								<0.003	mg/kg	TM15/PM1		
Surrogate Recovery Toluene D8	-	-	-								<0	%	TM15/PM1		
Surrogate Recovery 4-Bromofluorobenzene	-	-	-								<0	%	TM15/PM1		
TPH CWG															
Aliphatics															
>C5-C6 <sup>#</sup>	0.2	<0.1	<0.1 <sup>sv</sup>								<0.1	mg/kg	TM36/PM1		
>C6-C8 <sup>#</sup>	0.2	<0.1	<0.1 <sup>SV</sup>								<0.1	mg/kg	TM36/PM1		
>C8-C10	<0.1	<0.1	<0.1 <sup>SV</sup>								<0.1	mg/kg	TM36/PM1		
>C10-C12#	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM16		
>C12-C16 <sup>#</sup>	<4	<4	<4								<4	mg/kg	TM5/PM16		
>C16-C21 #	28	<7	<7								<7	mg/kg	TM5/PM16		
>C21-C35#	358	<7	<7								<7	mg/kg	TM5/PM16		
1 otal aliphatics C5-35	386	<19	<19								<19	mg/kg	TM5/TM36/PM12/PM		
Exova Jones Envir	onmente	al													
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Client Name: Reference: Location:	Arcadis 10016750 Pioneer P	) Park			Report : Solid Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub										
Contact: JE Job No.:	Jonathan 18/1227	Harris													
J E Sample No.	51-55	56-60	61-65						1						
Sample ID	TP112250118 SO0210	TP111250118 SO0030	TP110250118 SO0160												
Depth	2.10	0.30	1.60						Please se	e attached n	otes for all				
COC No / misc	;								abbrevi	ations and a	cronyms				
Containers	VJT	VJT	VJT												
Sample Date	25/01/2018	25/01/2018	25/01/2018												
Sample Type	Soil	Soil	Soil												
Batch Number	1	1	1						1.00/1.00		Method				
Date of Receipt	27/01/2018	27/01/2018	27/01/2018						LOD/LOR	Units	No.				
TPH CWG															
Aromatics															
>C5-EC7 #	<0.1	<0.1	<0.1 <sup>SV</sup>						<0.1	mg/kg	TM36/PM12				
>EC7-EC8#	<0.1	<0.1	<0.1 <sup>SV</sup>						<0.1	mg/kg	TM36/PM12				
>EC8-EC10*	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12				
>EC10-EC12"	4.7	<0.2	<0.2						<0.2	mg/kg	TM5/PM16				
>EC12-EC16	59	<7	<7						<7	mg/kg	TM5/PM16				
>EC21-EC35 #	477	<7	<7						<7	mg/kg	TM5/PM16				
Total aromatics C5-35#	555	<19	<19						<19	mg/kg	TM5/TM36/PM12/PM1				
Total aliphatics and aromatics(C5-35)	941	<38	<38						<38	mg/kg	TM5/TM36/PM12/PM1				
MTBE#	<0.005	<0.005	<0.005 <sup>SV</sup>						<0.005	mg/kg	TM31/PM12				
Benzene #	<0.005	<0.005	<0.005 <sup>SV</sup>						<0.005	mg/kg	TM31/PM12				
Toluene #	0.014	<0.005	<0.005 <sup>SV</sup>						<0.005	mg/kg	TM31/PM12				
Ethylbenzene #	<0.005	<0.005	<0.005 <sup>3V</sup>						<0.005	mg/kg	TM31/PM12				
m/p-Xylene "	<0.005	<0.005	<0.005°°						<0.005	mg/kg	TM31/PM12				
o-xylene	<0.005	<0.005	<0.005						<0.005	mg/kg					
Total Phenols HPLC	-	-	-						<0.15	mg/kg	TM26/PM2				
Natural Moisture Content	56.6	NDP	12.0						<0.1	%	PM4/PM0				
Fluoride	3.0	-	-						<0.3	ma/ka	TM173/PM2				
Hexavalent Chromium #	<0.3	<0.3	<0.3						<0.3	mg/kg	TM38/PM20				
Nitrate as NO3	<2.5	-	-						<2.5	mg/kg	TM38/PM20				
Nitrite as NO2	<0.05	-	-						<0.05	mg/kg	TM38/PM20				
Sulphate as SO4 (2:1 Ext) #	0.247	NDP	0.0951						<0.0015	g/l	TM38/PM20				
Sulphate as SO4 (2:1 Ext)	-	1.15	-						<0.0015	g/l	TM38/PM60				
Chromium III	1160.0	NDP	50.8						<0.5	mg/kg	NONE/NONI				
Free Cyanide	<0.5	<0.5	<0.5						<0.5	mg/kg	TM89/PM4				
Total Cyanide <sup>#</sup>	4.7	<0.5	<0.5						<0.5	mg/kg	TM89/PM4				
Total Organic Carbon *	3.59	-	-						<0.02	%	TM21/PM24				
Sulphide	<10	-	-						<10	mg/kg	TM106/PM11				
Faecal Coliforms*	<10	-	-							cfu/g	Subcontracte				
рН#	8.50	8.26	7.72						<0.01	pH units	TM73/PM1				
Total Coliforms*	<20	-	-							cfu/g	Subcontracte				

#### Arcadis Client Name SVOC Report : Solid 10016750 Reference: Pioneer Park Location: Jonathan Harris Contact: JE Job No.: 18/1227 J E Sample No. 41-45 21-25 36-40 TP103240118 FP10825011 TP109250118 Sample ID SO0140 SO0060 SO0050 Depth 1.40 0.60 0.50 Please see attached notes for all COC No / misc abbreviations and acronyms VJT VJT Containers VJT Sample Date 24/01/2018 25/01/201 25/01/2018 Sample Type Soil Soil Soil Batch Number Method 1 1 1 I Inits No. 27/01/2018 27/01/2018 27/01/2018 Date of Receipt SVOC MS Phenols < 0.01 < 0.01 < 0.01 < 0.01 TM16/PM8 2-Chlorophenol \* mg/kg 2-Methylphenol <0.01 <0.01 < 0.01 < 0.01 mg/kg TM16/PM8 2-Nitrophenol <0.01 <0.01 <0.01 <0.01 TM16/PM8 mg/kg TM16/PM8 2,4-Dichlorophenol \* <0.01 <0.01 <0.01 < 0.01 mg/kg 2,4-Dimethylphenol <0.01 < 0.01 <0.01 < 0.01 mg/kg TM16/PM8 2,4,5-Trichlorophenol <0.01 <0.01 <0.01 <0.01 mg/kg TM16/PM8 2,4,6-Trichlorophenol <0.01 <0.01 <0.01 <0.01 TM16/PM8 mg/kg 4-Chloro-3-methylphenol TM16/PM8 <0.01 <0.01 <0.01 <0.01 mg/kg 4-Methylphenol <0.01 <0.01 < 0.01 < 0.01 mg/kg TM16/PM8 4-Nitropheno <0.01 <0.01 <0.01 <0.01 TM16/PM8 mg/kg TM16/PM8 Pentachlorophenol < 0.01 < 0.01 < 0.01 < 0.01 mg/kg Phenol # < 0.01 < 0.01 < 0.01 < 0.01 mg/kg TM16/PM8 PAHs 2-Chloronaphthalene# <0.01 <0.01 < 0.01 < 0.01 TM16/PM8 ma/ka TM16/PM8 2-Methylnaphthalene # <0.01 <0.01 0.04 < 0.01 mg/kg Phthalates <0.1 TM16/PM8 Bis(2-ethylhexyl) phthalate <0.1 <0.1 <0.1 mg/kg TM16/PM8 Butvlbenzvl phthalate < 0.1 < 0.1 < 0.1 <0.1 mg/kg Di-n-butyl phthalate < 0.1 < 0.1 <0.1 <0.1 mg/kg TM16/PM8 Di-n-Octyl phthalate <0.1 <0.1 <0.1 TM16/PM8 <0.1 mg/kg TM16/PM8 Diethyl phthalate < 0.1 < 0.1 < 0.1 <0.1 ma/ka Dimethyl phthalate # < 0.1 < 0.1 <0.1 <0.1 mg/kg TM16/PM8 Other SVOCs 1,2-Dichlorobenzene <0.01 <0.01 <0.01 <0.01 TM16/PM8 mg/kg 1,2,4-Trichlorobenzene # TM16/PM8 < 0.01 < 0.01 < 0.01 < 0.01 mg/kg 1,3-Dichlorobenzene <0.01 <0.01 <0.01 <0.01 mg/kg TM16/PM8 1.4-Dichlorobenzene < 0.01 <0.01 <0.01 < 0.01 TM16/PM8 mg/kg TM16/PM8 2-Nitroaniline < 0.01 < 0.01 < 0.01 < 0.01 mg/kg 2.4-Dinitrotoluene < 0.01 < 0.01 < 0.01 < 0.01 mg/kg TM16/PM8 2,6-Dinitrotoluene <0.01 <0.01 <0.01 <0.01 TM16/PM8 mg/kg 3-Nitroaniline TM16/PM8 <0.01 <0.01 <0.01 <0.01 mg/kg TM16/PM8 4-Bromophenylphenylether # < 0.01 < 0.01 < 0.01 < 0.01 mg/kg 4-Chloroaniline <0.01 <0.01 <0.01 <0.01 mg/kg TM16/PM8 TM16/PM8 4-Chlorophenylphenylether <0.01 < 0.01 <0.01 <0.01 mg/kg 4-Nitroaniline TM16/PM8 < 0.01 < 0.01 < 0.01 < 0.01 mg/kg Azobenzene <0.01 < 0.01 < 0.01 <0.01 mg/kg TM16/PM8 Bis(2-chloroethoxy)methane <0.01 <0.01 <0.01 <0.01 TM16/PM8 mg/kg Bis(2-chloroethyl)ether <0.01 <0.01 <0.01 TM16/PM8 <0.01 mg/kg Carbazole <0.01 0.04 0.26 <0.01 mg/kg TM16/PM8 <0.01 <0.01 0.07 <0.01 mg/kg TM16/PM8 Dibenzofuran <sup>#</sup> <0.01 <0.01 <0.01 <0.01 TM16/PM8 -lexachlorobenzene mg/kg Hexachlorobutadiene \* TM16/PM8 < 0.01 < 0.01 < 0.01 < 0.01 mg/kg Hexachlorocyclopentadiene <0.01 <0.01 < 0.01 < 0.01 mg/kg TM16/PM8 TM16/PM8 Hexachloroethane <0.01 <0.01 <0.01 <0.01 mg/kg TM16/PM8 lsophorone \* < 0.01 < 0.01 < 0.01 < 0.01 mg/kg N-nitrosodi-n-propylamine # <0.01 <0.01 <0.01 <0.01 mg/kg TM16/PM8 <0.01 <0.01 <0.01 <0.01 TM16/PM8 Nitrobenzene mg/kg Surrogate Recovery 2-Fluorobiphenyl TM16/PM8 125 115 119 <0 % % TM16/PM8 Surrogate Recovery p-Terphenyl-d14 125 126 123 <0

**Exova Jones Environmental** 

Client Name:	Arcadis				VOC Rep	ort :	Solid			
Reference:	10016750	)								
Location:	Pioneer P	ark								
Contact:	Jonathan	Harris								
JE Job No.:	18/1227			 	 			_		
J E Sample No.	21-25	36-40	41-45							
Sample ID	TP103240118 SO0140	TP108250118 SO0060	TP109250118 SO0050							
Depth COC No / misc	1.40	0.60	0.50					Please se abbrevi	e attached n ations and a	otes for all cronyms
Containers	VJT	VJT	VJT							
Sample Date	24/01/2018	25/01/2018	25/01/2018							
Sample Type	Soil	Soil	Soil					<b> </b>		
Batch Number	1	1	1					LOD/LOR	Units	Method No.
VOC MS	21/01/2010	21101/2010	21/01/2010							
Dichlorodifluoromethane	<0.002	<0.002	<0.002					<0.002	mg/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.002	<0.002	<0.002					<0.002	mg/kg	TM15/PM10
Chloromethane <sup>#</sup>	< 0.003	< 0.003	< 0.003	 				< 0.003	mg/kg	TM15/PM10
Vinyl Chloride Bromomethane	<0.002	<0.002	<0.002					<0.002	mg/kg ma/kg	TM15_AVENING
Chloroethane #	<0.002	<0.002	<0.002					<0.002	mg/kg	TM15/PM10
Trichlorofluoromethane #	<0.002	<0.002	<0.002					<0.002	mg/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE)#	<0.006	<0.006	<0.006					<0.006	mg/kg	TM15/PM10
Dichloromethane (DCM) *	< 0.03	<0.03	< 0.03					<0.03	mg/kg	TM15/PM10
trans-1-2-Dichloroethene	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10
cis-1-2-Dichloroethene #	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10
2,2-Dichloropropane	<0.004	<0.004	<0.004					<0.004	mg/kg	TM15/PM10
Bromochloromethane #	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10
Chloroform <sup>#</sup>	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10
1,1,1-I fichloropropene <sup>#</sup>	<0.003	<0.003	<0.003					<0.003	ma/ka	TM15/PM10
Carbon tetrachloride #	<0.004	<0.004	<0.004					<0.004	mg/kg	TM15/PM10
1,2-Dichloroethane#	<0.004	<0.004	<0.004					<0.004	mg/kg	TM15/PM10
Benzene <sup>#</sup>	< 0.003	< 0.003	< 0.003					< 0.003	mg/kg	TM15/PM10
Trichloroethene (TCE) *	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10
1,2-Dichloropropane	<0.000	<0.000	<0.000					<0.000	ma/kg	TM15/PM10
Bromodichloromethane <sup>#</sup>	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10
cis-1-3-Dichloropropene	<0.004	<0.004	<0.004					<0.004	mg/kg	TM15/PM10
Toluene <sup>#</sup>	<0.003	<0.003	< 0.003					<0.003	mg/kg	TM15/PM10
trans-1-3-Dichloropropene	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10 TM15/PM10
Tetrachloroethene (PCE) #	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10
1,3-Dichloropropane #	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10
Dibromochloromethane #	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10
1,2-Dibromoethane *	<0.003	<0.003	<0.003	 ļI				<0.003	mg/kg	TM15/PM10
Chiorobenzene " 1 1 2-Tetrachloroethane	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10
Ethylbenzene <sup>#</sup>	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10
p/m-Xylene #	<0.005	<0.005	<0.005					<0.005	mg/kg	TM15/PM10
o-Xylene <sup>#</sup>	< 0.003	< 0.003	< 0.003					<0.003	mg/kg	TM15/PM10
Styrene	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15_A/PM10
Isopropylbenzene <sup>#</sup>	<0.003	<0.003	<0.003					<0.003	ma/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10
Bromobenzene	<0.002	<0.002	<0.002					<0.002	mg/kg	TM15/PM10
1,2,3-Trichloropropane #	<0.004	< 0.004	< 0.004					<0.004	mg/kg	TM15/PM10
Propylbenzene *	<0.004	<0.004	<0.004					<0.004	mg/kg	TM15/PM10 TM15/PM10
1 3.5-Trimethylbenzene <sup>#</sup>	<0.003	<0.003	<0.003					<0.003	ma/kg	TM15/PM10
4-Chlorotoluene	<0.003	<0.003	<0.003					<0.003	mg/kg	TM15/PM10
tert-Butylbenzene #	<0.005	<0.005	<0.005					<0.005	mg/kg	TM15/PM10
1,2,4-Trimethylbenzene#	< 0.006	<0.006	< 0.006	 				<0.006	mg/kg	TM15/PM10
sec-Butylbenzene "	<0.004	<0.004	<0.004					 <0.004	mg/kg	TM15/PM10 TM15/PM10
1.3-Dichlorobenzene <sup>#</sup>	<0.004	<0.004	<0.004					<0.004	mg/kg	TM15/PM10
1,4-Dichlorobenzene#	<0.004	<0.004	<0.004					<0.004	mg/kg	TM15/PM10
n-Butylbenzene <sup>#</sup>	<0.004	<0.004	<0.004					<0.004	mg/kg	TM15/PM10
1,2-Dichlorobenzene#	< 0.004	<0.004	<0.004					<0.004	mg/kg	TM15/PM10
1,2-Dibromo-3-chloropropane "	<0.004	<0.004	<0.004					<0.004	mg/kg	TM15/PM10
Hexachlorobutadiene	<0.007	<0.007	<0.007					<0.004	mg/kg	TM15/PM10
Naphthalene	<0.027	<0.027	<0.027					<0.027	mg/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<0.007	<0.007	<0.007					<0.007	mg/kg	TM15/PM10
Surrogate Recovery Toluene D8	113	108	99	 				<0	%	TM15/PM10

Client Name:	Arcadis
Reference:	10016750
Location:	Pioneer Park
Contact:	Jonathan Harris

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

#### Ryan Butterworth

Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/1227	1	TP104240118SO0030	0.30	5	31/01/2018	General Description (Bulk Analysis)	soil/stones
					31/01/2018	Asbestos Fibres	NAD
					31/01/2018	Asbestos Fibres (2)	NAD
					31/01/2018	Asbestos ACM	NAD
					31/01/2018	Asbestos ACM (2)	NAD
					31/01/2018	Asbestos Type	NAD
					31/01/2018	Asbestos Type (2)	NAD
					31/01/2018	Asbestos Level Screen	NAD
18/1227	1	TP105240118SO0010	0.10	10	31/01/2018	General Description (Bulk Analysis)	soil/stones
					31/01/2018	Asbestos Fibres	NAD
					31/01/2018	Asbestos Fibres (2)	NAD
					31/01/2018	Asbestos ACM	NAD
					31/01/2018	Asbestos ACM (2)	NAD
					31/01/2018	Asbestos Type	NAD
					31/01/2018	Asbestos Type (2)	NAD
					31/01/2018	Asbestos Level Screen	NAD
18/1227	1	TP101240118SO0120	1.20	15	31/01/2018	General Description (Bulk Analysis)	soil/stones
					31/01/2018	Asbestos Fibres	NAD
					31/01/2018	Asbestos Fibres (2)	NAD
					31/01/2018	Asbestos ACM	NAD
					31/01/2018	Asbestos ACM (2)	NAD
					31/01/2018	Asbestos Type	NAD
					31/01/2018	Asbestos Type (2)	NAD
					31/01/2018	Asbestos Level Screen	NAD
18/1227	1	TP102240118SO0030	0.30	20	31/01/2018	General Description (Bulk Analysis)	soil/stones
					31/01/2018	Asbestos Fibres	Fibre Bundles
					31/01/2018	Asbestos ACM	NAD
					31/01/2018	Asbestos Type	Chrysotile
					31/01/2018	Asbestos Level Screen	less than 0.1%
					06/02/2018	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					06/02/2018	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					06/02/2018	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					06/02/2018	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					06/02/2018	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)

# Jones Environmental Laboratory

Client N Referen Locatio Contact	lame: nce: on: t:		Arcadis 10016750 Pioneer F Jonathan	0 Park i Harris			
J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/1227	1	TP103240118SO0140	1.40	25	31/01/2018	General Description (Bulk Analysis)	soil/stones
					31/01/2018	Asbestos Fibres	NAD
					31/01/2018	Asbestos Fibres (2)	NAD
					31/01/2018	Asbestos ACM	NAD
					31/01/2018	Asbestos ACM (2)	NAD
					31/01/2018	Asbestos Type	NAD
					31/01/2018	Asbestos Type (2)	NAD
					31/01/2018	Asbestos Level Screen	NAD
18/1227	1	TP106250118SO0250	2.50	30	31/01/2018	General Description (Bulk Analysis)	Soil/Stones
					31/01/2018	Asbestos Fibres	NAD
					31/01/2018	Asbestos Fibres (2)	NAD
					31/01/2018	Asbestos ACM	NAD
					31/01/2018	Asbestos ACM (2)	NAD
					31/01/2018	Asbestos Type	NAD
					31/01/2018	Asbestos Type (2)	NAD
					31/01/2018	Asbestos Level Screen	NAD
18/1227	1	TP107250118SO0050	0.50	35	31/01/2018	General Description (Bulk Analysis)	soil.stones
					31/01/2018	Asbestos Fibres	NAD
					31/01/2018	Asbestos Fibres (2)	NAD
					31/01/2018	Asbestos ACM	NAD
					31/01/2018	Asbestos ACM (2)	NAD
					31/01/2018	Asbestos Type	NAD
					31/01/2018	Asbestos Type (2)	NAD
					31/01/2018	Asbestos Level Screen	NAD
18/1227	1	TP108250118SO0060	0.60	40	31/01/2018	General Description (Bulk Analysis)	soil.stones
					31/01/2018	Asbestos Fibres	NAD
					31/01/2018	Asbestos Fibres (2)	NAD
					31/01/2018		NAD
					31/01/2018	Asbestos ACM (2)	NAD
					31/01/2018	Asbestos Type	
					31/01/2010	Asbestos Lavel Sereen	
					51/01/2010		
18/1227	1	TP109250118SO0050	0.50	45	31/01/2018	General Description (Bulk Analysis)	soil.stones
			2.00		31/01/2018	Asbestos Fibres	NAD
					31/01/2018	Asbestos Fibres (2)	NAD
					31/01/2018	Asbestos ACM	NAD
					31/01/2018	Asbestos ACM (2)	NAD
					31/01/2018	Asbestos Type	NAD
					31/01/2018	Asbestos Type (2)	NAD
					31/01/2018	Asbestos Level Screen	NAD
18/1227	1	TP113250118SO0090	0.90	50	31/01/2018	General Description (Bulk Analysis)	Soil/Stones
					31/01/2018	Asbestos Fibres	NAD
					31/01/2018	Asbestos Fibres (2)	NAD
					31/01/2018	Asbestos ACM	NAD
					31/01/2018	Asbestos ACM (2)	NAD
					31/01/2018	Asbestos Type	NAD
					31/01/2018	Asbestos Type (2)	NAD
					31/01/2018	Asbestos Level Screen	NAD

# Jones Environmental Laboratory

Client Name: Reference: Location: Contact:		Arcadis 10016750 Pioneer F Jonathan	) Park Harris				
J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/1227	1	TP112250118SO0210	2.10	55	31/01/2018	General Description (Bulk Analysis)	Soil/Stones
					31/01/2018	Asbestos Fibres	NAD
					31/01/2018	Asbestos Fibres (2)	NAD
					31/01/2018	Asbestos ACM	NAD
					31/01/2018	Asbestos ACM (2)	NAD
					31/01/2018	Asbestos Type	NAD
					31/01/2018	Asbestos Type (2)	NAD
					31/01/2018	Asbestos Level Screen	NAD
18/1227	1	TP111250118SO0030	0.30	60	31/01/2018	General Description (Bulk Analysis)	soil/stones
					31/01/2018	Asbestos Fibres	Fibre Bundles
					31/01/2018	Asbestos ACM	NAD
					31/01/2018	Asbestos Type	Chrysotile
					31/01/2018	Asbestos Level Screen	less than 0.1%
					06/02/2018	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					06/02/2018	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					06/02/2018	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					06/02/2018	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					06/02/2018	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)
10/1007	1	TP110250118500160	1.60	6E	21/01/2019	Constal Description (Bulk Analysis)	agil/stance
10/1227	-	17110230118300100	1.00	65	31/01/2010		
					31/01/2018	Asbestos Fibres (2)	NAD
					31/01/2018	Asbestos ACM	NAD
					31/01/2018	Asbestos ACM (2)	NAD
					31/01/2018	Asbestos Type	NAD
					31/01/2018	Asbestos Type (2)	NAD
					31/01/2018	Asbestos Level Screen	NAD

Matrix : Solid

Client Name:	Arcadis
Reference:	10016750
Location:	Pioneer Park
Contact:	Jonathan Harris

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	NDP Reason
18/1227	1	TP102240118SO0030	0.30	16-20	Asbestos detected in sample
18/1227	1	TP111250118SO0030	0.30	56-60	Asbestos detected in sample

Client Name:	Arcadis
Reference:	10016750
Location:	Pioneer Park
Contact:	Jonathan Harris

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
			•		No deviating sample report results for job 18/1227	

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

### NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/1227

#### SOILS

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

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCI (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

#### WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

#### **DEVIATING SAMPLES**

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

#### SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

#### DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

#### BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

#### NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

#### **REPORTS FROM THE SOUTH AFRICA LABORATORY**

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

#### ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
В	Indicates analyte found in associated method blank.
DR	Dilution required.
М	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
СО	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
ТВ	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution
AB	x10 Dilution

# Method Code Appendix

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 $^{\circ}\text{C}.$			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM60	As received solid samples are extracted with deionised water in a 2:1 ratio of water to solid.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM61	As received solid samples are extracted with hot water in a 20:1 ratio of water to soil ready for analysis by ICP.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
TM106	Determination of Sulphide by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
TM131	Quantification of Asbestos Fibres and ACM, based on HSG248 and SCA method.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	Yes

# Method Code Appendix

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
Subcontracted	Subcontracted analysis, sent to an ISO 17025 accredited laboratory where possible.						Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes



Arcadis 3 Picadilly Place

M1 3BN

Manchester

# Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point Zone 3 Deeside Industrial Park Deeside CH5 2UA

#### Tel: +44 (0) 1244 833780 Fax: +44 (0) 1244 833781



Attention :	Jonathan Harris
Date :	21st February, 2018
Your reference :	10016750
Our reference :	Test Report 18/1550 Batch 1
Location :	Pioneer Park
Date samples received :	1st February, 2018
Status :	Final report
Issue :	1

Eight samples were received for analysis on 1st February, 2018 of which eight were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

**Compiled By:** 

5.60-20

Simon Gomery BSc Project Manager

Client Name: Reference: Location: Contact: JE Job No.: Arcadis 10016750 Pioneer Park Jonathan Harris

18/1550

#### Report : Solid

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24				
Sample ID	WS103-0.60- 0.70-20180130	WS103-1.60- 1.70-20180130	WS101-0.30- 0.40-20180130	WS101-1.90- 2.00-20180130	WS102-1.60- 1.70-20180130	W\$104-2.30- 2.40-20180131	WS106-0.50- 0.60-20180131	WS105-3.00- 3.10-20180131				
Depth	0.60-0.70	1.60-1.70	0.30-0.40	1.90-2.00	1.60-1.70	2.30-2.40	0.50-0.60	3.00-3.10		Disease		
COC No / miss										abbrevi	e attached n ations and a	otes for all cronyms
COC NO7 misc												
Containers	VJ	VJ	VJ	VJ	٧J	Λl	٧J	٧J				
Sample Date	30/01/2018	30/01/2018	30/01/2018	30/01/2018	30/01/2018	31/01/2018	31/01/2018	31/01/2018				
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil				
Batch Number	1	1	1	1	1	1	1	1				Mathad
Data of Receipt	01/02/2019	01/02/2019	01/02/2019	01/02/2019	01/02/2019	01/02/2018	01/02/2019	01/02/2019		LOD/LOR	Units	No.
Americ#	20.2	49.0	NDD	01/02/2010	01/02/2010	01/02/2010	NDD	12.9		-0.5	malka	TM20/DM15
Arsenic Borium <sup>#</sup>	146	40.0		-	0.4	23.5		62		<0.5	mg/kg	TM30/PM15
Beryllium	13	1.5	NDP	_	0.6	230	NDP	0.8		<0.5	ma/ka	TM30/PM15
Cadmium #	0.4	0.8	NDP	-	0.3	0.4	NDP	0.0		<0.0	ma/ka	TM30/PM15
Chromium <sup>#</sup>	54.7	54.7	NDP	-	62.0	80.2	NDP	71.2		<0.5	ma/ka	TM30/PM15
Copper <sup>#</sup>	13	18	NDP	-	22	62	NDP	18		<1	mg/kg	TM30/PM15
Lead <sup>#</sup>	8	35	NDP	-	44	124	NDP	21		<5	mg/kg	TM30/PM15
Mercury <sup>#</sup>	<0.1	<0.1	NDP	-	<0.1	1.4	NDP	<0.1		<0.1	mg/kg	TM30/PM15
Nickel <sup>#</sup>	22.7	27.0	NDP	-	18.6	31.0	NDP	17.7		<0.7	mg/kg	TM30/PM15
Selenium <sup>#</sup>	<1	1	NDP	-	<1	2	NDP	<1		<1	mg/kg	TM30/PM15
Vanadium	60	66	NDP	-	26	55	NDP	31		<1	mg/kg	TM30/PM15
Water Soluble Boron #	1.1	1.8	NDP	-	4.1	5.5	NDP	2.2		<0.1	mg/kg	TM74/PM32
Zinc <sup>#</sup>	65	100	NDP	-	87	130	NDP	61		<5	mg/kg	TM30/PM15
Arsenic	-	-	17.1	-	-	-	37.7	-		<0.5	mg/kg	TM30/PM62
Barium	-	-	347	-	-	-	216	-		<1	mg/kg	TM30/PM62
Beryllium	-	-	3.9	-	-	-	2.0	-		<0.5	mg/kg	TM30/PM62
Cadmium	-	-	0.2	-	-	-	<0.1	-		<0.1	mg/kg	TM30/PM62
Chromium	-	-	43.0	-	-	-	48.9	-		<0.5	mg/kg	TM30/PM62
Copper	-	-	53	-	-	-	53	-		<1	mg/kg	TM30/PM62
Lead	-	-	95	-	-	-	71	-		<5	mg/kg	TM30/PM62
Mercury	-	-	<0.1	-	-	-	<0.1	-		<0.1	mg/kg	TM30/PM62
Nickel	-	-	39.7	-	-	-	27.4	-		<0.7	mg/kg	TM30/PM62
Selenium	-	-	<1	-	-	-	<1	-		<1	mg/kg	TM30/PM62
Vanadium	-	-	61	-	-	-	75	-		<1	mg/kg	TM30/PM62
Water Soluble Boron	-	-	1.3	-	-	-	0.9	-		<0.1	mg/kg	TM74/PM61
ZINC	-	-	146	-	-	-	176	-		<5	mg/kg	110130/P10162

Client Name: Reference: Location: Contact: JE Job No.: Arcadis 10016750 Pioneer Park Jonathan Harris

18/1550

#### Report : Solid

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			1		
Sample ID	WS103-0.60- 0.70-20180130	WS103-1.60- 1.70-20180130	WS101-0.30- 0.40-20180130	WS101-1.90- 2.00-20180130	WS102-1.60- 1.70-20180130	WS104-2.30- 2.40-20180131	WS106-0.50- 0.60-20180131	WS105-3.00- 3.10-20180131					
Depth	0.60-0.70	1.60-1.70	0.30-0.40	1.90-2.00	1.60-1.70	2.30-2.40	0.50-0.60	3.00-3.10			Disease		
COC No / misc											abbrevi	ations and a	cronyms
											1		
Containers	VJ	٧J	٧J	VJ	VJ	VJ	VJ	VJ					
Sample Date	30/01/2018	30/01/2018	30/01/2018	30/01/2018	30/01/2018	31/01/2018	31/01/2018	31/01/2018					
Sample Type	Soil												
Batch Number	1	1	1	1	1	1	1	1					Method
Date of Receipt	01/02/2018	01/02/2018	01/02/2018	01/02/2018	01/02/2018	01/02/2018	01/02/2018	01/02/2018			LOD/LOR	Units	No.
Naphthalene #	<0.04	<0.04	0.12	-	<0.04	<0.04	0.08	<0.04			<0.04	ma/ka	TM4/PM8
Acenaphthylene	<0.03	<0.03	0.14	-	<0.03	<0.03	0.31	<0.03			<0.03	ma/ka	TM4/PM8
Acenaphthene #	<0.05	< 0.05	0.23	-	< 0.05	<0.05	0.16	<0.05			< 0.05	ma/ka	TM4/PM8
Fluorene <sup>#</sup>	< 0.04	<0.04	0.14	-	< 0.04	< 0.04	0.11	< 0.04			< 0.04	mg/kg	TM4/PM8
Phenanthrene <sup>#</sup>	<0.03	<0.03	1.26	-	< 0.03	< 0.03	1.75	<0.03			< 0.03	mg/kg	TM4/PM8
Anthracene #	< 0.04	<0.04	0.43	-	< 0.04	< 0.04	0.94	< 0.04			< 0.04	mg/kg	TM4/PM8
Fluoranthene#	<0.03	<0.03	3.17	-	<0.03	0.07	4.84	<0.03			< 0.03	mg/kg	TM4/PM8
Pyrene #	< 0.03	<0.03	2.65	-	< 0.03	0.07	4.59	< 0.03			< 0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	1.08	-	<0.06	<0.06	2.74	<0.06			<0.06	mg/kg	TM4/PM8
Chrysene <sup>#</sup>	<0.02	<0.02	1.39	-	<0.02	0.06	2.53	<0.02			<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	2.78	-	<0.07	<0.07	6.20	<0.07			<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	1.60	-	<0.04	<0.04	3.68	<0.04			<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene#	<0.04	<0.04	1.16	-	<0.04	<0.04	2.88	<0.04			<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	0.18	-	<0.04	<0.04	0.39	<0.04			<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	1.12	-	<0.04	<0.04	2.83	<0.04			<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	17.5	-	<0.6	<0.6	34.0	<0.6			<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	2.00	-	<0.05	<0.05	4.46	<0.05			<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	0.78	-	<0.02	<0.02	1.74	<0.02			<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	93	96	99	-	98	96	96	97			<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	<0.002	-	-	-	-	-	<0.002	-			<0.002	mg/kg	TM15/PM10
Benzene <sup>#</sup>	<0.003	-	-	-	-	-	<0.003	-			<0.003	mg/kg	TM15/PM10
Toluene <sup>#</sup>	<0.003	-	-	-	-	-	<0.003	-			<0.003	mg/kg	TM15/PM10
Ethylbenzene #	<0.003	-	-	-	-	-	<0.003	-			<0.003	mg/kg	TM15/PM10
p/m-Xylene #	<0.005	-	-	-	-	-	<0.005	-			<0.005	mg/kg	TM15/PM10
o-Xylene <sup>#</sup>	<0.003	-	-	-	-	-	<0.003	-			<0.003	mg/kg	TM15/PM10
Surrogate Recovery Toluene D8	108	-	-	-	-	-	92	-			<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	120	-	-	-	-	-	89	-			<0	%	TM15/PM10
Aliphatics													
	-0.1	-0.1	-0.1		-0.1	-0.1	-0.1	, SV			-0.1	ma/ka	TM26/DM12
>0-00	<0.1	<0.1	<0.1	_	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C10-C12 <sup>#</sup>	<0.1	<0.1	<0.1	_	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM5/PM16
>C12-C16 <sup>#</sup>	<4	<4	<4	-	<4	<4	<4	<4	l	l	<4	ma/ka	TM5/PM16
>C16-C21 #	<7	<7	<7	-	<7	<7	<7	<7			<7	mą/ka	TM5/PM16
>C21-C35#	<7	<7	49	-	<7	<7	82	58			<7	mą/ka	TM5/PM16
Total aliphatics C5-35	<19	<19	49	-	<19	<19	82	58			<19	mg/kg	TM5/TM36/PM12/PM16
	-	-	-		-	-		-			-	5.5	

Client Name: Reference: Location: Contact: JE Job No.: Arcadis 10016750 Pioneer Park Jonathan Harris

18/1550

#### Report : Solid

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24				
Sample ID	WS103-0.60- 0.70-20180130	WS103-1.60- 1.70-20180130	WS101-0.30- 0.40-20180130	WS101-1.90- 2.00-20180130	WS102-1.60- 1.70-20180130	WS104-2.30- 2.40-20180131	WS106-0.50- 0.60-20180131	WS105-3.00- 3.10-20180131				
Depth	0.60-0.70	1.60-1.70	0.30-0.40	1.90-2.00	1.60-1.70	2.30-2.40	0.50-0.60	3.00-3.10		Diagon on	a attached a	atoo for all
COC No / misc										abbrevi	ations and a	cronyms
Contoinere										ĺ		
Containers	VJ	٧J										
Sample Date	30/01/2018	30/01/2018	30/01/2018	30/01/2018	30/01/2018	31/01/2018	31/01/2018	31/01/2018				
Sample Type	Soil											
Batch Number	1	1	1	1	1	1	1	1		1.00/1.00		Method
Date of Receipt	01/02/2018	01/02/2018	01/02/2018	01/02/2018	01/02/2018	01/02/2018	01/02/2018	01/02/2018		LOD/LOR	Units	No.
TPH CWG												
Aromatics												
>C5-EC7 #	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1 <sup>SV</sup>		<0.1	mg/kg	TM36/PM12
>EC7-EC8#	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1 <sup>SV</sup>		<0.1	mg/kg	TM36/PM12
>EC8-EC10 <sup>#</sup>	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1 <sup>SV</sup>		<0.1	mg/kg	TM36/PM12
>EC10-EC12#	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2		<0.2	mg/kg	TM5/PM16
>EC12-EC16 <sup>#</sup>	<4	<4	<4	-	<4	<4	<4	<4		<4	mg/kg	TM5/PM16
>EC16-EC21 #	<7	<7	26	-	<7	<7	34	<7		<7	mg/kg	TM5/PM16
>EC21-EC35 #	<7	<7	206	-	<7	<7	307	28		<7	mg/kg	TM5/PM16
Total aromatics C5-35 <sup>#</sup>	<19	<19	232	-	<19	<19	341	28		<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	281	-	<38	<38	423	86		<38	mg/kg	TM5/TM36/PM12/PM16
MTBE#	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005 <sup>SV</sup>		<0.005	mg/kg	TM31/PM12
Benzene <sup>#</sup>	-	< 0.005	< 0.005	-	< 0.005	< 0.005	-	<0.005 <sup>SV</sup>		<0.005	mg/kg	TM31/PM12
Toluene <sup>#</sup>	-	< 0.005	< 0.005	-	< 0.005	< 0.005	-	<0.005 <sup>SV</sup>		<0.005	mg/kg	TM31/PM12
Ethylbenzene <sup>#</sup>	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005 <sup>SV</sup>		<0.005	mg/kg	TM31/PM12
m/p-Xylene #	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005 <sup>SV</sup>		<0.005	mg/kg	TM31/PM12
o-Xylene <sup>#</sup>	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005 <sup>SV</sup>		<0.005	mg/kg	TM31/PM12
Total Phenols HPLC	<0.15	-	-	-	-	-	<0.15	-		<0.15	mg/kg	TM26/PM21
Monoethylene glycol	<0.05	-	-	-	-	-	<0.05	-		<0.05	mg/kg	TM179/PM8
Propylene glycol	< 0.05	-	-	-	-	-	<0.05	-		<0.05	mg/kg	TM179/PM8
Diethylene glycol	<0.05	-	-	-	-	-	<0.05	-		<0.05	mg/kg	TM179/PM8
Triethylene glycol	<0.05	-	-	-	-	-	<0.05	-		<0.05	mg/kg	TM179/PM8
Thiodiglycol	<0.05	-	-	-	-	-	<0.05	-		<0.05	mg/kg	TM179/PM8
Natural Moisture Content	11.3	32.1	NDP	-	15.4	36.3	NDP	14.4		<0.1	%	PM4/PM0
Fluoride	1.7	-	-	-	-	-	1.1	-		<0.3	mg/kg	TM173/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	-	<0.3	<0.3	<0.3	<0.3		<0.3	mg/kg	TM38/PM20
Nitrate as NO3	<2.5	-	-	-	-	-	NDP	-		<2.5	mg/kg	TM38/PM20
Nitrate as NO3	-	-	-	-	-	-	<2.5	-		<2.5	mg/kg	TM38/PM60
Nitrite as NO2	0.43	-	-	-	-	-	NDP	-		<0.05	mg/kg	TM38/PM20
	-	-	-	-	-	-	<0.05	-		<0.05	mg/kg	TM38/PM60
Sulphate as SO4 (2:1 Ext) "	0.0890	0.0357	NDP	0.0092	0.1494	0.0413	NDP	0.0831		<0.0015	g/i	TM29/DM20
Chromium III	54.7	54.7	0.0145	-	62.0	80.2	0.0042	71.2		<0.0015	g/i mg/kg	NONE/NONE
	54.7	54.7	12.0	-	02.0	00.2	12.0	/1.2		<0.5	mg/kg	
	-	-	43.0	-	-	-	40.9	-		<0.5	mg/Kg	NUNE/NUNE
Free Cyanide	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5		<0.5	mg/kg	TM89/PM45
Total Cyanide #	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5		<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	0.41	0.94	-	-	-	-	NDP	-		<0.02	%	TM21/PM24

Client Name:
Reference:
Location:
Contact:
JE Job No.:

#### Arcadis 10016750 Pioneer Park Jonathan Harris

18/1550

#### Report : Solid

J E Sample No	. 1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24				
Sample I	WS103-0.60- 0.70-20180130	WS103-1.60- 1.70-20180130	WS101-0.30- 0.40-20180130	WS101-1.90- 2.00-20180130	WS102-1.60- 1.70-20180130	WS104-2.30- 2.40-20180131	WS106-0.50- 0.60-20180131	WS105-3.00- 3.10-20180131				
Dept	h 0.60-0.70	1.60-1.70	0.30-0.40	1.90-2.00	1.60-1.70	2.30-2.40	0.50-0.60	3.00-3.10		Please se	e attached n	otes for all
COC No / mis	c									abbrevi	ations and ac	cronyms
Container	s VJ	٧J										
Sample Dat	e 30/01/2018	30/01/2018	30/01/2018	30/01/2018	30/01/2018	31/01/2018	31/01/2018	31/01/2018				
Sample Typ	e Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil				
Batch Numbe	r 1	1	1	1	1	1	1	1				
Date of Receir	t 01/02/2018				01/02/2018			01/02/2018		LOD/LOR	Units	Method No.
Sulphide	<10	-	-	-	-	-	<10	-		<10	mg/kg	TM106/PM119
рН <sup>#</sup>	8.84	8.24	8.58	8.09	7.93	7.76	8.63	9.24		<0.01	pH units	TM73/PM11

Client Name: Reference: Location: Contact: JE Job No.:	Arcadis 10016750 Pioneer P Jonathan 18/1550	) ark Harris			SVOC Re	port :	Solid			
LE Sample No	1_3	10-21								
J E Sample No.	1-3	19-21								
Sample ID	WS103-0.60- 0.70-20180130	WS106-0.50- 0.60-20180131								
Depth	0.60-0.70	0.50-0.60						Please se	e attached n	otes for all
COC No / misc								abbrevia	ations and a	cronyms
Containers	V J	V J								
Sample Date	30/01/2018	31/01/2018								
Sample Type	Soil	Soil								ī
Batch Number	1	1						LOD/LOR	Units	Method
Date of Receipt	01/02/2018	01/02/2018								No.
SVOC MS										
2 Chlorophopol <sup>#</sup>	<0.01	<0.01						-0.01	ma/ka	TM16/DM9
2-Chiorophenol	<0.01	<0.01						<0.01	mg/kg	TM16/PM9
2-Nitrophenol	<0.01	<0.01						<0.01	ma/ka	TM16/PM8
2 4-Dichlorophenol #	<0.01	<0.01						<0.01	ma/ka	TM16/PM8
2,4-Dimethylphenol	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
2,4,5-Trichlorophenol	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
2,4,6-Trichlorophenol	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
4-Chloro-3-methylphenol	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
4-Methylphenol	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
4-Nitrophenol	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
Pentachlorophenol	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
Phenol #	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
PAHs										
2-Chloronaphthalene *	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
2-Methylnaphthalene "	<0.01	0.02						<0.01	mg/kg	TM16/PM8
Bis(2-ethylbeyyl) phthalate	<0.1	<0.1						<0.1	ma/ka	TM16/PM8
Butylbenzyl ohthalate	<0.1	<0.1						<0.1	ma/ka	TM16/PM8
Di-n-butyl phthalate	<0.1	<0.1						<0.1	ma/ka	TM16/PM8
Di-n-Octyl phthalate	<0.1	<0.1						<0.1	mg/kg	TM16/PM8
Diethyl phthalate	<0.1	<0.1						<0.1	mg/kg	TM16/PM8
Dimethyl phthalate #	<0.1	<0.1						<0.1	mg/kg	TM16/PM8
Other SVOCs										
1,2-Dichlorobenzene	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
1,2,4-Trichlorobenzene#	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
1,3-Dichlorobenzene	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
1,4-Dichlorobenzene	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
2-Nitroaniline	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
2,4-Dinitrotoluene	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
2,6-Dinitrotoluene	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
4 Bromonhonylohonylothor #	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
4-Chloroaniline	<0.01	<0.01						<0.01	ma/ka	TM16/PM8
4-Chlorophenvlphenvlether	<0.01	<0.01						<0.01	ma/ka	TM16/PM8
4-Nitroaniline	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
Azobenzene	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
Bis(2-chloroethyl)ether	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
Carbazole	<0.01	0.10						<0.01	mg/kg	TM16/PM8
Dibenzofuran <sup>#</sup>	<0.01	0.06						<0.01	mg/kg	TM16/PM8
Hexachlorobenzene	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
Hexachlorobutadiene #	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
Hexachlorocyclopentadiene	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
	<0.01	<0.01						<0.01	mg/kg	
Isophorone	<0.01	<0.01						<0.01	mg/kg	TM16/PM8
Nitrobenzene <sup>#</sup>	<0.01	<0.01						<0.01	ma/ka	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	108	104						<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	88	107						<0	%	TM16/PM8

#### Arcadis Client Name **VOC Report :** Solid 10016750 Reference: Pioneer Park Location: Contact: Jonathan Harris JE Job No.: 18/1550 J E Sample No. 19-21 1-3 WS106-0.50 WS103-0.60-Sample ID 0.70-20180130 0.60-2018013 Depth 0.60-0.70 0.50-0.60 Please see attached notes for al COC No / misc abbreviations and acronyms Containers VЈ V J Sample Date 30/01/2018 31/01/2018 Sample Type Soil Soil Batch Number Method 1 1 LOD/LOR I Inits No. 01/02/2018 01/02/2018 Date of Receipt VOC MS Dichlorodifluoromethane < 0.002 < 0.002 < 0.002 mg/kg TM15/PM1 < 0.002 TM15/PM1 Methyl Tertiary Butyl Ether < 0.002 < 0.002 mg/kg Chloromethane < 0.003 <0.003 < 0.003 mg/kg TM15/PM1 Vinyl Chloride <0.002 TM15\_A/PM10 < 0.002 < 0.002 mg/kg TM15/PM1 <0.001 < 0.001 Bromomethane <0.001 mg/kg TM15/PM10 Chloroethane <0.002 <0.002 < 0.002 mg/kg Trichlorofluoromethane # < 0.002 < 0.002 < 0.002 mg/kg TM15/PM10 <0.006 <0.006 TM15/PM1 1.1-Dichloroethene (1.1 DCE) \* <0.006 mg/kg TM15/PM10 Dichloromethane (DCM) <0.03 <0.03 <0.03 mg/kg trans-1-2-Dichloroethene # < 0.003 < 0.003 < 0.003 mg/kg TM15/PM10 < 0.003 < 0.003 < 0.003 TM15/PM1 1.1-Dichloroethane mg/kg TM15/PM10 cis-1-2-Dichloroethene < 0.003 < 0.003 < 0.003 mg/kg 2.2-Dichloropropane < 0.004 <0.004 < 0.004 mg/kg TM15/PM10 <0.003 TM15/PM10 Bromochloromethane \* < 0.003 < 0.003 mg/kg Chloroform # < 0.003 < 0.003 < 0.003 TM15/PM10 ma/ka 1.1.1-Trichloroethane # <0.003 <0.003 <0.003 mg/kg TM15/PM10 1.1-Dichloropropene <0.003 <0.003 < 0.003 mg/kg TM15/PM10 TM15/PM10 Carbon tetrachloride # <0.004 < 0.004 < 0.004 mg/kg TM15/PM10 1,2-Dichloroethane < 0.004 < 0.004 < 0.004 mg/kg Benzene \* < 0.003 < 0.003 < 0.003 mg/kg TM15/PM10 <0.003 < 0.003 TM15/PM10 Trichloroethene (TCE) # < 0.003 mg/kg TM15/PM1 < 0.006 < 0.006 1.2-Dichloropropane < 0.006 ma/ka TM15/PM1 Dibromomethane<sup>4</sup> -0.003 -0.003 < 0.003 mg/kg <0.003 <0.003 <0.003 TM15/PM10 Bromodichloromethane \* mg/kg cis-1-3-Dichloropropene <0.004 <0.004 <0.004 TM15/PM1 mg/kg Toluene \* TM15/PM1 < 0.003 < 0.003 < 0.003 mg/kg trans-1-3-Dichloropropene < 0.003 < 0.003 < 0.003 mg/kg TM15/PM10 < 0.003 < 0.003 < 0.003 TM15/PM1 1,1,2-Trichloroethane mg/kg TM15/PM10 Tetrachloroethene (PCE) < 0.003 < 0.003 < 0.003 mg/kg 1,3-Dichloropropane < 0.003 < 0.003 < 0.003 mg/kg TM15/PM10 <0.003 <0.003 <0.003 TM15/PM1 Dibromochloromethane <sup>4</sup> mg/kg TM15/PM10 1.2-Dibromoethane < 0.003 < 0.003 < 0.003 mg/kg Chlorobenzene \* < 0.003 < 0.003 < 0.003 mg/kg TM15/PM10 <0.003 1,1,1,2-Tetrachloroethane <0.003 < 0.003 mg/kg TM15/PM10 TM15/PM10 Ethylbenzene # < 0.003 < 0.003 < 0.003 mg/kg TM15/PM10 n/m-Xvlene < 0.005 < 0.005 < 0.005 mg/kg o-Xylene <sup>#</sup> < 0.003 < 0.003 < 0.003 mg/kg TM15/PM10 <0.003 <0.003 <0.003 TM15\_A/PM10 Styrene mg/kg < 0.003 < 0.003 TM15/PM1 Bromoform < 0.003 mg/kg sopropylbenzene # TM15/PM10 <0.003 <0.003 < 0.003 mg/kg < 0.003 < 0.003 < 0.003 TM15/PM10 1,1,2,2-Tetrachloroethane # mg/kg <0.002 <0.002 < 0.002 TM15/PM1 Bromobenzene mg/kg TM15/PM1 1.2.3-Trichloropropane <sup>#</sup> < 0.004 < 0.004 < 0.004 mg/kg Propylbenzene \* < 0.004 < 0.004 < 0.004 mg/kg TM15/PM10 TM15/PM10 2-Chlorotoluene < 0.003 < 0.003 < 0.003 mg/kg TM15/PM10 < 0.003 < 0.003 < 0.003 1.3.5-Trimethylbenzene mg/kg 4-Chlorotoluene <0.003 <0.003 <0.003 mg/kg TM15/PM10 <0.005 <0.005 TM15/PM10 ert-Butvlbenzene\* < 0.005 mg/kg TM15/PM10 1,2,4-Trimethylbenzene # < 0.006 0.008 < 0.006 ma/ka TM15/PM10 sec-Butylbenzene < 0.004 < 0.004 < 0.004 mg/kg <0.004 < 0.004 <0.004 TM15/PM10 1-Isopropyltoluene # mg/kg 1,3-Dichlorobenzene# <0.004 <0.004 <0.004 mg/kg TM15/PM10 TM15/PM10 1.4-Dichlorobenzene \* < 0.004 < 0.004 < 0.004 mg/kg n-Butylbenzene\* < 0.004 < 0.004 < 0.004 mg/kg TM15/PM1 <0.004 < 0.004 TM15/PM10 1,2-Dichlorobenzene # < 0.004 mg/kg < 0.004 < 0.004 TM15/PM1 1.2-Dibromo-3-chloropropane < 0.004 ma/ka TM15/PM10 1,2,4-Trichlorobenzene < 0.007 < 0.007 < 0.007 mg/kg Hexachlorobutadiene <0.004 <0.004 <0.004 mg/kg TM15/PM10 Naphthalene <0.027 0.200 <0.027 TM15/PM1 mg/kg 1,2,3-Trichlorobenzene TM15/PM10 < 0.007 < 0.007 < 0.007 mg/kg Surrogate Recovery Toluene D8 108 92 <0 % TM15/PM10

ery 4-Bron

120

89

Exova Jones Environmental

TM15/PM1

<0

%

Client Name:	Arcadis
Reference:	10016750
Location:	Pioneer Park
Contact:	Jonathan Harris

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

#### Ryan Butterworth

Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/1550	1	WS103-0.60-0.70-20180130	0.60-0.70	3	06/02/2018	General Description (Bulk Analysis)	Soil/Stone
					06/02/2018	Asbestos Fibres	NAD
					06/02/2018	Asbestos Fibres (2)	NAD
					06/02/2018	Asbestos ACM	NAD
					06/02/2018	Asbestos ACM (2)	NAD
					06/02/2018	Asbestos Type	NAD
					06/02/2018	Asbestos Type (2)	NAD
					06/02/2018	Asbestos Level Screen	NAD
18/1550	1	WS103-1.60-1.70-20180130	1.60-1.70	6	06/02/2018	General Description (Bulk Analysis)	Soil/Stone
					06/02/2018	Asbestos Fibres	NAD
					06/02/2018	Asbestos Fibres (2)	NAD
					06/02/2018	Asbestos ACM	NAD
					06/02/2018	Asbestos ACM (2)	NAD
					06/02/2018	Asbestos Type	NAD
					06/02/2018	Asbestos Type (2)	NAD
					06/02/2018	Asbestos Level Screen	NAD
18/1550	1	WS101-0.30-0.40-20180130	0.30-0.40	9	06/02/2018	General Description (Bulk Analysis)	Soil/Stone
					06/02/2018	Asbestos Fibres	Fibre Bundles
					06/02/2018	Asbestos ACM	NAD
					06/02/2018	Asbestos Type	Chrysotile
					06/02/2018	Asbestos Level Screen	less than 0.1%
18/1550	1	WS102-1.60-1.70-20180130	1.60-1.70	15	06/02/2018	General Description (Bulk Analysis)	soil/stones
					06/02/2018	Asbestos Fibres	NAD
					06/02/2018	Asbestos Fibres (2)	NAD
					06/02/2018	Asbestos ACM	NAD
					06/02/2018	Asbestos ACM (2)	NAD
					06/02/2018	Asbestos Type	NAD
					06/02/2018	Asbestos Type (2)	NAD
					06/02/2018	Asbestos Level Screen	NAD
18/1550	1	WS104-2.30-2.40-20180131	2.30-2.40	18	06/02/2018	General Description (Bulk Analysis)	soil/stones
					06/02/2018	Asbestos Fibres	NAD
					06/02/2018	Asbestos Fibres (2)	NAD
					06/02/2018	Asbestos ACM	NAD
					06/02/2018	Asbestos ACM (2)	NAD
					06/02/2018	Asbestos Type	NAD

# Jones Environmental Laboratory

Client Name:	Arcadis
Reference:	10016750
Location:	Pioneer Park
Contact:	Jonathan Harris

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/1550	1	W\$104-2.30-2.40-20180131	2.30-2.40	18	06/02/2018	Asbestos Type (2)	NAD
					06/02/2018	Asbestos Level Screen	NAD
18/1550	1	W\$106-0.50-0.60-20180131	0.50-0.60	21	06/02/2018	General Description (Bulk Analysis)	soil/stones
					06/02/2018	Asbestos Fibres	Fibre Bundles
					06/02/2018	Asbestos ACM	NAD
					06/02/2018	Asbestos Type	Chrysotile
					06/02/2018	Asbestos Level Screen	less than 0.1%
18/1550	1	W\$105-3.00-3.10-20180131	3.00-3.10	24	06/02/2018	General Description (Bulk Analysis)	soil/sand
					06/02/2018	Asbestos Fibres	NAD
					06/02/2018	Asbestos Fibres (2)	NAD
					06/02/2018	Asbestos ACM	NAD
					06/02/2018	Asbestos ACM (2)	NAD
					06/02/2018	Asbestos Type	NAD
					06/02/2018	Asbestos Type (2)	NAD
					06/02/2018	Asbestos Level Screen	NAD

Matrix : Solid

Client Name:	Arcadis
Reference:	10016750
Location:	Pioneer Park
Contact:	Jonathan Harris

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	NDP Reason
18/1550	1	WS101-0.30-0.40-20180130	0.30-0.40	7-9	Asbestos detected in sample
18/1550	1	WS106-0.50-0.60-20180131	0.50-0.60	19-21	Asbestos detected in sample

Client Name:	Arcadis
Reference:	10016750
Location:	Pioneer Park
Contact:	Jonathan Harris

Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason				
No deviating sample report results for job 18/1550									
38		Sample ID	Sample ID Depth   Image: Sample ID Depth   Image: Sample ID Depth   Image: Sample ID Image: Sample ID   Image: Sample ID Image: SampleI	Sample ID     Depth     No.       Image: No.     Image: No.     No.       Image: No.     Image: No.     Image: No.	Sample D     Depth     No.     Analysis       No.     No.     No.     No.     No.       No.     No.     No.     No.     No.       No.     No.     No.     No.     No.				

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

### NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/1550

#### SOILS

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

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCI (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

#### WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

#### **DEVIATING SAMPLES**

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

#### SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

#### DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

#### BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

#### NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

#### **REPORTS FROM THE SOUTH AFRICA LABORATORY**

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

#### ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
В	Indicates analyte found in associated method blank.
DR	Dilution required.
М	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
СО	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
Ν	Client Sample
ТВ	Trip Blank Sample
OC	Outside Calibration Range

# Method Code Appendix

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 $^\circ\text{C}.$			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakern Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM60	As received solid samples are extracted with deionised water in a 2:1 ratio of water to solid.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM61	As received solid samples are extracted with hot water in a 20:1 ratio of water to soil ready for analysis by ICP.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
TM106	Determination of Sulphide by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes

# Method Code Appendix

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM179	Determination of Glycols using LCMS	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes



Arcadis Part 3rd Floor

Charter House

62-68 Hills Road Cambridge Cambridgeshire CB2 1LA

# Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point Zone 3 Deeside Industrial Park Deeside CH5 2UA

#### Tel: +44 (0) 1244 833780 Fax: +44 (0) 1244 833781



Jon Harris
13th February, 2018
10016750
Test Report 18/1764 Batch 1
LCC-HCA
7th February, 2018
Final report
1

One sample were received for analysis on 7th February, 2018 of which one were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

**Compiled By:** 

Baler

Paul Boden BSc Project Manager

Client Name:	Arcadis
Reference:	10016750
Location:	LCC-HCA
Contact:	Jon Harris
JE Job No.:	18/1764

#### Report : Liquid

 $\label{eq:liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle H=H_2SO_4, Z=ZnAc, N=NaOH, HN=HNO_3$ 

							1		
J E Sample No.	1-5								
Sample ID	01WS1040502 18WG1115								
Depth							Please se	e attached n	otes for all
COC No / misc							abbrevi	ations and a	cronyms
Containona									
Containers	VPG								
Sample Date	05/02/2018 11:15								
Sample Type	Ground Water								
Batch Number	1								
							LOD/LOR	Units	Nethod No.
Date of Receipt	07/02/2018								
Dissolved Arsenic <sup>#</sup>	7.4						<2.5	ug/l	TM30/PM14
Dissolved Barium #	39						<3	ug/l	TM30/PM14
Dissolved Beryllium	<0.5						<0.5	ug/l	TM30/PM14
Dissolved Boron	757						<12	ug/l	TM30/PM14
Dissolved Cadmium <sup>#</sup>	<0.5						<0.5	ug/l	TM30/PM14
Dissolved Calcium <sup>#</sup>	304 <sub>AA</sub>						<0.2	mg/l	TM30/PM14
Total Dissolved Chromium#	<1.5						<1.5	ug/l	TM30/PM14
Dissolved Copper <sup>#</sup>	<7						<7	ug/l	TM30/PM14
Dissolved Lead #	<5						<5	ug/l	TM30/PM14
Dissolved Mercury <sup>#</sup>	<1						<1	ug/l	TM30/PM14
Dissolved Nickel <sup>#</sup>	7						<2	ug/l	TM30/PM14
Dissolved Selenium <sup>#</sup>	<3						<3	ug/l	TM30/PM14
Dissolved Vanadium#	<1.5						<1.5	ug/l	TM30/PM14
Dissolved Zinc <sup>#</sup>	<3						<3	ug/l	TM30/PM14
PAH MS									
Naphthalene #	0.2						<0.1	ug/l	TM4/PM30
Acenaphthylene <sup>#</sup>	0.054						<0.013	ug/l	TM4/PM30
Acenaphthene #	0.072						<0.013	ua/l	TM4/PM30
Fluorene <sup>#</sup>	0.044						<0.014	ug/l	TM4/PM30
Phenanthrene <sup>#</sup>	0.373						<0.011	ua/l	TM4/PM30
Anthracene #	0.159						< 0.013	ua/l	TM4/PM30
Fluoranthene <sup>#</sup>	0.721						< 0.012	ug/l	TM4/PM30
Pyrene <sup>#</sup>	0.795						<0.013	ug/l	TM4/PM30
Benzo(a)anthracene#	0.305						<0.015	ug/l	TM4/PM30
Chrysene <sup>#</sup>	0.302						<0.011	ug/l	TM4/PM30
Bonzo(bk)fluoranthono <sup>#</sup>	0.002						<0.011	ug/l	TM4/PM30
Benzo(a)pyrene <sup>#</sup>	0.405						<0.016	ug/i	TM4/PM30
Indono(122cd)pyrene	0.305						<0.010	ug/i	TM4/PM20
Dibenzo(ab)anthracana#	0.00						<0.01	ug/i	TM4/DM20
	0.04						-0.011	ug/i	
Benzo(gni)perviene	0.204						<0.011	ug/i	TN4/PN30
PAH 16 Total	4.760						<0.195	ug/i	TN4/PN30
Benzo(b)lluoranthene	0.51						<0.01	ug/i	TN4/PN30
Benzo(k)nuorantnene	0.20						<0.01	ug/i	TN4/PN30
PAH Surrogate % Recovery	85						<0	%	TM4/PM30
Mada 1 Tania ( 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	.0.1						.0.4		TMACONAS
Methyl Tertiary Butyl Ether	<0.1						<0.1	ug/I	TM15/PM10
Benzene"	<0.5						<0.5	ug/l	1M15/PM10
Toluene *	<5						<5	ug/l	I'M15/PM10
Ethylbenzene *	<1						<1	ug/l	TM15/PM10
p/m-Xylene #	<2						<2	ug/l	TM15/PM10
o-Xylene *	4						<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	97						<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	108	1				1	<0	%	TM15/PM10

#### Exova Jones Environmental Arcadis Client Name: Report : Liquid 10016750 Reference: Location: LCC-HCA Ion Harris Contact: Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle JE Job No.: 18/1764 H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HNO<sub>3</sub> J E Sample No. 1-5 01WS104050 18WG1115 Sample ID Depth Please see attached notes for all abbreviations and acronyms COC No / misc Containers VPG Sample Date 05/02/2018 11 Sample Type Ground Wate Batch Number 1 Method LOD/LOR Units No. Date of Receipt 07/02/2018 TPH CWG Aliphatics TM36/PM12 >C5-C6\* 11 <10 ug/l TM36/PM1 >C6-C8# <10 <10 ug/l TM36/PM12 >C8-C10# 36 <10 ug/l >C10-C12# TM5/PM30 <5 <5 ug/l >C12-C16# TM5/PM30 <10 <10 ua/l >C16-C21# TM5/PM30 <10 <10 ug/l >C21-C35# TM5/PM30 <10 <10 ug/l Total aliphatics C5-35# 47 <10 ug/l Aromatics >C5-EC7# TM36/PM12 <10 <10 ug/l TM36/PM12 >EC7-EC8# <10 <10 ua/l TM36/PM12 >EC8-EC10# <10 <10 ua/l >EC10-EC12# TM5/PM30 <5 <5 ua/l TM5/PM30 >EC12-EC16# <10 <10 ua/l >EC16-EC21 # TM5/PM30 <10 <10 ua/l TM5/PM30 >EC21-EC35 # <10 <10 ua/l Total aromatics C5-35# <10 <10 ua/l 47 <10 ug/l Total aliphatics and aromatics(C5-35) TM26/PM0 Total Phenols HPLC <0.1 <0.1 mg/l Fluoride <0.3 <0.3 TM173/PM0 mg/l 230 <0.5 TM38/PM0 Sulphate as SO4 # mg/l Nitrate as NO3 # <0.2 TM38/PM0 1.6 mg/l Nitrite as NO2 # <0.02 <0.02 TM38/PM0 mg/l Monoethylene glycol <10 <10 TM179/PM0 ug/l Propylene glycol <50<sub>AA</sub> <10 TM179/PM0 ug/l Diethylene glycol <10 <10 TM179/PM0 ug/l Triethylene glycol <10 <10 ug/l TM179/PM0 Thiodiglycol <10 <10 ug/l TM179/PM0 Free Cyanide # <0.01 <0.01 mg/l TM89/PM0 Total Cyanide # <0.01 <0.01 mg/l TM89/PM0 Hexavalent Chromium <6 <6 ug/l TM38/PM0 Total Dissolved Chromium III <6 <6 ug/l NONE/NON Sulphide <10 <10 ug/l TM106/PM0 NDP TM60/PM0 Dissolved Organic Carbon # <2 mg/l

Exova Jones Enviro	onmenta	ıl											
Client Name:	Arcadis						Report :	Liquid					
Reference:	10016750	)											
Location:	LCC-HCA							• • •					
Contact:	Jon Harris	5					H-H-SO	oducts: V= 7-7n∆c N-	40ml vial, G	i=glass bott	.e, P=plastic	bottle	
JE 300 NO	10/17/04	1	1	1	1	1	TI=T12504, 7	2-211AC, N-		-1 11 103	1		
J E Sample No.	1-5												
Sample ID	01WS1040502 18WG1115												
Denti													
COC No / misc											Please se abbrevi	otes for all cronyms	
Containers	VPG												
Sample Date	05/02/2018 11:15												
Sample Type	Ground Water												
Batch Number	1											Unite	Method
Date of Receipt	07/02/2018										LOD/LOR	Onits	No.
Faecal Coliforms*	NDP											MPN/100ml	Subcontracted
рН#	NDP										<0.01	pH units	TM73/PM0
Total Organic Carbon #	4										<2	mg/l	TM60/PM0
Total Coliforms*	NDP											MPN/100ml	Subcontracted
											L	L	1

Client Name: Reference: Location:	Arcadis 10016750 LCC-HCA Jon Harris					SVOC Re	port :	Liquid			
JE Job No.:	18/1764	,									
J F Sample No.	1-5								1		
Sample ID	01WS1040502 18WG1115										
Depth									Please se	e attached r	otes for all
COC No / misc									abbrevia	ations and a	cronyms
Containers	V P G										
Sample Date	05/02/2018 11:15 Ground Water										
Batch Number	1								LOD/LOR	Units	Method No
SVOC MS	07/02/2018										110.
Phenols											
2-Chlorophenol #	<1								<1	ug/l	TM16/PM30
2-Methylphenol #	<0.5								<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5								<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol <sup>#</sup>	<0.5								<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1								<1	ug/l	TM16/PM30
2,4,5-11/cniorophenol	<0.5								<0.5	ug/I	TM16/PM30
4-Chloro-3-methylphenol #	<0.5								<0.5	ug/i	TM16/PM30
4-Methylphenol	<1								<1	ug/l	TM16/PM30
4-Nitrophenol	<10								<10	ug/l	TM16/PM30
Pentachlorophenol	<1								<1	ug/l	TM16/PM30
Phenol	<1								<1	ug/l	TM16/PM30
PAHs											
2-Chloronaphthalene	<1								<1	ug/l	TM16/PM30
2-Methylnaphthalene "	<1								<1	ug/i	TM16/PM30
Bis(2-ethylbexyl) phthalate	<5								<5	ug/l	TM16/PM30
Butvlbenzvl phthalate	<1								<1	ug/l	TM16/PM30
Di-n-butyl phthalate #	5.3								<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1								<1	ug/l	TM16/PM30
Diethyl phthalate#	59								<1	ug/l	TM16/PM30
Dimethyl phthalate	<1								<1	ug/l	TM16/PM30
Other SVOCs											
1,2-Dichlorobenzene#	<1								<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene #	<1								<1	ug/l	TM16/PM30
1,3-Dichlorobenzene "	<1								<1	ug/i	TM16/PM30
1,4-Dichlorobenzene 2-Nitroaniline	<1								<1	ug/l	TM16/PM30
2 4-Dinitrotoluene <sup>#</sup>	<0.5								<0.5	ug/l	TM16/PM30
2,6-Dinitrotoluene	<1								<1	ug/l	TM16/PM30
3-Nitroaniline	<1								<1	ug/l	TM16/PM30
4-Bromophenylphenylether #	<1								<1	ug/l	TM16/PM30
4-Chloroaniline	<1								<1	ug/l	TM16/PM30
4-Chlorophenylphenylether #	<1								<1	ug/l	TM16/PM30
4-Nitroaniline	<0.5								<0.5	ug/l	TM16/PM30
Azobenzene"	<0.5								<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane	<0.5								<0.5	ug/I	TM16/PM30
Carbazole <sup>#</sup>	<0.5								<0.5	ug/l	TM16/PM30
Dibenzofuran <sup>#</sup>	<0.5								<0.5	ug/l	TM16/PM30
Hexachlorobenzene #	<1								<1	ug/l	TM16/PM30
Hexachlorobutadiene #	<1								<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<1								<1	ug/l	TM16/PM30
Hexachloroethane #	<1								<1	ug/l	TM16/PM30
Isophorone #	<0.5								<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine #	<0.5								<0.5	ug/l	TM16/PM30
Nitrobenzene "	<1								<1	ug/I	TM16/PM30
Surrogate Recovery 2-Fluorobiprienyl	113								<0	%	TM16/PM30
canogate recovery p-reipnenyi-014	123								<0	/0	110/1-10/30
											1
											}
											ł
Client Name: Reference: Location: Contact: JE Job No :	Arcadis 10016750 LCC-HCA Jon Harris 18/1764	5			VOC Rep	ort :	Liquid				
--	---	---	--	---	---------	-------	--------	-----------	--------------	------------------------	
	10,1101			1	1			l I			
J E Sample No. Sample ID	1-5 01WS1040502 18WG1115										
Depth								Please se	e attached r	notes for all	
COC No / misc								abbrevi	ations and a	icronyms	
Containers Sample Date	V P G										
Sample Type	Ground Water										
Batch Number	1							LOD/LOR	Units	Method	
VOC MS	07/02/2018									NO.	
Dichlorodifluoromethane	<2							<2	ug/l	TM15/PM10	
Methyl Tertiary Butyl Ether #	<0.1							<0.1	ug/l	TM15/PM10	
Chloromethane"	<3							<3	ug/l	TM15/PM10	
Bromomethane	<1							<1	ug/l	TM15/PM10	
Chloroethane #	<3							<3	ug/l	TM15/PM10	
Trichlorofluoromethane #	<3							<3	ug/l	TM15/PM10	
1,1-Dichloroethene (1,1 DCE)*	<3							<3	ug/l	TM15/PM10	
trans-1-2-Dichloroethene #	<3							<3	ug/l	TM15/PM10	
1,1-Dichloroethane#	<3							<3	ug/l	TM15/PM10	
cis-1-2-Dichloroethene #	<3							<3	ug/l	TM15/PM10	
2,2-Dichloropropane	<1							<1	ug/l	TM15/PM10	
Chloroform <sup>#</sup>	<2							<2	ug/l	TM15/PM10	
1,1,1-Trichloroethane #	<2							<2	ug/l	TM15/PM10	
1,1-Dichloropropene #	<3							<3	ug/l	TM15/PM10	
Carbon tetrachloride #	<2							<2	ug/l	TM15/PM10	
Benzene <sup>#</sup>	<0.5							<0.5	ug/l	TM15/PM10	
Trichloroethene (TCE) #	<3							<3	ug/l	TM15/PM10	
1,2-Dichloropropane #	<2							<2	ug/l	TM15/PM10	
Dibromomethane <sup>#</sup>	<3							<3	ug/l	TM15/PM10	
Bromodichloromethane	<2							<2	ug/l	TM15/PM10 TM15/PM10	
Toluene <sup>#</sup>	<5							<5	ug/l	TM15/PM10	
trans-1-3-Dichloropropene	<2							<2	ug/l	TM15/PM10	
1,1,2-Trichloroethane #	<2							<2	ug/l	TM15/PM10	
1 3-Dichloropropage <sup>#</sup>	<3							<3	ug/I	TM15/PM10	
Dibromochloromethane #	<2							<2	ug/l	TM15/PM10	
1,2-Dibromoethane #	<2							<2	ug/l	TM15/PM10	
Chlorobenzene#	<2							<2	ug/l	TM15/PM10	
1,1,1,2-Tetrachloroethane"	<2							<2	ug/l	TM15/PM10 TM15/PM10	
p/m-Xylene #	<2							<2	ug/l	TM15/PM10	
o-Xylene <sup>#</sup>	4							<1	ug/l	TM15/PM10	
Styrene	<2							<2	ug/l	TM15/PM10	
Bromotorm"	<2							<2	ug/l	TM15/PM10	
1,1,2,2-Tetrachloroethane	<4							<4	ug/l	TM15/PM10	
Bromobenzene <sup>#</sup>	<2							<2	ug/l	TM15/PM10	
1,2,3-Trichloropropane <sup>#</sup>	<3							<3	ug/l	TM15/PM10	
Propylbenzene " 2-Chlorotoluene #	<3							<3	ug/l	TM15/PM10 TM15/PM10	
1,3,5-Trimethylbenzene #	13							<3	ug/l	TM15/PM10	
4-Chlorotoluene #	<3							<3	ug/l	TM15/PM10	
tert-Butylbenzene#	<3							<3	ug/l	TM15/PM10	
1,2,4-Trimethylbenzene *	<3							<3	ug/l	TM15/PM10	
4-Isopropyltoluene #	<3							<3	ug/l	TM15/PM10	
1,3-Dichlorobenzene <sup>#</sup>	<3							<3	ug/l	TM15/PM10	
1,4-Dichlorobenzene #	<3							<3	ug/l	TM15/PM10	
n-Butylbenzene <sup>#</sup>	<3							<3	ug/l	TM15/PM10	
i,∠-Dicniorobenzene " 1,2-Dibromo-3-chloropropane	<3 <2							<3 <2	ug/I ug/I	TM15/PM10 TM15/PM10	
1,2,4-Trichlorobenzene	<3							<3	ug/l	TM15/PM10	
Hexachlorobutadiene	<3							<3	ug/l	TM15/PM10	
Naphthalene	<2							<2	ug/l	TM15/PM10	
Surrogate Recovery Toluene D8	<3 97							<3 <0	ug/I %	TM15/PM10	
Surrogate Recovery 4-Bromofluorobenzene	108							<0	%	TM15/PM10	

NDP Reason Report

Matrix : Liquid

Client Name:	Arcadis
Reference:	10016750
Location:	LCC-HCA
Contact:	Jon Harris

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	NDP Reason
18/1764	1	01WS104050218WG1115		1-5	Insufficient sample for test

Client Name:	Arcadis
Reference:	10016750
Location:	LCC-HCA
Contact:	Jon Harris

Image: Contract of the second of the seco	J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
Image: Serie Seri						No deviating sample report results for job 18/1764	
Image: Section of the section of th							
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Image: Solution of the second seco							
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Image: Second							
Image:							
Image:							

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

#### NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/1764

#### SOILS

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

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCI (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

#### WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

#### **DEVIATING SAMPLES**

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

#### SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

#### DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

#### BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

#### NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

#### **REPORTS FROM THE SOUTH AFRICA LABORATORY**

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

#### ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
В	Indicates analyte found in associated method blank.
DR	Dilution required.
М	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
СО	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
Ν	Client Sample
ТВ	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

#### Method Code Appendix

#### JE Job No: 18/1764

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM30/PM12	CWG GC-FID	Yes			
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				

#### Method Code Appendix

#### JE Job No: 18/1764

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes			
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.				
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.	Yes			
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.	Yes			
ТМ73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM106	Determination of Sulphide by Skalar Continuous Flow Analyser	PM0	No preparation is required.				
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM0	No preparation is required.				
TM179	Determination of Glycols using LCMS	PM0	No preparation is required.				

#### Method Code Appendix

#### **JE Job No:** 18/1764

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	NONE	No Method Code				
Subcontracted	Subcontracted analysis, sent to an ISO 17025 accredited laboratory where possible.						

Geo-Environmental Phase 2 Site Investigation

# APPENDIX H Geotechnical Laboratory Test Data





Contract	HCA Land at Pionee	er Park
Serial No.	S32533	
Client: Arcadis (I	JK) Limited	Soil Property Testing Ltd
2 Craven 0 Willie Sna Newmarke Suffolk CB8 7FA	Court ith Road et	15, 16, 18 Halcyon Court, St Margaret's Way, Stukeley Meadows, Huntingdon, Cambridgeshire, PE29 6DG Tel: 01480 455579 Email: <u>enquiries@soilpropertytesting.com</u> Website: <u>www.soilpropertytesting.com</u>
Samples Submittee	d By:	Approved Signatories:
Arcadis (I	JK) Limited	<ul> <li>J.C. Garner B.Eng (Hons) FGS</li> <li>Technical Director</li> <li>S.P. Townend FGS</li> </ul>
Samples Labelled:		Quality Manager
HCA Land	l at Pioneer Park	<ul> <li>W. Johnstone Materials Lab Manager</li> <li>D. Sabnis Operations Manager</li> </ul>
Date Received:	31/01/2018	Samples Tested Between: 31/01/2018 and 15/02/2018
<b>Remarks:</b> For the a Your Refe	ttention of Mr J Harr erence No: 10016750	ris D
Notes: 1	All remaining samples o unless we are notified to	or remnants from this contract will be disposed of after 21 days from today, o the contrary.
2	<ul><li>(a) UKAS - United Kir</li><li>(b) Opinions and inter</li></ul>	ngdom Accreditation Service erpretations expressed herein are outside the scope of UKAS accreditation
3	Tests marked "NOT UKA Schedule for this testing	AS ACCREDITED" in this test report are not included in the UKAS Accreditation g laboratory.
4	This test report may not issuing laboratory.	t be reproduced other than in full except with the prior written approval of the



# **TEST REPORT**

ISSUED BY SOIL PROPERTY TESTING LTD



Contra	act		HCA La	nd	at F	Pion	ee	r Pa	ırk														
Serial	No.		S32533	}														Т	arg	get C	Dat	е	14/02/2018
Sched	uled	Ву	Arcadis	i (UI	K) L	imi	ted																
									SC	HE	DU	LE (	OF	LA	BOF	RAT	ΓOF	RY TESTS					
Sched	ule R	emarks																					
Bore Hole No.	Туре	Sample Ref.	Top Depth	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	50 00	Net Si	eve Hydro	Net co	eve a	Hydro Hydro Hastic Hastic	innite Unite Pre	201311	on										Sample Remarks
TP101	В	5	1.10		1																		
TP101	В	6	3.80	1																			
TP102	В	9	2.00	1																			
TP103	В	11	1.60	1																			
TP104	D	2	3.00		1		1	1															
TP105	В	3	2.50	1																			
TP106	D	13	1.50				1	1	1														
TP107	В	15	2.00	1																			
TP108	D	16	1.30				1	1	1														
TP108	В	17	1.50			1																	
TP109	В	19	1.70	1																			
TP110	В	23	2.40	1																			
TP111	D	22	2.00				1	1	1														
TP112	В	21	3.50	1																			
TP113	D	20	2.00				1	1															
		Totals		8	2	1	5	5	3														End of Schedule





DATE ISSUED: 15/02/2018 NGOS Contract **HCA Land at Pioneer Park** Serial No. S32533 SUMMARY OF WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX Plasti-Liquid-SAMPLE PREPARATION Water Liquid Plastic Borehole Depth Туре Ref. city ity Ret'd Corr'd Curing CLASS Content Description Limit Limit Method /Pit No. 0.425mm w/c Time Index Index <0.425mm (m) (%) (%) (%) (%) (%) (%) (hrs) Stiff orangish brown slightly gravelly sandy From TP104 3.00 - 3.10 D 2 14.4 29 13 16 0.09 2 (A) 15.4\* 26 silty CLAY with rare black speckling. Gravel CL Natural is fine angular flint Wet Firm yellowish brown slightly gravelly sandy 17.1 7 0.01 CL TP106 1.50 - 1.60 D 13 24 17 12 (M) 19.4\* 26 Sieved silty CLAY. Gravel is fine and medium flint Very soft yellowish brown slightly gravelly Wet sandy silty CLAY. Gravel is fine to coarse TP108 1.30 - 1.40 D 16 34.0 42 23 19 0.58 50 (M) 67.9\* 26 CI Sieved angular to subrounded flint, quartz and claystone Firm yellowish brown and greyish brown Wet slightly gravelly slightly sandy silty CLAY TP111 2.00 - 2.10 D 22 24.0 33 21 12 0.25 15 (M) 28.3\* 26 CL Sieved possibly locally slightly organic. Gravel is fine and medium flint Friable pale olive and grey clayey SILT with From **TP113** 2.00 - 2.10 D 20 63.6 73 44 29 0.68 0 (A) 27 rare black organic pockets and recently MV Natural active and decayed roots

BS EN ISO: 17892-1: 2014 & BS 1377: Part 2:1990:4.2

temperature if not 105-110C

BS EN ISO: 17892-1: 2014 & BS1377:Part 2:1990:3.2, 4.4

U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

\*Corrected water content assume material greater than 0.425mm is non-porous. See BS1377: Part 2: 1990: Clause 3 Note 1

Sample disturbance, loss of water, variation from test procedure, location and origin of test specimen within original sample, oven drying

Method Of Preparation:

Method of Test:

Type of Sample Key: Comments:

Remarks to Include:











Contract	ŀ	ICA L	and at Pic	oneer Park	<u> </u>				
Serial No.	S	3253	3						
		DET	ERMINAT	ION OF W	ATER COI	NTENT, LIC	UID LIMIT A	ND PLASTIC LIMIT /	AND
Borehole / Pit No.	⊧pth m	S Type	Jample Reference	Water Content (W) %		[	Description		Remarks
TP104 3.0 3.	)0 - .10	D	2	14.4	Stiff orangish speckling. Gra	brown slightly ۽ avel is fine angu	gravelly sandy silty lar flint	CLAY with rare black	
			F	PREPARATIO	ON			Liquid Limit	29 %
Method of pr	ера	ration	i	Fron	n natural/g	gravel picke	d out by hand	Plastic Limit	13 %
Sample retair	ned (	).425ı	mm sieve	(Approxi	imate)		2 %	Plasticity Index	16 %
Corrected wa	ter	conte	nt for mate	erial passing	g 0.425mm	1	15.4 %	Liquidity Index	0.09
Sample retair	ned :	2mm :	sieve	(Approxi	imate)		2 %	NHBC Modified (I'p)	n/a
Curing time			26	5 hrs	Clay Cc	ontent	25 %	Derived Activity	0.64
C=CLAY Plasticity Ind % (Ip)	ex .	70 50 50 40 30 20 10		CL	CI	СН	CV	CE	Low Medium High NHBC Volume Change Potential
M=SILI Method of Pre Method of Tes Type of Sample	para t: e Key	0 0 tion: /:	10 BS EN ISO BS EN ISO U=Undistu	ML 20 30 : 17892-1: 2 : 17892-1: 2 rbed, B=Bulk	MI 40 50 2014 & BS 2014 & BS1 2014 & BS1	MH 3 60 1337: Part 3 1377: PART ed, J=Jar, W=	MV 70 80 Plastici 2: 1990: 4.2 2: 1990: 3.2, 4 Water, SPT=Sp	ME 90 100 110 12 ty Chart BS5930: 2015: Figure 4.4, 5.3, 5.4 lit Spoon Sample, C=Cor	Liquid Limit %





Contract		HCA L	and at Pio.	neer Park	(									
Serial No.		<b>S325</b> 3	13											
		DET				ONTENT,					IT ANI	D		
Borehole / Pit No.	Deptł	י י	Sample	Water Content		511(1111)	Desc	ription				Remar	ks	
TP106	m 1.50 · 1.60	Type - D	Reference 13	(W) %	Firm yellov and mediu	vish brown sliş m flint	ghtly grav	elly sandy silty	CLAY. Gravel	is fine				
			P	REPARATI	ON				Liquid Lin	nit			24 %	6
Method o	f prep;	aratior	1		Wet s	sieved ove	r 0.425	mm sieve	Plastic Lin	nit			17 %	6
Sample re	tained	0.425	mm sieve	(Meası	ured)			12 %	Plasticity	Index			7 %	6
Corrected	water	conte	nt for mate	rial passin	g 0.425m	ım		19.4 %	Liquidity I	ndex			0.01	
Sample re	tained	2mm	sieve (Measured) 6 % NHBC M							dified (	l'p)		6 %	6
Curing tim	ie		26	26 hrs Clay Content Not analysed Derived Activity							Not a	nalysed	-	
C=CLAY Plasticity   % (Ip) M=SILT	Index	70 60 50 40 30 20 10 0 0		CL	CI MI 40	CH	70	CV MV 80 Plasticit	CE ME 90 100 ty Chart BS593	110 30: 2015: F	120	Low Medium High	NHBC Volume Change Potential	
Method of Method of Type of Sar Comments:	Prepara Test: nple Ke	ation: :y:	BS EN ISO: BS EN ISO: U=Undistur <sup>1</sup> Corrected wa Volume Char Note: Modifi	17892-1: 2 17892-1: 2 bed, B=Bulk ater content a nge Potential: ed Plasticity I	2014 & B 2014 & B , D=Distur assume ma NHBC Star ndex I'p = I	S 1337: Pa S1377: PA 'bed, J=Jar, terial greate ndards Chap Ip x (% less th	ITT 2: 19 RT 2: 1 W=Wat r than 0 ter 4.2 U han 425m	990: 4.2 990: 3.2, 4 er, SPT=Spl 425mm non- nmodified Pl nicrons/100)	I.4, 5.3, 5.4 it Spoon Sa -porous. See lasticity Inde:	4 mple, C= BS1377:∣ x	=Core Cu Part2: 19	utter 190 Clause 1	3 Note 1	





Contract		HCA L	and at F	Pione	er Parl	K									_			
Serial No.		S3253	3															
		DET	ERMIN/		N OF W	/ATER (	CONT	ENT, L		D LIMIT A		PLAST			ID			
				DERIV		I OF PL	ASTIC	CITY IN	DEX A	AND LIQU	JIDIT	Y IND	EX					
Borehole	Dept		Sample	١	Water													
/ Pit No.	Dept.	` <u> </u>		C	ontent				Desc	ription					F	Remark	S	
	m	Туре	Reteren	ce (	W) %	──												
TP108	1.30 - 1.40	D	16		34.0	Very soft fine to cc	yellowi barse an	sh brown gular to sı	slightly រួ ubround	gravelly sandy ed flint, quart	/ silty Cl tz and c	.AY. Gra laystone	vel is					
				PRE	PARATI	ON					Liqui	id Lim	it				42	%
Method o <sup>r</sup>	f prepa	aration	1			Wet	sieve	d over	0.425	mm sieve	Plast	ic Lim	it				23	%
Sample re	tained	0.425	mm siev	e	(Meas	ured)				50 %	Plast	icity I	ndex				19	%
Corrected	water	conte	nt for ma	aterial	passin	g 0.425	mm		(	67.9 %	Liqui	idity Ir	ndex				0.58	
Sample re	tained	2mm	sieve (Measured) 18 % NHBC Modified (I'p)									10 %						
Curing tim	e		26 hrs Clay Content Not analysed Derived Activity									Not an	alysed					
	Г	70													٦			
C=CLAY		/0			CI			сн		CV.		CE						1
0 02.1		60						Ch									_	
																ligh	entia	
		50															Pote	
Diasticity																	agut	
Plasticity i	Index	40															s Cha	
/0																ш	ume	
(Ip)		30														Леdi	Nol	
																2	IHBC	
		20				×										Ň	2	
		10														Γο		
		10																
M=SIL1		0			ML	MI		MH		MV		ME						
		0	10	20	30	40	50	60	70	80	90	100	110	120	L	Liquid L	imit %	6
	L									Plastici	ty Char	t BS5930	): 2015: F	igure 8				
Method of	Prepara	ation:	BS EN IS	SO: 17	892-1:	2014 &	BS 13	37: Par	t 2: 19	90: 4.2								
Method of	Test:		BS EN IS	50: 17	892-1:	2014 &	BS137	77: PAR	T 2: 1	990: 3.2, 4	4.4, 5	3, 5.4						
Type of San	nple Ke	y:	U=Undist	turbed	, B=Bulk	(, D=Dist	urbed,	J=Jar, V	V=Wat	er, SPT=Sp	lit Spo	on San	nple, C	=Core (	Cutte	er		
Comments:	i		Corrected Volume C	l water hange I	content a Potential	assume m : NHBC St	naterial andard	greater i s Chapte	than 0.4 er 4.2 Ui	425mm non nmodified P	-porou lasticit	s. See E v Index	3\$1377:	Part2: 1	1990	Clause 3	Note 1	L
			Note: Mo	dified P	lasticity	Index l'p =	= lp x (%	6 less tha	an 425m	nicrons/100	)	,						
1																		



# TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD DATE ISSUED: 15/02/2018



Contract		HCA L	and at Pio.	neer Park	<u> </u>												
Serial No.		S3253	13														
		DET		ION OF W		ONTEN	NT, LI			ND P	LAST	IC LIN FX	/IT AN	ID			
Borehole / Pit No.	Depth m		Sample	Water Content (W) %		<u></u>	<u> </u>	Desc	ription					F	≀emark	:S	
TP111	2.00 - 2.10	D	22	24.0	Firm yellov silty CLAY   flint	wish brow possibly lo	n and g	₃reyish k lightly o	orown slightly rganic. Gravel	gravell I is fine a	y slightly and mec	y sandy lium					
			P	REPARATIO	ON					Liqui	d Limi	it				33	%
Method of	f prepa	aratior	1		Wet	sieved	over	0.425	mm sieve	Plast	ic Lim	it				21	%
Sample ret	tained	0.425	mm sieve	(Meası	ured)				15 %	Plast	icity lı	ndex				12	%
Corrected	water	conte	nt for mate	rial passing	g 0.425m	าฑ		Ĩ	28.3 %	Liqui	dity Ir	ndex				0.25	
Sample ret	tained	2mm	sieve (Measured) 8 % NHBC Modifie							dified	(l'p)	[l'p) 10 %			%		
Curing tim <sup>,</sup>	e		26 hrs Clay Content Not analysed						lysed	Deriv	ved Ac	tivity			Not an	alysed	
C=CLAY Plasticity I % (Ip) M=SILT	ndex	70 60 50 40 30 20 10 0 0		CL	CI MI 40	50	CH MH 60	70	CV MV 80 Plasticit	90 ty Chart	CE ME 100 BS5930	110	120 Figure 8	L	Low Medium High	. NHBC Volume Change Potential	%
Method of F Method of T Type of Sam Comments:	<sup>•</sup> repara Fest: 1ple Ke	ation:	BS EN ISO: BS EN ISO: U=Undisturł Corrected wa Volume Chan Note: Modifi	17892-1: 2 17892-1: 2 bed, B=Bulk, iter content a ige Potential: ed Plasticity I	2014 & B 2014 & B , D=Distur Issume ma NHBC Sta ndex I'p =	IS 1337 IS1377: rbed, J= aterial gro ndards C Ip x (% le	: Part PAR Jar, W eater t hapter	2: 19 7 2: 19 /=Wate han 0.4 r 4.2 Ur n 425m	190: 4.2 990: 3.2, 4 er, SPT=Spl 425mm non- nmodified Pl nicrons/100)	4.4, 5. lit Spor -porous lasticity	3, 5.4 on San s. See B r Index	nple, C \$\$1377:	=Core ( Part2: 1	Cutte 1990	ेr Clause 3	Note 1	1





Contract		HCA L	and at Pie	oneer Park						
Serial No.		S3253	13							
		DET		FION OF W	ATER CO	NTENT, L		AND PLASTIC LIN	/IT AND	)
Borehole / Pit No.	Depth m	ו Type	Sample Reference	Water Content e (W) %			Description			Remarks
TP113	2.00 - 2.10	D	20	63.6	Friable pale and recently	olive and grey active and dee	clayey SILT with rar cayed roots	e black organic pockets		
			I	PREPARATIO	ON			Liquid Limit		73 %
Method of	prepa	aration	1				From natur	al Plastic Limit		44 %
Sample ret	tained	0.425	mm sieve	(Assun	ned)		0 %	Plasticity Index		29 %
Corrected	water	conte	nt for mat	erial passing	g 0.425mr	m		Liquidity Index		0.68
Sample retained 2mm sieve (Assumed) 0 % NHBC Modified (I'p) n/a							n/a			
Curing time	e	27 hrs Clay Content Not analysed Derived Activity							Not analysed	
C=CLAY Plasticity I % (Ip) M=SILT	ndex	70 60 50 40 30 20 10 0 0		CL	CI MI 40	CH 60 MH	CV CV MV 70 80 Plast	CE ME 90 100 110 icity Chart BS5930: 2015: 1	120 Figure 8	Low     Medium     High       NHBC Volume Change Potential     NHBC Volume Change Potential
Method of F Method of T Type of Sam Comments:	repara Test: וple Ke	ation: y:	BS EN ISO BS EN ISO U=Undistu	: 17892-1: 2 : 17892-1: 2 rbed, B=Bulk,	:014 & BS :014 & BS , D=Disturt	i 1337: Pari i1377: PAR bed, J=Jar, W	t 2: 1990: 4.2 T 2: 1990: 3.2 /=Water, SPT=S	, 4.4, 5.3, 5.4 plit Spoon Sample, C	=Core Cu	ıtter







































































# Contract Number: 38122

Client Ref: **10016750** Client PO:

Laboratory Report

Report Date: 17-02-2018

Client Arcadis Fortran Rd St Mellons Cardiff CF3 0EY

Contract Title: HCA Land at Pioneer Park For the attention of: Jonathan Harris

Date Received: 02-02-2018 Date Commenced: 02-02-2018 Date Completed: 17-02-2018

#### **Test Description** Qty **Moisture Content** 9 BS 1377 : Part 2 : 3.2 - \* UKAS **1 Point Liquid & Plastic Limit** 6 1377 : 1990 Part 2 : 4.4 & 5.3 - \* UKAS **PSD Wet Sieve method** 2 1377 : 1990 Part 2 : 9.2 - \* UKAS PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) 2 1377 : 1990 Part 2 : 9.4 - \* UKAS **Disposal of Samples on Project** 1

Notes: Observations and Interpretations are outside the UKAS Accreditation

- \* denotes test included in laboratory scope of accreditation
- # denotes test carried out by approved contractor
- @ denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory. **Approved Signatories:** 

Alex Wynn (Associate Director) - Ben Sharp (Contracts Manager) - Emma Sharp (Office Manager) Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager) - Sean Penn (Administrative/Quality Assistant) Vaughan Edwards (Managing Director) - Wayne Honey (Administrative/Quality Assistant)

GSTL	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377 : Part 2 : 1990 Method 5 ) DESCRIPTIONS	
Contract Number	38122	
Site Name	HCA Land at Pioneer Park	

WS Window Sample	Sample Number	Sample Type	D	epth (i	n)	Descriptions
WS101	1	D	1.60	-	1.70	Brown slightly fine to medium gravelly sandy CLAY
WS102	2	D	1.70	-	1.80	Brown slightly fine to medium gravelly sandy CLAY
WS103	3	D	2.30	-	2.40	Brown slightly fine to medium gravelly sandy CLAY
WS104	3	D	1.60	-	2.30	
WS104	5	D	2.10	-	2.30	Brown slightly fine to medium gravelly sandy CLAY
WS104	7	D	3.40	-	3.50	
WS105	4	D	2.20	-	2.30	Brown slightly fine to medium gravelly sandy CLAY
WS105	6	D	3.50	-	3.80	Brown slightly fine to medium gravelly sandy CLAY
WS105	7	D	3.80	-	4.00	Brown sandy GRAVEL
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
	1			-		

Operators	Checked	16/02/2018	Richard John	R	
RO/MH	Approved	17/02/2018	Ben Sharp		



GSTL	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377 : Part 2 : 1990 Method 5 )	
Contract Number	38122	
Site Name	HCA Land at Pioneer Park	

WS Window Sample	Sample Number	Sample Type	D	epth (r	n)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing .425mm %	Remarks
WS101	1	D	1.60	-	1.70	19	33	16	17	92	CL Low Plasticity
WS102	2	D	1.70	-	1.80	13	35	14	21	86	CL/I Low/Inter. Plasticity
WS103	3	D	2.30	-	2.40	20	34	21	13	91	CL Low Plasticity
WS104	3	D	1.60	-	2.30	57	63	32	31	82	MH High Plasticity
WS104	5	D	2.10	-	2.30	18	31	22	9	90	CL Low Plasticity
WS104	7	D	3.40	-	3.50	14					
WS105	4	D	2.20	-	2.30	78	85	49	36	82	MV Very High Plasticity
WS105	6	D	3.50	-	3.80	16					
WS105	7	D	3.80	-	4.00	8.7					
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							

Symbols: NP : Non Plastic

Limit and Plastic Limit Wet Sieved

#### PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION BS 5930:1999+A2:2010









Operators	Checked	16/02/2018	Richard John	A	$\mathbf{A} \mathbf{A}$
RO/MH	Approved	17/02/2018	Ben Sharp		UKAS TESTING 2788

Geo-Environmental Phase 2 Site Investigation

# APPENDIX I Ground Gas Monitoring Results

Permanent Ground C	Permanent Ground Gas Monitoring							
	Borehol	e ID	WS101	WS102	WS103	WS104	WS105	WS106
	[	Date			05.02	.2018		
Weather				S	unny but co	ld		
Atmospheric Pressure	(mb)		1029	1029	1029	1029	1029	1026
Gas Flow Pato	Peak (l/hr)		<0.1	<0.1	0.1	0.1	0.1	0.3
Gas Flow Rate	Steady (l/hr)		<0.1	<0.1	<0.1	0.1	0.1	0.3
Mothana (CH4)	Peak (% v/v)		<0.1	0.4	<0.1	0.2	0.1	<0.1
	Steady (% v/v)		<0.1	0.3	<0.1	0.2	0.1	<0.1
Carbon Dioxido (CO2)	Peak (% v/v)		2.8	2.0	7.7	8.1	2.4	0.5
Carbon Dioxide (CO2)	Steady (% v/v)		2.4	2.0	7.7	8.1	2.4	0.5
Οχιαορ	Minimum (% v/v)		16.9	16.6	10.9	8.9	16.7	18.9
Охуден	Steady (% v/v)		17.2	17.5	10.9	8.9	16.8	19.0
Hydrogen Sulphide	ppm		<1	<1	<1	<1	<1	<1
Carbon Monoxide	ppm		<1	<1	<1	6	20	<1
Q(hg) CH4	(l/hr)		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Q(hg) CO2	(l/hr)		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Depth to Product	m bgl		NA	NA	NA	NA	NA	NA
Depth to Water	m bgl		Dry	Dry	Dry	3.758	Dry	Dry
Depth to Base of well	m bgl		1.74	2.97	4.013	4.03	3.63	1.21
Well Screening	m bgl		0.8-1.8	1.5-2.1	2.0-4.0	1.5-4.0	1.0-3.5	0.6-1.6
Geology / Geological Unit			MG/natural	natural	natural	natural	MG/natural	MG

#### Notes:

Parameter not measured
Millibar
Percentage Volume by Volume
Litres per hour
Parts Per Million
Hazardous gas flow rate
Metres below ground level
Made ground


Geo-Environmental Phase 2 Site Investigation

## APPENDIX J Derivation of Generic Assessment Criteria

#### SUMMARY

The purpose of this document is to describe the general principles adopted in the derivation of the Arcadis' Generic Assessment Criteria (GAC). The document and associated GAC underpins the generic quantitative risk assessments Arcadis undertakes for its clients and is not intended for any other use or use by others. Guidance has been provided by the EA to aid development of GAC which are appropriate for a typical England or Wales site, incorporating conservatism where warranted. Arcadis has used the EA guidance to develop in-house GAC to aid assessment of land contamination sites, and in particular to assess risks to human health receptors from chronic health effects and risks to water resource receptors. The GAC do not consider potential risks to ecological receptors, which may need to be assessed on specific sites. The following non-statutory technical guidance has been referred to in deriving the GAC.

- EA Science Reports SC050021/SR2, SC050021/SR3 and SC050021/SR7.
- Related Toxicity and Soil Guideline Value reports
- EA Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination
- EA. Groundwater Protection and Water Quality, March 2017 (accessible online https://www.gov.uk/government/collections/groundwater-protection)
- SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination

The GAC used within this report have been derived for "commercial end use". Commercial end use assumes a pre-1970s commercial property is present at the site with some open areas uncovered by hardstanding. A neighbouring resident is assumed present, comprising a small terraced house without basement.

Arcadis has undertaken environmental works on hundreds of potentially contaminated sites across the UK. The typical shallow geology encountered comprises granular soils or made ground, with a low organic matter content. As such, Arcadis has taken the decision to derive in-house GAC for a *sand* rather than sandy loam soil-type used by the EA to derive Soil Guideline Values, with an organic matter content of 0.34% (fraction of organic carbon content 0.002, typical of many sites).

To derive Human Health GAC (HH-GAC), the following exposure pathways are considered active for potential soil or groundwater exposures:

Site End-Use	On-Site Pathways
Commercial/ Industrial	<ul> <li>Incidental ingestion of soil or dust</li> <li>Incidental dermal contact with soil or dust</li> <li>Inhalation of dusts inside or outside</li> <li>Inhalation of vapours outside from a soil or groundwater source</li> <li>Inhalation of vapours inside from a soil or groundwater source</li> </ul>
Neighbouring resident	<ul> <li>Migration of impacted groundwater beneath neighbouring property, and subsequently:</li> <li>Inhalation of indoor air in an off-site property (originating from an on-site soil or groundwater source)</li> <li>Inhalation of outdoor air in an off-site garden (originating from an on-site soil or groundwater source)</li> </ul>

Two levels of water quality standard have been considered to enable Water Resource GAC (WR-GAC) to be developed depending on the environmental setting of a site. The WR-GAC have been derived based on adopted Environmental Quality Standards and Drinking Water Standards. No attenuation with transport off-site is assumed.

The following modelling tools have been utilised in the derivation of the GAC:

HH-GAC (on-site):	CLEA 1	.07 and I	RBCA	Toolki	t v2.6	
HH-GAC (off-site):	RBCA	Toolkit	v2.6	and	Remedial	Targets
	Worksh	eet v3.2				-
WR-GAC:	Remed	dial Targe	ets Wor	kshee	et v3.2	

Example model inputs are presented in the following tables, alongside the CLEA modelling outputs.



	Air-water parti	tion co-efficient	Diffusion co	o-efficient in air	Diffusion co-effici	ent in water	Relative m	olecular mass	Vapour pres	sure	Water solub	ility	Koc	
	cm3 cm3	Notes	m2 s-1	Notes	m2 s-1	Notes	g mol-1	Notes	Ра	Notes	mg L-1	Notes	Log (dimensior	Notes
Benzene	1.16E-01	Science Report – SC050021/SR7	8.77E-06	Science Report – SC050021/SR7	6.64E-10	Science Report – SC050021/SR7	78.11	Science Report – SC050021/SR7	6.24E+03	Science Report – SC050021/SR7	1.78E+03	Science Report – SC050021/SR7	1.83E+00	Science Report – SC050021/SR7
Toluene	1.15E-01	Science Report – SC050021/SR7	7.78E-06	Science Report – SC050021/SR7	5.88E-10	Science Report – SC050021/SR7	92.14	Science Report – SC050021/SR7	1.73E+03	Science Report – SC050021/SR7	5.90E+02	Science Report – SC050021/SR7	2.31E+00	Science Report – SC050021/SR7
Ethylbenzene	1.39E-01	Science Report – SC050021/SR7	7.04E-06	Science Report – SC050021/SR7	5.31E-10	Science Report – SC050021/SR7	106.17	Science Report – SC050021/SR7	5.53E+02	Science Report – SC050021/SR7	1.80E+02	Science Report – SC050021/SR7	2.65E+00	Science Report – SC050021/SR7
Sum xylenes	1.04E-01	Average for three xylenes	7.03E-06	Average for three xylenes	5.3E-10	Average for three xylenes	106.17	Average for three xylenes	4.52E+02	Average for three xylenes	1.91E+02	Average for three xylenes	2.66E+00	Average for three xylenes
МТВЕ	2.04E-02	Literature review	7.10E-06	Literature review	9.00E-10	Literature review	88.17	Literature review	3.45E+04	Literature review	4.80E+04	Literature review	1.08E+00	Literature review
Aliphatic >C5-6	3.40E+01	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	81	Literature review	3.60E+04	Literature review	3.60E+01	Literature review	2.90E+00	Literature review
Aliphatic>C6-8	5.10E+01	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	100	Literature review	6.40E+03	Literature review	5.40E+00	Literature review	3.60E+00	Literature review
Aliphatic>C8-10	8.20E+01	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	130	Literature review	6.40E+02	Literature review	4.30E-01	Literature review	4.51E+00	Literature review
Aliphatic>C10-12	1.30E+02	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	160	Literature review	6.50E+01	Literature review	3.40E-02	Literature review	5.40E+00	Literature review
Aliphatic>C12-16	5.40E+02	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	200	Literature review	4.80E+00	Literature review	7.60E-04	Literature review	6.70E+00	Literature review
Aliphatic>C16-35	6.40E+03	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	270	Literature review	7.70E-01	Literature review	1.30E-06	Literature review	9.00E+00	Literature review
Aromatic >C8-10	4.90E-01	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	120	Literature review	6.40E+02	Literature review	6.50E+01	Literature review	3.20E+00	Literature review
Aromatic >C10-12	1.40E-01	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	130	Literature review	6.40E+01	Literature review	2.50E+01	Literature review	3.40E+00	Literature review
Aromatic >C12-16	5.40E-02	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	150	Literature review	4.80E+00	Literature review	5.80E+00	Literature review	3.70E+00	Literature review
Aromatic >C16-21	1.30E-02	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	190	Literature review	7.70E-01	Literature review	5.10E-01	Literature review	4.20E+00	Literature review
Aromatic >C21-35	6.80E-04	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	240	Literature review	4.40E-04	Literature review	6.60E-03	Literature review	5.11E+00	Literature review



				Oral	HCV		-			Inhalati	on HCV			0	Oral MDI fo	r adults	Inhalation MD	I for adults
Chemical Name	Chemical Type	Type	µg kg-1 BW day-1	Notes	Oral exposure	Dermal exposure	Inhalation exposure	Type	µg kg-1 BW day-1	Notes	Oral exposure	Dermal exposure	Inhalation exposure	Combine oral and inhalation AC	µg kg-1 BW day-1	Notes	µg kg-1 BW day-1	Notes
Benzene	organic	ID	2.90E-01	UK TOX (March 2009)	Yes	Yes	No	ID	1.40E+00	UK TOX (March 2009)	No	No	Yes	Yes	NR	NA	NR	NA
Toluene	organic	TDI	2.23E+02	UK TOX (March 2009)	Yes	Yes	No	TDI	1.40E+03	UK TOX (March 2009)	No	No	Yes	Yes	1.00E+01	UK TOX (March 2009)	5.20E+02	UK TOX (March 2009)
Ethylbenzene	organic	TDI	1.00E+02	UK TOX (March 2009)	Yes	Yes	No	TDI	7.43E+01	Literature review	No	No	Yes	Yes	5.00E+00	UK TOX (March 2009)	1.30E+02	UK TOX (March 2009)
Sum xylenes	organic	TDI	1.80E+02	UK TOX (March 2009)	Yes	Yes	No	TDI	6.00E+01	UK TOX (March 2009)	No	No	Yes	Yes	1.10E+01	UK TOX (March 2009)	1.40E+02	UK TOX (March 2009)
МТВЕ	organic	TDI	8.60E+02	Literature review	Yes	Yes	No	TDI	8.60E+02	Literature review	No	No	Yes	Yes	3.00E+01	EU Risk Assessment Report	1.89E+02	EU Risk Assessment Report
Aliphatic >C5-6	organic	TDI	5.00E+03	TPHCWG	Yes	Yes	No	TDI	5.26E+03	TPHCWG	No	No	Yes	Yes	3.50E+05	TDI x 70kg (MDI unknown)	3.68E+05	TDI x 70kg (MDI unknown)
Aliphatic>C6-8	organic	TDI	5.00E+03	TPHCWG	Yes	Yes	No	TDI	5.26E+03	TPHCWG	No	No	Yes	Yes	3.50E+05	TDI x 70kg (MDI unknown)	3.68E+05	TDI x 70kg (MDI unknown)
Aliphatic>C8-10	organic	TDI	1.00E+02	TPHCWG	Yes	Yes	No	TDI	2.70E+02	TPHCWG	No	No	Yes	Yes	7.00E+03	TDI x 70kg (MDI unknown)	1.89E+04	TDI x 70kg (MDI unknown)
Aliphatic>C10-12	organic	TDI	1.00E+02	TPHCWG	Yes	Yes	No	TDI	2.70E+02	TPHCWG	No	No	Yes	Yes	7.00E+03	TDI x 70kg (MDI unknown)	1.89E+04	TDI x 70kg (MDI unknown)
Aliphatic>C12-16	organic	TDI	1.00E+02	TPHCWG	Yes	Yes	No	TDI	2.70E+02	TPHCWG	No	No	Yes	Yes	7.00E+03	TDI x 70kg (MDI unknown)	1.89E+04	(MDI
Aliphatic>C16-35	organic	TDI	2.00E+03	TPHCWG	Yes	Yes	No	NR			NR	NR	NR	NR	1.40E+05	TDI x 70kg (MDI unknown)		
Aromatic >C8-10	organic	TDI	4.00E+01	TPHCWG	Yes	Yes	No	TDI	5.50E+01	TPHCWG	No	No	Yes	Yes	2.80E+03	TDI x 70kg (MDI unknown)	3.85E+03	TDI x 70kg (MDI unknown)
Aromatic >C10-12	organic	TDI	4.00E+01	TPHCWG	Yes	Yes	No	TDI	5.50E+01	TPHCWG	No	No	Yes	Yes	2.80E+03	TDI x 70kg (MDI unknown)	3.85E+03	TDI x 70kg (MDI unknown)
Aromatic >C12-16	organic	TDI	4.00E+01	TPHCWG	Yes	Yes	No	TDI	5.50E+01	TPHCWG	No	No	Yes	Yes	2.80E+03	TDI x 70kg (MDI unknown)	3.85E+03	TDI x 70kg (MDI unknown)
Aromatic >C16-21	organic	TDI	3.00E+01	TPHCWG	Yes	Yes	No	NR			NR	NR	NR	NR	2.10E+03	TDI x 70kg (MDI unknown)		
Aromatic >C21-35	organic	TDI	3.00E+01	TPHCWG	Yes	Yes	No	NR			NR	NR	NR	NR	2.10E+03	TDI x 70kg (MDI unknown)		



PHYSICAL PROPERTIES			
		Commercial Land Use	Source
Soil type	na	Sand	Professional experience
Porosity (total)	cm3 cm-3	0.54	SC050021/SR3
Porosity (air-filled)*	cm3 cm-3	0.30	SC050021/SR3
Porosity (water-filled)*	cm3 cm-3	0.24	SC050021/SR3
Capillary fringe porosity (air-filled)	cm3 cm-3	0.01	Literature value
Capillary fringe porosity (water-filled)	cm3 cm-3	0.53	Literature value
Thickness of capillary fringe	m	0.1	Literature value
Residual soil water content	cm3 cm-3	0.07	SC050021/SR3
Saturated hydraulic conductivity	cm s-1	7.36E-03	SC050021/SR3
van Genuchten shape parameter	dimensionless	3.51E-01	SC050021/SR3
Bulk density	g cm-3	1.18	SC050021/SR3
Soil organic matter content	%	0.34	Professional experience
Threshold value of wind speed at 10m	m s-1	7.20	SC050021/SR3
Empirical function for dust model	dimensionless	1.22	SC050021/SR3
Ambient soil temperature	K	283	SC050021/SR3
Mean annual windspeed (10m)	m s-1	5.00	SC050021/SR3
Air dispersion factor at 0.8m	g m-2 s-1 per kg m-3	68.0	SC050021/SR3
Air dispersion factor at 1.6m	g m-2 s-1 per kg m-3	120.0	SC050021/SR3
Fraction of site with hard or vegetative cover	m2 m-2	0.80	SC050021/SR3
Depth to groundwater (RBCA)	m	1	Assumption
Infiltration rate in vadose zone	m day-1	6.80E-04	Likely worst-case
Aquifer type**	na	Sand	Assumption
Source width	m	40	Likely worst-case
Source length	m	40	Likely worst-case
Saturated aquifer thickness	m	10	Assumption
Mixing zone depth	m	5.5	Calculated in RTW
Hydraulic conductivity	m day-1	20	Literature value
Hydraulic gradient	m m-1	0.001	Typical value for sand
Aquifer soil organic matter content	%	0.34	Professional experience
Effective Porosity (total)**	cm3 cm-3	0.3	Literature value
Aquifer bulk density**	g cm-3	1.18	SC050021/SR3
Distance to neighbouring resident**	m	5	Likely worst-case

Notes:

\* Assumed to be present in foundation cracks when modelling in RBCA Toolkit
 \*\* Only used to generate GAC for neighbouring residents through off-site migration of impact in groundwater

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BUILDING PROPERTIES				]
		Residential (neighbouring resident)	Commercial (on-site)	Source
Building footprint	m2	2.80E+01	4.24E+02	SC050021/SR3
Living space air exchange rate	hr-1	0.50	1.00	SC050021/SR3
Living space height (above ground)	m	4.8	9.6	SC050021/SR3
Living space height (below ground)	m	0.0	0.0	SC050021/SR3
Pressure difference	Pa	3.1	4.4	SC050021/SR3
Foundation thickness	m	1.50E-01	1.50E-01	SC050021/SR3
Floor crack area	cm2	4.23E+02	1.65E+03	SC050021/SR3
Dust loading factor	µg m-3	5.00E+01	1.00E+02	SC050021/SR3

CLEA 1.07 EXPOSURE DATA		Age Class										
			Commercial Worker									
Age class	-	1	2	3	4	5	6	17				
Frequency of inhalation (dust and vapour indoors)	days yr-1	365	365	365	365	365	365	230				
Frequency of inhalation (dust and vapour outdoors)	days yr-1	365	365	365	365	365	365	170				
Occupancy period (indoors)	hr day-1	23	23	23	23	19	19	8.3				
Occupancy period (outdoors)	hr day-1	1	1	1	1	1	1	0.7				
Body weight	kg	5.6	9.8	12.7	15.1	16.9	19.7	70				
Body height	m	0.7	0.8	0.9	0.9	1	1.1	1.6				
Inhalation rate*	m3 day-1	5.4	8	8.9	10.1	10.1	10.1	15.7				

\* Inhalation rate adopted from Category 4 Screening Levels



RBCA Toolkit EXPOSURE DATA	Age	Class	
		0-6	17
Averaging time	yrs	6	49
Body weight	kg	13.3	70
Exposure duration	yrs	6	49
Averaging time (vapour flux)	yrs	6	49
Exposure frequency (indoors)*	days yr-1	365	29.9
Exposure frequency (outdoors)*	days yr-1	16.8	1.87

Notes:

Time-weighted average used for 0-6 year old female child

\* RBCA Toolkit compares an acceptable air concentration to a predicted air concentration. Only the exposure frequency can be modified (i.e. inhalation rate, time exposed cannot). As such, the TDSI (or ID) was converted to an acceptable indoor air concentration using the time-weighted properties for a 0-6 year old female child as defined within the Category 4 Screening Levels. The exposure frequency for other scenarios was modified to account for the differing exposure scenarios for the remaining pathways, to be equivalent to modifying the inhalation rate and time exposed.



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STEP	5: RESULTS	Find AC	Print Reports	Back to G	uide																<u>^</u>
		Ratio of ADE	to relevant Health	Criteria Value	Soil /	Assessment Cr	teria	SAC Flag	Soil Saturation Limit					Pathway C	ontributions (%	6)					
		oral HCV	inhal HCV	Combined	oral HCV	inhal HCV	Combined	Current SAC used for determining pathway contributions		direct soil ingestion	sum of consumption of homegrown produce and attached soil	dermal contact (indoor)	dermal contact (outdoor)	inhalation of dust (indoor)	inhalation of dust (outdoor)	inhalation of vapour (indoor)	inhalation of vapour (outdoor)	oral background	inhalation background	Total	
Number	Chemical	(dimensionless	(dimensionless)	(dimensionless)	mg kg <sup>-1</sup>	mg kg <sup>-1</sup>	mg kg <sup>-1</sup>	(unitless)	mg kg <sup>-1</sup>	%	%	%	%	%	%	%	%	%	%	%	
<u>1</u> 2	Benzene Loluene	0.01	0.99	1.00	4.25E+02	1.35E+00 1.35E+04	1.33E+00 1.31E+04	Combined	6.52E+02 3.74E+02	0.24	0.00	0.02	0.02	0.00	0.00	99.55 99.16	0.17	0.00	0.00	100.00	
3	Ethylbenzene Sum vilenes	0.01	0.99	1.00	1.91E+05	1.07E+03	1.07E+03	Combined	2.01E+02	0.65	0.00	0.04	0.06	0.00	0.00	98.53	0.26	0.10	0.36	100.00	
5	MTBE	0.00	1.00	1.00	1.64E+06	1.76E+03	1.75E+03	Combined	1.11E+04	0.09	0.00	0.00	0.00	0.00	0.00	99.50	0.03	0.05	0.31	100.00	
6 7	ETBE TBA	0.04	0.96	1.00	1.91E+03 1.72E+05	7.69E+01 1.86E+04	7.39E+01 1.68E+04	Combined	3.50E+03 2.35E+05	0.04	0.00	0.00	0.00	0.00	0.00	99.93 89.42	0.02	0.00	0.00	100.00	
8					1 775 . 00	1015 00	1.045.00		0.755.00						0.00				10.00		
<u>9</u> 10	Aliphatic >C5-C6 Aliphatic >C6-C8	0.00	1.00	1.00	4.77E+06 4.77E+06	1.31E+03 1.76E+03	1.31E+03 1.76E+03	Combined	3.75E+02 1.12E+02	0.01	0.00	0.00	0.00	0.00	0.00	49.96 49.95	0.03	0.01	49.99	100.00	
11	Aliphatic >C8-C10	0.00	1.00	1.00	9.53E+04	2.26E+02	2.26E+02	Combined	3.65E+01	0.04	0.00	0.00	0.00	0.00	0.00	49.90	0.05	0.04	49.96	100.00	
12	Aliphatic >C10-C12 Aliphatic >C12-C16	0.00	0.98	1.00	9.53E+04 9.53E+04	8.88E+02 4.04E+03	8.86E+02 4.00E+03	Combined	7.57E+00	0.15	0.00	0.01	0.01	0.00	0.00	49.73	0.10	0.17	49.83	100.00	
14	Aliphatic >C16-C35	1.00	NR	NR	1.91E+06	NR	NR	Oral	2.57E+00	42.91	0.00	2.86	4.23	0.00	0.00	0.00	0.00	50.00	0.00	100.00	
15	Aromatic >EC5-EC7 Aromatic >EC7-EC8	0.00	1.00	1.00	1.91E+05 1.91E+05	1.62E+02 2.53E+02	1.62E+02 2.53E+02	Combined	7.53E+02 3.99E+02	0.07	0.00	0.00	0.01	0.00	0.00	49.85	0.07	0.08	49.92	100.00	
17	Aromatic >EC8-EC10	0.00	1.00	1.00	3.81E+04	3.14E+02	3.13E+02	Combined	2.24E+02	0.25	0.00	0.02	0.03	0.00	0.00	49.57	0.13	0.30	49.70	100.00	
19	Aromatic >EC12-EC12 Aromatic >EC12-EC16	0.02	0.98	1.00	3.81E+04 3.81E+04	8.22E+03	7.73E+03	Combined	5.72E+02	5.81	0.00	0.09	0.13	0.01	0.00	48.17	0.30	6.77	48.48	100.00	
20	Aromatic >EC16-EC21 Aromatic >EC21-EC35	1.00	NR	NR	2.86E+04	NR	NR	Oral	1.60E+01	42.91	0.00	2.86	4.23	0.00	0.00	0.00	0.00	50.00	0.00	100.00	
22	Alomatic - LOZ I-LOSS	1.00		INIX	2.002.004	MIX	MIX		1.002.00	42.01	0.00	2.00	4.25	0.00	0.00	0.00	0.00	50.00	0.00	100.00	
23																					
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Geo-Environmental Phase 2 Site Investigation

## APPENDIX K Generic Assessment Criteria

COMMERCIAL END USE         Water Statution         Water Resources           Sumation Law         Commercial Workst and an one of the sumation Law         Commercial Workst and an one of the sumation Law         Sumation Law         Commercial Workst and an one of the sumation Law         Sumation Law         Aquadres           Seconds         692         593         7.43         7.33         1.44         0.010         0.021           Biological Seconds         1016         1.916         1.916         1.916         1.916         0.011         1.91           Biological Seconds         1016         1.916         1.916         1.916         0.011         1.91           Biological Seconds         1910         1.916         1.916         1.916         1.916         0.011         1.91           Biological Seconds         1910         759         4.776         1.926         1.926         0.014         0.014           Applance/G410         1.926         1.926         1.926         1.936         1.936         4.8         4           Applance/G410         1.926         1.936         1.926         1.937         NO         #         #           Applance/G410         1.936         4.926         1.937         NO         #	ARCADIS GENERIC ASSESSMENT CRITERIA FOR SOILS												
Composited         Image learning from Communication of the communicatis communication of the communication of the communica	- COMMERCIAL END USE -												
Compound         Prescription by Prescription by Prescription by Prescred by Prescription by Prescred by Prescription by Presc				Human Health -	Commercial		Water R	esources					
Bergere         662         553         7.43         7.33         1.84         0.019         0.019         0.019           Bergere         574         4.224-05         7.556-04         7.33         1.84         0.041         2.3           Stepsen         574         4.224-05         7.556-04         7.316-04         1.045         0.017         2.3           Stepsen         574         4.224-05         7.556-04         7.730         0.477         0.018         0.017         2.3           Stepsen         555         0.027         0.017         0.019         0.018         8         3.558         0.017         0.071	Compound	Saturation Limit	Commercial Worker - Oral	Commercial Worker - Inhalation	Commercial Worker - Combined	Neighbouring Resident	Surface Waters	Aquifers					
Backame         652         953         7.43         7.43         7.44         7.23         1.84         0.019         0.019         0.019         0.011         1.71           Emplorance         201         1.974-05         1.076-04         1070         ND         0.01         1.77           MTBE         2.01         1.974-05         1.070         ND         0.01         0.11         1.7           MTBE         3.000         1.910         7.69         7.10         4.67         0.018         0.018         0.019         0.017           MTBE         3.000         1.910         7.69         7.10         1.006-04         2.00         0.014 <th></th> <th></th> <th>mg/kg</th> <th>mg/kg</th> <th>mg/kg</th> <th>mg/kg</th> <th>mg/kg</th> <th>mg/kg</th>			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Totalame         374         4.25E-05         1.35E-04         1.71E-04         ND         0.24         2.3           Reference         210         3.25E-05         1750         1760         ND         0.11         17           Kenne         210         3.25E-05         1750         1769         1760         ND         0.17         2.3           Reference         1.35E-04         1.36E+04         1.06E+04         1.06E+04         200         0.014         0.014           Mehate-SC56         375         4.77E+06         1.370         ND         #         #           Mehate-SC56         375         4.77E+06         1.770         1.780         NB         #         #           Mehate-SC576         375         9.55E+04         4.680         866         ND         #         #           Mehate-SC576         1.777         9.55E+04         1.35E+04         1.37E+04         ND         #         #           Mehate-SC18-155         1.6         2.577         9.55E+04         1.35E+04         1.37E+04         ND         #         #           Mehate-SC18-15         1.6         2.5E+04         NR         #         #         #         #	Benzene	652	553	7.43	7.33	1.84	0.019	0.0019					
Eltrybenzenen         201         1.01/1-01         3.02/1-02         11/0         No         0.11         1.17           Weiner         1.10         A.45-00         11/20         11/20         11/20         11/20         11/20         11/20         11/20         11/20         11/20         11/20         11/20         11/20         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.017         0.014         0.019         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         0.0118         <	Toluene	374	4.25E+05	1.35E+04	1.31E+04	ND	0.24	2.3					
Weenes.         140         3.426-05         1760         11.40         ND         0.17         2.3           MBE         1.11-0.0         1.04-00         1020         1120         400         0.014         0.014           MBE         2.355-056         1.72E-006         1.36E-044         1.66E-04         2.260         0.014         0.014           Minimiz-OS-6         317.0         1.370         ND         #         #           Minimiz-OS-6         317.0         1.77E-06         1700         ND         #         #           Minimiz-OS-6         317.0         1.77E-06         NR         1.976-06         NR         #         #           Minimiz-OS-16-3         9.5.5         9.358-04         2.28         2.28         ND         #         #           Alphaniz-OS-16-3         1.977         1.976-06         NR         1.976-06         NR         #         #         #           Minimiz-OS-16-3         2.57         1.976-06         NR         #         #         #         #         #         #         #         #         #         #         #         #         #         #         #         #         #         #         #<	Ethylbenzene	201	1.91E+05	1070	1070	ND	0.11	1.7					
International         1.300         1.90         76.9         76.9         76.9         76.9         76.9         76.9         76.9         76.9         76.9         76.9         76.9         76.9         76.9         76.9         76.9         76.9         76.9         76.9         77.9         76.9         77.9         76.9         77.9         76.9         77.9         76.9         77.9         76.9         77.9	Xylenes	216	3.43E+05	1150	1140	ND 467	0.17	2.9					
TBA         2.35E-05         1.72E-06         1.56E-04         1.56E-04         2.260         0.014         0.014           Alphata-CG53:         375         4.77E-06         1730         1730         ND         #         #           Alphata-CG54:         3112         4.77E-06         1730         1730         ND         #         #           Alphata-CG54:         30.5         0.35E-04         226         223         ND         #         #           Alphata-CG54:         1770         1.780         Alb         0.01         #         #           Alphata-CG54:         1770         1.780         NR         1.01E-06         NR         #         #           Alphata-CG54:         1.35E-04         1.35E-04         1.37E-04         ND         #         #           Alphata-CG54:         130         3.74         4.22E-03         1.36E-04         1.37E-04         ND         #         #           Aromata -SC10:12         130         3.27E-04         1.62E-04         ND         #         #           Aromata -SC10:12         130         3.26E-04         NN         2.23E-04         ND         -         -           Aromata -SC10:12         1	FTRE	1.11E+04 3500	1.04E+00	76.9	73.0	407	0.018	0.018					
Special         375         4.77E-00         130         130         130         8         8           Separatic CS-10         39.5         9.57E-04         226         226         ND         8         8           Algebraics CS-10         39.5         9.57E-04         246         226         ND         8         8           Algebraics CS-16         15.7         9.55E-04         4400         4000         ND         8         8           Algebraics CS-16         15.5         9.75E-04         4404         4000         ND         8         8           Algebraics CS-16         15.5         0.74         4.25E-05         1.35E-04         1.34E-04         ND         0.014         0.0019         0.0019         0.0019         8         8           Algebraics CS-16         1.02         2.31E-04         3.14         3.13         ND         8 <td< th=""><th>ТВА</th><th>2.35E+05</th><th>1.72E+05</th><th>1.86E+04</th><th>1.68E+04</th><th>2260</th><th>0.014</th><th>0.014</th></td<>	ТВА	2.35E+05	1.72E+05	1.86E+04	1.68E+04	2260	0.014	0.014					
Alphabac-GS-8         112         4.775-60         1760         1760         ND         #         #           Alphabac-GS-10-12         18         9.535-64         888         866         ND         #         #           Alphabac-GS-10-12         18         9.535-64         888         866         ND         #         #           Alphabac-GS-10-12         18         9.535-64         44040         4000         ND         #         #           Alphabac-GS-10-12         18         9.535-64         44040         10.1640         1.18         0.019         0.019           Alphabac-GS-10-12         130         3.815-64         1.16-04         1.16-04         1.16         2.067-64         ND         #         #           Aromata SC12-12         16         2.265-64         NR         2.865-64         NR         #         #         #           Aromata SC12-15         1.68         2.865-64         NR         2.865-64         ND         -         -         -           Aromata SC12-15         1.68         2.865-64         NR         #         #         #         #         #         #         #         #         #         #         #	Aliphatic >C5-6	375	4.77E+06	1310	1310	ND	#	#					
Allohalas, Cick-10         36,5         9,585+64         226         227         ND         #         #           Allohalas, Cick-12         18         9,585+64         4600         4000         ND         #         #           Allohalas, Cick-12         18         9,585+64         4600         4000         ND         #         #           Allohalas, Cick-12         13         9,555+64         1,355+04         1,315+06         NR         0.019           Aromatis CCC (1s rolumn)         374         4,255+05         1,355+04         1,315+06         ND         #         #           Aromatis CCC (1s rolumn)         374         4,255+05         1,375+04         1,60         2,867+04         NR         #         #           Aromatis CCC (1s rolumn)         168         2,865+04         NR         2,865+04         NR         #         #         #           Aromatis CCC (1s rolumn)         168         2,865+04         NR         2,865+04         NR         #         #         #           Aromatis CCC (1s rolumn)         168         1,675+05         6,465+04         NR         #         #         #           Repaintare         221,1         1,665+05         5,86+106 </th <th>Aliphatic&gt;C6-8</th> <td>112</td> <td>4.77E+06</td> <td>1760</td> <td>1760</td> <td>ND</td> <td>#</td> <td>#</td>	Aliphatic>C6-8	112	4.77E+06	1760	1760	ND	#	#					
Alphatack/10-12         18         0.3.8±-04         889         886         N3         #         #           Alphatack/10-12         1         5.57         0.3.8±-04         400         4000         N0         0         #         #           Alphatack/10-12         1.55         N.M         1.970         N.M         0.019         0.0019           Alphatack/10-12         3.34         4.252-05         1.3.55-04         1.316-04         1.316         0.001         0.019         0.0019           Aromatic 502-16         5.72         3.34E-04         3.74         3.73         N.D         #         #           Aromatic 502-16         5.72         3.8E-04         NR         2.86E-04         NR         #         #         #           Aromatic 502-15         1.68         2.86E-04         NR         2.86E-04         NR         #         #         #           Aromatic 502-16         1.67         2.26E-04         NR         # <th>Aliphatic&gt;C8-10</th> <td>36.5</td> <td>9.53E+04</td> <td>226</td> <td>226</td> <td>ND</td> <td>#</td> <td>#</td>	Aliphatic>C8-10	36.5	9.53E+04	226	226	ND	#	#					
Algistabic Jackie         1.37         3.38±1/3         40.0         40.0         ND         #         #           Algistabic Jackie Structurio         2.52         1.55         1.35±0/4         1.31±0/4         0.019         0.019           Aromatis CSC 10 tes Followeit         3.24         4.25±0/5         1.35±0/4         1.31±0/4         ND         0.24         0.019           Aromatis CSC 10 tes Followeit         3.24         0.24         3.24±0/5         1.35±0/4         1.31±0/4         ND         #         #           Aromatis CSC 10:12         130         3.81±0/4         1.84±0/4         1.80±0/2         7.73         ND         #         #           Aromatis CSC 10:12         16         2.86±0/4         NR         2.86±0/4         NR         #         #         #           Aromatis CSC 10:12         16         2.86±0/4         NR         # <th>Aliphatic&gt;C10-12</th> <td>18</td> <td>9.53E+04</td> <td>888</td> <td>886</td> <td>ND</td> <td>#</td> <td>#</td>	Aliphatic>C10-12	18	9.53E+04	888	886	ND	#	#					
Automatic SOCIEV DIS NOTIVATION         Lock         Field         TA3         TA3         TA3         US4         US1         <	Aliphatic>C16 25	2.57	9.53E+04	4040 ND	4000		#	#					
Arematic SC/26 (is is blacene)         37.4         4.226-05         1.355-04         1.315-04         ND         0.24         23.3           Aromatic SCI-01         30         3.81E-04         1640         1630         ND         #         #           Aromatic SCI-012         30         3.81E-04         1640         1630         ND         #         #           Aromatic SCI-012         16         2.86E+04         NR         2.86E+04         NR         #         #         #           Aromatic SCI-02         16.8         2.86E+04         NR         2.86E+04         NR         #	Aromatic >C5-C7 (as benzene)	652	553	7.43	7.33	1.84	0.019	0.0019					
Acomatic SCB-10         224         3.81E-0.4         314         313         ND         #         #           Aromatic SC12-16         57.2         3.81E-0.4         8220         7730         ND         #         #           Aromatic SC12-16         57.2         3.81E-0.4         8220         7730         ND         #         #           Aromatic SC12-16         16         2.86E-0.4         NR         2.86E-0.4         NR         # 2.86E-0.4         NR         #         #           Aromatic SC12-15         1.68         2.86E-0.4         NR         # 2.86E-0.4         NR         #<	Aromatic >C7-C8 (as toluene)	374	4.25E+05	1.35E+04	1.31E+04	ND	0.24	2.3					
Aronatis Col:012         130         3.81E-0.4         1640         1630         ND         #         #           Aronatis Col:0210         57.2         3.81E-0.4         NR         2.06E-0.4         NR         #         #           Aronatis Col:0210         168         2.86E-0.4         NR         2.06E-0.4         NR         #         #           Aronatis Col:0150         0.66E-0.4         NR         #         #         #         #           Naphthalene         2.81         3.64E-0.4         NR         #         #         #           Naphthalene         1.65         1.10E-0.5         9.37E+0.4         6.64E-0.4         ND         -         -           Aconaphthylene         7.2.7         1.10E+0.5         9.37E+0.4         5.19E+0.4         ND         -         -           Aconaphthylene         1.2         2.731E+0.4         9.30E+0.6         5.22E+0.4         ND         -         -           Binazol(aphthalene         0.43         2.28E+0.4         9.22E+0.4         ND         -         -           Binazol(aphthalene         0.15         5.67         9.46         3.30         ND         -         -         -           Coryane <th>Aromatic &gt;C8-10</th> <td>224</td> <td>3.81E+04</td> <td>314</td> <td>313</td> <td>ND</td> <td>#</td> <td>#</td>	Aromatic >C8-10	224	3.81E+04	314	313	ND	#	#					
Aromatic SC[2:16]         57.2         38/E+0-4         B220         7730         ND         #         #           Aromatic SC[2:15]         16         2.86E+04         NR         2.86E+04         NR         2.86E+04         NR         #         #           Aromatic SC[2:15]         1.68         2.86E+04         NR         #.266E+04         NR         #         #           Magnitudes         28.1         3.64E+04         3.34         301         ND         0.015         0.015           Acomaphitylene         72.7         1.10E+05         5.04E+04         0.64E+04         ND         -         -           Acomaphitylene         72.7         1.10E+05         5.04E+06         5.02E+05         ND         -         -           Acomaphitylene         7.2         2.28E+04         2.22E+04         ND         -         -           Branzolantence         0.57         5.64E+05         5.23E+04         ND         -         -           Branzolantence         0.582         2.84         325         151         ND         -         -           Branzolantence         0.567         6.45         339         ND         -         -         -         - <th>Aromatic &gt;C10-12</th> <td>130</td> <td>3.81E+04</td> <td>1640</td> <td>1630</td> <td>ND</td> <td>#</td> <td>#</td>	Aromatic >C10-12	130	3.81E+04	1640	1630	ND	#	#					
Atomatis SC/19:21         Tis         2 2 deF-04         NR         2 deF-04         NR         2 deF-04         NR         #         #           Itematis SC/13:20         1.68         2 deF-04         NR         na	Aromatic >C12-16	57.2	3.81E+04	8220	7730	ND	#	#					
Additional Source Sou	Aromatic >C16-21	16	2.86E+04	NR	2.86E+04	NR	#	#					
Naphthalene         28.1         3.64E+04         334         331         ND         0.015         0.015           Acenaphthylene         72.7         1.10E+05         9.87E+04         5.19E+04         ND         -         -           Fluorene         12         7.31E+04         1.39E+05         5.28E+04         ND         -         -           Antiracene         0.706         5.49E+04         1.29E+04         ND         -         -           Construction         0.706         5.49E+05         5.28E+04         ND         -         -           Fluorene         0.75         5.49E+04         2.19E+06         5.38E+04         ND         -         -           Encololatinacene         0.75         5.49E+04         2.12E+06         5.38E+04         ND         -         -           Encololitioranthene         0.515         567         845         339         ND         -         -         0.026           Benzololitioranthene         0.234         1880         3070         1170         ND         -         0.022           Benzololitioranthene         0.2014         5.67         9.08         3.497         ND         -         0.022	TPH	na	na	na	na	na	na na	na na					
Accessphiltylene         72.7         1.10E-06         9.157E-05         6.44E-04         ND         -         -           Fluorense         12         7.31E-04         1.90E-05         5.22E-04         ND         -         -           Fluorense         12         7.31E-04         1.90E-05         5.22E-04         ND         -         -           Anthrazense         0.706         5.49E+04         2.72E-06         5.02E+03         ND         -         -           Preme         6.46         2.29E+04         2.02E+06         5.39E+04         ND         -         -           Fluorentee         0.15         5.67         8.45         3.39         ND         -         -         -           Chysene         0.15         5.67         8.45         3.39         ND         -         0.226           Enzolyfiluoranthene         0.413         71.3         115         44         ND         -         0.022           Enzolyfiluoranthene         0.234         1800         3070         1170         ND         -         0.222           Dietroodfiluoranthene         0.237         5.67         9.08         3.49         ND         -         -         <	Naphthalene	28.1	3.64E+04	334	331	ND	0.015	0.015					
Acamaphtene         15.6         1.0E-06         9.87E+04         5.09E+04         ND         -         -           Phonanthrane         12         7.31E+04         1.90E+05         5.28E+04         ND         -         -           Phonanthrane         4.83         2.22E+04         1.22E+04         1.22E+04         ND         -         -           Fluoranthrane         6.46         2.22E+04         8.99E+05         2.23E+04         ND         -         -           Prene         0.75         5.49E+04         2.92E+06         5.39E+04         ND         -         -           Chrystene         0.15         5.67         8.45         3.33         ND         -         -         0.026           Benzols/filtoranthrene         0.234         1780         3070         1170         ND         -         0.022           Benzols/filtoranthreae         0.2034         5.67         9.08         3.49         ND         -         -         -           Decisorashan (1.2)         5.64         2.29         0.212         0.212         0.042         0.0042         0.0042         0.0042         0.0042         0.0042         0.0042         0.0042         0.0044         0.044<	Acenaphthylene	72.7	1.10E+05	1.57E+05	6.46E+04	ND	-	-					
Floorene         12         7.31E-04         1.90E-05         5.28E-04         ND         -         -           Anthracene         0.706         5.49E-04         5.27E-06         ND         -         -           Anthracene         0.706         5.49E-04         8.99E-05         5.23E+04         ND         -         -           Pyrene         0.75         5.49E-04         8.19E-06         5.22E+06         ND         -         -           Benzolajiantracene         0.55         2.22E+04         8.25E         151         ND         -         -           Chrysene         0.413         71.3         115         44         ND         -         0.022           Benzolajiuoranthene         0.234         1880         3070         1170         ND         -         0.022           Denzolajiuoranthene         0.0039         810         1280         497         ND         -         0.022           Denzolajiuoranthracene         0.0034         6290         1.04E+04         3820         ND         -         0.105           Denzolajiunanthracene         0.0034         6290         1.04E+04         3820         ND         -         0.105	Acenaphthene	15.6	1.10E+05	9.87E+04	5.19E+04	ND	-	-					
Phenanthrene         4.83         2.28E+04         2.79E+04         1.25E+04         ND         -         -           Fluoranthrene         6.46         2.29E+05         5.34E+06         5.32E+04         ND         -         -           Fluoranthrene         0.75         5.49E+04         8.39E+05         2.23E+04         ND         -         -           Benzolgianthracene         0.582         2.84         325         151         ND         -         -           Benzolgianthracene         0.413         71.3         115         44         ND         -         0.002           Benzolgianthracene         0.433         71.3         115         44         ND         -         0.002           Benzolgianthracene         0.0034         5.67         9.08         497         ND         -         0.002           Benzolgianthracene         0.0034         5.67         9.08         3.49         ND         -         -         0.002           Dichoresthane (1,1)         1580         1.52E+05         44.2         44.1         50.6         0.0042         0.0042           Dichoresthane (1,2)         2160         229         0.212         0.212         0.212	Fluorene	12	7.31E+04	1.90E+05	5.28E+04	ND	-	-					
Aftmache         0.00         5.49E+405         5.02E+405         ND         -         -           Elucantinene         6.46         2.29E+04         8.99E+05         2.23E+04         ND         -         -           Branca(a)anthracene         0.75         5.49E+04         8.29E+05         2.23E+04         ND         -         -           Chrysene         0.15         567         845         339         ND         -         -           Benzo(b)[lucranthene         0.413         77.3         115         44         ND         -         0.026           Benzo(b)[lucranthene         0.434         1880         3070         1170         ND         -         0.026           Benzo(b)[lucranthene         0.0234         1880         3070         1170         ND         -         0.022           Dichoroethane (0.421)         5.46         76         ND         -         0.022         0.013           Benzo(b)[lucranthene         0.00134         5.67         9.26         3.49         ND         -         0.105           Dichoroethene (1.1)         1560         1.22E+05         44.2         44.1         50.6         0.0042         0.0042	Phenanthrene	4.83	2.28E+04	2.79E+04	1.25E+04	ND	-	-					
Induiting         0.40         2.28.444         0.53440         ND         -         -           Benzolgianthracene         0.592         284         325         151         ND         -         -           Benzolgianthracene         0.413         71.3         115         44         ND         -         0.026           Benzolgianthracene         0.413         71.3         115         44         ND         -         0.026           Benzolgianthracene         0.413         77.3         115         44         ND         -         0.026           Benzolgianthracene         0.029         810         1280         497         ND         -         0.022           Dibenzolanjanthracene         0.00134         5.67         9.08         3.49         ND         -         -           Dichloroethane (1.1)         1580         1.524-05         44.2         44.1         50.6         0.0042         0.0042           Dichloroethane (1.1)         721         1.144-06         160         160         ND         0.28         5.64           Dichloroethane (1.1)         721         1.144-06         6.39         6.39         37.7         0.37         0.019	Anthracene	0.706	5.49E+05	5.84E+06	5.02E+05	ND	-	-					
Benot(s)anthracene         0.582         2.24         325         151         ND         -           Chrysene         0.15         567         845         339         ND         -         -           Benzot(s)/louranthene         0.413         71.3         115         44         ND         -         0.026           Benzot(s)/louranthene         0.234         1880         3070         1170         ND         -         0.037           Benzot(s)/louranthene         0.0209         810         1280         497         ND         -         0.002           Dehzo(s)/louranthene         0.00034         6.567         9.08         3.49         ND         -         -           Benzo(s)/louranthezene         0.00034         6.567         9.08         3.49         ND         -         -         -           Benzo(s)/louranthezene         0.00034         6.567         9.08         3.49         ND         -         -         -         -         -         -         Benzo(s)/louranthezene         0.0022         0.0042         0.0042         0.0042         0.0042         0.0042         0.0042         0.0042         0.0042         0.0041         0.041         0.041         0.04	Pyrene	0.40	5.49E+04	2.12E+06	5.35E+04	ND	-						
Chrysene         0.15         567         845         339         ND         -         -           Benzolu/llucranthene         0.13         77.3         115         44         ND         -         0.026           Benzolu/llucranthene         0.234         1880         3070         1170         ND         0.0020         0.033           Benzolu/llucranthene         0.209         810         1280         497         ND         -         0.022           Dibenzolu/lipyrene         0.00634         5.67         9.08         3.49         ND         -         -           Dichorochtnane (1.2)         0.00634         6.290         1.04E+04         3920         ND         -         0.105           Dichorochtnane (1.2)         2160         229         0.212         0.212         0.0861         0.013         0.0038           Trichlorochtnane (1.1)         1510         9.52E+04         6.39         6.39         3.77         0.37         0.019           Dichlorochtnane (1.1)         1310         9.52E+04         3.34         3.33         3.62         0.041         0.041           Dichlorochtnane (1.1)         1310         9.52E+04         3.78         3.17         0.37	Benzo(a)anthracene	0.582	284	325	151	ND	-	-					
Benzo(h)uoranthene         0.413         71.3         115         44         ND         -         0.026           Benzo(h)uoranthene         0.234         1880         3070         1170         ND         -         0.033           Benzo(h)uoranthene         0.209         810         1280         497         ND         -         0.022           Benzo(h)perylene         0.00534         5.67         9.08         3.49         ND         -         0.105           Dichloroethane (1.1)         1580         1.52E+05         44.2         44.1         50.6         0.0042         0.0042           Dichloroethane (1.1)         1580         1.52E+05         44.2         44.1         50.6         0.0042         0.0042           Dichloroethane (1.2)         2160         229         0.212         0.0261         0.013         0.038           Tichloroethane (1.2)         1120         1.13E+04         3.34         3.33         3.62         0.041         0.041           Dichloroethene (1.1)         1310         9.52E+04         4.9.4         49.3         11.9         0.041         0.041           Dichloroethene (1.1)         132         0.24         9.53         0.28         0.28	Chrysene	0.15	567	845	339	ND	-	-					
Benze(k)fluoranthene         0.234         1880         3070         1170         ND         -         0.037           Benze(a)pyrene         0.0209         810         1280         497         ND         -         0.022           Dibenzo(a)panhaceene         0.00134         5.67         9.08         3.49         ND         -         -         0.105           Benzo(a)perviene         0.00634         6290         1.04E+04         3820         ND         -         -         0.105           Dichloroethane (1.1)         1580         1.52E+05         44.2         44.1         50.6         0.0042         0.0042           Dichloroethane (1.1)         721         1.14E+06         160         160         ND         0.28         5.64           Dichloroethene (11)         721         1.14E+04         3.34         3.33         3.62         0.041         0.041           Dichloroethene (11)         724         953         0.28         0.73         0.027         0.027         0.027         0.027         0.027         0.027         0.027         0.027         0.027         0.021         0.041         0.041         0.041           Dichloroethene         138         1.12E+04	Benzo(b)fluoranthene	0.413	71.3	115	44	ND	-	0.026					
Deficicital         0.46         70         ND         0.0002         0.013           Indeno(1230)prene         0.00034         5.67         9.08         3.49         ND         -         0.022           Dibenzo(gh)perylene         0.00634         6290         1.04E+04         3920         ND         -         0.105           Dichorocithane (1,1)         1580         1.52E+05         44.2         44.1         50.6         0.0042         0.0042           Dichorocithane (1,1)         1580         1.52E+05         44.2         44.1         50.6         0.0042         0.0042           Dichorocithane (1,1)         171         1.14E+06         160         160         ND         0.28         5.64           Dichorocithane (1,1)         1310         9.52E+04         6.39         6.39         37.7         0.37         0.019           Dichorocithane (1,1)         120         1.13E+04         3.34         3.33         3.62         0.041         0.041           Dichorocithane (1,1)         120         1.3E+04         3.78         3.78         11.7         0.027         0.027         0.027         0.027         0.027         0.027         0.027         0.027         0.027         0.027 <th>Benzo(k)fluoranthene</th> <th>0.234</th> <th>1880</th> <th>3070</th> <th>1170</th> <th>ND</th> <th>-</th> <th>0.037</th>	Benzo(k)fluoranthene	0.234	1880	3070	1170	ND	-	0.037					
Internet (Exboly) for	Indepo(123cd)pyrene	0.0209	810	1280	/07		0.0002	0.013					
Benzolghiperylene         0.00634         6290         1.04E+04         3920         ND         -         0.105           Dichloroethane (1.1)         1580         1.52E+05         44.2         44.1         50.6         0.0042         0.0042           Dichloroethane (1.2)         2160         229         0.212         0.212         0.0212         0.0861         0.013         0.0038           Trichoroethane (1.1)         721         1.14E+06         160         ND         0.28         5.64           Dichloroethene (is1.2)         1120         1.32E+04         6.39         6.39         37.7         0.37         0.019           Dichloroethene (is1.2)         2040         3.23E+04         49.4         49.3         11.9         0.041         0.041           Dichloroethene (is1.2)         2040         3.23E+04         3.78         3.78         11.7         0.041         0.041           Dichloroethene (is1.2)         2040         3.24E+04         2.7.4         2.7         0.227         0.027         0.227         0.027         0.027         0.027         0.027         0.027         0.027         0.027         0.027         0.027         0.011         0.011         0.014         0.014	Dibenzo(ah)anthracene	0.00134	5.67	9.08	3.49	ND	-	-					
Dichloroethane (1.1)         1580         1.52E+05         44.2         44.1         50.6         0.0042         0.0042           Dichloroethane (1.2)         2160         229         0.212         0.212         0.0861         0.013         0.0038           Trichloroethane (11)         721         1.14E+06         160         ND         0.28         5.64           Dichloroethene (1,1)         1310         9.52E+04         6.39         6.39         37.7         0.37         0.019           Dichloroethene (1,1)         1310         9.52E+04         4.9.4         49.3         11.9         0.041         0.041           Dichloroethene (1,1)         2040         3.23E+04         49.4         49.3         11.9         0.041         0.041           Dichloroethene         724         953         0.28         0.73         0.027         0.027         0.027         0.027         0.027         0.027         0.027         0.021         0.0011         0.0011           Chloroform (Trichloromethane)         2.880         2.34E+04         2.7.4         2.7         2.5         0.0011         0.0011           Chloroform (CickSU)         NVP         3.28E+05         111         11         10.1         0.3	Benzo(ghi)perylene	0.00634	6290	1.04E+04	3920	ND	-	0.105					
Dickloroethane (1.2)         2160         229         0.212         0.212         0.0861         0.013         0.0038           Trichloroethane (11)         721         1.14E+06         160         160         ND         0.28         5.64           Dichloroethene (11)         1310         9.52E+04         6.39         6.39         37.7         0.07         0.019           Dichloroethene (11)         1120         1.13E+04         3.34         3.33         3.62         0.041         0.041           Dichloroethene (11)         724         953         0.28         0.28         0.73         0.027         0.027           Trichloroethene         183         1.12E+04         3.78         3.78         11.7         0.041         0.041           Chloroform (Trichloromethane)         2880         2.34E+04         27.4         27.4         25         0.0041         0.49           Vnyl Chlorde (chloroethene)         1180         2.67         0.027         0.027         0.027         0.027         0.011         0.011           Chloroform (Trichloromethane)         2.02E+04         4.69E+04         1.90E+04         NVP           Barum         NVP         2.02E+04         4.69E+04         1.90E+04	Dichloroethane (1,1)	1580	1.52E+05	44.2	44.1	50.6	0.0042	0.0042					
Trichloroethane (11)       721       1.14E+06       160       160       ND       0.28       5.64         Dichloroethene (1,1)       1310       9.52E+04       6.39       37.7       0.37       0.019         Dichloroethene (is 1.2)       1120       1.13E+04       3.34       3.33       3.62       0.041       0.041         Dichloroethene (is 1.2)       120       3.23E+04       49.4       49.3       11.9       0.041       0.041         Dichloroethene (is 1.2)       1120       3.23E+04       49.4       49.3       11.9       0.041       0.041         Dichloroethene       724       953       0.28       0.28       0.73       0.027       0.027       0.027       0.027       0.027       0.027       0.027       0.027       0.021       0.041       0.49         Chloroform (Trichloroethene)       1183       1.2E+04       3.78       111       10.1       0.37       0.37         Pitchloroethene       279       1.48E+05       11       11       10.1       0.37       0.37         Ohroethene       202E+04       4.69E+04       1.90E+04       NVP         Arsenic (C4SL)       NVP       2.3E+07       2.3E+05       NVP       0.014	Dichloroethane (1,2)	2160	229	0.212	0.212	0.0861	0.013	0.0038					
Dickhoroethene (1,1)         1310         9.52E+04         6.39         6.39         37.7         0.37         0.019           Dickhoroethene (cis 1,2)         1120         1.13E+04         3.34         3.33         3.62         0.041         0.041           Dickhoroethene (rans 1,2)         2040         3.23E+04         49.4         49.3         11.9         0.041         0.041           Dickhoroethene         724         953         0.28         0.28         0.73         0.027         0.027           Tetrachloroethene         183         1.12E+04         3.78         3.77         0.37         0.041         0.041           Chloroform (Trichloromethane)         2880         2.34E+04         27.4         27         0.027         0.027         0.227         0.0011         0.0011           Chloroform (Trichloromethane)         1180         26.7         0.027         0.027         0.227         0.011         0.0011           Chlorobenzene         279         1.48E+05         11         11         10.1         0.37         0.37           Phenol (SGV)         2.02E+04         4.69E+04         1.90E+04         NVP           Gamium (ASL)         NVP         2.38E+05         2.82E+07	Trichloroethane (111)	721	1.14E+06	160	160	ND	0.28	5.64					
Dichloroethene (ist, 12)         1120         1.13E+04         3.34         3.33         3.62         0.041         0.041           Dichloroethene (trans 1.2)         2040         3.23E+04         49.4         49.3         11.9         0.041         0.041           Trichloroethene         724         953         0.28         0.28         0.73         0.027         0.027           Tetrachloroethene         183         1.12E+04         3.78         3.78         11.7         0.041         0.041           Chloroform (Trichloromethane)         2880         2.34E+04         27.4         27.4         25         0.0011         0.091           Chloroform (Trichloromethane)         2880         2.34E+05         11         11         10.1         0.37         0.37           Vinyl Chloride (chloroethene)         1180         26.7         0.027         0.027         0.027         0.027         0.011         0.0011           Chlorobenzene         27.9         1.48E+05         11         11         10.1         0.37         0.37           Barium         NVP         2.02E+04         4.89E+04         1.90E+04         NVP           Cadmium (C4SL)         NVP         31E+05         8570	Dichloroethene (1,1)	1310	9.52E+04	6.39	6.39	37.7	0.37	0.019					
Dick involution (and (and (a)))         2040         3.22 L+04         4.9.4         4.9.3         11.3         0.041         0.041           Trichloroethene         724         953         0.28         0.28         0.73         0.027         0.027           Tetrachloroethene         183         1.12E+04         3.78         3.78         11.7         0.041         0.041           Chloroform (Trichloromethane)         2880         2.34E+04         27.4         27.4         25         0.0041         0.49           Vinyl Chloride (chloroethene)         1180         26.7         0.027         0.227         0.227         0.227         0.2011         0.0011           Chlorobenzene         279         1.48E+05         11         11         10.1         0.37         0.37           Phenol (SGV)         2.02E+04         4.69E+04         1.90E+04         NVP           Barium         NVP         2.38E+05         2.82E+07         2.36E+05         NVP           Chromium (as III)         NVP         49         NVP         Chromium (as UV) (C4SL)         NVP           Chromium (as III)         NVP         331E+05         8570         8570         NVP           Lead (C4SL)         NVP	Dichloroethene (cis 1,2)	1120	1.13E+04	3.34	3.33	3.62	0.041	0.041					
Introduction         Int         Int <t< th=""><th>Trichloroethene</th><td>724</td><td>953</td><td>0.28</td><td>0.28</td><td>0.73</td><td>0.041</td><td>0.041</td></t<>	Trichloroethene	724	953	0.28	0.28	0.73	0.041	0.041					
Chloroform (Trichloromethane)         2880         2.34E+04         27.4         27.4         25         0.0041         0.49           Vinyl Chloride (chloroethene)         1180         26.7         0.027         0.227         0.0211         0.0011           Chlorobenzene         279         1.48E+05         11         11         10.1         0.37         0.37           Phenol (SGV)         2.02E+04         3200         2570         0.014         0.014           Arsenic (C4SL)         NVP         640         NVP           Barium         NVP         2.32E+04         1.90E+04         NVP           Boron         NVP         2.38E+05         2.82E+07         2.36E+05         NVP           Chromium (as VI) (C4SL)         NVP         410         NVP         Chromium (as VI) (C4SL)         NVP           Copper         NVP         1.89E+05         8.96E+04         6.83E+04         NVP           Copper         NVP         3600         NVP         NVP           Mercury (inorganic - SGV)         NVP         36600         NVP           Mercury (inorganic - SGV)         NVP         5550         1.12E+06         5540         NVP           Molybdenum         NVP	Tetrachloroethene	183	1.12E+04	3.78	3.78	11.7	0.041	0.041					
Vinyl Chloride (chloroethene)         1180         26.7         0.027         0.227         0.0011         0.0011           Chlorobenzene         279         1.48E+05         11         11         10.1         0.37         0.37           Phenol (SGV)         202E+04         3200         2570         0.014         0.014           Arsenic (C4SL)         NVP         640         NVP           Barium         NVP         2.22E+04         4.69E+04         1.90E+04         NVP           Boron         NVP         2.38E+05         2.82E+07         2.36E+05         NVP           Cadmium (C4SL)         NVP         410         NVP         Chromium (as VI) (C4SL)         NVP         49         NVP           Chromium (as III)         NVP         3.31E+05         8570         8570         NVP           Choronium (as III)         NVP         1.89E+05         8.96E+04         6.83E+04         NVP           Gopper         NVP         3600         NVP         NVP           Mercury (Inorganic - SGV)         NVP         36600         NVP           Mercury (leemental)         1.47         NR         2.68         2.68         1.43           Mercury (leemental) <td< th=""><th>Chloroform (Trichloromethane)</th><th>2880</th><th>2.34E+04</th><th>27.4</th><th>27.4</th><th>25</th><th>0.0041</th><th>0.49</th></td<>	Chloroform (Trichloromethane)	2880	2.34E+04	27.4	27.4	25	0.0041	0.49					
Chlorobenzene         279         1.48E+05         11         11         10.1         0.37         0.37           Phenol (SGV)         202E+04         3200         2570         0.014         0.014           Arsenic (C4SL)         NVP         640         NVP           Barium         NVP         2.22E+04         4.69E+04         1.90E+04         NVP           Boron         NVP         2.38E+05         2.82E+07         2.36E+05         NVP           Cadmium (C4SL)         NVP         410         NVP         Chromium (as III)         NVP           Chromium (as III)         NVP         3.31E+05         8570         8570         NVP           Copper         NVP         1.89E+05         8.96E+04         6.83E+04         NVP           Lead (C4SL)         NVP         3600         NVP         Mercury (inorganic - SGV)         NVP           Mercury (leemental)         1.47         NR         2.68         2.68         1.43           Mercury (inorganic - SGV)         NVP         5550         1.12E+06         5540         NVP           Molybdenum         NVP         5308         983         983         NVP           Selenium (SGV)         NVP <t< th=""><th>Vinyl Chloride (chloroethene)</th><th>1180</th><th>26.7</th><th>0.027</th><th>0.027</th><th>0.227</th><th>0.0011</th><th>0.0011</th></t<>	Vinyl Chloride (chloroethene)	1180	26.7	0.027	0.027	0.227	0.0011	0.0011					
Arsenic (C4SL)         NVP         640         NVP           Barium         NVP         2.22E+04         4.69E+04         1.90E+04         NVP           Boron         NVP         2.32E+05         2.82E+07         2.36E+05         NVP           Boron         NVP         2.38E+05         2.82E+07         2.36E+05         NVP           Cadmium (C4SL)         NVP         410         NVP           Chromium (as VI) (C4SL)         NVP         49         NVP           Chromium (as VI) (C4SL)         NVP         3.31E+05         8570         8570         NVP           Copper         NVP         1.89E+05         8.96E+04         6.83E+04         NVP           Lead (C4SL)         NVP         2330         NVP           Mercury (inorganic - SGV)         NVP         3600         NVP           Mercury (inorganic - SGV)         NVP         3600         NVP           Mercury (inorganic - SGV)         NVP         5550         1.12E+06         5540         NVP           Molybdenum         NVP         5080         983         983         NVP           Selenium (SGV)         NVP         1.30E+04         NVP         Zinc	Chlorobenzene Phenol (SGV)	279 2.02E+04	1.48E+05	3200	11	10.1	0.37	0.37					
Arsenic (C4SL)         NVP         640         NVP           Barium         NVP         2.22E+04         4.69E+04         1.90E+04         NVP           Boron         NVP         2.38E+05         2.82E+07         2.36E+05         NVP           Cadmium (C4SL)         NVP         410         NVP           Chromium (as VI) (C4SL)         NVP         49         NVP           Chromium (as III)         NVP         3.31E+05         8570         8570         NVP           Copper         NVP         1.89E+05         8.96E+04         6.83E+04         NVP           Lead (C4SL)         NVP         2330         NVP           Mercury (inorganic - SGV)         NVP         3600         NVP           Mercury (leemental)         1.47         NR         2.68         2.68         1.43           Mercury (methylated)         36         357         852         252         34.7           Molybdenum         NVP         5550         1.12E+06         5540         NVP           Selenium (SGV)         NVP         1.30E+04         NVP         XVP           Zinc         NVP         1.97E+08         7.33E+05         NVP		2.021+04		3200		2310	0.014	0.014					
Barium         NVP         2.22E+04         4.69E+04         1.90E+04         NVP           Boron         NVP         2.38E+05         2.82E+07         2.36E+05         NVP           Cadmium (C4SL)         NVP         410         NVP           Chromium (as VI) (C4SL)         NVP         49         NVP           Chromium (as III)         NVP         3.31E+05         8570         8570         NVP           Copper         NVP         1.89E+05         8.96E+04         6.83E+04         NVP           Lead (C4SL)         NVP         2330         NVP           Mercury (inorganic - SGV)         NVP         3600         NVP           Mercury (inorganic - SGV)         NVP         3600         NVP           Mercury (inorganic - SGV)         NVP         5550         1.12E+06         5540         NVP           Molybdenum         NVP         5080         983         983         NVP           Selenium (SGV)         NVP         1.30E+04         NVP         NVP           Zinc         NVP         7.35E+05         1.97E+08         7.33E+05         NVP	Arsenic (C4SL)	NVP		640		NVP							
Boron         NVP         2.38E+05         2.82E+07         2.36E+05         NVP           Cadmium (C4SL)         NVP         410         NVP           Chromium (as VI) (C4SL)         NVP         49         NVP           Chromium (as III)         NVP         3.31E+05         8570         8570         NVP           Copper         NVP         1.89E+05         8.96E+04         6.83E+04         NVP           Lead (C4SL)         NVP         2330         NVP           Mercury (inorganic - SGV)         NVP         3600         NVP           Mercury (inorganic - SGV)         NVP         3600         NVP           Mercury (inorganic - SGV)         NVP         5550         1.12E+06         5540         NVP           Molybdenum         NVP         5550         1.12E+06         5540         NVP           Selenium (SGV)         NVP         1.30E+04         NVP         NVP           Zinc         NVP         7.35E+05         1.97E+08         7.33E+05         NVP	Barium	NVP	2.22E+04	4.69E+04	1.90E+04	NVP							
NVP         40         NVP           Chromium (as VI) (C4SL)         NVP         3.31E+05         8570         NVP           Chromium (as VI)         NVP         3.31E+05         8570         NVP           Chromium (as III)         NVP         3.31E+05         8.96E+04         6.83E+04         NVP           Copper         NVP         1.89E+05         8.96E+04         6.83E+04         NVP           Lead (C4SL)         NVP         2330         NVP           Mercury (inorganic - SGV)         NVP         3600         NVP           Mercury (nethylated)         36         357         852         252         34.7           Molybdenum         NVP         5050         1.12E+06         5540         NVP           Selenium (SGV)         NVP         1.30E+04         NVP         NVP           Zinc         NVP         7.35E+05         1.97E+08         7.33E+05         NVP	Cadmium (CASL)	NVP	2.38E+05	2.82E+07 410	2.30E+05	NVP NVP							
NVP         3.31E+05         8570         8570         NVP           Copper         NVP         1.89E+05         8.96E+04         6.83E+04         NVP           Lead (C4SL)         NVP         2330         NVP           Mercury (inorganic - SGV)         NVP         3600         NVP           Mercury (inorganic - SGV)         1.47         NR         2.68         2.68         1.43           Mercury (inethylated)         36         357         852         252         34.7           Molybdenum         NVP         5550         1.12E+06         5540         NVP           Nickel         NVP         3080         983         983         NVP           Selenium (SGV)         NVP         1.30E+04         NVP         XVP	Chromium (as VI) (C4SL)	NVP		49		NVP							
NVP         1.89E+05         8.96E+04         6.83E+04         NVP           Lead (C4SL)         NVP         2330         NVP           Mercury (inorganic - SGV)         NVP         3600         NVP           Mercury (elemental)         1.47         NR         2.68         1.43           Mercury (methylated)         36         357         852         252         34.7           Molybdenum         NVP         5550         1.12E+06         5540         NVP           Nickel         NVP         3080         983         983         NVP           Selenium (SGV)         NVP         1.30E+04         NVP           Zinc         NVP         7.35E+05         1.97E+08         7.33E+05         NVP	Chromium (as III)	NVP	3.31E+05	8570	8570	NVP							
Lead (C4SL)         NVP         2330         NVP           Mercury (inorganic - SGV)         NVP         3600         NVP           Mercury (elemental)         1.47         NR         2.68         1.43           Mercury (methylated)         36         357         852         252         34.7           Molybdenum         NVP         5550         1.12E+06         5540         NVP           Nickel         NVP         3080         983         983         NVP           Selenium (SGV)         NVP         1.30E+04         NVP           Zinc         NVP         7.35E+05         1.97E+08         7.33E+05         NVP	Copper	NVP	1.89E+05	8.96E+04	6.83E+04	NVP							
Mercury (inorganic - SGV)         NVP         3600         NVP           Mercury (elemental)         1.47         NR         2.68         1.43           Mercury (methylated)         36         357         852         252         34.7           Molybdenum         NVP         5550         1.12E+06         5540         NVP           Nickel         NVP         3080         983         983         NVP           Selenium (SGV)         NVP         1.30E+04         NVP           Zinc         NVP         7.35E+05         1.97E+08         7.33E+05         NVP	Lead (C4SL)	NVP		2330		NVP							
Immercury (elementar)         1.47         IVK         2.68         2.68         1.43           Mercury (methylated)         36         357         852         252         34.7           Molybdenum         NVP         5550         1.12E+06         5540         NVP           Nickel         NVP         3080         983         983         NVP           Selenium (SGV)         NVP         1.30E+04         NVP           Zinc         NVP         7.35E+05         1.97E+08         7.33E+05         NVP	Mercury (inorganic - SGV)	NVP		3600	0.00	NVP							
Note         NVP         5550         1.12E+06         5540         NVP           Nickel         NVP         3080         983         983         NVP           Selenium (SGV)         NVP         1.30E+04         NVP           Zinc         NVP         7.35E+05         1.97E+08         7.33E+05         NVP	Mercury (elemental)		357	∠.08 852	∠.08 252	34.7							
Nickel         NVP         3080         983         983         NVP           Selenium (SGV)         NVP         1.30E+04         NVP           Zinc         NVP         7.35E+05         1.97E+08         7.33E+05         NVP	Molvbdenum	NVP	5550	1.12E+06	5540	NVP							
Selenium (SGV)         NVP         1.30E+04         NVP           Zinc         NVP         7.35E+05         1.97E+08         7.33E+05         NVP	Nickel	NVP	3080	983	983	NVP							
Zinc NVP 7.35E+05 1.97E+08 7.33E+05 NVP	Selenium (SGV)	NVP		1.30E+04		NVP							
	Zinc	NVP	7.35E+05	1.97E+08	7.33E+05	NVP							

Notes: Where combined GAC is greater t	than the theoretical maximum concentration in soil (1kg per kg), 1.0E+06 mg/kg presented as GAC
Italics	Target exceeds theoretical soil saturation limit. Concentrations above the soil saturation limit may indicate the presence of separate phase in
	soil, but does not necessarily present a significant risk
NR	No appropriate reference dose identified during review of toxicological data
#	No GAC for individual TPH fractions given that the compliance criteria is for sum TPH
na	Comprises multiple contaminants - no GAC derived
-	No water quality standard identified as suitable for deriving generic assessment criteria
C4SL	Category Four Screening Level, adopted from The Companion Document to SP1010, DEFRA 2014
NVP	Contaminant has only a low vapour pressure in soil
Metals/inorganics	Inhalation exposure via dust inhalation only
ND	Results of modelling indicates pathway not considered to present a significant risk
	No GAC as potential for leaching commonly linked to the soil pH/cannot be readily modelled

ARCADIS Design & Consultancy for natural and built assets

ARCADIS GENERIC ASSESSMENT CRITERIA FOR GROUNDWATER											
- COMMERCIAL END USE -											
	Human Hea	alth - Commercial	Water R	esources							
Compound	Commercial	Neighbouring Resident	Surface Waters	Aquifers							
	µg/l	µg/l	µg/l	µg/l							
Benzene	5.70E+04	1010	10	1							
Toluene	>SOL	>SOL	74	700							
Ethylbenzene	>SOL	5.87E+04	20	300							
Xylenes	>SOL	6.76E+04	30	500							
MTBE	2.40E+07	6.76E+04	15	15							
ETBE	2.00E+06	3.80E+04	47	47							
ТВА	1.00E+08	1.96E+06	12	12							
Aliphatic >C5-6	>SOL	>SOL	#	#							
Aliphatic>C6-8	>SOL	>SOL	#	#							
Aliphatic>C8-10	>SOL	>SOL	#	#							
Aliphatic>C10-12	>SOL	>SOL	#	#							
Aliphatic>C12-16	>SOL	>SOL	#	#							
Aliphatic>C16-35		NR	#	#							
Aromatic >C5-C7 (as benzene)	5.70E+04	1010	74	700							
Aromatic >C8-10	>30L	>SOL 1 15E±04	<u>/4</u>	/00							
Aromatic >C10-12	>SOL	9490	#	#							
Aromatic >C12-16	>30L	 >SOI	#	#							
Aromatic >C16-21	NR	NR	#	#							
Aromatic >C21-35	NR	NR	#	#							
ТРН	na	na	10	10							
Naphthalene	>SOI	4110	2	2							
Acenaphthylene	>SOL	>SOL									
Acenaphthene	>SOL	>SOL	-	-							
Fluorene	>SOL	>SOL	-	-							
Phenanthrene	>SOL	>SOL	-	-							
Anthracene	>SOL	>SOL	-	-							
Fluoranthene	>SOL	>SOL	-	-							
Pyrene	>SOL	>SOL	-	-							
Benzo(a)anthracene	>SOL	>SOL	-	-							
Chrysene	>SOL	>SOL	-	-							
Benzo(b)fluoranthene	>SOL	>SOL	-	0.025							
Benzo(k)fluoranthene	>SOL	>SOL	-	0.025							
Benzo(a)pyrene	>SUL	>SOL	0.00017	0.01							
Dibonzo(ab)onthracono	>30L	>30L	-	0.025							
Benzo(ahi)pervlene	>50L	>SOL	-	0.025							
Donzo(gri)poryiono	2002	FOOL		0.020							
Dichloroethane (1,1)	1.60E+06	3.33E+04	2.7	2.7							
Dichloroethane (1,2)	3600	69.8	10	3							
Trichloroethane (111)	>SOL	2.97E+05	100	2000							
Dichloroethene (1,1)	7.40E+05	1.42E+04	140	7							
Dichloroethene (cis 1,2)	1.20E+05	2240	25	25							
Triebloroothono	4.30E+05	274	20	25							
Tetrachloroethene	1.30E+04	214	10	10							
Chloroform (Trichloromethane)	8 20E+05	1 54E+04	25	300							
Vinyl Chloride (chloroethene)	5000	108	0.5	0.5							
Chlorobenzene	1.30E+05	2850	100	100							
Phenol	>SOL	1.42E+06	7.7	7.7							
Arsenic (inorganic)	NVP	NVP	50	10							
Barium	NVP	NVP	700	700							
Boron	NVP	NVP	2000	1000							
Cadmium	NVP	NVP	0.08 - 0.25	5							
Chromium (as VI)	NVP	NVP	3.4	50							
Chromium (as III)	NVP	NVP	4.7	50							
Copper	NVP	NVP	1	2000							
Lead	NVP	NVP	1.2	10							
Mercury (inorganic)	NVP	NVP									
Mercury (elemental)	>SOL	9.7	0.05	1							
Mercury (methylated)	>SOL	1.90E+04									
Molybdenum	NVP	NVP	70	70							
	NVP	NVP	4	20							
Selenium	NVP	NVP	10	10							
ZINC	NVP	NVP	12.1 '	3000							

Notes: >SOL NR #

na

NVP

Target acceptable risk not exceeded at theoretical solubility concentration No appropriate inhalation reference dose identified during review of toxicological data No GAC for individual TPH fractions given that the compliance criteria is for sum TPH Comprises multiple contaminants - no GAC derived

No water quality standard identified as suitable for deriving generic assessment criteria Contaminant has low vapour pressure in groundwater

Adjusted to account for background concentrations



Geo-Environmental Phase 2 Site Investigation





### Waste Classification Report



# Job name Pioneer Park Description/Comments Asbestos detected in 4 samples but <0.1% when quantified. Sample tested for SVOCs and VOCs, all <LOD except those entered. Analysis for glycol suite undertaken on samples WS103 (0.6) and WS106 (0.5) but <LOD. Project Pioneer Park Site Leicester

#### Waste Stream Template

Pioneer Park

#### **Classified by**

Name: Simon Hay Date: 23/02/2018 09:58:09 UTC Telephone: 01638 674564 Company: Arcadis Consulting (UK) Ltd 3rd Floor, Charter House 62-68 Hills Road Cambridge CB2 1LA

#### Report

Created by: Simon Hay Created date: 23/02/2018 09:58 UTC

#### Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP102	0.30	Non Hazardous		3
2	TP104	0.30	Non Hazardous		6
3	TP105	0.10	Non Hazardous		9
4	TP107	0.50	Non Hazardous		12
5	TP108	0.60	Non Hazardous		15
6	TP109	0.50	Non Hazardous		18
7	TP110	1.60	Non Hazardous		21
8	TP111	0.30	Non Hazardous		24
9	TP113	0.90	Non Hazardous		27
10	WS101	0.30-0.40	Non Hazardous		30
11	WS103	0.60-0.70	Non Hazardous		33
12	WS106	0.50-0.60	Non Hazardous		35

Appendices	Page
Appendix A: Classifier defined and non CLP deter	ninands 38





Appendices	Page
Appendix B: Rationale for selection of metal species	40
Appendix C: Version	41



Non Hazardous Waste Classified as 17 05 04 in the List of Waste	
<u>.</u>	

#### Sample details

Sample Name:	LoW Code:	
TP102	Chapter:	17: Construction and Demolition Wastes (including excavated soil
Sample Depth:		from contaminated sites)
0.30 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
		03)

#### **Hazard properties**

None identified

#### Determinands

#		Determinand           CLP index number         EC Number         CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	AC Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide } 033-003-00-0 215-481-4 1327-53-3		15.1 mg/kg	1.32	19.937 mg/kg	0.00199 %	2	
2	4	barium { • barium sulfate }		163 mg/kg	1.7	277.021 mg/kg	0.0277 %		
3	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 1304-56-9		1.7 mg/kg	2.775	4.718 mg/kg	0.000472 %		
4	4	boron { boron tribromide/trichloride/trifluoride (combined) } 10294-33-4, 10294-34-5, 7637-07-2	-	5.6 mg/kg	13.43	75.208 mg/kg	0.00752 %		
5	4	cadmium { cadmium sulfide } 048-010-00-4 215-147-8 1306-23-6	1	0.5 mg/kg	1.285	0.643 mg/kg	0.00005 %		
6	4	chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 1308-38-9	_	56.8 mg/kg	1.462	83.016 mg/kg	0.0083 %		
7	4	chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 215-607-8 1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<lod< td=""></lod<>
8	4	copper { <sup>a</sup> dicopper oxide; copper (I) oxide } 029-002-00-X 215-270-7 1317-39-1	_	43 mg/kg	1.126	48.413 mg/kg	0.00484 %		
9	4	lead { I lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	137 mg/kg		137 mg/kg	0.0137 %		
10	4	nickel { nickel(II) carbonate } 028-010-00-0 222-068-2 [1] 3333-67-3 [1] 240-408-8 [2] 16337-84-1 [2] 265-748-4 [3] 65405-96-1 [3] 235-715-9 [4] 12607-70-4 [4]		20.5 mg/kg	2.022	41.459 mg/kg	0.00415 %		
11	4	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<lod< th=""></lod<>



#			Determinand	CAS Number	P Note	User entere	d data	Conv. Factor	Compound	conc.	Classification value	C Applied	Conc. Not Used
		CLP Index number	EC Number	CAS Number	5							ž	
12	4	vanadium { divanad	dium pentaoxide; va	anadium pentoxide }		31	mg/kg	1.785	55.341	mg/kg	0.00553 %		
-	•	023-001-00-8	215-239-8	1314-62-1									
13	~	030-013-00-7	215-222-5	1314-13-2		143	mg/kg	1.245	177.994	mg/kg	0.0178 %		
14	æ	mercury { mercury	dichloride }			0.1		1 252	0.425		0.0000125.0/		
14		080-010-00-X	231-299-8	7487-94-7		0.1	тід/кд	1.353	0.135	тід/кд	0.0000135 %		
15		naphthalene				< 0.04	ma/ka		<0.04	ma/ka	<0.000004 %		<lod< th=""></lod<>
		601-052-00-2	202-049-5	91-20-3									
16	۲	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<lod< th=""></lod<>
			205-917-1	208-96-8	-								
17	8	acenaphthene	201-469-6	83-32-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<lod< th=""></lod<>
		fluorene	201-403-0	05-52-5								Н	
18			201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
10	8	phenanthrene				0.00			0.00		0.000000.0/		1.00
19		·	201-581-5	85-01-8		<0.03	mg/kg		<0.03	тд/кд	<0.000003 %		<lod< th=""></lod<>
20	8	anthracene				<0.04	ma/ka		<0.04	ma/ka	<0.000004.9%		
20			204-371-1	120-12-7		<0.04	iiig/kg			iiig/kg	<0.000004 /8		
21		fluoranthene				0.1	ma/ka		0.1	ma/ka	0.00001 %		
			205-912-4	206-44-0									
22	۲	pyrene				0.1	mg/kg		0.1	mg/kg	0.00001 %		
		h f - ] + h	204-927-3	129-00-0									
23		benzolajanthracen	e	E6 EE 2		0.07	mg/kg		0.07	mg/kg	0.000007 %		
-		chrysene	200-280-0	po-55-5									
24		601-048-00-0	205-923-4	218-01-9		0.07	mg/kg		0.07	mg/kg	0.000007 %		
		benzolblfluoranthe	ne	F10 01 0									
25		601-034-00-4	205-911-9	205-99-2		0.08	mg/kg		0.08	mg/kg	0.000008 %		
26		benzo[k]fluoranthe	ne	1		0.03	ma/ka		0.03	ma/ka	0.000003 %		
20		601-036-00-5	205-916-6	207-08-9		0.03	шу/ку		0.03	шу/ку	0.000003 /8		
27		benzo[a]pyrene; be	enzo[def]chrysene			0.06	ma/ka		0.06	ma/ka	0.000006 %		
		601-032-00-3	200-028-5	50-32-8									
28	۲	indeno[123-cd]pyre	ene	100.00 5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
-		dihanala hlanthraa	205-893-2	193-39-5	-							H	
29				53 70 3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
-	_	benzo[abi]nervlene	200-161-6	p3-70-3								Н	
30	۲	benzolgnijperviene	205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
		tert-butyl methyl et	her; MTBE;	1.2								H	
31		2-methoxy-2-methy	/lpropane			<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
		603-181-00-X	216-653-1	1634-04-4									
32		benzene		<b></b>		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
<u> </u>		601-020-00-8	200-753-7	/1-43-2	-							Н	
33		601-021-00-2	203-625 0	108-88 3		<0.005	mg/kg		<0.005	mg/kg	<0.000005 %		<lod< th=""></lod<>
		ethylbenzene	203-625-9	108-88-3	-							Н	
34	۲	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.000005 %		<lod< th=""></lod<>
		o-xylene; [1] p-xyle	ne; [2] m-xylene; [3	3] xylene [4]								H	
		601-022-00-9	202-422-2 [1]	95-47-6 [1]									
35			203-396-5 [2]	106-42-3 [2]		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
			203-576-3 [3] 215-535-7 [4]	1330-20-7 [4]									
20		TPH (C6 to C40) p	etroleum group			40	m ~//		40	mc//	0.0040.%	П	
30				TPH		49	ту/кд		49	пу/кд	0.0049 %		
		asbestos											
		650-013-00-6		12001-28-4	1								
37				12172-73-5		<1000	ma/ka		<1000	ma/ka	<0.1 %		
				77536-66-4		1000	ing/kg		<1000	ing/kg			~200
				17536-68-6 77536-67-5									
				12001-29-5									





#		Determinand			User entered data	Conv. Factor	Compound conc.	Classification value	Applied	Conc. Not Used	
		CLP index number EC Number CA	CAS Number	CLP					MC /		
	Total: 0.197 %										

- 1	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
0	Determinand defined or amended by HazWasteOnline (see Appendix A)
æ <mark>i</mark>	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<lod< th=""><th>Below limit of detection</th></lod<>	Below limit of detection

CLP: Note 1 Only the metal concentration has been used for classification

#### **Supplementary Hazardous Property Information**

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

#### Force this Hazardous property to non hazardous because No free phase observed

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0049%)



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

#### Sample details

Sample Name:	LoW Code:	
TP104	Chapter:	17: Construction and Demolition Wastes (including excavated soil
Sample Depth:		from contaminated sites)
0.30 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
		03)

#### Hazard properties

None identified

#### Determinands

#		Determinand CLP index number EC Number CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide } 033-003-00-0 215-481-4 1327-53-3		12.7 mg/kg	1.32	16.768 mg/kg	0.00168 %		
2	4	barium { • barium sulfate } 231-784-4 7727-43-7		123 mg/kg	1.7	209.041 mg/kg	0.0209 %		
3	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 1304-56-9		1.2 mg/kg	2.775	3.33 mg/kg	0.000333 %		
4	4	boron { • boron tribromide/trichloride/trifluoride (combined) } 10294-33-4, 10294-34-5, 7637-07-2		1.5 mg/kg	13.43	20.145 mg/kg	0.00201 %		
5	4	cadmium {	1	0.1 mg/kg	1.285	0.129 mg/kg	0.00001 %		
6	4	chromium in chromium(III) compounds { Chromium(III) oxide }		38.5 mg/kg	1.462	56.27 mg/kg	0.00563 %		
7	4	chromium in chromium(VI) compounds { chromium(VI)           oxide }           024-001-00-0         215-607-8         1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<lod< th=""></lod<>
8	4	copper { <sup>e</sup> dicopper oxide; copper (I) oxide } 029-002-00-X 215-270-7 1317-39-1		33 mg/kg	1.126	37.154 mg/kg	0.00372 %		
9	4	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	18 mg/kg		18 mg/kg	0.0018 %		
10	4	nickel { nickel(II) carbonate } 028-010-00-0 222-068-2 [1] 3333-67-3 [1] 240-408-8 [2] 16337-84-1 [2] 265-748-4 [3] 65405-96-1 [3] 235-715-9 [4] 12607-70-4 [4]		28 mg/kg	2.022	56.628 mg/kg	0.00566 %		
11	4	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<lod< th=""></lod<>



#		CLP index number	Determinand		P Note	User entered	d data	Conv. Factor	Compound conc.		Classification value	C Applied	Conc. Not Used
		CLP Index number	EC Number	CAS Number	5							ž	
12	4	vanadium { divana	dium pentaoxide; va	anadium pentoxide }	-	48	mg/kg	1.785	85.689	mg/kg	0.00857 %		
40	æ	zinc { zinc oxide }	215-255-0	1314-02-1		74		4.045	00.400		0.00001.0/		
13	~	030-013-00-7	215-222-5	1314-13-2		/4	mg/кg	1.245	92.109	тg/кg	0.00921 %		
14	4	mercury { mercury	dichloride }			<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<lod< th=""></lod<>
		080-010-00-X	231-299-8	7487-94-7								-	
15		601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
10		acenaphthylene	F02 010 0	0.200	1	.0.02			-0.02		-0.000003.0/		
10			205-917-1	208-96-8		<0.03	тід/кд		<0.03	тід/кд	<0.000003 %		<lod< th=""></lod<>
17	•	acenaphthene		laa		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<lod< th=""></lod<>
		fluorono	201-469-6	83-32-9	-							-	
18	8		201-695-5	86-73-7	-	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
10		phenanthrene				0.08	ma/ka		0.08	ma/ka	0.00008 %		
13			201-581-5	85-01-8		0.00	iiig/kg		0.00	шу/ку	0.000000 //		
20	0	anthracene		100 10 7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
		fluoranthene	204-371-1	120-12-7	-							-	
21			205-912-4	206-44-0	-	0.14	mg/kg		0.14	mg/kg	0.000014 %		
22		pyrene	,			0.13	ma/ka		0.13	ma/ka	0.000013 %		
			204-927-3	129-00-0	1	0.10			0.10				
23		benzo[a]anthracen				0.13	mg/kg		0.13	mg/kg	0.000013 %		
	-	chrysene	200-280-6	56-55-3	-								
24		601-048-00-0	205-923-4	218-01-9		0.07	mg/kg		0.07	mg/kg	0.000007 %		
25		benzo[b]fluoranthe	ne		1	0.09	ma/ka		0.09	ma/ka	0 000009 %		
		601-034-00-4	205-911-9	205-99-2		0.00							
26		benzo[k]fluoranthe	ne	007.00.0	_	0.04	mg/kg		0.04	mg/kg	0.000004 %		
-		benzolalovrene: be	205-916-6	207-08-9	-								
27		601-032-00-3	200-028-5	50-32-8	-	0.07	mg/kg		0.07	mg/kg	0.000007 %		
28		indeno[123-cd]pyre	ene			0.05	ma/ka		0.05	ma/ka	0 000005 %		
			205-893-2	193-39-5									
29		dibenz[a,h]anthrac	ene	F2 70 2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
		benzolahilpervlene	200-181-8	53-70-3									
30	ľ		205-883-8	191-24-2		0.05	mg/kg		0.05	mg/kg	0.000005 %		
		tert-butyl methyl et	her; MTBE;		1								
31		2-methoxy-2-methy	vlpropane	1634-04-4	-	<0.005	mg/kg		<0.005	mg/kg	<0.000005 %		<lod< th=""></lod<>
		benzene	-10 000-1	1.00- 0	+	0.005			0.007		0.000005.00		1.05
32		601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
33		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
		601-021-00-3	203-625-9	108-88-3	-							_	
34		601-023-00-4	202-849-4	100-41-4	-	<0.005	mg/kg		<0.005	mg/kg	<0.000005 %		<lod< th=""></lod<>
		o-xylene; [1] p-xyle	ene; [2] m-xylene; [3	) xylene [4]									
35		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
36		TPH (C6 to C40) p	etroleum group			-38	ma/ka		-38	ma/ka	<0.0038.%		
				TPH	1	<b>100</b>	nig/kg		<b>100</b>	mg/kg			
		asbestos	1	10001.05									
37		650-013-00-6		12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<0	mg/kg		<0	mg/kg	<0%		<lod< th=""></lod<>



#		Determinand		Note	User entered data	Conv. Factor	Compound conc.	Classification value	Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number	CLP					MC	
							Total:	0.0638 %		

1009	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
0	Determinand defined or amended by HazWasteOnline (see Appendix A)
4	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<lod< td=""><td>Below limit of detection</td></lod<>	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



💿 Non Ha	zardous Waste
Classifie	d as 17 05 04
in the L	ist of Waste
	•••••••••••••••••••••••••••••••••••••••

#### Sample details

Sample Name:	LoW Code:	
TP105	Chapter:	17: Construction and Demolition Wastes (including excavated soil
Sample Depth:		from contaminated sites)
0.10 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
		03)

#### **Hazard properties**

None identified

#### Determinands

#		CLP index number EC Number CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	AC Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide } 033-003-00-0 215-481-4 1327-53-3		8.4 mg/kg	1.32	11.091 mg/kg	0.00111 %		
2	4	barium { <sup>•</sup> barium sulfate } 231-784-4 7727-43-7		113 mg/kg	1.7	192.045 mg/kg	0.0192 %		
3	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 1304-56-9		0.8 mg/kg	2.775	2.22 mg/kg	0.000222 %		
4	4	boron {      boron tribromide/trichloride/trifluoride     (combined) }     10294-33-4,     10294-34-5,     7637-07-2	_	1.9 mg/kg	13.43	25.517 mg/kg	0.00255 %		
5	*	cadmium {	_ 1	0.3 mg/kg	1.285	0.386 mg/kg	0.00003 %		
6	*	chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 1308-38-9		39.8 mg/kg	1.462	58.17 mg/kg	0.00582 %		
7	<b>\$</b>	chromium in chromium(VI) compounds {		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<lod< th=""></lod<>
8	*	copper {	_	34 mg/kg	1.126	38.28 mg/kg	0.00383 %		
9	<b>Å</b>	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	25 mg/kg		25 mg/kg	0.0025 %		
10	4	nickel { nickel(II) carbonate } 028-010-00-0 222-068-2 [1] 3333-67-3 [1] 240-408-8 [2] 16337-84-1 [2] 265-748-4 [3] 65405-96-1 [3] 235-715-9 [4] 12607-70-4 [4]		18.7 mg/kg	2.022	37.819 mg/kg	0.00378 %		
11	*	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<lod< th=""></lod<>



#		Determinand		P Note	User entere	d data	Conv. Factor	Compound	conc.	Classification value	C Applied	Conc. Not Used
		CLP Index number EC Number	CAS Number	Ч							ž	
12	4	vanadium { divanadium pentaoxide;	vanadium pentoxide	}	43	mg/kg	1.785	76.763	mg/kg	0.00768 %		
		023-001-00-8 215-239-8	1314-62-1	+								
13	44	030-013-00-7 215-222-5	1314-13-2	-	110	mg/kg	1.245	136.919	mg/kg	0.0137 %		
	æ	mercury { mercury dichloride }	1		0.4		4.050	0.405	0	0.0000405.0/		
14	~	080-010-00-X 231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/кg	<0.0000135 %		<lod< th=""></lod<>
15		naphthalene			<0.04	ma/ka		<0.04	ma/ka	<0.000004 %		
		601-052-00-2 202-049-5	91-20-3		<b>NO.04</b>	ing/kg				<0.000004 /0		
16	۲	acenaphthylene			< 0.03	ma/ka		<0.03	ma/ka	<0.000003 %		<lod< th=""></lod<>
		205-917-1	208-96-8									
17	۲	acenaphthene			< 0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<lod< th=""></lod<>
		201-469-6	83-32-9	+								
18	۲	huorene	06 72 7	-	< 0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
	_	phenanthrene	00-73-7	+								
19	۲	201-581-5	85-01-8	-	0.12	mg/kg		0.12	mg/kg	0.000012 %		
		anthracene	00 01 0	+								
20	-	204-371-1	120-12-7		0.05	mg/kg		0.05	mg/kg	0.000005 %		
21	0	fluoranthene		Τ	0.22	ma/ka		0.22	ma/ka	0.000033.%		
21		205-912-4	206-44-0		0.33	пу/ку		0.33	iiig/kg	0.000033 /8		
22	۲	pyrene			0.32	ma/ka		0.32	ma/ka	0.000032 %		
		204-927-3	129-00-0									
23		benzo[a]anthracene			0.31	mg/kg		0.31	mg/kg	0.000031 %		
		601-033-00-9 200-280-6	56-55-3	+								
24		cnrysene	010.01.0		0.21	mg/kg		0.21	mg/kg	0.000021 %		
		benzo[b]fluoranthene	210-01-9	+								
25		601-034-00-4 205-911-9	205-99-2	-	0.32	mg/kg		0.32	mg/kg	0.000032 %		
		benzo[k]fluoranthene		+	0.40			0.40		0.000040.0/		
26		601-036-00-5 205-916-6	207-08-9		0.13	mg/kg		0.13	mg/kg	0.000013 %		
27		benzo[a]pyrene; benzo[def]chrysen	e		0.26	ma/ka		0.26	ma/ka	0.000026 %		
		601-032-00-3 200-028-5	50-32-8	0.20	iiig/kg		0.20	iiig/kg	0.000020 /8			
28	۲	indeno[123-cd]pyrene			0.2	ma/ka		0.2	ma/ka	0.00002 %		
		205-893-2	193-39-5									
29		dibenz[a,h]anthracene			< 0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
		601-041-00-2 <u>200-181-8</u>	53-70-3	-								
30	۲	benzo[gni]perviene	101 24 2		0.2	mg/kg		0.2	mg/kg	0.00002 %		
		tert-butyl methyl ether: MTBE:	191-24-2	+								
31		2-methoxy-2-methylpropane			< 0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
		603-181-00-X 216-653-1	1634-04-4									
32		benzene			< 0.005	ma/ka		<0.005	ma/ka	<0.0000005 %		<lod< th=""></lod<>
Ľ		601-020-00-8 200-753-7	71-43-2	1								
33		toluene			< 0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
		601-021-00-3 203-625-9	108-88-3	+								
34	۵	601-023-00-4 202 840 4	100-41-4	-	< 0.005	mg/kg		<0.005	mg/kg	<0.000005 %		<lod< th=""></lod<>
		0-xylene: [1] p-xylene: [2] m-xylene:	[3] xylene [4]	+								
		601-022-00-9 202-422-2 [1]	95-47-6 [1]									
35		203-396-5 [2]	106-42-3 [2]		< 0.005	mg/kg		<0.005	mg/kg	<0.000005 %		<lod< td=""></lod<>
		203-576-3 [3] 215-535-7 [4]	108-38-3 [3] 1330-20-7 [4]									
	e	TPH (C6 to C40) petroleum group	1.000 =0 / [1]	+	100			100		0.0100.01		
36	-	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	TPH	1	188	mg/kg		188	mg/kg	0.0188 %		
		asbestos	1	1								
		650-013-00-6	12001-28-4	1								
07			132207-32-0 12172-73-5		0		()					
37			77536-66-4		<0	тід/кд		<0	mg/кg	<0%		<lod< td=""></lod<>
			77536-68-6									
			12001-29-5									





#	£	Determinand			Note	User entered data	Conv. Factor	Compound conc.	Classification value	Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number	CLP				U U	MC /	
								Total:	0.0798 %		

- 1	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
0	Determinand defined or amended by HazWasteOnline (see Appendix A)
æ <mark>i</mark>	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<lod< th=""><th>Below limit of detection</th></lod<>	Below limit of detection

CLP: Note 1 Only the metal concentration has been used for classification

#### **Supplementary Hazardous Property Information**

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

#### Force this Hazardous property to non hazardous because No free phase observed

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0188%)



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

#### Sample details

Sample Name:	LoW Code:	
TP107	Chapter:	17: Construction and Demolition Wastes (including excavated soil
Sample Depth:		from contaminated sites)
0.50 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
		03)

#### Hazard properties

None identified

#### Determinands

#		Determinand CLP index number EC Number CAS Number	L D Note		User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide } 033-003-00-0 215-481-4 1327-53-3			22.4 mg/kg	1.32	29.575 mg/kg	0.00296 %		
2	4	barium { • barium sulfate } 231-784-4 7727-43-7			180 mg/kg	1.7	305.913 mg/kg	0.0306 %		
3	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 1304-56-9			1.4 mg/kg	2.775	3.885 mg/kg	0.000389 %		
4	4	boron { • boron tribromide/trichloride/trifluoride (combined) } 10294-33-4, 10294-34-5, 7637-07-2			2 mg/kg	13.43	26.86 mg/kg	0.00269 %		
5	4	cadmium {	1	1	0.3 mg/kg	1.285	0.386 mg/kg	0.00003 %		
6	4	chromium in chromium(III) compounds { Chromium( oxide }	II)		52.1 mg/kg	1.462	76.147 mg/kg	0.00761 %		
7	4	chromium in chromium(VI) compounds { chromium(VI)           oxide }           024-001-00-0         215-607-8         1333-82-0			<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<lod< th=""></lod<>
8	4	copper { <sup>@</sup> dicopper oxide; copper (I) oxide } 029-002-00-X 215-270-7 1317-39-1			23 mg/kg	1.126	25.895 mg/kg	0.00259 %		
9	4	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	1	1	39 mg/kg		39 mg/kg	0.0039 %		
10	4	nickel { nickel(II) carbonate } 028-010-00-0 222-068-2 [1] 3333-67-3 [1] 240-408-8 [2] 16337-84-1 [2] 265-748-4 [3] 65405-96-1 [3] 235-715-9 [4] 12607-70-4 [4]			22.1 mg/kg	2.022	44.695 mg/kg	0.00447 %		
11	4	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewher in this Annex } 034-002-00-8	e		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<lod< th=""></lod<>



#		Determinand	P Note	User entere	d data	Conv. Factor	Compound conc.	Classification value	C Applied	Conc. Not Used
		Vanadium (divenadium penteovide: vanadium penteovide:	5						ž	
12	~	023-001-00-8 215-239-8 1314-62-1	1	49	mg/kg	1.785	87.474 mg/kg	0.00875 %		
13	4	zinc { zinc oxide }		126	ma/ka	1 245	156 834 mg/kg	0.0157 %		
		030-013-00-7 215-222-5 1314-13-2		120		1.240		0.0107 %		
14	4	mercury { mercury dichloride }		<0.1	mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<lod< th=""></lod<>
		080-010-00-X 231-299-8 //487-94-7	-							
15		601-052-00-2 202-049-5 91-20-3		0.56	mg/kg		0.56 mg/kg	0.000056 %		
16		acenaphthylene		<0.03	ma/ka		<0.03 mg/kg	<0.00003 %		
		205-917-1 208-96-8		<0.00				<0.000000 /0		
17	۲	acenaphthene		0.34	mg/kg		0.34 mg/kg	0.000034 %		
		201-469-6 83-32-9 fluorene								
18		201-695-5 86-73-7	-	0.21	mg/kg		0.21 mg/kg	0.000021 %		
10		phenanthrene		1.67	ma/ka		1.67 mg/kg	0.000167.%		
19		201-581-5 85-01-8		1.07	iiig/kg		1.07 Hig/kg	0.000107 /8		
20	۲	anthracene		0.42	mg/kg		0.42 mg/kg	0.000042 %		
<u> </u>		204-371-1 120-12-7	_							
21		205-912-4 206-44-0		2.22	mg/kg		2.22 mg/kg	0.000222 %		
22		pyrene		21	ma/ka		2.1 mg/kg	0.00021 %		
		204-927-3 129-00-0		2.1				0.00021 //		
23		benzo[a]anthracene		1.13	mg/kg		1.13 mg/kg	0.000113 %		
		601-033-00-9 200-280-6 56-55-3	-							
24		601-048-00-0 205-923-4 218-01-9		1.18	mg/kg		1.18 mg/kg	0.000118 %		
25		benzo[b]fluoranthene		1 1 1			1.44 malle	0.000144.8/		
25		601-034-00-4 205-911-9 205-99-2	_	1.44	тід/кд		1.44 mg/kg	0.000144 %		
26		benzo[k]fluoranthene		0.56	mg/kg		0.56 mg/kg	0.000056 %		
<u> </u>		601-036-00-5 205-916-6 207-08-9	-							
27		601-032-00-3 200-028-5 50-32-8	_	1.08	mg/kg		1.08 mg/kg	0.000108 %		
	o indeno[123-cd]pvrene			0.75						
28		205-893-2 193-39-5		0.75	mg/ĸg		0.75 mg/kg	0.000075 %		
29		dibenz[a,h]anthracene		0.17	mg/kg		0.17 mg/kg	0.000017 %		
		601-041-00-2 200-181-8 53-70-3	-							
30	•	205-883-8 191-24-2		0.84	mg/kg		0.84 mg/kg	0.000084 %		
		tert-butyl methyl ether; MTBE;								
31		2-methoxy-2-methylpropane		<0.005	mg/kg		<0.005 mg/kg	<0.000005 %		<lod< td=""></lod<>
<u> </u>	_	603-181-00-X 216-653-1 1634-04-4	-						-	
32		601-020-00-8 200-753-7 71-43-2	_	<0.005	mg/kg		<0.005 mg/kg	<0.000005 %		<lod< td=""></lod<>
		toluene	-	0.005			0.005	0.000005.00		1.00
33		601-021-00-3 203-625-9 108-88-3		< 0.005	mg/kg		<0.005 mg/kg	<0.0000005 %		<lod< td=""></lod<>
34	۲	ethylbenzene		< 0.005	ma/ka		<0.005 ma/ka	<0.000005 %		<lod< th=""></lod<>
		601-023-00-4 202-849-4 100-41-4								-
		0-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]								
35		203-396-5 [2] 106-42-3 [2]		<0.005	mg/kg		<0.005 mg/kg	<0.000005 %		<lod< td=""></lod<>
		203-576-3 [3] 108-38-3 [3] 215-535-7 [4] 1330-20-7 [4]								
00		TPH (C6 to C40) petroleum group	+	100			100 "	0.0100.0/		
36		TPH		199	mg/kg		199 mg/kg	0.0199 %		
		asbestos								
		650-013-00-6 12001-28-4 132207-32-0								
37		12172-73-5		<0	mg/kg		<0 mg/kg	<0%		<lod< td=""></lod<>
		77536-66-4 77536-68-6								
		77536-67-5								
		12001-29-5								



#		Determinand		Note	User entered data	Conv. Factor	Compound conc.	Classification value	Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number	CLP					MC /	
							Total:	0.101 %		

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
Θ	Determinand defined or amended by HazWasteOnline (see Appendix A)
4	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<lod< th=""><th>Below limit of detection</th></lod<>	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

#### **Supplementary Hazardous Property Information**

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

Force this Hazardous property to non hazardous because No free phase observed

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0199%)



💿 Non Ha	zardous Waste
Classifie	d as 17 05 04
in the L	ist of Waste
	•••••••••••••••••••••••••••••••••••••••

#### Sample details

Sample Name:	LoW Code:	
TP108	Chapter:	17: Construction and Demolition Wastes (including excavated soil
Sample Depth:		from contaminated sites)
0.60 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
		03)

#### **Hazard properties**

None identified

#### Determinands

#		Determinand           CLP index number         EC Number         CAS Number	LP Note	User entered data	Conv. Factor	Compound conc.	Classification value	1C Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide } 033-003-00-0 215-481-4 1327-53-3		33.7 mg/kg	1.32	44.495 mg/kg	0.00445 %	2	
2	4	barium { <sup>•</sup> barium sulfate } 231-784-4 7727-43-7	_	117 mg/kg	1.7	198.844 mg/kg	0.0199 %		
3	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 1304-56-9		1.4 mg/kg	2.775	3.885 mg/kg	0.000389 %		
4	4	boron {      boron tribromide/trichloride/trifluoride     (combined) }     [10294-33-4,     10294-34-5,     7637-07-2	_	0.6 mg/kg	13.43	8.058 mg/kg	0.000806 %		
5	4	cadmium {	1	<0.1 mg/kg	1.285	<0.129 mg/kg	<0.00001 %		<lod< td=""></lod<>
6	4	chromium in chromium(III) compounds { chromium(III) oxide }		57.3 mg/kg	1.462	83.747 mg/kg	0.00837 %		
7	4	chromium in chromium(VI) compounds { chromium(VI)           oxide }           024-001-00-0         215-607-8         1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<lod< td=""></lod<>
8	4	copper {		<1 mg/kg	1.126	<1.126 mg/kg	<0.000113 %		<lod< td=""></lod<>
9	4	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	18 mg/kg		18 mg/kg	0.0018 %		
10	4	nickel { nickel(II) carbonate } 028-010-00-0 222-068-2 [1] 3333-67-3 [1] 240-408-8 [2] 16337-84-1 [2] 265-748-4 [3] 65405-96-1 [3] 235-715-9 [4] 12607-70-4 [4]		25.6 mg/kg	2.022	51.774 mg/kg	0.00518 %		
11	4	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<lod< td=""></lod<>



#		Determinand	CAS Number	P Note	User entered	l data	Conv. Factor	Compound	conc.	Classification value	C Applied	Conc. Not Used
		CLP Index number EC Number	CAS Number	Ч							ž	
12	4	vanadium { divanadium pentaoxide; var	nadium pentoxide }		64	mg/kg	1.785	114.252	mg/kg	0.0114 %		
	-	23-001-00-8 $213-239-8$	1314-02-1								$\square$	
13	•••	030-013-00-7 215-222-5	1314-13-2		79	mg/kg	1.245	98.332	mg/kg	0.00983 %		
14	æ	mercury { mercury dichloride }			-0.1	ma/ka	1 252	<0.125	ma/ka	<0.0000135.%		
14	_	080-010-00-X 231-299-8	7487-94-7		<0.1	iiig/kg	1.555	<0.135	my/ky	<0.0000135 /8		<lod< th=""></lod<>
15		naphthalene			<0.04	ma/ka		<0.04	ma/ka	<0.000004 %		<lod< th=""></lod<>
		601-052-00-2 202-049-5	91-20-3									
16	۲	acenaphthylene	000.00.0		0.04	mg/kg		0.04	mg/kg	0.000004 %		
		205-917-1	208-96-8								$\square$	
17	۲	201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<lod< th=""></lod<>
		fluorene	00 02 0								$\square$	
18		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
10	8	phenanthrene			0.26	ma/ka		0.26	ma/ka	0.000026.%		
19		201-581-5	85-01-8		0.20	тту/ку		0.20	тту/ку	0.000020 %		
20	8	anthracene			0.16	ma/ka		0.16	ma/ka	0.000016 %		
20		204-371-1	120-12-7		0.10			0.10		0.000010 /0		
21	۲	fluoranthene		ļ	0.86	mg/kg		0.86	mg/kg	0.000086 %		
		205-912-4	206-44-0									
22	۲	pyrene	100.00.0		0.87	mg/kg		0.87	mg/kg	0.000087 %		
		204-927-3	129-00-0								$\square$	
23		601-033-00-9 200-280-6	56-55-3		0.53	mg/kg		0.53	mg/kg	0.000053 %		
	_	chrysene	00 00 0									
24		601-048-00-0 205-923-4	218-01-9		0.49	mg/kg		0.49	mg/kg	0.000049 %		
25		benzo[b]fluoranthene			0.95			0.95		0.000085.8/		
25		601-034-00-4 205-911-9	205-99-2		0.85	тід/кд		0.85	тід/кд	0.000085 %		
26		benzo[k]fluoranthene			0.33	ma/ka		0 33	ma/ka	0.000033 %		
20		601-036-00-5 205-916-6	207-08-9		0.55	iiig/kg		0.00	iiig/kg	0.000033 /8		
27		benzo[a]pyrene; benzo[def]chrysene			0.64	ma/ka		0.64	ma/ka	0.000064 %		
		601-032-00-3 200-028-5	50-32-8									
28	۲	indeno[123-cd]pyrene			0.46	mg/kg		0.46	mg/kg	0.000046 %		
		205-893-2	193-39-5									
29		dibenz[a,njantnracene	53 70 3		0.09	mg/kg		0.09	mg/kg	0.000009 %		
	_	benzo[ghi]pervlene	55-70-5									
30	۲	205-883-8	191-24-2		0.43	mg/kg		0.43	mg/kg	0.000043 %		
	_	tert-butyl methyl ether; MTBE;										
31		2-methoxy-2-methylpropane			<0.002	mg/kg		<0.002	mg/kg	<0.000002 %		<lod< th=""></lod<>
		603-181-00-X 216-653-1	1634-04-4									
32		benzene			<0.003	mg/kg		<0.003	mg/kg	<0.000003 %		<lod< th=""></lod<>
		601-020-00-8 200-753-7	71-43-2								$\square$	
33			100.00.0		< 0.003	mg/kg		<0.003	mg/kg	<0.000003 %		<lod< th=""></lod<>
-	_	pu1-u21-uu-3 203-625-9	100-00-3								$\vdash$	
34	۲	601-023-00-4 202-849-4	100-41-4		<0.003	mg/kg		<0.003	mg/kg	<0.000003 %		<lod< th=""></lod<>
		o-xylene: [1] p-xylene: [2] m-xylene: [3]	xvlene [4]								$\square$	
		601-022-00-9 202-422-2 [1]	95-47-6 [1]									
35		203-396-5 [2]	106-42-3 [2]		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
		203-576-3 [3] 215-535-7 [4]	108-38-3 [3] 1330-20-7 [4]									
	0	TPH (C6 to C40) petroleum group	· • • • • • • • • • • • • • • • • • • •		00			0.0		0.0000.01	H	
36	-		TPH		<38	mg/kg		<38	mg/kg	<0.0038 %		<lod< th=""></lod<>
		asbestos										
37		650-013-00-6	12001-28-4									
			132207-32-0 12172-73-5		-0	m c // -		.0		-09/		1.00
			77536-66-4		<0	тід/кд		<0	mg/кg	<0%		<lod< th=""></lod<>
			77536-68-6									
			12001-29-5									





#		CLP index number	Determinand	CAS Number	P Note	User entered data	Conv. Factor	Compound conc.	Classification value	C Applied	Conc. Not Used
			LC Nulliber	CAS Number	Ы					M	
38	8	carbazole				0.04 ma/ka		0.04 ma/ka	0.000004 %		
			201-696-0	86-74-8		oro i mg/ng		····g···g			
	Total:								0.067 %		

ittey	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
0	Determinand defined or amended by HazWasteOnline (see Appendix A)
4	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<lod< td=""><td>Below limit of detection</td></lod<>	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

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

#### Sample details

Sample Name:	LoW Code:	
TP109	Chapter:	17: Construction and Demolition Wastes (including excavated soil
Sample Depth:		from contaminated sites)
0.50 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
		03)

#### Hazard properties

None identified

#### Determinands

#		Determinand CLP index number EC Number CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide } 033-003-00-0 215-481-4 1327-53-3		18.4 mg/kg	1.32	24.294 mg/kg	0.00243 %		
2	4	barium { • barium sulfate } 231-784-4 7727-43-7		211 mg/kg	1.7	358.598 mg/kg	0.0359 %		
3	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 1304-56-9		2 mg/kg	2.775	5.551 mg/kg	0.000555 %		
4	4	boron { • boron tribromide/trichloride/trifluoride (combined) } 10294-33-4, 10294-34-5, 7637-07-2		1.3 mg/kg	13.43	17.459 mg/kg	0.00175 %		
5	4	cadmium {	1	0.2 mg/kg	1.285	0.257 mg/kg	0.00002 %		
6	4	chromium in chromium(III) compounds { Chromium(III) oxide }		60 mg/kg	1.462	87.693 mg/kg	0.00877 %		
7	4	chromium in chromium(VI) compounds { chromium(VI)           oxide }           024-001-00-0         215-607-8         1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<lod< th=""></lod<>
8	4	copper { <sup> </sup>		36 mg/kg	1.126	40.532 mg/kg	0.00405 %		
9	4	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	56 mg/kg		56 mg/kg	0.0056 %		
10	4	nickel { nickel(II) carbonate } 028-010-00-0 222-068-2 [1] 3333-67-3 [1] 240-408-8 [2] 16337-84-1 [2] 265-748-4 [3] 65405-96-1 [3] 235-715-9 [4] 12607-70-4 [4]		25.2 mg/kg	2.022	50.965 mg/kg	0.0051 %		
11	4	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<lod< th=""></lod<>



#		Determinand CLP index number EC Number CAS Number	LP Note	User entered	d data	Conv. Factor	Compound co	onc.	Classification value	C Applied	Conc. Not Used
	-	vanadium { divanadium pentaoxide; vanadium pentoxide }	Ū							Σ	
12	~	023-001-00-8 215-239-8 1314-62-1	-	50	mg/kg	1.785	89.259	mg/kg	0.00893 %		
13	4	zinc { zinc oxide }		100	ma/ka	1 245	124 471	ma/ka	0 0124 %		
		030-013-00-7 215-222-5 1314-13-2	_								
14	4	mercury { mercury dichloride }		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<lod< th=""></lod<>
<u> </u>		naphthalene	+								
15		601-052-00-2 202-049-5 91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
16		acenaphthylene		0.14	ma/ka		0.14	ma/ka	0.000014 %		
		205-917-1 208-96-8	]				-				
17	8	201-469-6 83-32-9	-	0.28	mg/kg		0.28	mg/kg	0.000028 %		
		fluorene		0.40			0.40		0.000040.00		
18		201-695-5 86-73-7		0.19	mg/ĸg		0.19	mg/kg	0.000019 %		
19	8	phenanthrene		2.78	mg/kg		2.78	mg/kg	0.000278 %		
		201-581-5 85-01-8	-								
20	8	204-371-1 120-12-7	-	1.4	mg/kg		1.4	mg/kg	0.00014 %		
24		fluoranthene	+	7.0	melle		7.6	malle	0.00076.0/		
21		205-912-4 206-44-0		7.0	тід/кд		7.0	тід/кд	0.00076 %		
22	0	pyrene		6.49	mg/kg		6.49	mg/kg	0.000649 %		
		204-927-3 [129-00-0	+								
23		601-033-00-9 200-280-6 56-55-3	-	4.16	mg/kg		4.16	mg/kg	0.000416 %		
24		chrysene		3 36	ma/ka		3 36	ma/ka	0.000336 %		
27		601-048-00-0 205-923-4 218-01-9		0.00			0.00	ing/kg	0.000000 /0		
25		benzo[b]fluoranthene	_	4.27	mg/kg		4.27	mg/kg	0.000427 %		
-		benzoľkifluoranthene									
26		601-036-00-5 205-916-6 207-08-9	-	1.66	mg/kg		1.66	mg/kg	0.000166 %		
27		benzo[a]pyrene; benzo[def]chrysene		3.39	ma/ka		3.39	ma/ka	0.000339 %		
_		601-032-00-3 200-028-5 50-32-8	]								
28	•	Indeno[123-cd]pyrene		2.38	mg/kg		2.38	mg/kg	0.000238 %		
		dibenz[a,h]anthracene	1	0.44			0.44		0.000044.0/		
29		601-041-00-2 200-181-8 53-70-3		0.44	mg/ĸg		0.44	mg/kg	0.000044 %		
30		benzo[ghi]perylene		2.22	mg/kg		2.22	mg/kg	0.000222 %		
	-	205-883-8 191-24-2	_								
31		2-methoxy-2-methylpropane		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<lod< td=""></lod<>
		603-181-00-X 216-653-1 1634-04-4									
32		benzene		<0.003	mg/kg		<0.003	mg/kg	<0.000003 %		<lod< td=""></lod<>
<u> </u>		601-020-00-8 200-753-7 71-43-2	+							-	
33		601-021-00-3 203-625-9 108-88-3		<0.003	mg/kg		<0.003	mg/kg	<0.000003 %		<lod< td=""></lod<>
34		ethylbenzene	$\uparrow$	~0.003	ma/ka		~0.003	ma/ka	<0.000003.%		
		601-023-00-4 202-849-4 100-41-4	1_						.0.0000000 70		
		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]									
35		203-396-5 [2] 106-42-3 [2]		<0.005	mg/kg		<0.005	mg/kg	<0.000005 %		<lod< td=""></lod<>
		203-576-3 [3] 108-38-3 [3] 215-535-7 [4] 1330-20-7 [4]									
20		TPH (C6 to C40) petroleum group	+	124	melle		121	malle	0.0121.0/		
30		ТРН	1_	131	під/кд		131	пу/кд	0.0131 %		
		asbestos									
		рър-п13-00-е									
37		12172-73-5		<0	mg/kg		<0	mg/kg	<0%		<lod< td=""></lod<>
		77536-68-6									
		77536-67-5									





#		CLP index number	Determinand EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
38	8	carbazole		,		0.26 ma/ka		0.26 ma/ka	0.000026 %		
			201-696-0	86-74-8							
39		dibenzofuran				0.07 ma/ka	a	0.07 ma/ka	0 000007 %		
			205-071-3	132-64-9							
								Total:	0.103 %		

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
0	Determinand defined or amended by HazWasteOnline (see Appendix A)
æ <mark>\$</mark>	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<lod< th=""><th>Below limit of detection</th></lod<>	Below limit of detection

CLP: Note 1  $\,$  Only the metal concentration has been used for classification

#### **Supplementary Hazardous Property Information**

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

#### Force this Hazardous property to non hazardous because No free phase observed

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0131%)



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

#### Sample details

Sample Name:	LoW Code:	
TP110	Chapter:	17: Construction and Demolition Wastes (including excavated soil
Sample Depth:		from contaminated sites)
1.60 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
		03)

#### **Hazard properties**

None identified

#### Determinands

#		Determinand           CLP index number         EC Number         CAS Number	CP Note	User entered data	Conv. Factor	Compound conc.	Classification value	AC Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide } 033-003-00-0 215-481-4 1327-53-3		19.2 mg/kg	1.32	25.35 mg/kg	0.00254 %	2	
2	4	barium { <sup>•</sup> barium sulfate } 231-784-4 7727-43-7	_	257 mg/kg	1.7	436.776 mg/kg	0.0437 %		
3	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 1304-56-9		1.2 mg/kg	2.775	3.33 mg/kg	0.000333 %		
4	4	boron {      boron tribromide/trichloride/trifluoride     (combined) }     [0294-33-4,     10294-34-5,     7637-07-2		1.6 mg/kg	13.43	21.488 mg/kg	0.00215 %		
5	4	cadmium { cadmium sulfide } 048-010-00-4 215-147-8 1306-23-6	1	0.1 mg/kg	1.285	0.129 mg/kg	0.00001 %		
6	4	chromium in chromium(III) compounds { Chromium(III) oxide }		50.8 mg/kg	1.462	74.247 mg/kg	0.00742 %		
7	4	chromium in chromium(VI) compounds { chromium(VI)           oxide }           024-001-00-0         215-607-8         1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<lod< th=""></lod<>
8	4	copper {	_	14 mg/kg	1.126	15.762 mg/kg	0.00158 %		
9	4	lead { I lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	14 mg/kg		14 mg/kg	0.0014 %		
10	4	nickel { nickel(II) carbonate } 028-010-00-0 222-068-2 [1] 3333-67-3 [1] 240-408-8 [2] 16337-84-1 [2] 265-748-4 [3] 65405-96-1 [3] 235-715-9 [4] 12607-70-4 [4]	-	32.5 mg/kg	2.022	65.728 mg/kg	0.00657 %		
11	4	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8	_	<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<lod< th=""></lod<>



#		CLP index number	Determinand EC Number	CAS Number	LP Note	User entered	l data	Conv. Factor	Compound	conc.	Classification value	C Applied	Conc. Not Used
-	æ	vanadium { divanadium	pentaoxide: va	nadium pentoxide }	Ū							Σ	
12	~	023-001-00-8 215-	-239-8	1314-62-1		47	mg/kg	1.785	83.904	mg/kg	0.00839 %		
13	4	zinc { <mark>zinc oxide</mark> }				65	mg/kg	1.245	80.906	mg/kg	0.00809 %		
		030-013-00-7 215-	-222-5	1314-13-2									
14	4	mercury { mercury dich	lloride }	7407 04 7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<lod< th=""></lod<>
_		nanhthalene	-299-0	1401-94-1								$\square$	
15		601-052-00-2 202-	-049-5	91-20-3	ł	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
10		acenaphthylene		1		-0.02			.0.02		-0.000002.0/		
10		205-	-917-1	208-96-8		<0.03	шу/ку		<0.03	тту/ку	<0.000003 %		<lod< th=""></lod<>
17	8	acenaphthene		1	ļ	<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<lod< th=""></lod<>
_		201-	-469-6	83-32-9									
18	8	201-	-695-5	86-73-7	ł	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
-		phenanthrene	-030-0	00-13-1									
19	-	201-	-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<lod< th=""></lod<>
20	8	anthracene		1		<0.04	ma/ka		<0.04	ma/ka	<0.000004.%		
20		204-	-371-1	120-12-7			iiig/kg				<0.000004 70		
21	8	fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<lod< th=""></lod<>
		205-	-912-4	206-44-0									
22	8	204-	-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<lod< th=""></lod<>
		benzo[a]anthracene	02.0	.20 00 0		0.00			0.00		0.000000.0/		1.00
23		601-033-00-9 200-	-280-6	56-55-3		<0.06	тg/кg		<0.06	тg/кg	<0.000006 %		<lod< th=""></lod<>
24		chrysene				<0.02	ma/ka		<0.02	ma/ka	<0.000002 %		<lod< th=""></lod<>
		601-048-00-0 205-	-923-4	218-01-9									
25		benzo[b]fluoranthene	011.0	DOF 00 2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<lod< th=""></lod<>
		benzo[k]fluoranthene	-311-3	203-33-2								$\square$	
26		601-036-00-5 205-	-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<lod< th=""></lod<>
27		benzo[a]pyrene; benzo[	[def]chrysene	1		<0.04	ma/ka		<0.04	ma/ka	<0.00004.94		
21		601-032-00-3 200-	-028-5	50-32-8		<0.04	iiig/kg			iiig/kg	<0.000004 78		
28	۲	indeno[123-cd]pyrene		1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
		205-	-893-2	193-39-5									
29		601-041-00-2 200-	-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
		benzo[ghi]perylene	101 0			0.04			0.04		0.000004.0/		
30		205-	-883-8	191-24-2		<0.04	тg/кg		<0.04	тg/кg	<0.00004 %		<lod< th=""></lod<>
		tert-butyl methyl ether; I	MTBE;										
31		2-methoxy-2-methylprop	pane	1624 04 4		<0.005	mg/kg		<0.005	mg/kg	<0.000005 %		<lod< th=""></lod<>
-		benzene	-033-1	1034-04-4								$\square$	
32		601-020-00-8 200-	-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
33		toluene				<0.005	ma/ka		<0.005	ma/ka	<0.000005 %		
		601-021-00-3 203-	-625-9	108-88-3	1								200
34	0	ethylbenzene	0.10.1			<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
-		601-023-00-4 202-	-849-4 [2] m-xvlene: [3]	100-41-4									
		601-022-00-9 202-	-422-2 [1]	95-47-6 [1]	ł								
35		203-	-396-5 [2]	106-42-3 [2]		<0.005	mg/kg		<0.005	mg/kg	<0.000005 %		<lod< th=""></lod<>
		203- 215-	-576-3 [3] -535-7 [4]	108-38-3 [3] 1330-20-7 [4]									
36		TPH (C6 to C40) petrole	leum group			~38	ma/ka		-38	ma/ka	<0.0038.%	П	
				ТРН		<b>~</b> 00	ing/kg		<b>NO</b>	ing/kg	<0.0000 //		
		asbestos		40004									
		650-013-00-6		12001-28-4 132207-32-0									
37				12172-73-5		<0	mg/kg		<0 mg	mg/kg	<0%		<lod< th=""></lod<>
				77536-66-4 77536-68-6									
				77536-67-5									
1	İ.	I		12001-23-0	1							1	





#		Determinand		Note	User entered data	Conv. Factor	Compound conc.	Classification value	Applied	Conc. Not Used	
		CLP index number	EC Number	CAS Number	CLP					MC	
	Total										

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
0	Determinand defined or amended by HazWasteOnline (see Appendix A)
4	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<lod< th=""><th>Below limit of detection</th></lod<>	Below limit of detection
CLP: Note 1	Only the motel concentration has been used for elegation

CLP: Note 1 Only the metal concentration has been used for classification



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

#### Sample details

Sample Name:	LoW Code:	
TP111	Chapter:	17: Construction and Demolition Wastes (including excavated soil
Sample Depth:		from contaminated sites)
0.30 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
		03)

#### Hazard properties

None identified

#### Determinands

#		Determinand CLP index number EC Number CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide } 033-003-00-0 215-481-4 1327-53-3		20.4 mg/kg	1.32	26.935 mg/kg	0.00269 %		
2	4	barium { • barium sulfate } 231-784-4 7727-43-7		93 mg/kg	1.7	158.055 mg/kg	0.0158 %		
3	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 1304-56-9		1.3 mg/kg	2.775	3.608 mg/kg	0.000361 %		
4	4	boron { • boron tribromide/trichloride/trifluoride (combined) } 10294-33-4, 10294-34-5, 7637-07-2		1.2 mg/kg	13.43	16.116 mg/kg	0.00161 %		
5	4	cadmium { cadmium sulfide }	1	0.1 mg/kg	1.285	0.129 mg/kg	0.00001 %		
6	4	chromium in chromium(III) compounds { Chromium(III) oxide } 215-160-9 [1308-38-9		31.7 mg/kg	1.462	46.331 mg/kg	0.00463 %		
7	4	chromium in chromium(VI) compounds { chromium(VI)           oxide }           024-001-00-0         215-607-8         1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<lod< th=""></lod<>
8	4	copper {		17 mg/kg	1.126	19.14 mg/kg	0.00191 %		
9	<b>\$</b>	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	28 mg/kg		28 mg/kg	0.0028 %		
10	4	nickel { nickel(II) carbonate } 028-010-00-0 222-068-2 [1] 3333-67-3 [1] 240-408-8 [2] 16337-84-1 [2] 265-748-4 [3] 65405-96-1 [3] 235-715-9 [4] 12607-70-4 [4]		29.9 mg/kg	2.022	60.47 mg/kg	0.00605 %		
11	*	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<lod< th=""></lod<>


#		CLP index number	Determinand	CAS Number	P Note	User entere	d data	Conv. Factor	Compound c	onc.	Classification value	C Applied	Conc. Not Used
			EC Number	CAS Number	5							ž	
12	~	023-001-00-8	bum pentaoxide; va	1314-62-1	-	45	mg/kg	1.785	80.333	mg/kg	0.00803 %		
12	2	zinc { zinc oxide }	F 10 200 0			01	malka	1 245	112 260	malka	0.0112.9/		
13		030-013-00-7	215-222-5	1314-13-2		91	mg/kg	1.240	113.209	mg/kg	0.0113 %		
14	4	mercury { mercury	dichloride }	7407.04.7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<lod< th=""></lod<>
	-	080-010-00-X	231-299-8	/48/-94-/	-								
15		601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
16		acenaphthylene	,			~0.03	ma/ka		<0.03	ma/ka	<0.00003.%		
			205-917-1	208-96-8	1	<0.03	iiig/kg		<0.00	mg/kg			
17	0	acenaphthene	bo4 400 0			<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<lod< th=""></lod<>
		fluorene	201-469-6	83-32-9	-							-	
18			201-695-5	86-73-7	-	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
19	8	phenanthrene	1			0.03	ma/ka		0.03	ma/ka	0 000003 %		
			201-581-5	85-01-8						ing/itg			
20	8	anthracene	004 074 4	400 40 7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
		fluoranthene	204-371-1	120-12-7									
21	ľ		205-912-4	206-44-0	-	0.1	mg/kg		0.1	mg/kg	0.00001 %		
22		pyrene	1			0.09	ma/ka		0.09	ma/ka	0 000009 %		
			204-927-3	129-00-0	1								
23		benzo[a]anthracen	e	E6 EE 2		0.08	mg/kg		0.08	mg/kg	0.000008 %		
		chrysene	200-280-8	50-55-5	-								
24		601-048-00-0	205-923-4	218-01-9		0.06	mg/kg		0.06	mg/kg	0.000006 %		
25		benzo[b]fluoranthe	ne			0.07	ma/ka		0.07	ma/ka	0 000007 %		
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthe	ne	007.00.0	_	0.03	mg/kg		0.03	mg/kg	0.000003 %		
-		benzolalpyrene: be	205-916-6	207-08-9	-								
27	601-032-00-3 200-028-5 50-32-8		-	0.06	mg/kg		0.06	mg/kg	0.000006 %				
28	8	indeno[123-cd]pyre	ene			<0.04	ma/ka		<0.04	ma/ka	<0.000004 %		<lod< th=""></lod<>
			205-893-2	193-39-5									
29		dibenz[a,h]anthrac	ene	53 70 3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
		benzolahilpervlene	200-101-0	53-70-3								-	
30	ľ		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
		tert-butyl methyl et	her; MTBE;										
31		2-methoxy-2-meth	vlpropane	1634 04 4	_	<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
		benzene	210-000-1	1034-04-4									
32		601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
33		toluene				<0.005	mg/ka		<0.005	mg/ka	<0.0000005 %		<lod< th=""></lod<>
<u> </u>		601-021-00-3	203-625-9	108-88-3									
34	8	etnyibenzene 601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.000005 %		<lod< th=""></lod<>
		o-xylene; [1] p-xyle	ene; [2] m-xylene; [3	B] xylene [4]									
35		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
36		TPH (C6 to C40) p	etroleum group	, - L'J		-38	ma/ka		-38	ma/ka	<0.0038.%		
				TPH		<b>100</b>	ing/kg		<b>100</b>	mg/kg	<0.0000 //		~LOD
		asbestos	1	10001.05									
37		650-013-00-6		12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5		<1000	mg/kg		<1000	mg/kg	<0.1 %		<lod< th=""></lod<>



#			Determinand		Note	User entered data	Conv. Factor	Compound conc.	Classification value	Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number	CLP	CLP				MC	
Total: 0.159 %											

Key

1009	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
0	Determinand defined or amended by HazWasteOnline (see Appendix A)
4	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<lod< td=""><td>Below limit of detection</td></lod<>	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



## **Classification of sample: TP113**

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

### Sample details

Sample Name:	LoW Code:	
TP113	Chapter:	17: Construction and Demolition Wastes (including excavated soil
Sample Depth:		from contaminated sites)
0.90 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
		03)

### Hazard properties

None identified

### Determinands

#		Determinand CLP index number EC Number CAS	Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	IC Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide } 033-003-00-0 215-481-4 1327-53	-3	<u>o</u>	14.8 mg/kg	1.32	19.541 mg/kg	0.00195 %	2	
2	4	barium { • barium sulfate } 231-784-4 7727-43	-7		175 mg/kg	1.7	297.416 mg/kg	0.0297 %		
3	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 [1304-56	-9		1 mg/kg	2.775	2.775 mg/kg	0.000278 %		
4	4	boron { boron tribromide/trichloride/trifluoride (combined) } 10294-3 10294-3 7637-07	3-4, 4-5, -2		1.6 mg/kg	13.43	21.488 mg/kg	0.00215 %		
5	4	cadmium {	-6	1	<0.1 mg/kg	1.285	<0.129 mg/kg	<0.00001 %		<lod< td=""></lod<>
6	4	chromium in chromium(III) compounds { chro	omium(III) -9		47 mg/kg	1.462	68.693 mg/kg	0.00687 %		
7	4	chromium in chromium(VI) compounds { chrom           oxide }           024-001-00-0         215-607-8         1333-82	ium(VI) -0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<lod< td=""></lod<>
8	4	copper {	-1		10 mg/kg	1.126	11.259 mg/kg	0.00113 %		
9	4	lead { lead compounds with the exception of specified elsewhere in this Annex (worst case) 082-001-00-6	<mark>those</mark> }	1	35 mg/kg		35 mg/kg	0.0035 %		
10	4	nickel { nickel(II) carbonate } 028-010-00-0 222-068-2 [1] 3333-67 240-408-8 [2] 16337-8 265-748-4 [3] 65405-9 235-715-9 [4] 12607-7	-3 [1] 4-1 [2] 6-1 [3] 0-4 [4]		22.2 mg/kg	2.022	44.898 mg/kg	0.00449 %		
11	4	selenium { selenium compounds with the excep cadmium sulphoselenide and those specified ei in this Annex } 034-002-00-8	btion of Isewhere		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<lod< td=""></lod<>



#		CLP index number	Determinand	CAS Number	P Note	User entere	d data	Conv. Factor	Compound	conc.	Classification value	C Applied	Conc. Not Used
			EC Number	CAS Nulliber	러							ž	
12	4	vanadium { divanad	bum pentaoxide; va	nadium pentoxide }		29	mg/kg	1.785	51.77	mg/kg	0.00518 %		
	æ	zinc { zinc oxide }	213-233-0	1314-02-1									
13	~	030-013-00-7	215-222-5	1314-13-2		46	mg/kg	1.245	57.257	mg/kg	0.00573 %		
14	4	mercury { mercury	dichloride }	1		<01	ma/ka	1 353	<0.135	ma/ka	<0.0000135 %		
14		080-010-00-X	231-299-8	7487-94-7		<0.1	iiig/kg	1.555		mg/kg	<0.0000133 /8		
15		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
		601-052-00-2	202-049-5	91-20-3									
16	۲	acenaphthylene	005 047 4			<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<lod< th=""></lod<>
	_	acenanhthene	205-917-1	208-90-8	-								
17	۲	acenaprimerie	201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<lod< th=""></lod<>
-		fluorene		00 02 0								$\square$	
18	Ŭ		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
10	8	phenanthrene	Į.	1		-0.02			-0.02	malka	-0.00003.8/		
19			201-581-5	85-01-8		<0.03	шу/ку		<0.03	тту/ку	<0.000003 %		<lod< th=""></lod<>
20	8	anthracene				<0.04	ma/ka		<0.04	ma/ka	<0.000004 %		
			204-371-1	120-12-7									200
21	0	fluoranthene				0.03	mg/kg		0.03	mg/kg	0.000003 %		
			205-912-4	206-44-0									
22	۲	pyrene	004 007 0	400.00.0		0.05	mg/kg		0.05	mg/kg	0.000005 %		
		hanzalalanthraaan	204-927-3	129-00-0									
23			<del>0</del>	56-55-3		0.08	mg/kg		0.08	mg/kg	0.000008 %		
		chrysene	200 200 0	00 00 0								$\square$	
24		601-048-00-0	205-923-4	218-01-9		0.02	mg/kg		0.02	mg/kg	0.000002 %		
0.5		benzo[b]fluoranthe	ne			0.05			0.05		0.000005.0/		
25		601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<lod< th=""></lod<>
26		benzo[k]fluoranther	ne	1		<0.02	ma/ka		<0.02	ma/ka			
20		601-036-00-5	205-916-6	207-08-9		<0.02	iiig/kg		<0.02	mg/kg	<0.000002 /8		
27		benzo[a]pyrene; be	enzo[def]chrysene			<0.04	ma/ka		<0.04	ma/ka	<0.000004 %		<lod< td=""></lod<>
		601-032-00-3	200-028-5	50-32-8									
28	۲	indeno[123-cd]pyre	ene			<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< td=""></lod<>
-		dib a sefe blandbar a	205-893-2	193-39-5									
29		dibenz[a,njanthrace		52 70 2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
		benzolabilpervlene	200-161-6	p3-70-3								$\square$	
30	۲	benzolgnijberviene	205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< th=""></lod<>
		tert-butyl methyl etl	her; MTBE;										
31		2-methoxy-2-methy	Ipropane			<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< td=""></lod<>
		603-181-00-X	216-653-1	1634-04-4									
32		benzene		1		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< th=""></lod<>
		601-020-00-8	200-753-7	71-43-2	-							$\square$	
33			202 625 0	109 99 2		<0.005	mg/kg		<0.005	mg/kg	<0.000005 %		<lod< th=""></lod<>
		601-021-00-3	203-625-9	108-88-3								$\square$	
34	۲	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.000005 %		<lod< th=""></lod<>
		o-xvlene: [1] p-xvle	ne: [2] m-xvlene: [3	1 xvlene [4]								H	
		601-022-00-9	202-422-2 [1]	95-47-6 [1]									
35			203-396-5 [2]	106-42-3 [2]		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<lod< td=""></lod<>
			203-576-3 [3] 215-535-7 [4]	108-38-3 [3] 1330-20-7 [4]									
20		TPH (C6 to C40) p	etroleum group	1		.00			-20		.0.0028.0/	H	.1.00
36				TPH		<38	mg/kg		<38	тg/кg	<0.0038 %		<lod< th=""></lod<>
		asbestos											
		650-013-00-6		12001-28-4									
37				132207-32-0		~1000	ma/ka	/kg	<1000 mg/l	ma/ka	/kg <0.1 %		
				77536-66-4		1000	ту/кд		<1000	ту/кд	<b>\U.1</b> /0		<lod< th=""></lod<>
				77536-68-6 77536-67-5									
				12001-29-5									





#	Determinand	Note Us	User entered data	Conv. Factor	Compound conc.	Classification value	vpplied	Conc. Not Used		
	CLP index number	EC Number	CAS Number	CLP				C	MC /	
							Total:	0.165 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
0	Determinand defined or amended by HazWasteOnline (see Appendix A)
4	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<lod< th=""><th>Below limit of detection</th></lod<>	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for description

CLP: Note 1 Only the metal concentration has been used for classification



## **Classification of sample: WS101**

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

### Sample details

Sample Name:	LoW Code:	
WS101	Chapter:	17: Construction and Demolition Wastes (including excavated soil
Sample Depth:		from contaminated sites)
0.30-0.40 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
		03)

## Hazard properties

None identified

## Determinands

#		Determinand CLP index number EC Number CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide } 033-003-00-0 215-481-4 1327-53-3		17.1 mg/kg	1.32	22.578 mg/kg	0.00226 %		
2	4	barium { • barium sulfate } 231-784-4 7727-43-7	_	347 mg/kg	1.7	589.732 mg/kg	0.059 %		
3	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 1304-56-9		3.9 mg/kg	2.775	10.824 mg/kg	0.00108 %		
4	4	boron { • boron tribromide/trichloride/trifluoride (combined) } 10294-33-4, 10294-34-5, 7637-07-2		1.3 mg/kg	13.43	17.459 mg/kg	0.00175 %		
5	4	cadmium {	1	0.2 mg/kg	1.285	0.257 mg/kg	0.00002 %		
6	4	chromium in chromium(III) compounds { chromium(III) oxide }		43 mg/kg	1.462	62.847 mg/kg	0.00628 %		
7	4	chromium in chromium(VI) compounds { chromium(VI)           oxide }           024-001-00-0         215-607-8         1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<lod< th=""></lod<>
8	4	copper { <sup> </sup>		53 mg/kg	1.126	59.672 mg/kg	0.00597 %		
9	4	lead { Plead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	95 mg/kg		95 mg/kg	0.0095 %		
10	4	nickel { nickel(II) carbonate } 028-010-00-0 222-068-2 [1] 3333-67-3 [1] 240-408-8 [2] 16337-84-1 [2] 265-748-4 [3] 65405-96-1 [3] 235-715-9 [4] 12607-70-4 [4]		39.7 mg/kg	2.022	80.29 mg/kg	0.00803 %		
11	4	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<lod< th=""></lod<>



#		Determinand CLP index number EC Number CAS Number	P Note	User entered	d data	Conv. Factor	Compound conc.	Classification value	C Applied	Conc. Not Used
	-	vanadium / divanadium pentaovide: vanadium pentovide }	Ū						Σ	
12	~	023-001-00-8 215-239-8 1314-62-1	-	61	mg/kg	1.785	108.896 mg/k	0.0109 %		
13	4	zinc { zinc oxide }		1.3	ma/ka	1.245	1.618 mg/k	0.000162 %		
		030-013-00-7 215-222-5 1314-13-2								
14	4	mercury { mercury dichloride }		146	mg/kg	1.353	197.609 mg/k	0.0198 %		
<u> </u>		naphthalene								
15		601-052-00-2 202-049-5 91-20-3		0.12	mg/kg		0.12 mg/k	g 0.000012 %		
16		acenaphthylene		0.14	ma/ka		0.14 ma/k	0.000014 %		
		205-917-1 208-96-8	]							
17	8	acenaphtnene		0.23	mg/kg		0.23 mg/k	g 0.000023 %		
		fluorene		0.1.1			0.4.4	0.000044.0/		
18		201-695-5 86-73-7		0.14	mg/ĸg		0.14 mg/k	0.000014 %		
19	8	phenanthrene		1.26	mg/kg		1.26 mg/k	0.000126 %		
		201-581-5 85-01-8							_	
20	8	anthracene 204-371-1 120-12-7	-	0.43	mg/kg		0.43 mg/k	g 0.000043 %		
04		fluoranthene		0.47			0.47	0.000047.0/		
21		205-912-4 206-44-0		3.17	тід/кд		3.17 mg/k	0.000317 %		
22		pyrene		2.65	mg/kg		2.65 mg/k	0.000265 %		
		204-927-3 129-00-0								
23		601-033-00-9 200-280-6 56-55-3		1.08	mg/kg		1.08 mg/k	g 0.000108 %		
24		chrysene		1 39	ma/ka		1 39 mg/k	0.000139 %		
24		601-048-00-0 205-923-4 218-01-9	1	1.55	iiig/kg		1.09 mg/k	0.000139 /8		
25		benzo[b]fluoranthene		2	mg/kg		2 mg/k	0.0002 %		
26	-	benzo[k]fluoranthene	-						-	
26		601-036-00-5 205-916-6 207-08-9	-	0.78	mg/kg		0.78 mg/k	0.000078 %		
27		benzo[a]pyrene; benzo[def]chrysene		16	ma/ka		1.6 mg/k	0.00016 %		
		601-032-00-3 200-028-5 50-32-8								
28	۲	indeno[123-cd]pyrene		1.16	mg/kg		1.16 mg/k	0.000116 %		
		dibenz[a,h]anthracene								
29		601-041-00-2 200-181-8 53-70-3		0.18	mg/kg		0.18 mg/k	g 0.000018 %		
30	8	benzo[ghi]perylene		1.12	ma/ka		1.12 mg/k	0.000112 %		
		205-883-8 191-24-2								
31		2-methoxy-2-methylpropane		<0.005	mg/kg		<0.005 mg/k	<0.0000005 %		<lod< th=""></lod<>
		603-181-00-X 216-653-1 1634-04-4								
32		benzene		<0.005	mg/kg		<0.005 mg/k	<0.0000005 %		<lod< th=""></lod<>
<u> </u>		601-020-00-8 200-753-7 71-43-2	-						$\vdash$	
33		601-021-00-3 203-625-9 108-88-3	-	<0.005	mg/kg		<0.005 mg/k	<0.000005 %		<lod< th=""></lod<>
24		ethylbenzene		~0.005	ma/ka		<0.005 mg/k	z <0.000005 %	F	
- 34		601-023-00-4 202-849-4 100-41-4	1	<0.005	mg/kg		<0.003 mg/k			
		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]								
35		203-396-5 [2] 106-42-3 [2]		<0.005	mg/kg		<0.005 mg/k	g <0.0000005 %		<lod< td=""></lod<>
		203-576-3 [3] 108-38-3 [3] 215 535 7 [4] 1330 20 7 [4]								
		TPH (C6 to C40) petroleum group	+	004			201 "	0.0004.0/	⊢	<u> </u>
36		ТРН		281	mg/kg		281 mg/k	0.0281 %		
		asbestos								
		650-013-00-6 12001-28-4 132207-32-0								
37		12172-73-5		<1000	mg/kg		<1000 mg/k	g <0.1 %		<lod< th=""></lod<>
		77536-68-6								
		77536-67-5							Ĺ	
		12001-23=3							l	1





#		Determinand		Note	User entered data	Conv. Factor	Compound conc.	Classification value	Applied	Conc. Not
	CLP index number	EC Number	CAS Number	CLP					MC /	l
							Total:	0.255 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
Θ	Determinand defined or amended by HazWasteOnline (see Appendix A)
4	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<lod< th=""><th>Below limit of detection</th></lod<>	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

### **Supplementary Hazardous Property Information**

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

Force this Hazardous property to non hazardous because No free phase observed

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0281%)



## Classification of sample: WS103

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

### Sample details

Sample Name: WS103	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil
Sample Depth:		from contaminated sites)
0.60-0.70 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
		03)

### Hazard properties

None identified

#### **Determinands**

#		CLP index number EC Number CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	AC Applied	Conc. Not Used
1	4	arsenic { arsenic trioxide } 033-003-00-0 215-481-4 1327-53-3		39.2 mg/kg	1.32	51.757 mg/kg	0.00518 %	2	
2	4	barium { <sup>•</sup> barium sulfate } 231-784-4 7727-43-7		146 mg/kg	1.7	248.13 mg/kg	0.0248 %		
3	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 1304-56-9		1.3 mg/kg	2.775	3.608 mg/kg	0.000361 %		
4	4	boron {      boron tribromide/trichloride/trifluoride     (combined) }     10294-33-4,     10294-34-5,     7637-07-2	_	1.1 mg/kg	13.43	14.773 mg/kg	0.00148 %		
5	4	cadmium { cadmium sulfide }	1	0.4 mg/kg	1.285	0.514 mg/kg	0.00004 %		
6	4	chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 1308-38-9	_	54.7 mg/kg	1.462	79.947 mg/kg	0.00799 %		
7	4	chromium in chromium(VI) compounds { chromium(VI)           oxide }           024-001-00-0         215-607-8         1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<lod< th=""></lod<>
8	4	copper { <sup>e</sup> dicopper oxide; copper (I) oxide } 029-002-00-X 215-270-7 1317-39-1	_	13 mg/kg	1.126	14.637 mg/kg	0.00146 %		
9	4	lead { I lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	8 mg/kg		8 mg/kg	0.0008 %		
10	4	nickel { nickel(II) carbonate } 028-010-00-0 222-068-2 [1] 3333-67-3 [1] 240-408-8 [2] 16337-84-1 [2] 265-748-4 [3] 65405-96-1 [3] 235-715-9 [4] 12607-70-4 [4]	-	22.7 mg/kg	2.022	45.909 mg/kg	0.00459 %		
11	4	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8	_	<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<lod< th=""></lod<>



#			Determinand		Note	User entered data		Conv. Factor	v. or Compound conc.		Classification value	Applied	Conc. Not Used
		CLP index number	CLF							MC			
12	4	vanadium { <mark>divanadi</mark>	um pentaoxide; va	nadium pentoxide }		60	ma/ka	1 785	107 111	ma/ka	0.0107 %		
<u> </u>		023-001-00-8 2	15-239-8	1314-62-1			ing/kg	1.1 00					
13	4	zinc { <mark>zinc oxide</mark> }				65	ma/ka	1 245	80 906	ma/ka	0 00809 %		
		030-013-00-7 2	15-222-5	1314-13-2									
14	4	mercury { mercury d	lichloride }			<0.1	ma/ka	1.353	<0.135	ma/ka	<0.0000135 %		<lod< td=""></lod<>
		080-010-00-X 2	31-299-8	7487-94-7									
15		naphthalene				<0.04	ma/ka		<0.04	ma/ka	<0.000004 %		<lod< td=""></lod<>
		601-052-00-2 2	02-049-5	91-20-3			5.5						
16	۲	acenaphthylene				< 0.03	ma/ka		< 0.03	ma/ka	<0.000003 %		<lod< td=""></lod<>
		2	05-917-1	208-96-8									
17	۲	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<lod< td=""></lod<>
		2	01-469-6	83-32-9									
18	۲	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< td=""></lod<>
		2	01-695-5	86-73-7									
19	Θ	phenanthrene				<0.03	mg/kg		< 0.03	mg/kg	<0.000003 %		<lod< td=""></lod<>
		2	01-581-5	85-01-8									
20	۲	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< td=""></lod<>
		2	04-371-1	120-12-7									
21	۲	fluoranthene				<0.03	mg/kg		< 0.03	mg/kg	<0.000003 %		<lod< td=""></lod<>
		2	05-912-4	206-44-0									
22	۲	pyrene				<0.03	mg/kg		< 0.03	mg/kg	<0.000003 %		<lod< td=""></lod<>
		2	04-927-3	129-00-0									
23		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<lod< td=""></lod<>
		601-033-00-9 2	00-280-6	56-55-3									
24		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<lod< td=""></lod<>
		601-048-00-0 2	05-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<lod< td=""></lod<>
		601-034-00-4 2	05-911-9	205-99-2									
26		benzo[k]fluoranthene	9			<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<lod< td=""></lod<>
		601-036-00-5 2	05-916-6	207-08-9									
27		benzo[a]pyrene; ben	zo[def]chrysene			<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< td=""></lod<>
		601-032-00-3 2	00-028-5	50-32-8									
28	۲	indeno[123-cd]pyren	10			<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< td=""></lod<>
<u> </u>		2	05-893-2	193-39-5	-								
29		dibenz[a,h]anthracer	ne			<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< td=""></lod<>
<u> </u>		601-041-00-2 2	00-181-8	53-70-3	-								
30	۲	benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<lod< td=""></lod<>
<u> </u>		2	05-883-8	191-24-2									
31	۲	1PH (C6 to C40) pet	troleum group			<38	mg/kg		<38	mg/kg	<0.0038 %		<lod< td=""></lod<>
<u> </u>				IPH									
		aspestos		40004 00 1									
		650-013-00-6 -		12001-28-4 132207-32-0					<0				
32				12172-73-5		<0	mg/kg			mg/kg	<0%		<lod< td=""></lod<>
				77536-68-6									
				77536-67-5									
				12001-29-5						_			
1										iotal:	0.0697 %	1	

Key

Determinand values ignored for classification, see column 'Conc. Not Used' for reason

Determinand defined or amended by HazWasteOnline (see Appendix A) 

Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound 4 concentration

<LOD Below limit of detection

CLP: Note 1 Only the metal concentration has been used for classification



## Classification of sample: WS106

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

### Sample details

Sample Name:	LoW Code:	17: Construction and Demolition Wastes (including excavated soil
Sample Depth:	onapter.	from contaminated sites)
0.50-0.60 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05
		03)

### Hazard properties

None identified

### Determinands

#		CLP index number EC Number CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	AC Applied	Conc. Not Used
1	~	arsenic { arsenic trioxide } 033-003-00-0 215-481-4 1327-53-3		37.7 mg/kg	1.32	49.776 mg/kg	0.00498 %	2	
2	4	barium { • barium sulfate }		216 mg/kg	1.7	367.096 mg/kg	0.0367 %		
3	4	beryllium { beryllium oxide } 004-003-00-8 215-133-1 [1304-56-9		2 mg/kg	2.775	5.551 mg/kg	0.000555 %		
4	4	boron {      boron tribromide/trichloride/trifluoride     (combined) }     [0294-33-4,     10294-34-5,     7637-07-2		0.9 mg/kg	13.43	12.087 mg/kg	0.00121 %		
5	4	cadmium { cadmium sulfide } 048-010-00-4 215-147-8 1306-23-6	1	<0.1 mg/kg	1.285	<0.129 mg/kg	<0.00001 %		<lod< th=""></lod<>
6	4	chromium in chromium(III) compounds { Chromium(III) oxide }	_	48.9 mg/kg	1.462	71.47 mg/kg	0.00715 %		
7	4	chromium in chromium(VI) compounds { chromium(VI)           oxide }           024-001-00-0         215-607-8         1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<lod< th=""></lod<>
8	4	copper {		53 mg/kg	1.126	59.672 mg/kg	0.00597 %		
9	4	lead { I lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	71 mg/kg		71 mg/kg	0.0071 %		
10	4	nickel { nickel(II) carbonate } 028-010-00-0 222-068-2 [1] 3333-67-3 [1] 240-408-8 [2] 16337-84-1 [2] 265-748-4 [3] 65405-96-1 [3] 235-715-9 [4] 12607-70-4 [4]		27.4 mg/kg	2.022	55.414 mg/kg	0.00554 %		
11	4	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	_	<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<lod< th=""></lod<>



#		CLP index number	Determinand	CAS Number	P Note	User entere	d data	Conv. Factor	Compound conc.		Classification value		Conc. Not Used
		CLF INDEX NUMBER	EC Number	CAS Number	Ы								
12	4	vanadium { divana	dium pentaoxide; v	anadium pentoxide	ł	75	mg/kg	1.785	133.889	mg/kg	0.0134 %		
		023-001-00-8	215-239-8	1314-62-1	_								
13	4	zinc { zinc oxide }				176	mg/kg	1.245	219.07	mg/kg	0.0219 %		
	_	030-013-00-7	215-222-5	1314-13-2	-								
14	4	mercury { mercury	dichioride }	7407 04 7	-	<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<lod< td=""></lod<>
-		nanhthalana	231-299-0	/48/-94-/	+								
15		601-052-00-2	202-049-5	01-20-3	-	0.08	mg/kg		0.08	mg/kg	0.000008 %		
-	_	acenaphthylene	202-043-3	51-20-5	+								
16			205-917-1	208-96-8	-	0.31	mg/kg		0.31	mg/kg	0.000031 %		
<b>—</b>		acenaphthene	200 011 1	200 00 0									
11	-		201-469-6	83-32-9		0.16	mg/kg		0.16	mg/kg	0.000016 %		
10		fluorene		1		0.11			0.11		0.000011.0/		
10			201-695-5	86-73-7		0.11	тід/кд		0.11	тід/кд	0.000011 %		
10		phenanthrene		1		1 75	ma/ka		1 75	ma/ka	0 000175 %		
13			201-581-5	85-01-8		1.75	iiig/iig		1.75	iiig/kg	0.000173 /8		
20		anthracene				0.94	ma/ka		0.94	ma/ka	0 000094 %		
			204-371-1	120-12-7		0.01					0.000001 /0		
21	۲	fluoranthene				4.84	ma/ka		4.84	ma/ka	0.000484 %		
			205-912-4	206-44-0	_								
22	۲	pyrene				4.59	mg/kg		4.59	mg/kg	0.000459 %		
<u> </u>			204-927-3	129-00-0	_								
23		benzo[a]anthracen			4	2.74	mg/kg		2.74	mg/kg	0.000274 %		
24		601-033-00-9	200-280-6	00-00-3	+								
24		601-048-00-0	205-023-4	218-01-0	-	2.53	mg/kg		2.53	mg/kg	0.000253 %		
-		benzo[b]fluoranthe	200-920-4 ne	210-01-3	+								
25		601-034-00-4	205-911-9	205-99-2	-	4.46	mg/kg		4.46	mg/kg	0.000446 %		
		benzo[k]fluoranthe	ne		+								
26		601-036-00-5	205-916-6	207-08-9		1.74 m	mg/kg		1.74	mg/kg	0.000174 %		
07		benzo[a]pyrene; be	enzo[def]chrysene	1		2.69			2.69		0.000268.0/		
21		601-032-00-3	200-028-5	50-32-8		3.00	mg/kg		3.00	тід/кд	0.000368 %		
20		indeno[123-cd]pyre	ene			2.00	ma/ka		2 66	malka	0 000288 %		
20			205-893-2	193-39-5		2.00	ing/kg		2.00	шу/ку	0.000200 %		
29		dibenz[a,h]anthrac	ene			0.39	ma/ka		0.39	ma/ka	0 000039 %		
Ľ		601-041-00-2	200-181-8	53-70-3	1	0.00					5.000000		
30	۲	benzo[ghi]perylene	9			2.83	mg/kg		2.83	mg/ka	0.000283 %		
			205-883-8	191-24-2									
31	۲	TPH (C6 to C40) p	etroleum group			423	mg/kg		423	mg/kg	0.0423 %		
				TPH	_								
		asbestos	1	40004 00 4	4								
		050-013-00-0		132207-32-0									
32				12172-73-5		<1000	mg/kg		<1000	mg/kg	<0.1 %		<lod< td=""></lod<>
				77536-66-4									
				77536-67-5									
				12001-29-5									
33	۲	carbazole				0.1	ma/ka		0.1	mg/ka	0.00001 %		
			201-696-0	86-74-8	_								
34	۲	dibenzofuran	0.05.054	400.045		0.06	mg/kg		0.06	mg/kg	0.000006 %		
<u> </u>			205-071-3	132-64-9							0.054.04		
1										iotal:	0.251 %	1	



Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
0	Determinand defined or amended by HazWasteOnline (see Appendix A)
4	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<lod< th=""><th>Below limit of detection</th></lod<>	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

### Supplementary Hazardous Property Information

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

#### Force this Hazardous property to non hazardous because No free phase observed

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0423%)



#### Appendix A: Classifier defined and non CLP determinands

#### • barium sulfate (EC Number: 231-784-4, CAS Number: 7727-43-7)

Conversion factor: 1.7 Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 17/07/2015 Risk Phrases: R36/37/38, R33, R20/22 Hazard Statements: Skin Irrit. 2 H315, STOT SE 3 H335, Eye Irrit. 2 H319, STOT RE 2 H373, Acute Tox. 4 H302, Acute Tox. 4 H332

#### <sup>e</sup> boron tribromide/trichloride/trifluoride (combined) (CAS Number: 10294-33-4, 10294-34-5, 7637-07-2)

Conversion factor: 13.43 Description/Comments: Combines the hazard statements and the average of the conversion factors for boron tribromide, boron trichloride and boron trifluoride Data source: N/A Data source date: 06/08/2015 Risk Phrases: C R35, C R34, T+ R26/28, R14 Hazard Statements: Skin Corr. 1B H314, Skin Corr. 1A H314, Acute Tox. 2 H300, Acute Tox. 2 H330, EUH014

• chromium(III) oxide (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462 Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 17/07/2015 Risk Phrases: R61, R60, R50/53, R43, R42, R38, R37, R36, R22, R20 Hazard Statements: Aquatic Chronic 1 H410, Aquatic Acute 1 H400, Repr. 1B H360FD, Skin Sens. 1 H317, Resp. Sens. 1 H334, Skin Irrit. 2 H315, STOT SE 3 H335, Eye Irrit. 2 H319, Acute Tox. 4 H302, Acute Tox. 4 H332

#### • dicopper oxide; copper (I) oxide (EC Number: 215-270-7, CAS Number: 1317-39-1)

CLP index number: 029-002-00-X Description/Comments: M-factor for long-term aquatic hazard not included as per paragraph (5), ATP9 Data source: Regulation (EU) 2016/1179 of 19 July 2016 (ATP9) Additional Risk Phrases: N R50/53 >= 0.25 %, N R50/53 Additional Hazard Statement(s): None. Reason for additional Hazards Statement(s)/Risk Phrase(s): 10/10/2016 - N R50/53 >= 0.25 % risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases 10/10/2016 - N R50/53 risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases

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

CLP index number: 082-001-00-6 Description/Comments: Worst Case: IARC considers lead compounds Group 1; Carcinogenic to humans; Lead REACH Consortium considers some lead compounds Carcinogenic category 1A Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP) Additional Risk Phrases: None. Additional Hazard Statement(s): Carc. 1A H350 Reason for additional Hazards Statement(s)/Risk Phrase(s): 03/06/2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015 • acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 17/07/2015 Risk Phrases: R38, R37, R36, R27, R26, R22 Hazard Statements: Skin Irrit. 2 H315, STOT SE 3 H335, Eye Irrit. 2 H319, Acute Tox. 1 H310, Acute Tox. 1 H330, Acute Tox. 4 H302

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

Description/Comments: Data from C&L Inventory Database

 ${\tt Data\ source:\ http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database}$ 

Data source date: 17/07/2015

Risk Phrases: N R51/53 , N R50/53 , R38 , R37 , R36

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



<sup>e</sup> fluorene (EC Number: 201-695-5, CAS Number: 86-73-7) Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 06/08/2015 Risk Phrases: N R50/53 Hazard Statements: Aquatic Chronic 1 H410, Aquatic Acute 1 H400 • phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8) Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 06/08/2015 Risk Phrases: N R50/53, R43, R40, R38, R37, R36, R22 Hazard Statements: Skin Irrit. 2 H315, Aquatic Chronic 1 H410, Aquatic Acute 1 H400, Skin Sens. 1 H317, Carc. 2 H351, STOT SE 3 H335, Eye Irrit. 2 H319, Acute Tox. 4 H302 anthracene (EC Number: 204-371-1, CAS Number: 120-12-7) Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 17/07/2015 Risk Phrases: N R50/53 , R43 , R38 , R37 , R36 Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 Iluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0) Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 21/08/2015 Risk Phrases: N R50/53, Xn R22 Hazard Statements: Aquatic Chronic 1 H410, Aquatic Acute 1 H400, Acute Tox. 4 H302 • pyrene (EC Number: 204-927-3, CAS Number: 129-00-0) Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014 Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 21/08/2015 Risk Phrases: N R50/53, Xi R36/37/38 Hazard Statements: Aquatic Chronic 1 H410, Aquatic Acute 1 H400, STOT SE 3 H335, Eye Irrit. 2 H319, Skin Irrit. 2 H315 indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5) Description/Comments: Data from C&L Inventory Database Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 06/08/2015 Risk Phrases: R40 Hazard Statements: Carc. 2 H351 • benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2) Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015 Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 23/07/2015 Risk Phrases: N R50/53 Hazard Statements: Aquatic Chronic 1 H410, Aquatic Acute 1 H400 ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4) CLP index number: 601-023-00-4 Description/Comments: Data source: Commission Regulation (EU) No 605/2014 - 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6) Additional Risk Phrases: None. Additional Hazard Statement(s): Carc. 2 H351 Reason for additional Hazards Statement(s)/Risk Phrase(s): 03/06/2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000



Report created by Simon Hay on 23/02/2018

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

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013 Data source: WM3 1st Edition 2015 Data source date: 25/05/2015 Risk Phrases: R65, R63, R51/53, R46, R45, R10 Hazard Statements: Aquatic Chronic 2 H411, Repr. 2 H361d, Carc. 1B H350, Muta. 1B H340, STOT RE 2 H373, Asp. Tox. 1 H304, Flam. Liq. 3 H226

#### 

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B; Data source: https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 02/03/2017 Risk Phrases: R50/53 Hazard Statements: Acute Tox. 3 H301, Acute Tox. 3 H311, Acute Tox. 3 H331, Aquatic Chronic 1 H410, Aquatic Acute 1 H400, Carc. 2 H351, Muta. 2 H341, STOT SE 3 H335, Eye Irrit. 2 H319, Skin Irrit. 2 H315, Acute Tox. 4 H302

• dibenzofuran (EC Number: 205-071-3, CAS Number: 132-64-9)

Description/Comments: VOC; Data from C&L Inventory Database Data source: https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database Data source date: 02/03/2017 Risk Phrases: R51/53 Hazard Statements: Aquatic Chronic 2 H411, Acute Tox. 4 H332, Acute Tox. 4 H312, Acute Tox. 4 H302

#### Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}	
Worst case species based on hazard statements	
barium {barium sulfate}	
Most likely species based on site usage	
beryllium {beryllium oxide}	
Worst case species based on hazard statements	
boron {boron tribromide/trichloride/trifluoride (combined)}	
Combined	
cadmium {cadmium sulfide}	
Worst case species based on hazard statements	
chromium in chromium(III) compounds {chromium(III) oxide}	
Need Chromium III	
chromium in chromium(VI) compounds {chromium(VI) oxide}	
Worst case species based on hazard statements	
copper {dicopper oxide; copper (I) oxide}	
Most likely common species	
lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}	
no Cr VI >LOD	
nickel {nickel(II) carbonate}	
Worst case species based on hazard statements	
selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}	
Worst case species based on hazard statements	
vanadium {divanadium pentaoxide; vanadium pentoxide}	
test	
zinc {zinc oxide}	
Worst case species based on hazard statements	
mercury {mercury dichloride}	
Worst case species based on hazard statements	





#### **Appendix C: Version**

HazWasteOnline Classification Engine: WM3 1st Edition, May 2015 HazWasteOnline Classification Engine Version: 2018.30.3501.7153 (30 Jan 2018) HazWasteOnline Database: 2018.30.3501.7153 (30 Jan 2018)

This classification utilises the following guidance and legislation: **WM3 - Waste Classification** - May 2015 CLP Regulation - Regulation 1272/2008/EC of 16 December 2008 1st ATP - Regulation 790/2009/EC of 10 August 2009 2nd ATP - Regulation 286/2011/EC of 10 March 2011 **3rd ATP** - Regulation 618/2012/EU of 10 July 2012 4th ATP - Regulation 487/2013/EU of 8 May 2013 Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013 5th ATP - Regulation 944/2013/EU of 2 October 2013 6th ATP - Regulation 605/2014/EU of 5 June 2014 WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014 Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014 7th ATP - Regulation 2015/1221/EU of 24 July 2015 8th ATP - Regulation (EU) 2016/918 of 19 May 2016 9th ATP - Regulation (EU) 2016/1179 of 19 July 2016 10th ATP - Regulation (EU) 2017/776 of 4 May 2017 POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004 1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010 2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010



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