

SITE INVESTIGATION, LAND QUALITY RISK ASSESSMENT & OUTLINE GEOTECHNICAL ASSESSMENT

**Proposed Development
Of a Care Home**

Yapton Road, Middleton-on-Sea

Prepared for: Frontier Estates Ltd

SLR Ref: 402.06594.00008 RC
Version No: 1
August 2020

SLR



BASIS OF REPORT

This document has been prepared by SLR Consulting Limited with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it by agreement with Frontier Estates Limited (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

SLR shall not be liable for the use of or reliance on any information, advice, recommendations and opinions in this document for any purpose by any person other than the Client. Reliance may be granted to a third party only in the event that SLR and the third party have executed a reliance agreement or collateral warranty.

Information reported herein may be based on the interpretation of public domain data collected by SLR, and/or information supplied by the Client and/or its other advisors and associates. These data have been accepted in good faith as being accurate and valid.

The copyright and intellectual property in all drawings, reports, specifications, bills of quantities, calculations and other information set out in this report remain vested in SLR unless the terms of appointment state otherwise.

This document may contain information of a specialised and/or highly technical nature and the Client is advised to seek clarification on any elements which may be unclear to it.

Information, advice, recommendations and opinions in this document should only be relied upon in the context of the whole document and any documents referenced explicitly herein and should then only be used within the context of the appointment.

CONTENTS

1.0	INTRODUCTION	1
1.1	Background	1
1.2	Proposed Development	1
1.3	Objectives	1
1.4	Scope of Work.....	2
1.4.1	Scope of Field Work.....	7
2.0	RECORD OF SITE ACTIVITIES	8
2.1	Utility Clearance.....	8
2.2	Exploratory Holes.....	8
2.3	Laboratory Analysis - Environmental	8
2.3.1	Soil Samples	9
2.3.2	Groundwater Samples.....	9
2.4	Laboratory Analysis - Geotechnical	9
3.0	RECORD OF PHYSICAL CONDITIONS.....	10
3.1	Geology.....	10
3.2	Groundwater.....	10
4.0	GEOTECHNICAL LABORATORY DATA	12
4.1.1	Classification Testing	14
4.1.2	Chemical Tests	15
5.0	RECORD OF CHEMICAL CONDITIONS	16
5.1	Visual Observations.....	16
5.2	Soil Chemistry	16
5.3	Groundwater Chemistry	18
6.0	WASTE ASSESSMENT	19
6.1	Background	19
6.2	Step 1 – LoW Code.....	19
6.3	Step 2 – Hazard Assessment	19
6.4	Step 3 – Asbestos Waste.....	20
7.0	OUTLINE GEOTECHNICAL ASSESSMENT	21
7.1	Limitations	21

7.2	Foundation Recommendations.....	21
7.2.1	Shrinkage and Swelling of Soils.....	21
7.2.2	Foundation Options.....	22
7.3	Temporary Works and Basal Heave	23
7.3.1	Groundwater Control	23
7.4	General	23
8.0	LAND QUALITY RISK ASSESSMENT.....	24
8.1	PPL1a	24
8.2	PPL1b	24
8.2.1	Approach & Assessment Criteria	24
8.2.2	Heavy Metals	25
8.2.3	PAHs	25
8.2.4	Asbestos	26
8.3	PPL 1c.....	27
8.4	PPL 1d	27
8.4.1	Approach and Assessment.....	27
8.5	PPL 2a&b.....	28
8.6	PPL 3a&b.....	28
8.7	PPL 4a-c.....	29
8.8	PPL 5	29
9.0	CONCLUSIONS AND RECOMMENDATIONS.....	30
9.1	Physical Ground Conditions	30
9.2	Preliminary Geotechnical Conclusions.....	30
9.3	Significance of Potential Pollutant Linkages.....	31
9.3.1	PPL 1a: Potential Harm to Human Health from Exposure to Contaminants Entering Water Supply Pipework.....	31
9.3.2	PPL 1b: Potential Harm to Human Health from Contaminants in Made Ground	31
9.3.3	PPL 1c: Potential Damage to Future Buildings from Exposure to Aggressive Ground.....	32
9.3.4	PPL 1d: Potential Harm to Controlled Waters from Contaminants in Made Ground.....	32
9.3.5	PPL2a&b: Potential pollution of Controlled Waters (groundwater & surface water) by contaminants from leaking sewer 32	
9.3.6	PPL 3a&b: Potential harm to human health and Controlled Waters from contaminants from possible off-site source (vehicle repair garage)	32
9.3.7	PPL 4a-c: Potential Harm to Human Health from Potential Contaminants in (yet to be) Imported Landscaping Soils32	
9.3.8	PPL 5: Potential Risks to Health or the Environment from Unidentified Sources.....	32
9.4	Overall.....	33

DOCUMENT REFERENCES

TABLES

Table 1-1 PPL Requiring Further Investigation & Action Taken	4
Table 3-1 Groundwater Monitoring Results Summary	10
Table 4-1 Geotechnical Laboratory Test Results	13
Table 5-1 Visual/olfactory Evidence of Contamination - Soil	16
Table 5-2 Summary of Soil Data – Asbestos	17

DRAWINGS

- Drawing 1: Site Location Plan
- Drawing 2: Existing Site Layout
- Drawing 3: Exploratory Hole Location Plan

APPENDICES

- Appendix 01: Proposed Development Layout
- Appendix 02: Exploratory Hole Logs
- Appendix 03: Chemical Laboratory Test Certificates
- Appendix 04: Human Health Risk Assessment – GQRA
- Appendix 05: Controlled Waters Risk Assessment – GQRA
- Appendix 06: Geotechnical Laboratory Test Certificates
- Appendix 07: HazWaste Online Output Sheets
- Appendix 08: PAH Double Ratio Plots
- Appendix 09: Asbestos Quantitative Risk Assessment

1.0 INTRODUCTION

1.1 Background

In February 2019, SLR Consulting Limited (SLR) was appointed by Frontier Estates Limited (the Client) to provide consultancy services to support a planning application for the construction of a care home with associated car parking and soft landscaping at the Former Yapton Road Poultry Farm, Yapton Road, Middleton-on-Sea, West Sussex, PO22 6DY (the site).

A site location plan is provided in **Drawing 1**, while the existing site layout is illustrated in **Drawing 2**.

Building upon SLR's Preliminary Land Quality Risk Assessment (PLQRA) dated July 2020, SLR has carried out a ground investigation and this report provides the factual results alongside an assessment of the land quality risks and consideration of the ground conditions in the form of an outline geotechnical assessment.

The report has been completed by SLR Consulting's Land Quality and Remediation team based at Treewood House, Rowden Lane, Bradford on Avon, Wiltshire, BA15 2AU (Tel: 01225 309400).

1.2 Proposed Development

A planning application will be made for Frontier Estates Limited and will seek to demolish the existing buildings and redevelop the site into a care home, which will comprise:

- ◆ A two-storey building with a partial basement;
- ◆ 66 no. en-suite bedrooms, along with internal communal and operational areas;
- ◆ Car parking and cycle storage, and
- ◆ Managed landscaped gardens.

Indicative site layout plans are provided in **Appendix 01**.

1.3 Objectives

SLR's PLQRA report presented basic site information and detailed desk study information. The information therein was used to develop a preliminary conceptual model of potential risks to human and environmental receptors. The conceptual model examined the potential for contaminant-pathway-receptor linkages. The risks associated with the potential linkages were discussed and SLR recommended an intrusive investigation to provide the scheme's environmental consultant and (foundation) designers with information regarding the chemistry of the Made Ground and outline geotechnical properties.

This report presents the findings of the voluntary ground investigation. The information obtained has been used to further develop the conceptual model, and to provide information about foundation options. The risks associated with the potential linkages are discussed as is the need for further assessment.

Overall, this "precautionary" approach is designed to give confidence to future residents, those lending to Frontier and the local authority that the development site, in the words of the National Planning Policy Framework 2019, is:

...suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation.

It is also our objective to show that Frontier's redevelopment will leave the site / land in a condition where it is not capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990.

The secondary objective of this LQRA is to establish if there is any evidence of significant subsurface contamination from past or present activities on or adjacent to the site which could give rise to abnormal development costs i.e. expenditure on remedial works to deal with unacceptable risks to the environment or proposed residents, employees, visitors and contractors.

1.4 Scope of Work

As part of the evaluation of the site and in accordance with current best practice, SLR's PLQRA used the information collected from the desk-based research and site walkover:

- ✦ to identify the likely contaminant sources, receptors and pathways present at the site;
- ✦ to develop a conceptual model; and
- ✦ to identify potential pollutant linkages which required inspection.

When considering the potential pollutant linkages (PPL), their significance and acceptability, SLR was aware that:

- ✦ The site was open land until the 1960s, when it was redeveloped into a poultry farm. Various stages of construction and demolition of barns has occurred;
- ✦ Stockpiles of mixed soil and construction demolition rubble have been identified in the north of the site. Fragments of fibre cement sheet have been identified which might contain asbestos. This assessment assumes **these will be removed from site** prior to the commencement of groundworks.
- ✦ The site is underlain by River Terrace Deposits (sand and gravel) which are further underlain by the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formations.
- ✦ The site is reported to be in an area which does not require radon protection measures;
- ✦ The River Terrace Deposits are designated as secondary (A) aquifer. Groundwater is anticipated to be present at c.2-3m depth;
- ✦ The Chalk Aquifer is designated as a principal aquifer;
- ✦ The site is not in the vicinity of a groundwater Source Protection Zone;
- ✦ The site is not listed as being within a Zone 2/3 flood plain;
- ✦ there is a negligible too low to very low risk from ground stability hazards on site, including from ground dissolution features;
- ✦ On-site potentially contaminative land uses are limited **to the demolition of buildings** (possibly containing ACM) associated with the poultry farm;
- ✦ A **leaking sewer** has been revealed on-site which may be discharging to groundwater;
- ✦ A vehicle repair garage has been identified off-site that could pose a potential source of contamination.

Given the proposed use as a care home with managed gardens the most likely / significant PPL appear to be:

- ❖ **PPL 1a:** Potential harm to human health from exposure to contaminants entering water supply pipework
- ❖ **PPL 1b:** Potential harm to human health from exposure to contaminants in Made Ground
- ❖ **PPL 1c:** Potential damage to future buildings from exposure to aggressive ground and differential settlement
- ❖ **PPL 1d:** Potential pollution of Controlled Waters (groundwater) by contaminants in Made Ground
- ❖ **PPL 2&b:** Potential pollution of Controlled Waters (groundwater & surface water) by contaminants from leaking sewer
- ❖ **PPL 3a:** Potential harm to human health from inhalation of vapours from possible off-site contamination.
- ❖ **PPL 3b:** Potential pollution of Controlled Waters (groundwater) by contaminants migrating from an off-site source.
- ❖ **PPL 4a-c:** Potential Harm to Human and Plant Health from Potential Contaminants in Imported / Site-Won Landscaping Soils
- ❖ **PPL 5:** Potential Risks to Health or the Environment from Unidentified Sources.

Table 1-1
 PPL Requiring Further Investigation & Action Taken

Source / Area of Concern	PPL	Description of PPL	SLR's PLQRA Recommendation	Action Taken
Source 1 – Made Ground associated with the demolition of multiple on-site structures such as poultry sheds and barns.	PPL 1a	<i>Potential harm to human health from exposure to contaminants entering water supply pipework</i>	Shallow intrusive investigation along proposed water supply route or precautionary installation of barrier supply pipe.	At the time of investigation, the proposed route of the water supply pipework was not known. As such, Source 1 relevant to water pipes has not been investigated. Once the route of the pipe is known the developer will only commit to testing if Made Ground or organic contamination is suspected along the proposed route.
	PPL 1b	<i>Potential harm to human health from exposure to contaminants in Made Ground.</i>	Shallow intrusive investigation and screening to take account of the chemistry of soils within areas of possible soft landscaping and beneath the building footprint.	Source 1 relevant to potential harm for human health has been investigated by visual / olfactory observation within the trial pits and boreholes, along with chemical analysis of soil samples. The results have been subject to a Generic Quantitative Risk Assessment (GQRA) – see Section 8.2
	PPL 1c	<i>Potential damage to future buildings from exposure to aggressive ground</i>	Intrusive investigation to provide information regarding aggressive ground conditions.	Source 1 relevant to foundations has been investigated by trial pits and boreholes located close to and within the footprint of the proposed building. Soil samples have been tested for aggressive compounds – see Section 8.3

Source / Area of Concern	PPL	Description of PPL	SLR's PLORA Recommendation	Action Taken
	PPL 1d	<i>Potential pollution of Controlled Waters (groundwater) by contaminants in Made Ground.</i>	Intrusive investigation and environmental screening of soil samples to take account of soil chemistry, and collection of groundwater samples to assess groundwater chemistry.	Source 1 relevant to risk to Controlled Waters has been investigated by the collection of groundwater samples, along with chemical analysis and Generic Quantitative Risk Assessment (GQRA) – See Section 8.4 .
Source 2 – Possible leaking sewer <i>Note: Anecdotal information indicates that the sewer crossing the south of the site may be leaking.</i>	PPL2a	<i>Potential pollution of Controlled Waters (groundwater) by contaminants from leaking sewer.</i>	Collection of groundwater sample from historic well located adjacent to possible location of leaking sewer, as well as collection of additional groundwater samples to assess groundwater chemistry.	Source 2 has been investigated by the collection of groundwater samples and analysis for ammoniacal nitrogen and Generic Quantitative Risk Assessment (GQRA) – see Section 8.5 .
	PPL 2b	<i>Potential Pollution of Controlled Waters (surface water) by contaminants from leaking sewer.</i>		
Source 3 – Off-site vehicle repair garage to the east. <i>Note: No spills or pollution incidents have been recorded from the adjacent properties</i>	PPL 3a	<i>Potential harm to human health from inhalation vapours from a possible off-site source</i>	Intrusive investigation comprising the monitoring of groundwater and retrieval of groundwater samples to assess groundwater chemistry. Analysis to include petroleum hydrocarbons.	Source 3 has been investigated by the investigation of soil samples, collection of groundwater samples and analysis for evidence of petroleum hydrocarbons migrating onto site – see Section 8.6 .
	PPL 3b	<i>Potential pollution of Controlled Waters (groundwater) by contaminants migrating from off-site source</i>		
Source 4 – Contaminants within (yet to be) imported / site-won soils to be used in landscaped areas (subsoil & topsoil).	PPL 4a-c	<i>Potential Harm to Human and Plant Health from Potential Contaminants in Imported / Site-Won Landscaping Soils</i>	Site-won / imported topsoil is to be tested for compliance with BS 3882:2015, and compost tested against BSI PAS100.	-

Source / Area of Concern	PPL	Description of PPL	SLR's PLORA Recommendation	Action Taken
<i>Note: It is possible that site-won soil will need to be supplemented with imported material in order to create the areas of soft landscaping planned.</i>				
Source 5 - Unidentified Contaminant Sources <i>Although unlikely, the possibility of unidentified contaminant sources should be anticipated.</i>	PPL 5	<i>Potential Risks to Health or the Environment from Unidentified Sources</i>	Shallow intrusive investigation and screening to take account of the chemistry of soils.	Source 5 has been investigated by the collecting soil samples around site, followed by a generic quantitative risk assessment. No unexpected contaminants identified to date.

1.4.1 Scope of Field Work

The fieldworks are detailed in **Section 2**, but briefly the tasks undertaken by SLR, after consideration of the findings of PLQRA, comprised;

- ✧ health and safety planning and project management;
- ✧ procuring utility plans;
- ✧ clearance of all excavation locations with reference to underground service plans and use of a Cable Avoidance Tool (CAT);
- ✧ Excavation of nine trial pits excavated to between 3.10 and 3.20 meters below ground level (m BGL) (TP01-TP09);
- ✧ Drilling of four boreholes progressed to between 5.00 and 5.20m BGL using dynamic sampling techniques (WS01-WS04), including the installation of groundwater monitoring wells;
- ✧ Field screening tests and collection of soil samples and logging of soil arisings from all locations to BS5930¹;
- ✧ geotechnical and environmental laboratory analysis of soil samples.

¹ British Standards Institution (2015). BS5930 BSI Standards Publication Code of Practice for Ground Investigations

2.0 Record of Site Activities

2.1 Utility Clearance

Utility plans were obtained in advance of the fieldwork. A site-specific utilities clearance was undertaken at all proposed locations by a specialist utilities clearance company (Service Location Ltd.). This included tracing of services using a cable avoidance tool (CAT) & Genny, and a ground penetrating radar (GPR) survey.

Each location was also cleared by SLR's on site engineer using a CAT and Genny. The location of underground and above ground utilities, in combination with visible obstructions shaped the final locations of SLRs exploratory hole locations.

2.2 Exploratory Holes

The nine trial pits (TP01 –TP09) were excavated using a JCB 3CX Eco on the 29th & 30th May 2019 to a maximum depth of 3.20mbgl. “

The four boreholes (WS01-WS04) we progressed via dynamic sampling techniques, utilising a Premier PP1110 tracked dynamic sampling rig on 1st May 2019. Boreholes were progressed to a maximum depth of 5.20m BGL. A hand pit was excavated to 1.20m BGL at each borehole location to ensure clearance from buried utilities.

Exploratory hole locations are shown in relation to the existing site layout on **Drawing 3**. Exploratory hole locations were selected to enable an assessment of the soil chemistry to give overall site coverage and assess ground conditions in the vicinity of demolished / current agricultural buildings (Source 1). WS02 & WS04 were also progressed in the eastern part of the site to allow an assessment to be made on whether contaminants may have migrated onto site from the adjacent off-site vehicle repair garage.

Soil samples were collected during the excavation for environmental testing and small and bulk disturbed samples were obtained for initial geotechnical testing and assessment. Field screening of all samples for hydrocarbon vapours using a MiniRAE Lite Photo Ionisation Detector (PID) calibrated with isobutylene.

In order to assess groundwater conditions at the site, monitoring standpipes were installed in each of the four boreholes. Each borehole was constructed with a 50mm diameter slotted well screen from 0.50m BGL to the base (response zone), with the screen being surrounded with gravel filter pack. The wells were completed with 50mm plain well casing, sealed with bentonite clay. The remainder of the annulus was backfilled and completed with flush sealed covers, secured in concrete. The plain well casing and bentonite seal prevents surface water run-off or near surface water, contamination or air from the atmosphere from directly entering the response zone of the standpipe. The standpipes were constructed of HDPE (high density polyethylene) and finished with plastic end caps.

The response zones for the wells are screened into the River Terrace Deposits, spanning the water table and area of groundwater fluctuation, to enable the wells to be monitored for the presence of floating non-aqueous phase liquid (NAPL).

Ground conditions at all exploratory hole locations were logged to EN ISO 14688 (BS5930+A2) by SLR. The trial pit and borehole logs are presented in **Appendix 02**.

2.3 Laboratory Analysis - Environmental

All soil samples were stored in cool boxes and transported by courier under chain of custody to Jones Environmental Laboratories.

2.3.1 Soil Samples

Fourteen selected shallow soil samples were analysed for pH, metals, polycyclic aromatic hydrocarbons (PAH) and asbestos screening. Following initial screening, asbestos was identified within seven, so quantification via a combination of detailed gravimetric analysis and Phase Contrast Optical Microscopy (PCOM).

In addition to the above analysis, seven samples were tested for total petroleum hydrocarbons by criteria working group (TPH CWG).

The results are discussed in **Section 8.2 and 8.6**. Copies of the test certificates are contained in **Appendix 03** and collated within a generic quantitative risk assessment in **Appendix 04**.

2.3.2 Groundwater Samples

Four groundwater samples were retrieved from WS01, WS02, WS03 and MW01 using low flow techniques.

Samples were analysed for dissolved metals, TPH CWG including BTEX, nitrate and ammoniacal nitrogen. Two samples were also scheduled for PAHs.

The results are discussed in **Section 8.4**. Copies of the test certificates are contained in **Appendix 03** and collated within a generic quantitative risk assessment in **Appendix 05**.

2.4 Laboratory Analysis - Geotechnical

Disturbed samples recovered from the boreholes were submitted to Geolabs Limited for analysis. The laboratory analysis included:

- ✦ water content;
- ✦ Atterberg Limits 4-point liquid and plastic limit;
- ✦ particle size distribution (PSD) by wet sieve and pipette sedimentation method;
- ✦ pH; and
- ✦ water soluble sulphate content by 2:1 aqueous extract.

The results are discussed in **Section 4.0**. Copies of the test certificates are contained in **Appendix 06**.

3.0 Record of Physical Conditions

3.1 Geology

Ground conditions were proven during the site investigation as comprising topsoil underlain by a variably clayey sandy gravelly silt of the River Terrace Deposits. Thin localised layers of Made Ground were noted across the site, likely to be present as a result of construction and demolition of agricultural buildings.

Reference should be made to the excavation records, **Appendix 02**. For full details of the strata encountered by this investigation, but in summary the encountered geological horizons are described below:

Topsoil: Topsoil was encountered between 0.0-0.25mbgl and comprised a sandy gravelly silt with roots and rootlets. This stratum was encountered in all exploratory holes with the exception of TP8.

Made Ground: Made Ground was encountered between 0.15-0.45m BGL within TP6, TP7, TP8 & TP9. Made Ground does not appear to be constrained to one particular area of the site and is likely to be localised to areas where construction/demolition of agricultural buildings has occurred. Made Ground encountered comprised silty slightly gravelly sand with anthropogenic inclusions including brick and charcoal. Made Ground within TP9 identified a pocket of material found to contain multiple fragments of fibre cement sheet (found to contain asbestos). Further information provided in **Section 8.2** of this report.

Superficial Geology - River Terrace Deposits: River Terrace Deposits were found in all exploratory holes from 0.15 - >5.20m BGL. The superficial deposits primarily comprised variably clayey sandy gravelly silt. Bands of variably silty sand were encountered within all locations within the exception of TP01, TP02 and TP09.

Solid Geology – Chalk: The Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated) was encountered within all boreholes, and within TP08 and TP09 in the south of the site. The chalk was found to be deeper within the north of the site; recorded at 4.10m BGL within WS01, rising to 2.80m BGL within WS03.

3.2 Groundwater

Groundwater was encountered within all boreholes hole locations. Although arisings were logged as damp, no water strikes were recorded within the trial pits. The groundwater strikes are presented on the Logs in **Appendix 02** and summarised in Table 3-1, below.

Table 3-1
Groundwater Monitoring Results Summary

BH/TP	Strata	Initial Water Strike (m BGL)	Water Level (after Zennings) (m BGL)	Water Level at first monitoring round 07/05/2019 (m BGL)	Water Level (mAOD)
WS01	RTD	3.20	1.55	1.55	3.25
WS02	RTD	2.51	1.85	1.85	3.16
WS03	RTD	3.11	1.53	1.53	3.28
WS04		3.40	Not recorded	Not installed	
MW01	?	-	-	1.62	-

Groundwater was generally encountered in the chalk formation, confined by the overlying cohesive River Terrace Deposits. Groundwater has been found to be flowing to the north east, toward the Ryebank Rye.

The site is not listed as being within a groundwater Source Protection Zone.

4.0 Geotechnical Laboratory Data

On completion of the fieldwork selected samples were submitted for laboratory testing. Geotechnical testing comprised the following:

- ✦ Atterberg (plasticity) limits;
- ✦ water content;
- ✦ particle size distribution analysis;
- ✦ pH; and,
- ✦ water soluble sulphate content by 2:1 aqueous.

The results of the laboratory testing are discussed in detail below and summarised in **Table 4-1**. Laboratory testing result certificates are presented in **Appendix 06**.

Table 4-1
 Geotechnical Laboratory Test Results

Location No.	Depth (m)	Type	Water Content (%)	Atterberg Classification				Modified Plasticity Index (I _p)	Particle Size Distribution				Chemical	
				Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% passing #425 (µm sieve)		Clay (%)	Silt (%)	Sand (%)	Gravel (%)	pH	Li W/O ₂ (g/l)
TP02	0.8	D	21.9	42	20	22	99	21.8	-	-	-	-	-	-
TP02	0.9	B	-	-	-	-	-	-	19	69	11	1	-	-
TP02	2.1	D	17.5	25	18	7.0	79	5.5	-	-	-	-	8.5	0.02
TP04	0.8	B	21.3	-	-	-	-	-	-	-	-	-	-	-
TP04	0.8	D	21.3	48	19	29	99	28.7	-	-	-	-	-	-
TP04	2.0	B	-	-	-	-	-	-	-	-	-	-	8.8	<0.01
TP04	2.1	D	10.4	-	-	NP	82	-	-	-	-	-	-	-
TP05	2.0	B	-	-	-	-	-	-	10	61	24	5	-	-
TP06	0.7	D	18.0	31	19	12	99	11.9	-	-	-	-	8.8	<0.01
TP07	0.8	D	21.7	37	20	17	99	16.8	-	-	-	-	-	-
TP09	0.8	D	20.4	-	-	-	-	-	-	-	-	-	-	-
TP09	2.3	D	13.8	20	14	6.0	58	3.5	-	-	-	-	8.6	<0.01
WS01	1.3	D	21.4	38	19	19	99	18.8	-	-	-	-	-	-

4.1.1 Classification Testing

The ground investigation intersected a veneer of topsoil and localised Made Ground overlying superficial deposits comprising slightly gravelly clayey silt and sand deposits. Weathered chalk bedrock was intersected from a minimum of 2.8mbgl, increasing to 4.1mbgl in the north of the Site.

Water content analysis carried out on nine samples indicates water content is higher within the superficial deposits ranging from 18% to 21.9%. As shown in **Figure 4-1** there is a decrease in water content with depth with water content of the underlying weathered chalk ranging from 10.0% to 17.5%.

Atterberg classification testing was carried out on seven samples with results presented in **Figure 4-2**. The cohesive superficial deposits are considered to be low to intermediate plasticity clay with low to medium volume change potential. When plotted using the modified plasticity index, two samples of weathered chalk, recovered at 2.1mbgl in TP02 and 2.3mbgl in TP09, are considered to be low plasticity silt.

Figure 4-1 Water Content with Depth

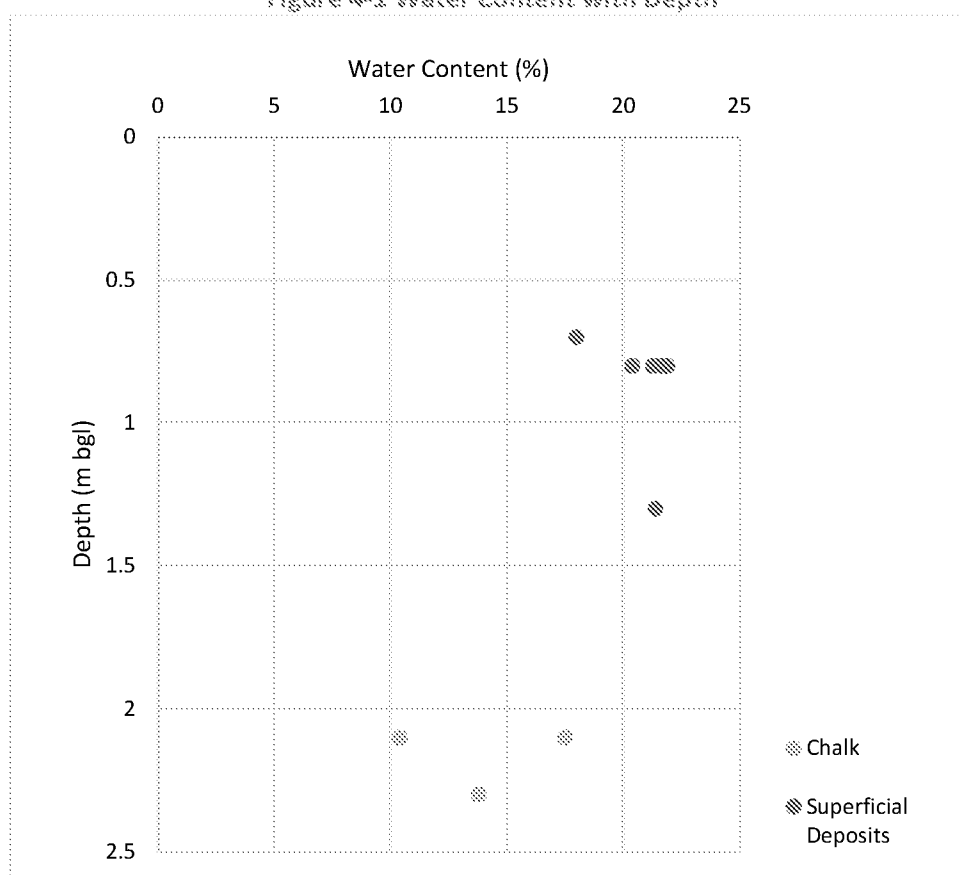
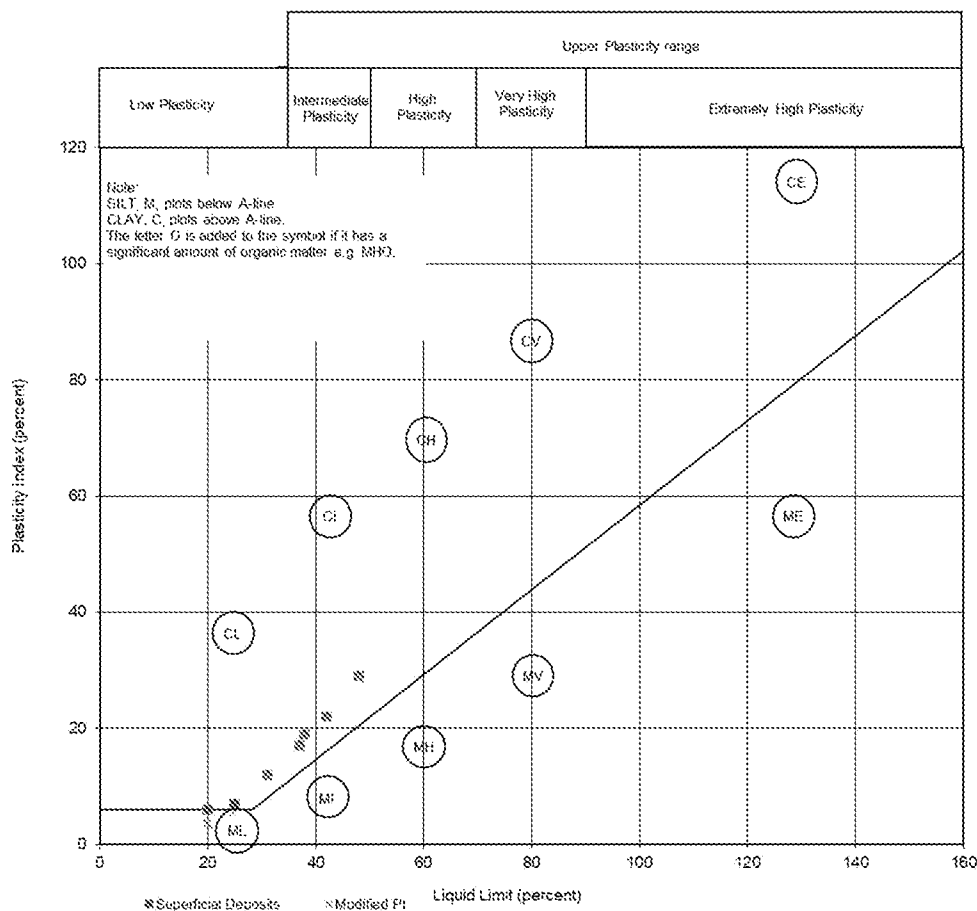


Figure 4-2 Atterberg Classification



Two samples of superficial deposits were submitted for particle size distribution analysis. Testing determined the samples comprise predominantly silt (61 – 69%) with up to 24% sand and less than 5% gravel. The samples range from slightly sandy to sandy clayey silt.

4.1.2 Chemical Tests

The pH tests recorded predominantly slightly alkali results, ranging from pH 8.5 to pH 8.8. Testing to determine soluble sulphate content returned one sample with 0.02g/l WS SO₄ with the remainder below the detection limit of <0.010g/l WS SO₄. This needs to be taken into account when selecting the concrete qualities for construction. Based on BRE guidelines,² the site is classified as Design Sulphate class DS-1 and as ACEC (aggressive chemical environment for concrete) AC-1s.

² BRE Construction Division. Special Digest 1: Concrete in Aggressive Ground. Third edition 2005

5.0 Record of Chemical Conditions

5.1 Visual Observations

Made Ground was encountered only in TP6, TP7, TP8 and TP9 to a maximum depth of 0.45m BGL. Anthropogenic material comprised localised areas of brick and fibre cement sheet. Metal was also noted within the hand pit in WS04. Evidence of ash was noted within the topsoil, possibly evidence as a result of small-scale bonfires.

No hydrocarbon or sulphurous odours were noted during the site investigation, and all samples retained for laboratory analysis were screened for organic vapours using a MiniRAE Lite PID calibrated to isobutylene.

Visual and olfactory evidence of hydrocarbon contamination was not encountered within any of the exploratory holes Table 5-1 below summarises the evidence of contamination encountered.

Table 5-1
Visual/olfactory Evidence of Contamination - Soil

Hole	Depth Encountered (m BGL)	Headspace Test Result (ppm)	Strata	Notes
TP01	0.00-0.25	<0.1	Topsoil	Ash noted
TP06	0.15-0.45	<0.1	Made Ground	Brick fragments and rare charcoal
TP07	0.00-0.30	<1	Made Ground	Brick fragments, concrete, brick tiles
TP08	0.00-0.20	<0.1	Made Ground	Rare brick
TP09	0.10-0.40	<0.1	Made Ground	Rare charcoal gravel and brick. Abundant fibre cement sheets (asbestos)
WS04	0.00-0.20	<0.1	Made Ground	Brick and occasional metal debris. Ash and charcoal noted.

5.2 Soil Chemistry

During the site investigation, fourteen soil samples were collected and scheduled for contaminants detailed in **Section 2.3**. Full chemical analysis certificates are provided as **Appendix 03**, and the results are summarised in the context of a GQRA within **Appendix 04**.

The data trends are summarised below:

- ✦ The concentrations of metals exceed the limit of detection (LOD) in the majority of samples tested, although concentrations are low.
- ✦ PAHs were not typically encountered within the River Terrace Deposits; however PAHs were encountered within the topsoil/Made Ground. Significantly elevated PAHs were encountered where ash/charcoal was noted (to a maximum total concentration of 918 mg/kg) within the trial pit and

borehole logs. The PAH profile indicates the ash/charcoal is likely to be the source of the elevated PAHs (see **Section 8.2** for more detail);

- TPH was recorded in excess of the LOD within two of the seven samples analysed; in TP06 @ 0.20m BGL C5-C35 recorded a 130 mg/kg and WS04 @ 0.25m BGL recorded at 719 mg/kg. Both samples detected the majority of hydrocarbons in the aromatic EC16-EC35 band, indicating a waste oil source;

Asbestos was identified within seven of the fourteen samples tested. Table 5-2 below summarises the asbestos identified from the samples analysed:

Table 5-2
Summary of Soil Data – Asbestos

BH/TP	Depth (m BGL)	Visible Asbestos		Asbestos in Soil Result	
		Type	Description	Type	Quantity (% wt/wt)
TP04	0.20	NAD	-	Chrysotile fibre bundles	0.001
TP06	0.20	NAD	-	Chrysotile fibre bundles	<0.001
TP07	0.20	NAD	-	NAD	-
TP09	0.30m	Asbestos cement sheet	Multiple cement sheet fragments. Good condition, limited weathering. Sheet in sample weighs 23.5grams (2.2% of sample).	Chrysotile fibre bundles	0.001
WS01	0.20	Asbestos cement sheet	Single cement sheet fragment. Good condition, weighs 48.6 grams (4.1% of sample)	Chrysotile fibre bundles	<0.001
WS02	0.25	NAD	-	Chrysotile fibre bundles	<0.001
WS04	0.25	NAD	-	Chrysotile fibre bundles	<0.001

NAD=No asbestos detected. Asbestos quantified using detailed gravimetric analysis and phase contract optical microscopy.

Based on the above, the following conclusions have been drawn with respect to the assessment of contaminants:

- Concentrations of metals encountered were generally low;
- Elevated levels of PAHs have been identified within the topsoil and Made Ground, possibly associated with the presence of ash/charcoal; and
- Asbestos is present locally within the Made Ground.

5.3 Groundwater Chemistry

During the site investigation, four groundwater samples were collected from WS01, WS02, WS03 and MW101. Samples were scheduled for contaminants detailed in **Section 2.3**. Full chemical analysis certificates are provided as **Appendix 03**, and the results are summarised in the context of a GQRA within **Appendix 05**.

The data trends are summarised below:

- ✦ Low concentrations of total dissolved chromium and dissolved nickel were identified within all samples above the LOD. Dissolved arsenic was recorded within WS01 at a concentration of 0.019 mg/l.
- ✦ No petroleum hydrocarbons were recorded within samples above the LOD, with the exception of the sample collected from MW01, where aromatic EC16-EC21 was recorded at a concentration of 0.01 mg/l;
- ✦ Nitrate was recorded within all samples above the LOD, with the highest being recorded within WS01 at 190 mg/l;
- ✦ Ammoniacal nitrogen was recorded above the LOD within three of the four samples, significantly elevated within WS01 (1.31 mg/l) and MW01 (1.92 mg/l);
- ✦ Low concentrations of PAHs were recorded within both samples collected.

6.0 Waste Assessment

6.1 Background

Wastes are listed in the List of Waste Regulations (LoW 2005 – which transpose the European Waste Catalogue (EWC) into domestic legislation) and are grouped according to generic industry, process or waste type. Wastes within the LoW are either Hazardous or Non-Hazardous. Some of these wastes are Hazardous without further assessment (absolute entries) or are ‘mirror’ entries that require further assessment of the hazardous properties in order to determine the potential for hazardous waste.

Waste soil has “mirror” entries on the LoW and as such the first phase of the waste classification process is that of determining if the waste is hazardous or not, i.e. the hazard assessment.

Certain contaminants such as asbestos or diesel have prescribed concentration thresholds that if breached will render the material hazardous waste. Thus, in the first instance the concentrations of plausible contaminants within the soil should be identified. Results of this assessment should help to determine the likely fate of the soil and whether or not the soil is hazardous or non-hazardous.

Dependent on the results of the hazard assessment advice can be given as to the likely options available for a given waste and any further testing or assessment that may be required.

Subject to passing further WAC testing and after pre-treatment/off site treatment, hazardous wastes are likely to require landfilling. Non-hazardous waste may be suitable for re-use rather than landfilling; however this would be based on compliance with the appropriate code of practice or environmental permit of the receiving site.

It should be noted that where waste is classified as “non-hazardous”, in order to dispose of this material at a licensed inert landfill facility, it should pass a suitable inert waste WAC test.

6.2 Step 1 – LoW Code

The first decision in the waste assessment is to determine the LoW Code for the waste soil and whether that material is Hazardous, Non-Hazardous or a mirror entry which is potentially Hazardous or Non Hazardous depending on the presence of certain contaminant. Based upon observations made during the initial site investigation the following two LoW codes for the material are judged to be applicable:

- ✦ 17 05 03 – soils and stones containing hazardous substances; or
- ✦ 17 05 04 – soils and stones other than those mentioned in 17 05 03.

The purpose of the remainder of the assessment is to determine if the soil material is either Hazardous or Non-Hazardous waste and therefore which of the above is applicable.

6.3 Step 2 – Hazard Assessment

The second stage of the assessment is to determine the nature of the soil material, based on the composition or properties. In this case we can determine the composition of the soil material from laboratory analysis.

The contaminants present above laboratory detection limits were assessed in terms of the hazard phrases present. The HazWasteOnline model was used to undertake the initial Hazard Assessment screen, the purpose of which is to establish whether the sampled soils should be considered as either Hazardous or Non-Hazardous

waste. This classification process is in line with the Environment Agency's technical guidance WM3 "Guidance on the classification and assessment of waste", 1st edition 2015 Version 1.1. The model output sheets are attached in **Appendix 07** for reference.

Based on the results of the Hazard Assessment, indicative List of Waste (LoW) coding for all the soil analysed, all are likely to be classified as '17 05 04, soil and stones other than those mentioned in 17 05 03', i.e. non-hazardous waste.

6.4 Step 3 – Asbestos Waste

The presence of asbestos containing materials (ACM) with the shallow soil does pose a potential issue with regards to waste classification.

Materials, including waste soils and construction waste, become hazardous waste if the asbestos content exceeds the 0.1% carcinogenic threshold on a weight for weight (w/w) basis. In practice whether the asbestos content is above or below 0.1% is difficult to prove and depends on whether asbestos containing materials (ACMs) and/or loose asbestos fibres are present. Under current legislation (WM3) SLR's interpretation of whether the presence of asbestos renders waste soils or aggregate hazardous is as follows:

1. If no visible asbestos is present and asbestos fibre content is below 0.1% - the material is non-hazardous waste.
2. If no visible asbestos is present and asbestos fibre content is above 0.1% - the material is hazardous waste.
3. If visible asbestos is present and asbestos fibre content is above 0.1% - the material is hazardous waste.
4. If visible asbestos is present and asbestos fibre content is below 0.1% - the parent material is non-hazardous BUT the asbestos is hazardous waste. In this case the material should be given two EWC codes and will be treated as though all the material is hazardous waste until the visible asbestos has been removed.

The above effectively means that if asbestos is visibly present then it will require disposal to a hazardous treatment centre. Alternatively, the shallow topsoil/Made Ground could be segregated and pre treated (i.e. removing visible asbestos through grading and hand picking). The soil fraction would then be classified as non-hazardous waste, and the asbestos fragments as hazardous.

7.0 Outline Geotechnical Assessment

In broad terms, this section seeks to support the NPPF by ensuring the site is suitable for its new use *taking account of ground conditions and land instability*. This section relates to PPL2c which deals with the physical ground conditions by way of an outline geotechnical assessment; the land's chemical qualities are assessed in **Section 8**.

7.1 Limitations

The comments and recommendations contained below are based on the observed ground conditions from the recent ground investigation; once geotechnical testing results are available further assessment will be undertaken. Extrapolation between, and to, other parts of the site is not considered possible given the nature of the information gathered and the geological setting, as interpreted. No responsibility is accepted for geological and geotechnical conditions which vary from those on which this report is based. It should be noted that the solutions are discussed in principle only and must be subject to a more complete assessment at the detailed design stage of the project.

7.2 Foundation Recommendations

The ground investigation intersected a thin veneer of topsoil and localised Made Ground in several areas comprising sandy silt to silty sand with variable clay and gravel content (brick, charcoal and asbestos containing material) to a maximum depth of 0.45mbgl. Superficial deposits comprising slightly gravelly clayey silt and sand were encountered underlying the topsoil and Made Ground. The silt and sand deposits were generally described as soft to firm slightly gravelly clayey sandy silt with frequent beds of silty sand and occasionally increasing gravelly content with increasing depth. Gravel comprised chalk and flint. Weathered chalk bedrock was encountered within TP08 and TP09 in the south of the site and in the boreholes from 2.8m and 4.1mbgl. The superfcials / chalk contact was deeper in the north of the site.

Groundwater seepages were recorded in several trial pit excavations between 2.1mbgl and 2.6mbgl. Installation of groundwater monitoring wells within the four boreholes recorded groundwater levels between 1.53mbgl and 1.85mbgl (3.28mAOD and 3.16mAOD). Groundwater was generally encountered within the chalk bedrock, rising following water strike indicating it is confined by the overlying cohesive River Terrace Deposits.

The proposed development will comprise a two-storey residential care home, with a basement, landscaped gardens, parking and service areas.

7.2.1 Shrinkage and Swelling of Soils

An Arboricultural Impact Assessment Survey conducted in January 2017³ identified a number of trees onsite and offsite along the eastern and southern site boundaries. Species including Oak, Hazel, Hawthorn, Cherry, Maple, Birch, Bay Laurel and Ash in good to poor form were recorded.

The Tree Survey identified a number of high water demand trees including Oak offsite and Hawthorn onsite plus several moderate water demand trees onsite including Bay Laurel, Ash and Cherry. The proposed building lies within the zone of influence of a number of trees. These factors need to be considered within the foundation design, for which the worst-case scenario will be taken i.e. highest water uptake.

³PJC Consultancy Limited (January 2017). Ref: 3822/16-02 r2. Arboricultural Impact Assessment – Poultry Farm, Yapton Road, Middleton-on-Sea, West Sussex PO22 6HS

Whilst there may not be an explicit requirement for the proposed development to adhere to NHBC guidelines⁴, in the context of building near trees, this is considered to provide a best practice approach.

In accordance with NHBC guidance the modified plasticity index has been calculated from the geotechnical testing of cohesive superficial samples. The soils range from low to medium volume change potential. Reference has been made to the NHBC guidance and the Tree Survey to determine the possible worst case of required depth of foundations with medium volume change potential soil.

The Oak recorded offsite is approximately 10m from the proposed structure and was recorded as 11m tall. Foundations installed in medium volume change potential soils within 10m of a high water demand tree species, such as Oak, should be constructed to a depth of 1.6m. The 7m tall Bay Laurel tree recorded in the south-eastern corner of the Site is a moderate water demand species and is located approximately 2m south of the proposed structure. Foundations within 2m of such a tree should be constructed to 1.65m. This is considered to be a worst case, along the southern boundary.

The depth of foundation will vary dependent on the proximity to trees and tree species and reference should be made to the NHBC guidelines during detailed design. Given the general absence of trees for the north-western area of the Site it may be feasible to construct foundations at various depths based on the zone of influence of trees. Foundation design will need to take into account the proposed planting as well as species removed.

7.2.2 Foundation Options

Foundation solutions have been considered taking into account ground conditions, proximity of high and moderate water demand tree species and location of the proposed structure within the Site. Limited Made Ground and topsoil was encountered during the investigation and as such foundations installed into the superficial deposits are considered during this assessment.

The foundation design takes into consideration a worst-case scenario. This uses the poorest ground conditions within the footprint of the proposed development with the highest load. This allows for some variation in ground conditions as well as considering a maximum load.

As discussed in **Section 7.2.1**, above, the depth of foundation will be determined by the proximity to and water demand of the tree species and the volume change potential of the underlying soils. Where high or moderate water demand tree species are sufficiently distant from the proposed structure, traditional shallow strip foundations may be appropriate. Trench fill foundations are recommended where foundations deeper than 1.5mbgl are required.

Calculations have been carried out to determine the bearing capacity for ground conditions primarily comprising soft to firm sandy silts. Traditional shallow strip foundations installed within the superficial River Terrace Deposits provide a bearing capacity in excess of 175kPa. This is considered to be adequate for the proposed development, however no loading information regarding the proposed development has been provided.

Foundations will need to be installed deeper in close proximity to trees, resulting in a higher allowable bearing capacity. Recommended additional protection measures for foundations susceptible to shrink-swell are outlined in the NHBC Guidance⁴.

The risk of excessive differential settlement impacting the proposed structure is considered to be moderately low. Foundations will be constructed into the underlying River Terrace Deposits which primarily consist of slightly gravelly sandy clayey silts. As such settlement will likely occur in the months to years following construction, and total settlement is anticipated to be within acceptable limits, estimated to be <25mm.

There is potential for limited areas of softer material within the silts which may not be considered suitable for strip foundations. It is recommended that prior to construction foundation excavations are proof rolled with a

⁴ NHBC Standards 2020, Part 4 Foundations

Wacker plate to highlight any soft areas. These should then be removed and backfilled with suitable granular material to ensure the structure remains stable.

7.3 Temporary Works and Basal Heave

Excavations were stable during the ground investigation; however, the presence of groundwater seepages and granular horizons within the River Terrace Deposit may lead to instability of excavation during construction (particularly where excavation for the basement is required). If instability occurs during excavations temporary shoring is likely to be required Where there is not sufficient space to batter excavation sides to a stable gradient.

Monitoring wells installed within WS01 to WS03 recorded groundwater levels between 1.53mbgl and 1.85mbgl. During excavation slight groundwater seepages were recorded. The shallow groundwater recorded in monitoring wells may be associated with the underlying chalk bedrock. Given their largely cohesive nature, the overlying superficial deposits may be confining the groundwater and as such the potential for basal heave within excavations should be considered.

7.3.1 Groundwater Control

Groundwater will need to be taken into consideration during construction. Groundwater seepages within the River Terrace Deposits were encountered between 2.1mbgl and 2.6mbgl, associated with more granular horizons. Excavation for the basement in the northwest corner of the structure is likely to extend beyond this depth; therefore dewatering will likely be required. Traditional sump pumping from within the excavations may not be an efficient or cost-effective option. If possible, it is recommended that construction occurs whilst the water table is at its lowest, in the summer months.

An alternative foundation solution may be required if groundwater within shallow foundation excavations is higher than currently recorded and cannot be managed efficiently.

Wellpointing may be suitable for reducing the head of water during temporary works for the basement excavation however further information is needed to calculate the hydrostatic uplift force present and address other factors including discharge of pumped water from the site Further investigation will likely include drilling into the chalk aquifer and groundwater monitoring.

It is recommended that all groundwater control solutions are designed by a competent specialist.

7.4 General

In addition to the above, it is recommended that all design and construction works be carried out on site in accordance with recognised engineering codes of practice including BS 8004 (2015: Code of Practice for Foundations) and BS 6031 (2009: Code of Practice for Earthworks).

8.0 Land Quality Risk Assessment

In broad terms, this section seeks to support the NPPF by ensuring the site is suitable for its new use *taking account of ground conditions and land instability*. The previous section dealt with the suitability of the physical ground conditions, and the subsections below assess the land's chemical quality by assessing the PPL set out in **Section 1.4** of this report – which were drawn from SLR's PLQRA report.

8.1 PPL1a

Potential Harm to Human Health from Exposure to Contaminants Entering Water Supply Pipework

This PPL (Potential Harm to Human Health from Exposure to Contaminants Entering Water Supply Pipework) concerns ground conditions along the route of all proposed water supply pipes. At the time of investigation the proposed route of the water supply pipework was not known. As such, Source 1 relevant to water pipes has not been investigated. Once the route of the pipe is known the developer will only commit to testing if Made Ground or organic contamination is suspected along the route of the water supply pipework. Alternatively the developer may elect to install barrier pipe as a precautionary measure.

8.2 PPL1b

Potential Harm to Human Health from Exposure to Contaminants in Made Ground

This PPL concerns the chemistry of the soils in the proposed landscaped areas. The contaminants of concern associated with the shallow soils are heavy metals, PAHs and asbestos.

8.2.1 Approach & Assessment Criteria

Chemical analysis have been screened against generic assessment criteria (GAC) protective of human health. The GAC have been developed as a guide for regulators and developers; if the concentrations recorded on site are lower than the GAC it is generally accepted that the contaminants in question are present at acceptable concentrations which aren't capable of putting human health at significant risk - as long as the humans make normal use of the site. An exceedance of these values indicates to an assessor that soil contaminant concentrations need to be considered further. GACs combine both authoritative science and policy judgements.

The GAC and S4ULs / C4SLs used have been derived using the CLEA model according to several typical land uses:

- ✦ Residential (with and without vegetable growth);
- ✦ Allotments;
- ✦ Commercial/Industrial;
- ✦ Public Open Space residential (POS1);
- ✦ Public Open space park (POS2).

The proposed development at the site is considered a residential land use. The proposed site layout in **Appendix 01** indicates the site will comprise a care home building, with associated soft landscaping and car parking. The generic land use most appropriate to the majority of the site is therefore residential without plant uptake. The ingestion pathways concerning vegetables are not assessed here as any crops grown in the raised planters for resident's use will be nourished by imported soil / compost.

The selected GAC for the site for an initial screen are the LQM/CIEH S4ULs. These provide screening criteria derived using the most recent toxicological data, whilst still modelling "minimal risk". The selected criteria are designed to be protective of small children who are assumed to live on site and play in the garden – as such it

will be overly protective of the elderly residents of this care home and the workers (the CLEA model would anticipate those adult receptors to have a far lower exposure to soil based and soil-derived contaminants). The S4ULs are therefore considered conservative. It should be noted that no S4UL is available for lead. As such SLR has adopted the C4SL as an initial screening criteria.

Where contaminants are sensitive to soil organic matter (SOM), 1% values have been adopted as a conservative measure. When assessing PAHs, chemical analysis results have been compared with GAC derived using the Toxicological Equivalency Factor (TEF), rather than the Surrogate Marker (SM) method.

No GAC are available in the UK for asbestos in soils, therefore asbestos has been assessed separately, as detailed in **Section 8.2.4**.

The results for the chemistry of the Made Ground are presented in **Appendix 04**. The table compares the laboratory results to the generic human health assessment criteria⁵ (GAC) (NB: the cells shaded red represent concentrations in excess of the criteria, while those in green indicate a concentration above the limit of detection (LOD)).

The individual sample results for each contaminant were compared to generic assessment criteria. The GAC and their sources are detailed in **Appendix 04** and the full laboratory results are provided in **Appendix 03**.

8.2.2 Heavy Metals

Testing comprised the analysis of fourteen shallow samples (nine topsoil/ Made Ground, six natural ground) from twelve locations.

No metals were revealed in excess of the adopted GAC. The risk to the proposed redevelopment from metals is therefore considered very low.

8.2.3 PAHs

Exceedances

Testing comprised the analysis of fourteen shallow samples (nine topsoil/ Made Ground, six natural ground) from twelve locations.

PAHs were recorded in excess of the adopted GAC in four locations; summarised below:

- ✧ TP01 @ 0.25m BGL – B(a)P (3.6 mg/kg), D(ah)A (0.43 mg/kg) & B(b)F (3.9 mg/l);
- ✧ TP07 @ 0.30m BGL – BaA (33 mg/kg), Chrys (34 mg/kg), BaP (41 mg/kg), DahA (3 mg/kg) & B(b)F (49 mg/kg);
- ✧ TP09 @ 0.30m BGL - BaA (86 mg/kg), Chrys (63 mg/kg), BaP (64 mg/kg), I(123cd)P (47 mg/kg) D(ah)A (7.3 mg/kg) & B(b)F (86 mg/kg);

⁵ The generic risk assessment criteria are drawn from several sources of guidance, some from non-statutory guidance and some informal. SLR uses a combination of assessment criteria that are currently available to assist in the screening of soil data prior to determining whether further action is required. The following assessment criteria have been used for the assessment of contaminant levels in soil:

- LQM/CIEH – Land Quality Management and the Chartered Institute of Environmental Health have published S4ULs derived following CLR technical guidance and using the Environment Agency's CLEA UK model; and
- SLR's own in-house screening criteria derived following CLR technical guidance using the CLEA UK model,
- CLAIRE / AGS / EIC – these institutions have published publicly available GACs derived following CLR technical guidance and using the Environment Agency's CLEA UK model; and
- Category 4 Screening Levels (Defra)

- WS04 @ 0.25m BGL – BaP (9.1 mg/kg), D(ah)A (1.5 mg/kg), B(b)F (11 mg/kg).

Given that the data set is relatively limited (nine samples from the shallow topsoil/Made Ground), there is insufficient data to justify the use of statistical analysis.

It should be noted that the adopted assessment criteria are protective of a female child, aged 0-6 occupying the site, and are therefore conservative. Nevertheless, some of the PAH exceedances are significant (up to 24 times the screening criteria). When assessed against a less sensitive receptor (elderly resident or on-site worker), exceedances of assessment criteria would still be present.

Source of PAHs

Where PAHs are identified, it is essential to understand the possible source to fully understand the risks posed. PAHs are formed as a result of the incomplete combustion of carbon, with man-made sources including motor vehicle engines & fuel, coal or wood fires, coal tar and creosote.

In order to assess the origin and significance of these detections SLR has produced a series of double ratio plots that involves plotting pairs of isomers to tentatively determine different PAH source profiles. The double ratio plots are included in **Appendix 08**. The double ratio plots indicate a combustion/pyrogenic signature from grass/wood/coal combustion and/or coal. This corresponds to the ash and charcoal identified within the shallow ground, likely to be present as a result of small bonfires.

8.2.4 Asbestos

Of the fourteen soil samples subject to asbestos analysis, seven identified asbestos fibre bundles, and two identified visible pieces of asbestos cement sheet. Within TP09, a layer of shallow Made Ground was identified which contained abundant asbestos cement sheet fragments. Where fibre bundles were identified, they were quantifiable in two locations ; TP04 @ 0.20m BGL (0.001%) and TP09 @ 0.30m (0.001%).

It should be noted that asbestos is likely to be present as a result of the construction/demolition of agricultural buildings, and is likely to be limited to the surface 500mm of ground.

The presence of asbestos within the Made Ground can pose a risk to human health in two principal areas, namely:

- 1) long term human health impacts (proposed end users of the site); and
- 2) short term human health impacts (ground workers during the construction phase of the redevelopment)

Long Term Human Health Impact

There is currently no GAC for asbestos in the UK, and where asbestos is identified, assessment is required on a site by site basis.

SLR has carried out an assessment of asbestos exposure using predictive exposure modelling, for asbestos free fibre within the soil, included as **Appendix 09**. SLR has calculated that at a free fibre concentration of 0.001%, the risk to the proposed end users of the site is very low.

The application of the free fibre criterion of 0.001 % for asbestos cement fragments in the ground however is not appropriate as this does not account for the significant difference in free fibre release from asbestos cement compared with unbound free fibres. For bound asbestos, SLR has therefore adopted 0.1%; a justification for which is provided in **Appendix 09**.

Visible asbestos cement sheet fragments in the locations of TP09 and WS01 have been identified at concentrations in excess of the 0.1% threshold. Action is therefore necessary in relation to asbestos.

Short Term Human Health Impact (Occupational Exposure)

The presence of asbestos within the ground can lead to groundworks which may disturb it to be classified under the Control of Asbestos Regulations (2012) (CAR 2012). Any earthworks/groundworks contractor should

therefore be provided with the results of this report and ensure the presence of asbestos is taken into account when carrying out work that may disturb the shallow ground.

8.3 PPL1c

Potential Damage to Future Buildings from Aggressive Ground Conditions

Chemical analyses has been scheduled but as of yet the test results are not available. Once test results are received the chemical analyses will be discussed.

8.4 PPL1d

Potential Harm to Controlled Waters from Contaminants in Made Ground

This PPL relates to potential impact from metals, PAHs & nitrate. Ammoniacal nitrogen is considered as part of PPL2, and petroleum hydrocarbons are considered as part of PPL3. Four groundwater samples were collected from WS01, WS02, WS03 and MW01

8.4.1 Approach and Assessment

Risks to groundwater and surface water from dissolved contaminants have been assessed by screening the results against generic water quality standards (WQS).

These criteria are protective of the environmental quality of surface waters (EQS) or of human health (via Drinking Water Standards). The screening criteria are drawn from the following list with criteria from the latter standards/guidance only being used where Environmental Quality Standards (EQS) and UK Drinking Water Standards are not available:

- Environmental Quality Standards (EQS) - The River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Directions 2010
- UK Drinking Water Standards (UK DWS) – are for the protection for human health and derive from either the Water Supply (Water Quality) Regulations 1989 or 2000.
- EU Drinking Water Standards (EU DWS) – are for the protection of human health and derive from the Council Directive 98/83/EC.
- World Health Organisation Guidelines (WHO Health) protect health and derive from the World Health Organisation Guidelines for Drinking Water Quality, 1984.

As an initial tier of generic screening, the lowest applicable WQS have been used to screen the laboratory results. Individual sample exceedances do not constitute an actual risk, but indicate that further consideration or assessment of the result should occur.

This could also include consideration of natural background concentrations within the strata under assessment.

The screening sheets are included in **Appendix 05**, with samples exceeding the GAC highlighted in red. The results of the water environment screening are discussed below.

Heavy Metals

Metals have not been identified in excess of the adopted WQS. The risk to the underlying aquifer from dissolved metals is therefore considered very low.

Nitrate

Nitrate has been revealed within all samples in excess of the LOD, and in excess of the WQS within two samples:

- ◆ WS01 (190 mg/l); and

✦ WS03 (66 mg/l)

The nitrate is likely to be present within the groundwater from the past use of the site as a poultry farm (as nitrate can leak from poultry manure). Given that the poultry farm is no longer operational, nitrate would degrade over time, and the risk is not considered significant.

PAHs

PAHs have been identified within the groundwater from the two samples analysed, with the following identified in excess of the WQS:

- ✦ WS02 – Fluoranthene at 0.000012 mg/l; and
- ✦ WS02 – Fluoranthene at 0.000052 mg/l; and

PAHs are typically large hydrocarbon molecules, with a relatively low solubility, and high carbon partition coefficient (K_{oc}). CLAIRE recently published guidance regarding risk assessment of petroleum hydrocarbon in groundwater⁶. The guidance states:

“...the heavier fractions (compounds >20 carbon atoms) are very unlikely to contain hydrocarbon compounds with appreciable aqueous solubility. These compounds are therefore unlikely to be of interest in a hydrogeological risk assessment, except in certain geological environmental environments such as karst, where suspected solid and/or LNPAL may potential be transported over significant distances”

Referencing the above, this effectively means due to their low mobility, PAHs typically do not pose a significant risk to groundwater, and the risk is considered very low.

8.5 PPL 2a&b

Potential pollution of Controlled Waters (groundwater & surface water) by contaminants from leaking sewer

This PPL relates to the risk to Controlled Waters from contaminants arising from a potential leaking sewer.

All groundwater samples were scheduled for ammoniacal nitrogen to assess any potential impact from a potential leaking sewer.

Results have been screened in accordance with the procedure set out in **Section 8.4.1**. The following exceedances of the WQS have been identified:

- ✦ WS01 at 1.31 mg/l
- ✦ MW01 at 1.92 mg/l

The above indicates that the sewer is likely to be leaking near MW01, and the elevated result from WS01 is likely to be attributed to the use of the site as a poultry farm. With regards to the sewer, it is recommended that this be repaired as soon as possible to stop the release of contaminants into the groundwater.

Once the sewer has been repaired, SLR do not consider further action is necessary, as groundwater is shallow and ammoniacal nitrogen will degrade readily, as reduction requires oxic conditions (likely to be present on-site).

8.6 PPL 3a&b

Potential harm to human health from inhalation of vapours from possible off-site contamination

Potential pollution of Controlled Waters (groundwater) by contaminants migrating from an off-site source.

⁶ CL:AIRE, 2017. Petroleum Hydrocarbon in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies. CL:AIRE, London. ISBN 978-1-905046-31-7.

These PPL relate to risk to human health and Controlled Waters from mobile contaminants migrating onto site from a vehicle repair garage located immediately east of the site. Following intrusive investigation and risk assessment, SLR do not consider Source 3 to pose a risk to the proposed redevelopment for the following reasons:

- ✦ No evidence of hydrocarbon impact has been noted within the soil or groundwater during the excavation of trial pits and drilling of boreholes. Field screening did not identify volatile contaminants within the soil;
- ✦ Groundwater samples analysed for TPH CWG did not identify petroleum hydrocarbons in excess of the LOD (with the exception of MW01, which identified heavy end hydrocarbons at the LOD of 0.01 mg/l);
- ✦ Groundwater has been found to be flowing to the north east i.e. away from the off-site source

The above indicates that it is unlikely that hydrocarbons have migrated onto the site, and are unlikely to do so in the future. The risk to the proposed redevelopment is therefore considered very low.

8.7 PPL 4a-c

Potential Harm to Human Health from Potential Contaminants in Imported Landscaping Soils – If Required

Any imported soil will need to meet the specification outlined in **Section 6.1** of the PLQRA. By working to the specification and ensuring compliance with the British Standards, Frontier Ltd should prevent PPL3 (a-c) from occurring. However, further chemical testing of any imported soil/material may be prudent to demonstrate that it does not pose a significant risk to human health.

Although the assessments reported above have demonstrated that the soils present on site are suitable for the proposed end-use of the site in terms of risk to human health and potential harm to landscape plants from phytotoxic elements, the work herein does not include an assessment regarding the suitability of the in-situ soils as a growing media (i.e. compliance with BS 3882:2015 topsoil criteria).

8.8 PPL 5

Potential Risks to Health or the Environment from Unidentified Sources

With the exception of buried asbestos (which requires further action), given the historic use of the site as a poultry farm, it is unlikely unexpected sources of contamination will be identified. Regardless, a watching brief should be maintained for any material exhibiting visual/olfactory evidence of contamination.

In practice, should the developer encounter potentially hazardous materials work should cease and the matter be referred to an appropriate environmental consultant, as specified in **Sections 6.2** and **6.3** of the PLQRA.

9.0 Conclusions and Recommendations

In broad terms, this report aims to support the NPPF by ensuring the site is suitable for its new use *taking account of ground conditions and land instability*.

The PLQRA identified that the most likely / significant PPL appeared to be:

- ✦ **PPL 1a:** Potential harm to human health from exposure to contaminants entering water supply pipework
- ✦ **PPL 1b:** Potential harm to human health from exposure to contaminants in Made Ground
- ✦ **PPL 1c:** Potential damage to future buildings from exposure to aggressive ground and differential settlement
- ✦ **PPL 1d:** Potential pollution of Controlled Waters (groundwater) by contaminants in Made Ground
- ✦ **PPL 2&b:** Potential pollution of Controlled Waters (groundwater & surface water) by contaminants from leaking sewer
- ✦ **PPL 3a:** Potential harm to human health from inhalation of vapours from possible off-site contamination.
- ✦ **PPL 3b:** Potential pollution of Controlled Waters (groundwater) by contaminants migrating from an off-site source.
- ✦ **PPL 4a-c:** Potential Harm to Human and Plant Health from Potential Contaminants in Imported / Site-Won Landscaping Soils
- ✦ **PPL 5:** Potential Risks to Health or the Environment from Unidentified Sources

9.1 Physical Ground Conditions

Nine trial pits were excavated to a maximum depth of 3.20mbgl, and four dynamic boreholes were drilled to a maximum depth of 5.20m BGL. The ground conditions across the site comprised topsoil overlying superficial River Terrace Deposits. The topsoil was found to contain occasional patches of ash/charcoal, and the Made Ground was found to contain occasional pockets of anthropogenic material including brick and fibre cement sheet fragments; found to contain asbestos.

Groundwater was encountered between 1.55-1.85m BGL (3.16-3.25m AOD) found to lie within the River Terrace Deposits

9.2 Preliminary Geotechnical Conclusions

Geotechnical laboratory testing results are not available currently and the following preliminary conclusions are based off observations only. Final geotechnical conclusions will be verified once testing results are analysed.

Geotechnical field observations found a thin layer of topsoil and Made Ground overlying natural River Terrace Deposits comprising slightly gravelly sandy silts with frequent granular horizons present. The underlying chalk bedrock geology was encountered, between 2.80m BGL in the south of the site and 4.10m BGL in the north of the site.

Based on information obtained across the Site, the risk of differential settlement (PPL1c) is not considered to be a significant issue and shallow strip or trench-fill foundations are likely to be suitable for the proposed development. Where foundations fall within the zone of influence of existing / proposed trees, the depth of foundations may need to be increased. The proposed foundation design should consider the presence of silt susceptible to shrinkage and swelling, shallow groundwater and earthworks stability.

If shallow groundwater is encountered during foundation excavation and this cannot be adequately managed via dewatering, an alternative foundation solution may be required. Additional ground and groundwater data will be required to inform any new foundation solution.

In order to duly consider the potential of basal heave within the proposed basement excavation further information on the underlying groundwater conditions will be required.

9.3 Significance of Potential Pollutant Linkages

The assessed significance of each PPL is summarised below, along with recommendations for any further work (if required).

9.3.1 PPL 1a: Potential Harm to Human Health from Exposure to Contaminants Entering Water Supply Pipework

At the time of this investigation the proposed route of the water supply pipe was not known, as such PPL1a has not been assessed. However, by undertaking a targeted investigation along the route of the water supply pipe (once it is known) and working to the methodology set out in **Section 5.1** of the PLQRA, the developer will prevent PPL1a from occurring.

9.3.2 PPL 1b: Potential Harm to Human Health from Contaminants in Made Ground

Fourteen soil samples were recovered during the site investigation, and scheduled for a suite of contaminants comprising metals, PAH, TPH CWG including BTEX and asbestos. The data set was subject to a GQRA protective of residential land use.

It was found that the topsoil/Made Ground contains PAHs which might constitute a potential risk to the proposed end users of the site. Asbestos cement sheet fragments were also identified within shallow soils in TP09 and WS01 which may pose a potential risk.

PAHs only pose a risk to proposed end land users when they are exposed to impacted soils (i.e. in proposed soft landscaped areas). Equally asbestos only poses a risk in soil when it is disturbed, thus giving the potential to release asbestos fibres into the atmosphere or allowing asbestos impacted soils to be tracked indoors.

Remediation in relation to this PPL is therefore necessary. Impacted soil from landscaped areas should be excavated and replaced with validated clean sub-soil/topsoil. Given the limited depth of impact (typically 300mm, maximum 500mm), and given the underlying natural strata is suitable for use, it is recommended that all the topsoil/Made Ground in proposed landscaped areas is removed.

To limit off-site disposal, it may be possible to re-use this material beneath the proposed building footprint as engineered fill, or beneath proposed hard landscaped areas (i.e. car parks).

Where shallow soils are destined for off-site disposal, the presence of visible asbestos cement sheet fragments may lead to the material being classified as hazardous waste. It may therefore be more cost effective to pre treat the material (via screening and hand-picking visible asbestos) prior to off-site disposal.

Given the presence of visible asbestos within the shallow ground, and quantifiable free fibre bundles within two samples, it is likely CAR 2012 will apply to works which disturb the Made Ground. Groundworks contractors should therefore be provided with this report and ensure the presence of asbestos is accounted for in their health and safety planning.

In addition to the removal of topsoil/Made Ground from proposed soft landscaped areas, the stockpiles of mixed demolition rubble/soil should be removed from site during groundworks. The presence of visible asbestos in these piles means it is unlikely this material could be re-used within the redevelopment.

The asbestos encountered above ground adjacent to the existing building on site can be mitigated by an asbestos hand pick by a suitable contractor to ensure that there is no risk to ground workers or potential end users.

9.3.3 PPL 1c: Potential Damage to Future Buildings from Exposure to Aggressive Ground

Awaiting laboratory testing results to determined potential for aggressive ground conditions.

9.3.4 PPL 1d: Potential Harm to Controlled Waters from Contaminants in Made Ground

Concentrations of metals or PAHs have not been identified within the groundwater that pose a significant risk to the underlying secondary A or principal aquifer. Nitrates have been encountered within two locations in excess of the adopted screening criteria (likely present as a result of the historic use of the site as a poultry farm, however given that these activities have stopped, nitrate in groundwater is likely to degrade over time, and the risk to Controlled Waters is considered to be low.

Referencing the above, no further assessment or mitigation measures are necessary in relation to this PPL is necessary.

9.3.5 PPL2a&b: Potential pollution of Controlled Waters (groundwater & surface water) by contaminants from leaking sewer

Contaminants have been identified within the shallow Groundwater that indicate a possible release from a broken sewer on-site (namely elevated ammoniacal nitrogen).

It is recommended that the sewer is fixed as soon as is reasonably practicable to cease ongoing release. Once this has occurred SLR do not consider further remediation is required, as the residual ammoniacal nitrogen will readily degrade.

9.3.6 PPL 3a&b: Potential harm to human health and Controlled Waters from contaminants from possible off-site source (vehicle repair garage)

This source related to an off-site vehicle repair garage occupying the land immediately to the east of the site. Investigation did not identify contaminants within the groundwater that are indicative of a release of hydrocarbons and off-site migration. It should also be noted that groundwater is flowing to the north east; away from the site.

As such, it is unlikely that contaminants are migrating onto site which may pose an unacceptable risk to human health or the wider environment, and no further investigation in relation to this is required at this time.

9.3.7 PPL 4a-c: Potential Harm to Human Health from Potential Contaminants in (yet to be) Imported Landscaping Soils

Any imported soil will need to meet the specification outlined in **Section 6.1** of the PLQRA. By working to the specification and ensuring compliance with the British Standards, Frontier should prevent PPL4(a-c) from occurring. However, further chemical testing of any imported soil/material may be prudent to demonstrate that it does not pose a significant risk to human health.

9.3.8 PPL 5: Potential Risks to Health or the Environment from Unidentified Sources

It is possible that unidentified sources of contamination may be revealed, not identified during investigation to date (i.e. buried caches of asbestos).

In practise, should the developer encounter potentially hazardous materials work should cease and the matter be referred to an appropriate environmental consultant, as specified in **Sections 6.2** and **6.3** of the PLQRA.

9.4 Overall

Building on the findings of SLR's Preliminary Land Quality Risk Assessment, Frontier Estates Ltd commissioned SLR to undertake a voluntary ground investigation to inform a Land Quality Risk Assessment and Outline Geotechnical Assessment.

This report has presented the findings of that voluntary ground investigation. The information obtained has also been used to provide information about foundation options.

Potential PPL's have been identified that require remediation/mitigation prior to occupation of the site. Nevertheless, SLR considers that by completing the above further works, along with a well-managed construction process, the site / land will be in a condition where it is fit for its proposed uses and not capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990.

In order to address the outstanding PPLs that pose a potential risk to human health, a remedial strategy for the site should be produced and submitted to the LPA prior to the commencement of construction.

SLR considers that further land quality work can be secured by appropriately worded planning conditions.

DRAWINGS

Drawing 1: Site Location Plan
Drawing 2: Existing Site Layout
Drawing 3: Exploratory Hole Location Plan



LEGEND



SITE LOCATION



FRONTIER



SLR

global environmental solutions

TREENWOOD HOUSE
ROWDEN LANE
BRADFORD-ON-AVON
WILTS. BA15 2AU
T: 01225 309400
F: 01225 309401
www.slrconsulting.com

YAPTON ROAD POULTRY FARM
MIDDLETON-ON-SEA

LAND QUALITY RISK ASSESSMENT

SITE LOCATION PLAN

DWG No. 1

Scale

1:10,000 @ A3

Date

MAY 2019

06594.00008.019.001.0_SITE_LOC_PLAN.dwg

Contains OS data © Crown copyright [and database rights] (2015) 0100031673.
Contains public sector information licensed under Open government Licence v3.0 

© This drawing and its content are the copyright of SLR Consulting Ltd and may not be reproduced or amended except by prior written permission. SLR Consulting Ltd accepts no liability for any amendments made by other persons

ARUN DISTRICT COUNCIL 14662971



TIN ROOF

POSSIBLE ASBESTOS ROOF

BRICK BASE COURSE

TIN ROOF

MW01

MANHOLE 3701

TYRES

POSSIBLE ASBESTOS
ROOF AND WALLS

VEHICLE REPAIR GARAGE

SITE ACCESS

SILVER BIRCH DRIVE

YAPTON ROAD

Middleton
Business Park

El Sub Sta

FRONTIER



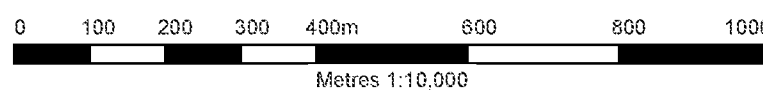
TREENWOOD HOUSE
ROWDEN LANE
BRADFORD-ON-AVON
WILTS. BA15 2AU
T: 01225 309400
F: 01225 309401
www.slrconsulting.com

YAPTON ROAD POULTRY FARM
MIDDLETON-ON-SEA
LAND QUALITY RISK ASSESSMENT
SITE LAYOUT PLAN

DWG No. 2

Scale
1:10,000 @ A3

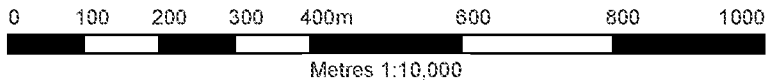
Date
MAY 2019



NOTES
1. DRAWING IS BASED ON EDMUND WILIAMS
SITE LOCATION/EXISTING DRAWING, DATED
FEB 2019.

- LEGEND
- SITE BOUNDARY
 - DENSE VEGETATION
 - HISTORIC MONITORING
WELL IDENTIFIED DURING
WALKOVER
 - SOUTHERN WATER
MANHOLE, REF:3701
 - SMALL STOCKPILES
CONTAINING: SOIL, TIMBER,
DEMOLITION MATERIAL,
TYRES, CEMENT SHEETING
(POSSIBLY CONTAINING
ASBESTOS)

06594.00008.019.003.0a_EXP_HOLE_LOC_PLAN.dwg

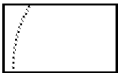


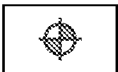
NOTES

1. DRAWING IS BASED ON EDMUND WILIAMS SITE LOCATION/EXISTING DRAWING, DATED FEB 2019.

LEGEND

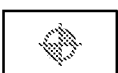
SITE BOUNDARY

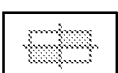
DENSE VEGETATION

HISTORIC MONITORING WELL IDENTIFIED DURING WALKOVER

SOUTHERN WATER MANHOLE, REF:3701

SMALL STOCKPILES CONTAINING: SOIL, TIMBER, DEMOLITION MATERIAL, TYRES, CEMENT SHEETTING (POSSIBLY CONTAINING ASBESTOS)

BOREHOLE LOCATION

TRIAL PIT LOCATION





SLR
global environmental solutions

TREENWOOD HOUSE
ROWDEN LANE
BRADFORD-ON-AVON
WILTS. BA15 2AU
T: 01225 309400
F: 01225 309401
www.slrconsulting.com

YAPTON ROAD POULTRY FARM
MIDDLETON-ON-SEA

LAND QUALITY RISK ASSESSMENT

EXPLORATORY HOLE LOCATION PLAN

DWG No. 3

Scale
1:10,000 @ A3

Date
MAY 2019

Contains OS data © Crown copyright [and database rights] (2015) 0100031673.
Contains public sector information licensed under Open government Licence v3.0 

© This drawing and its content are the copyright of SLR Consulting Ltd and may not be reproduced or amended except by prior written permission. SLR Consulting Ltd accepts no liability for any amendments made by other persons

ARUN DISTRICT COUNCIL WMS2019

APPENDICES

APPENDIX 01

PROPOSED CARE HOME - 66 RESIDENTS IN
TOTAL GIA OF 3474m² = 52.64m² per resident

EXISTING TREES TO BE RETAINED AS SHOWN.

ACCESS TO SITE FROM SILVER BIRCH DRIVE TO
TO BE DESIGNED AND ENGINEERED WITH NEW
CULVERT FOR STREAM AND PROTECTION TO
TREE ROOTS AND WORKS TO PUBLIC
FOOTPATH.

PUBLIC FOOTPATH SHADED IN BLUE BUT NOTE
EDGES ARE UNDEFINED.



FRONTIER

DRAWING STATUS

PLANNING APPLICATION

REV.	DATE	DESCRIPTION



PROJECT:
YAPTON RD, MIDDLETON-on-SEA
PROPOSED 66 BED CARE HOME

TITLE:
SITE PLAN AS PROPOSED

SCALE: 5000/1
DATE: MAY 20
AUTHOR: -
D.R.G. NO.: 2017/PA/004
FILE:

APPENDIX 02

BOREHOLE LOG				BOREHOLE No. WS-01	
Client: FRONTIER					
Project No: Yapton Road Farm		Date: 01/05/19	Ground Level: 4.80maOD	Co-ordinates: E497364 N100776	
Project: GROUND INVESTIGATION					
					Sheet: 1 of 1

SAMPLES & TESTS						Water	STRATA				Instrument/ Backfill
Depth	Type No	HS(ppm)	HV(kPa)	PP(kPa)	SPT-N		Reduced Level	Legend (Thick-ness)	Depth	DESCRIPTION	
0.00	BAG	1								Grey brown slightly sandy clay SILT with occasional rootlets. (TOPSOIL)	
0.20	J						4.60		0.20	Soft to firm orangey brown, sandy, slightly clayey SILT. Gravels are fine angular of chalk and flint.	
1	1.00	BAG	1						(1.60)		
	1.30	J									
							3.00		1.80		
2	2.00	BAG	0						(0.80)	Firm, mottled orange and white, silty gravelly SAND. Gravel consists of angular fine to medium chalk and flint, moist to wet.	
	2.50	J					2.20		2.60		
	2.80	J							(0.50)	Firm, grey SILT with rare sand, moist to wet.	
3	3.00	BAG	0				1.70		3.10	Firm, mottled orange and white, slightly gravelly sandy SILT. Gravel consists of rounded to angular fine to medium chalk and flint, moist to wet.	
									(1.00)		
4	4.00	BAG	1				0.70		4.10	Soft, grey slightly gravelly slightly sandy SILT. Gravel is fine to coarse, angular to sub angular of flint. moist to wet.	
							0.30		4.50		
									(0.70)	Grey to white sandy, silty, GRAVEL. Gravel consists of angular fine chalk and flint, wet.	
5	5.00	BAG	0				-0.40		5.20		
										Borehole complete at 5.20m	

Boring Progress and Water Observations				Casing		Chiselling			Water Added		General Remarks
Date	Time	Depth	Water Dpt	Depth	Dia. mm	From	To	Hours	From	To	
01-05-19	10.00		3.20								Hand pit to 1.2mbg
01-05-19	10.30		1.95								
07-05-19	15.00		1.545								

All dimensions in metres Scale 1:34.375		Contractor: ESL Plant:		Method: Windowless Sampler Hole Size: 200mm		Logged By: JG	Approved By: BAJ
--	--	---------------------------	--	--	--	------------------	---------------------

Form SLR AGS3 UK BH File MIDDLETON_FINAL.GPJ 29-05-19

BOREHOLE LOG				BOREHOLE No. WS-02	
Client: FRONTIER					
Project No: Yapton Road Farm		Date: 01/05/19	Ground Level: 5.01maOD	Co-ordinates: E497413 N100782	
Project: GROUND INVESTIGATION					
					Sheet: 1 of 1

SAMPLES & TESTS							Water	STRATA				Instrument/ Backfill
Depth	Type No	HS(ppm)	HV(kPa)	PP(kPa)	SPT-N	Reduced Level		Legend (Thick-ness)	Depth	DESCRIPTION		
0.00	BAG	1								Grey brown slightly sandy clay SILT with occasional rootlets. (TOPSOIL)		
0.20	J						4.76		0.25	Firm, orangey brown, sandy slightly clayey SILT.		
								(0.75)				
1.00	BAG	1					4.01		1.00	Firm, orangey brown, slightly gravelly, sandy slightly clayey SILT. Gravel consists of angular to rounded, fine to medium chalk and flint, moist.		
1.30	J							(0.60)				
							3.41		1.60	Firm, orangey brown, sandy gravelly SILT. Gravel consists of angular fine to medium chalk and flint, moist to wet.		
								(0.60)				
2.00	BAG	0					2.81		2.20	Firm, mottled orange and white, slightly gravelly sandy SILT. Gravel consists of rounded fine to medium chalk and flint, moist to wet.		
2.30	J							(1.30)				
3.00	BAG	0							3.50	Soft to firm, brown changing to grey slightly gravelly sandy SILT. Occasional sand lenses. Wet.		
3.10	J											
3.90	J								(1.10)			
4.00	BAG	0					0.41		4.60	Grey to white sandy, silty, GRAVEL. Gravel consists of angular fine chalk and flint, wet.		
								(0.60)				
5.00	BAG	0					-0.19		5.20	Borehole complete at 5.20m		

Boring Progress and Water Observations				Casing		Chiselling			Water Added		General Remarks
Date	Time	Depth	Water Dpt	Depth	Dia. mm	From	To	Hours	From	To	
01-05-19	13.00		2.511								
01-05-19	13.30		1.992								
07-05-19	15.05		1.853								
All dimensions in metres Scale 1:34.375				Contractor: ESL Plant:		Method: Windowless Sampler Hole Size: 200mm			Logged By: JG		Approved By: BAJ

Form SLR AGS3 UK BH File MIDDLETON_FINAL.GPJ 29-05-19

BOREHOLE LOG				BOREHOLE No. WS-03	
Client: FRONTIER					
Project No: Yapton Road Farm		Date: 01/05/19	Ground Level: 4.81maOD	Co-ordinates: E497348 N100731	
Project: GROUND INVESTIGATION					
					Sheet: 1 of 1

SAMPLES & TESTS						STRATA				Instrument/ Backfill			
Depth	Type No	HS(ppm)	HV(kPa)	PP(kPa)	SPT-N	Water	Reduced Level	Legend (Thick- ness)	Depth		DESCRIPTION		
1							4.56		0.25	Grey brown slightly sandy clay SILT with occasional rootlets. (TOPSOIL)			
									(1.25)	Soft to firm, orangey brown slightly sandy slightly clayey SILT.			
							3.31		1.50				
							3.01		1.80	Firm, mottled orange white, slightly sandy slightly gravelly SILT. Gravel is fine to coarse, angular to sub angular of flint.			
2									(0.40)	Mottled orange white slightly gravelly slightly silty fine to medium SAND. Gravel is rounded to angular chalk and flint. Moist to wet.			
							2.61		2.20				
3									(0.60)	Firm, mottled brown and white slightly gravelly sandy SILT. Becoming increasingly white and sandy with depth. Wet.			
							2.01		2.80				
										(1.90)			Loose, white, slightly silty, fine to medium SAND and GRAVEL. Gravel is fine chalk and flint, wet.
4													
							0.11		4.70				
5									(0.30)	Firm, grey white, slightly sandy gravelly SILT. Gravel is medium to coarse, angular to sub angular of flint and chalk.			
							-0.19		5.00				
										Borehole complete at 5.20m			

Boring Progress and Water Observations				Casing		Chiselling			Water Added		General Remarks
Date	Time	Depth	Water Dpt	Depth	Dia. mm	From	To	Hours	From	To	
01-05-19	08.30		3.11								Hand pit to 1.2mbg
01-05-19	09.15		2.31								
07-05-19	15.10		1.53								
All dimensions in metres Scale 1:34.375				Contractor: ESL Plant:		Method: Windowless Sampler Hole Size: 200mm			Logged By: JG		Approved By: BAJ

Form SLR AGS3 UK BH File MIDDLETON_FINAL.GPJ 29-05-19

TRIAL PIT LOG				TRIAL PIT No TP-01	
Client: FRONTIER					
Project: GROUND INVESTIGATION					
Project No: Yapton Road Farm		Date: 29/04/19	Ground Level: 4.90mAOD	Co-ordinates: E 497379 N 100775	Sheet: 1 of 1

SAMPLES & TESTS				Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00	BAG	HS	0ppm		4.65		0.25	Grey brown slightly sandy clay SILT with occasional rootlets. (TOPSOIL).	
0.25	J					(1.05)		Firm, light brown, slightly gravelly, sandy SILT with rare clay. Gravel consists of fine angular chalk and flint, moist.	
1.00	BAG	HS	0ppm		3.60	(1.20)		Firm, mottled brown and white, sandy, gravelly SILT. Gravel consists of fine angular chalk and flint, moist.	
1.00	J					(0.70)		Soft, white to brown, gravelly SILT. Gravel consists of medium to coarse flint and chalk. Moist to wet.	
2.00	BAG	HS	1ppm		2.40				
2.00	J					1.70	3.20	Trial Pit complete at 3.20m	
3.00	BAG	HS	0ppm						
3.00	J								
4.00									
5.00									

GENERAL REMARKS: Trial pit dry.		Trial Pit Dimensions: Shoring/Support: None Stability: Pit Stable
KEY: V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Small Disturbed Sample B = Large Bulk Sample HS = Head Space Measurement		

All dimensions in metres Scale 1:34.375	Contractor : ESL Plant: JCB 3CX	Method: Trial Pit/trench	Logged By: JG	Approved By: BAJ
--	------------------------------------	--------------------------	------------------	---------------------

Form SLR AGS3 UK TP File MIDDLETON_FINAL GPJ 29-05-19

SLR 

From SLR AGS3 UK TP File MIDDLETON FINAL.GPJ 29-05-19

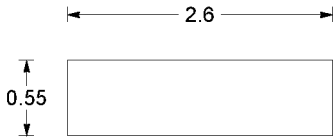
ARUN DISTRICT COUNCIL M/8

TRIAL PIT LOG				TRIAL PIT No TP-03	
Client: FRONTIER					
Project: GROUND INVESTIGATION					
Project No: Yapton Road Farm		Date: 29/04/19	Ground Level: 4.88mAOD	Co-ordinates: E 497365 N 497365	Sheet: 1 of 1

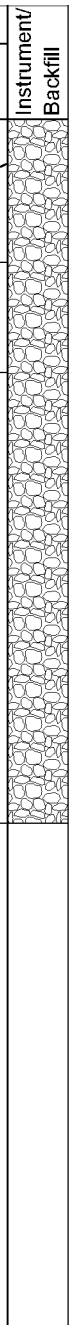
SAMPLES & TESTS				Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	
1	0.00 0.15	BAG J	HS	0ppm			0.15	Grey brown slightly sandy clay SILT with occasional rootlets. (TOPSOIL).
							(0.65)	Firm, light brown, slightly gravelly sandy SILT. Gravel consists of angular fine chalk and flint. Dry.
	0.90 1.00	B B	HS	1ppm			(0.60)	Light brown, silty fine to medium SAND.
							1.40	1.20 - 1.30 fine to medium lense of sand.
2	2.00	BAG	HS	0ppm			(0.70)	Firm, mottled orange white sandy SILT. moist.
							(1.10)	Firm, mottled orange white, slightly gravelly SILT with rare clay and sand. Gravel consists of fine to medium chalk and flint. Moist.
3	3.00	BAG	HS	0ppm			3.20	Trial Pit complete at 3.20m
4								
5								

GENERAL REMARKS: Trial pit dry.		Trial Pit Dimensions: 2.4 Shoring/Support: None Stability: Pit Stable	
KEY: V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Small Disturbed Sample B = Large Bulk Sample HS = Head Space Measurement			
All dimensions in metres Scale 1:34.375	Contractor : ESL Plant: JCB 3CX	Method: Trial Pit/trench	Logged By: JG Approved By: BAJ

Form SLR AGS3 UK TP File MIDDLETON_FINAL GPJ 29-05-19

TRIAL PIT LOG										TRIAL PIT No TP-04	
Client: FRONTIER											
Project: GROUND INVESTIGATION											
Project No: Yapton Road Farm			Date: 29/04/19		Ground Level: 4.86m AOD		Co-ordinates: E 497386 N 100755			Sheet: 1 of 1	
SAMPLES & TESTS				Water	STRATA					Instrument/ Backfill	
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION			
0.00	BAG	HS	0ppm		4.76		0.10	Grey brown slightly sandy clay SILT with occasional brick and charcoal. (TOPSOIL).			
0.20	J						(1.10)	Firm, light brown, slightly gravelly sandy SILT. Gravel consists of angular to rounded fine chalk and flint. Dry.			
0.80	DIST B B	HS	0ppm		3.66		1.20	Light brown, silty fine to medium SAND.			
0.90							1.40	1.20 - 1.30 fine to medium sand lense.			
1.00								(0.70)	Firm, mottled orange white, SILT with rare clay and sand, moist.		
2.00	BAG	HS	0ppm		2.76		2.10	Firm, mottled orange white, slightly gravelly SILT with rare clay and sand. Gravel consists of rounded to angular fine to medium chalk and flint. Moist.			
2.10	DIST						(1.10)				
2.50	J										
3.00	BAG	HS	0ppm		1.66		3.20	Trial Pit complete at 3.20m			
4											
5											
GENERAL REMARKS: Trial pit dry.								Trial Pit Dimensions:  Shoring/Support: None Stability: Pit Stable			
KEY: V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Small Disturbed Sample B = Large Bulk Sample HS = Head Space Measurement											
All dimensions in metres Scale 1:34.375			Contractor : ESL Plant: JCB 3CX			Method: Trial Pit/trench			Logged By: JG		Approved By: BAJ

TRIAL PIT LOG				TRIAL PIT No TP-05	
Client: FRONTIER					
Project: GROUND INVESTIGATION					
Project No: Yapton Road Farm		Date: 30/04/19	Ground Level: 4.91mAOD	Co-ordinates: E 497365 N 100746	Sheet: 1 of 1

SAMPLES & TESTS				Water	STRATA			Instrument/ Backfill	
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)		DESCRIPTION
0.00	BAG	HS	0ppm		4.71		0.20	Grey brown slightly sandy clay SILT with occasional rootlets. (TOPSOIL)	
0.20	J	HS	1ppm				(0.45)	Firm, light brown, slightly gravelly sandy SILT. Gravel consists of fine chalk and flint. Dry.	
					4.26		0.65	Light brown, silty SAND. Moist.	
0.90	B						(0.50)		
1.00	B				3.76		1.15	Firm, mottled orange white, slightly gravelly, slightly clayey SILT with rare sand. Gravel consists of angular fine to medium chalk and flint. 1.20 - 1.30 Fine to medium sand lense.	
							(2.05)		
									
									
									
2.00	BAG	HS	0ppm						
									
2.50	B								
									
									
3.00	BAG	HS	0ppm		1.71		3.20		
								Trial Pit complete at 3.20m	

GENERAL REMARKS: Trial pit dry.		Trial Pit Dimensions: 2.6 0.6
KEY: V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Small Disturbed Sample B = Large Bulk Sample HS = Head Space Measurement		

All dimensions in metres Scale 1:34.375	Contractor : ESL Plant: JCB 3CX	Method: Trial Pit/trench	Logged By: JG	Approved By: BAJ
--	------------------------------------	--------------------------	------------------	---------------------

Form SLR AGS3 UK TP File MIDDLETON_FINAL GPJ 29-05-19

ARUN DISTRICT COUNCIL

TRIAL PIT LOG				TRIAL PIT No TP-07	
Client: FRONTIER					
Project: GROUND INVESTIGATION					
Project No: Yapton Road Farm		Date: 30/04/19	Ground Level: 5.11mAOD	Co-ordinates: E 497411 N 100753	Sheet: 1 of 1

SAMPLES & TESTS				Water	STRATA			Instrument/ Backfill		
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)		DESCRIPTION	
0.00	BAG	HS	0ppm		4.96		0.15	Grey brown slightly gravelly sandy clay SILT with occasional rootlets. Gravel concists of chalk and rare charcoal and brick. Dry. (MADE GROUND) Orangey brown, silty SAND. Moist. Firm, orangey brown, slightly clayey, gravelly sandy SILT. Gravel consists of angular to rounded fine chalk and flint. Moist.		
0.30	J				4.81		0.30			
0.80	DIST					(1.40)				
0.80	J									
0.90	B									
					3.41		1.70			Firm, mottled orange white, gravelly, slightly sandy SILT. Gravel consists of fine to medium chalk and flint.
						(1.50)				
				1.91		3.20	Trial Pit complete at 3.20m			

GENERAL REMARKS: Trial pit dry.		Trial Pit Dimensions: 0.5 ↑ ↓ 2.6 ← →
KEY: V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Small Disturbed Sample B = Large Bulk Sample HS = Head Space Measurement		

All dimensions in metres Scale 1:34.375	Contractor : ESL Plant: JCB 3CX	Method: Trial Pit/trench	Logged By: JG	Approved By: BAJ
--	------------------------------------	--------------------------	------------------	---------------------

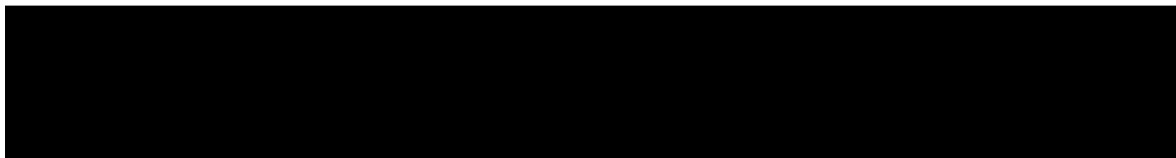
Form SLR AGS3 UK TP File MIDDLETON_FINAL GPJ 29-05-19

SLR 

From SLR AGS3 UK TP File MIDDLETON FINAL.GPJ 29-05-19

ARUN DISTRICT COUNCIL M/6

APPENDIX 03



Client Name: SLR Consulting Ltd
Reference:
Location: Middleton
Contact: Will Anstey
JE Job No.: 19/7324

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

J E Sample No.	4-7	8-10	15-17	24-26	27-30	31-33	37-39	40-43	46-49	53-56	Please see attached notes for all abbreviations and acronyms		
Sample ID	TP-02	TP-02	TP-04	TP-05	TP-06	TP-06	TP-07	TP-08	TP-09	TP-01			
Depth	0.20	0.80	0.20	0.60	0.20	2.30	0.80	0.20	0.30	0.25			
COC No / misc													
Containers	V J T	V J	V J T	V J	V J T	V J	V J	V J T	V T B	V J T			
Sample Date	30/04/2019	30/04/2019	29/04/2019	29/04/2019	30/04/2019	30/04/2019	30/04/2019	29/04/2019	30/04/2019	29/04/2019			
Sample Type	Clay	Clay	Clay	Clay	Clayey Loam	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019			
Arsenic ^{#M}	8.3	12	NDP	12	-	4.5	6.3	8.6	NDP	3.8	<0.5	mg/kg	TM30/PM15
Cadmium ^{#M}	0.1	0.1	NDP	<0.1	-	0.2	<0.1	0.2	NDP	0.5	<0.1	mg/kg	TM30/PM15
Chromium ^{#M}	85	43	NDP	52	-	26	37	89	NDP	82	<0.5	mg/kg	TM30/PM15
Copper ^{#M}	19	14	NDP	18	-	7	8	15	NDP	34	<1	mg/kg	TM30/PM15
Lead ^{#M}	18	14	NDP	15	-	7	11	20	NDP	68	<5	mg/kg	TM30/PM15
Mercury ^{#M}	<0.1	<0.1	NDP	<0.1	-	<0.1	<0.1	<0.1	NDP	<0.1	<0.1	mg/kg	TM30/PM15
Nickel ^{#M}	17	40	NDP	51	-	14	14	18	NDP	12	<0.7	mg/kg	TM30/PM15
Selenium ^{#M}	<1	1	NDP	1	-	<1	<1	<1	NDP	1	<1	mg/kg	TM30/PM15
Zinc ^{#M}	120	58	NDP	71	-	32	47	80	NDP	390	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene ^{#M}	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	1.3 ^{AA}	1.3	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	-	<0.03	<0.03	<0.03	3.0 ^{AA}	0.09	<0.03	mg/kg	TM4/PM8
Acenaphthene ^{#M}	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	15 ^{AA}	0.23	<0.05	mg/kg	TM4/PM8
Fluorene ^{#M}	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	10 ^{AA}	0.20	<0.04	mg/kg	TM4/PM8
Phenanthrene ^{#M}	<0.03	<0.03	0.07	<0.03	-	<0.03	<0.03	0.05	120 ^{AA}	2.0	<0.03	mg/kg	TM4/PM8
Anthracene [#]	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	39 ^{AA}	0.27	<0.04	mg/kg	TM4/PM8
Fluoranthene ^{#M}	0.10	<0.03	0.20	<0.03	-	<0.03	<0.03	0.13	160 ^{AA}	4.3	<0.03	mg/kg	TM4/PM8
Pyrene [#]	0.09	<0.03	0.18	<0.03	-	<0.03	<0.03	0.12	140 ^{AA}	3.3	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene [#]	0.07	<0.06	0.12	<0.06	-	<0.06	<0.06	0.10	86 ^{AA}	2.0	<0.06	mg/kg	TM4/PM8
Chrysene ^{#M}	0.07	<0.02	0.13	<0.02	-	<0.02	<0.02	0.10	63 ^{AA}	3.6	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene ^{#M}	0.11	<0.07	0.23	<0.07	-	<0.07	<0.07	<0.07	120 ^{AA}	7.3	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene [#]	0.06	<0.04	0.10	<0.04	-	<0.04	<0.04	<0.04	64 ^{AA}	3.6	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene ^{#M}	<0.04	<0.04	0.09	<0.04	-	<0.04	<0.04	<0.04	47 ^{AA}	3.1	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene [#]	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	<0.04	7.3 ^{AA}	0.43	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene [#]	<0.04	<0.04	0.09	<0.04	-	<0.04	<0.04	<0.04	43 ^{AA}	2.7	<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	1.2	<0.6	-	<0.6	<0.6	<0.6	918.6 ^{AA}	34.4	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.08	<0.05	0.17	<0.05	-	<0.05	<0.05	<0.05	86 ^{AA}	5.3	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.03	<0.02	0.06	<0.02	-	<0.02	<0.02	<0.02	34 ^{AA}	2.0	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	94	91	83	84	-	76	95	96	90 ^{AA}	97	<0	%	TM4/PM8
MTBE [#]	-	-	-	-	<0.005	<0.005	-	-	-	-	<0.005	mg/kg	TM31/PM12
Benzene [#]	-	-	-	-	<0.005	<0.005	-	-	-	-	<0.005	mg/kg	TM31/PM12
Toluene [#]	-	-	-	-	<0.005	<0.005	-	-	-	-	<0.005	mg/kg	TM31/PM12
Ethylbenzene [#]	-	-	-	-	<0.005	<0.005	-	-	-	-	<0.005	mg/kg	TM31/PM12
m/p-Xylene [#]	-	-	-	-	<0.005	<0.005	-	-	-	-	<0.005	mg/kg	TM31/PM12
o-Xylene [#]	-	-	-	-	<0.005	<0.005	-	-	-	-	<0.005	mg/kg	TM31/PM12
Xylenes (sum of isomers) [#]	-	-	-	-	<0.01	<0.01	-	-	-	-	<0.01	mg/kg	TM31/PM12

Please include all sections of this report if it is reproduced

Client Name: SLR Consulting Ltd
Reference:
Location: Middleton
Contact: Will Anstey
JE Job No.: 19/7324

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

J E Sample No.	4-7	8-10	15-17	24-26	27-30	31-33	37-39	40-43	46-49	53-56	Please see attached notes for all abbreviations and acronyms		
Sample ID	TP-02	TP-02	TP-04	TP-05	TP-06	TP-06	TP-07	TP-08	TP-09	TP-01			
Depth	0.20	0.80	0.20	0.60	0.20	2.30	0.80	0.20	0.30	0.25			
COC No / misc													
Containers	V J T	V J	V J T	V J	V J T	V J	V J	V J T	V T B	V J T			
Sample Date	30/04/2019	30/04/2019	29/04/2019	29/04/2019	30/04/2019	30/04/2019	30/04/2019	29/04/2019	30/04/2019	29/04/2019			
Sample Type	Clay	Clay	Clay	Clay	Clayey Loam	Clay	Clay	Clay	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019			
TPH CWG													
Aliphatics													
>C5-C6 ^{#M}	-	-	-	-	<0.1	<0.1	-	-	-	-	<0.1	mg/kg	TM36/PM12
>C6-C8 ^{#M}	-	-	-	-	<0.1	<0.1	-	-	-	-	<0.1	mg/kg	TM36/PM12
>C8-C10	-	-	-	-	<0.1	<0.1	-	-	-	-	<0.1	mg/kg	TM36/PM12
>C10-C12 ^{#M}	-	-	-	-	<0.2	<0.2	-	-	-	-	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 ^{#M}	-	-	-	-	<4	<4	-	-	-	-	<4	mg/kg	TM5/PM8/PM16
>C16-C21 ^{#M}	-	-	-	-	<7	<7	-	-	-	-	<7	mg/kg	TM5/PM8/PM16
>C21-C35 ^{#M}	-	-	-	-	<7	<7	-	-	-	-	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	-	-	-	-	<19	<19	-	-	-	-	<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 [#]	-	-	-	-	<0.1	<0.1	-	-	-	-	<0.1	mg/kg	TM36/PM12
>EC7-EC8 [#]	-	-	-	-	<0.1	<0.1	-	-	-	-	<0.1	mg/kg	TM36/PM12
>EC8-EC10 ^{#M}	-	-	-	-	<0.1	<0.1	-	-	-	-	<0.1	mg/kg	TM36/PM12
>EC10-EC12 [#]	-	-	-	-	<0.2	<0.2	-	-	-	-	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 [#]	-	-	-	-	<4	<4	-	-	-	-	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 [#]	-	-	-	-	20	<7	-	-	-	-	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 [#]	-	-	-	-	110	<7	-	-	-	-	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 [#]	-	-	-	-	130	<19	-	-	-	-	<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics (C5-35)	-	-	-	-	130	<38	-	-	-	-	<38	mg/kg	TM5/PM8/PM16/PM12/PM10
Natural Moisture Content	21.4	20.7	22.1	23.8	14.9	18.8	21.4	22.4	8.4	42.5	<0.1	%	PM4/PM0
Hexavalent Chromium [#]	<0.3	<0.3	<0.3	<0.3	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Sample Type	Clay	Clay	Clay	Clay	Clayey Loam	Clay	Clay	Clay	Clay	Clay		None	PM13/PM0
Sample Colour	Light Brown	Light Brown	Medium Brown	Light Brown	Medium Brown	Light Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones and roots	stones	roots and vegetation	stones	stones and brick fragment	stones and chalk	none	vegetation, stones	vegetation, stones	vegetation		None	PM13/PM0
Arsenic	-	-	25	-	-	-	-	-	9.3	-	<0.5	mg/kg	TM30/PM62
Cadmium	-	-	0.4	-	-	-	-	-	1.1	-	<0.1	mg/kg	TM30/PM62
Chromium	-	-	35	-	-	-	-	-	24	-	<0.5	mg/kg	TM30/PM62
Copper	-	-	60	-	-	-	-	-	54	-	<1	mg/kg	TM30/PM62
Lead	-	-	110	-	-	-	-	-	130	-	<5	mg/kg	TM30/PM62
Mercury	-	-	<0.1	-	-	-	-	-	<0.1	-	<0.1	mg/kg	TM30/PM62
Nickel	-	-	20	-	-	-	-	-	22	-	<0.7	mg/kg	TM30/PM62
Selenium	-	-	<1	-	-	-	-	-	<1	-	<1	mg/kg	TM30/PM62
Zinc	-	-	470	-	-	-	-	-	510	-	<5	mg/kg	TM30/PM62
pH ^{#M}	8.2	8.4	7.5	8.6	-	9.0	8.1	8.1	7.7	7.5	<0.01	pH units	TM73/PM11

Please include all sections of this report if it is reproduced

Client Name: SLR Consulting Ltd
Reference:
Location: Middleton
Contact: Will Anstey
JE Job No.: 19/7324

Report : Solid

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

J E Sample No.	57-58	59-62	66-69	70-72	77-79	80-83	84-86				Please see attached notes for all abbreviations and acronyms		
Sample ID	TP-07	WS-01	WS-02	WS-02	WS-03	WS-04	WS-04						
Depth	0.30	0.20	0.25	2.30	2.30	0.25	3.10						
COC No / misc													
Containers	J T	V J T	V J T	V J	V J	V J T	V J						
Sample Date	30/04/2019	01/05/2019	01/05/2019	01/05/2019	01/05/2019	01/05/2019	01/05/2019						
Sample Type	Clay	Clayey Loam	Clayey Loam	Clay	Clayey Sand	Sandy Loam	Clay						
Batch Number	1	1	1	1	1	1	1				LOD/LOR	Units	Method No.
Date of Receipt	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019						
Arsenic ^{#M}	6.0	NDP	NDP	-	-	NDP	-				<0.5	mg/kg	TM30/PM15
Cadmium ^{#M}	0.5	NDP	NDP	-	-	NDP	-				<0.1	mg/kg	TM30/PM15
Chromium ^{#M}	67	NDP	NDP	-	-	NDP	-				<0.5	mg/kg	TM30/PM15
Copper ^{#M}	30	NDP	NDP	-	-	NDP	-				<1	mg/kg	TM30/PM15
Lead ^{#M}	56	NDP	NDP	-	-	NDP	-				<5	mg/kg	TM30/PM15
Mercury ^{#M}	<0.1	NDP	NDP	-	-	NDP	-				<0.1	mg/kg	TM30/PM15
Nickel ^{#M}	33	NDP	NDP	-	-	NDP	-				<0.7	mg/kg	TM30/PM15
Selenium ^{#M}	<1	NDP	NDP	-	-	NDP	-				<1	mg/kg	TM30/PM15
Zinc ^{#M}	240	NDP	NDP	-	-	NDP	-				<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene ^{#M}	0.75	<0.04	<0.04	-	<0.04	0.19	-				<0.04	mg/kg	TM4/PM8
Acenaphthylene	1.9 _{AB}	<0.03	<0.03	-	<0.03	0.63	-				<0.03	mg/kg	TM4/PM8
Acenaphthene ^{#M}	2.8 _{AB}	<0.05	<0.05	-	<0.05	0.45	-				<0.05	mg/kg	TM4/PM8
Fluorene ^{#M}	1.9 _{AB}	<0.04	<0.04	-	<0.04	0.34	-				<0.04	mg/kg	TM4/PM8
Phenanthrene ^{#M}	34 _{AB}	0.33	0.22	-	<0.03	4.1	-				<0.03	mg/kg	TM4/PM8
Anthracene [#]	12 _{AB}	<0.04	<0.04	-	<0.04	1.6	-				<0.04	mg/kg	TM4/PM8
Fluoranthene ^{#M}	92 _{AB}	0.49	0.43	-	<0.03	12	-				<0.03	mg/kg	TM4/PM8
Pyrene [#]	82 _{AB}	0.37	0.38	-	<0.03	11	-				<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene [#]	33 _{AB}	0.20	0.21	-	<0.06	8.1	-				<0.06	mg/kg	TM4/PM8
Chrysene ^{#M}	34 _{AB}	0.42	0.32	-	<0.02	6.6	-				<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene ^{#M}	68 _{AB}	0.79	0.63	-	<0.07	15	-				<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene [#]	41 _{AB}	0.26	0.27	-	<0.04	9.1	-				<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene ^{#M}	29 _{AB}	0.29	0.21	-	<0.04	6.6	-				<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene [#]	3.0 _{AB}	0.07	<0.04	-	<0.04	1.5	-				<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene [#]	28 _{AB}	0.27	0.21	-	<0.04	6.6	-				<0.04	mg/kg	TM4/PM8
PAH 16 Total	463.4	3.5	2.9	-	<0.6	83.8	-				<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	49 _{AB}	0.57	0.45	-	<0.05	11	-				<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	19 _{AB}	0.22	0.18	-	<0.02	4.2	-				<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	96	90	95	-	89	93	-				<0	%	TM4/PM8
MTBE [#]	-	<0.005	-	<0.005	<0.005	<0.005	<0.005				<0.005	mg/kg	TM31/PM12
Benzene [#]	-	<0.005	-	<0.005	<0.005	<0.005	<0.005				<0.005	mg/kg	TM31/PM12
Toluene [#]	-	<0.005	-	<0.005	<0.005	<0.005	<0.005				<0.005	mg/kg	TM31/PM12
Ethylbenzene [#]	-	<0.005	-	<0.005	<0.005	<0.005	<0.005				<0.005	mg/kg	TM31/PM12
m/p-Xylene [#]	-	<0.005	-	<0.005	<0.005	<0.005	<0.005				<0.005	mg/kg	TM31/PM12
o-Xylene [#]	-	<0.005	-	<0.005	<0.005	<0.005	<0.005				<0.005	mg/kg	TM31/PM12
Xylenes (sum of isomers) [#]	-	<0.01	-	<0.01	<0.01	<0.01	<0.01				<0.01	mg/kg	TM31/PM12

Please include all sections of this report if it is reproduced

Client Name: SLR Consulting Ltd
Reference:
Location: Middleton
Contact: Will Anstey
JE Job No.: 19/7324

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

J E Sample No.	57-58	59-62	66-69	70-72	77-79	80-83	84-86				Please see attached notes for all abbreviations and acronyms		
Sample ID	TP-07	WS-01	WS-02	WS-02	WS-03	WS-04	WS-04						
Depth	0.30	0.20	0.25	2.30	2.30	0.25	3.10						
COC No / misc													
Containers	J T	V J T	V J T	V J	V J	V J T	V J						
Sample Date	30/04/2019	01/05/2019	01/05/2019	01/05/2019	01/05/2019	01/05/2019	01/05/2019						
Sample Type	Clay	Clayey Loam	Clayey Loam	Clay	Clayey Sand	Sandy Loam	Clay						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019				LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 ^{#M}	-	<0.1	-	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C6-C8 ^{#M}	-	<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	mg/kg	TM36/PM12
>C10-C12 ^{#M}	-	<0.2	-	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 ^{#M}	-	<4	-	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>C16-C21 ^{#M}	-	12	-	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>C21-C35 ^{#M}	-	22	-	<7	<7	64	<7				<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	-	34	-	<19	<19	64	<19				<19	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 [#]	-	<0.1	-	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC7-EC8 [#]	-	<0.1	-	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC8-EC10 ^{#M}	-	<0.1	-	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC10-EC12 [#]	-	<0.2	-	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 [#]	-	<4	-	<4	<4	9	<4				<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 [#]	-	<7	-	<7	<7	66	<7				<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 [#]	-	<7	-	<7	<7	580	<7				<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 [#]	-	<19	-	<19	<19	655	<19				<19	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics (C5-35)	-	<38	-	<38	<38	719	<38				<38	mg/kg	TM5/PM8/PM16
Natural Moisture Content	21.0	35.8	40.2	18.0	19.3	16.2	25.0				<0.1	%	PM4/PM0
Hexavalent Chromium [#]	<0.3	<0.3	<0.3	-	-	<0.3	-				<0.3	mg/kg	TM38/PM20
Sample Type	Clay	Clayey Loam	Clayey Loam	Clay	Clayey Sand	Sandy Loam	Clay					None	PM13/PM0
Sample Colour	Medium Brown	Dark Brown	Medium Brown	Light Brown	Light Brown	Medium Brown	Light Brown					None	PM13/PM0
Other Items	stones, vegetation	roots	stones and roots	sand	none	stones and roots	stones, clots, sand and water					None	PM13/PM0
Arsenic	-	8.3	5.2	-	-	6.7	-				<0.5	mg/kg	TM30/PM62
Cadmium	-	0.3	1.1	-	-	0.7	-				<0.1	mg/kg	TM30/PM62
Chromium	-	26	21	-	-	17	-				<0.5	mg/kg	TM30/PM62
Copper	-	24	190	-	-	42	-				<1	mg/kg	TM30/PM62
Lead	-	15	93	-	-	62	-				<5	mg/kg	TM30/PM62
Mercury	-	<0.1	<0.1	-	-	<0.1	-				<0.1	mg/kg	TM30/PM62
Nickel	-	31	15	-	-	13	-				<0.7	mg/kg	TM30/PM62
Selenium	-	<1	1	-	-	<1	-				<1	mg/kg	TM30/PM62
Zinc	-	110	870	-	-	520	-				<5	mg/kg	TM30/PM62
pH ^{#M}	8.1	8.1	7.4	-	-	7.8	-				<0.01	pH units	TM73/PM11

Please include all sections of this report if it is reproduced

Client Name: SLR Consulting Ltd
Reference:
Location: Middleton
Contact: Will Anstey

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 less than 0.1%, 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
19/7324	1	TP-02	0.20	7	10/05/2019	General Description (Bulk Analysis)	soil.stones
					10/05/2019	Asbestos Fibres	NAD
					10/05/2019	Asbestos ACM	NAD
					10/05/2019	Asbestos Type	NAD
					10/05/2019	Asbestos Level Screen	NAD
19/7324	1	TP-03	0.15	14	10/05/2019	General Description (Bulk Analysis)	soil.stones
					10/05/2019	Asbestos Fibres	NAD
					10/05/2019	Asbestos ACM	NAD
					10/05/2019	Asbestos Type	NAD
					10/05/2019	Asbestos Level Screen	NAD
19/7324	1	TP-04	0.20	17	10/05/2019	General Description (Bulk Analysis)	soil.stones
					10/05/2019	Asbestos Fibres	Fibre Bundles
					10/05/2019	Asbestos ACM	NAD
					10/05/2019	Asbestos Type	Chrysotile
					10/05/2019	Asbestos Level Screen	Asbestos level cannot be determined from Screen. Quantification required.
					15/05/2019	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	0.001 (mass %)
19/7324	1	TP-05	0.10	23	15/05/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	0.001 (mass %)
					10/05/2019	General Description (Bulk Analysis)	soil.stones
					10/05/2019	Asbestos Fibres	NAD
					10/05/2019	Asbestos ACM	NAD
					10/05/2019	Asbestos Type	NAD
					10/05/2019	Asbestos Level Screen	NAD
					10/05/2019	General Description (Bulk Analysis)	soil.stones
19/7324	1	TP-06	0.20	30	10/05/2019	Asbestos Fibres	Fibre Bundles
					10/05/2019	Asbestos ACM	NAD
					10/05/2019	Asbestos Type	Chrysotile
					10/05/2019	Asbestos Level Screen	less than 0.1%
					15/05/2019	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
19/7324	1	TP-07	0.20	36	10/05/2019	General Description (Bulk Analysis)	soil.stones
					10/05/2019	Asbestos Fibres	Fibre Bundles
					10/05/2019	Asbestos ACM	NAD

Client Name: SLR Consulting Ltd
Reference:
Location: Middleton
Contact: Will Anstey

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/7324	1	TP-07	0.20	36	10/05/2019	Asbestos Type	Chrysotile
					10/05/2019	Asbestos Level Screen	less than 0.1%
					15/05/2019	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
19/7324	1	TP-08	0.20	43	10/05/2019	General Description (Bulk Analysis)	soil-stones
					10/05/2019	Asbestos Fibres	NAD
					10/05/2019	Asbestos ACM	NAD
					10/05/2019	Asbestos Type	NAD
					10/05/2019	Asbestos Level Screen	NAD
19/7324	1	TP-09	0.30	49	10/05/2019	General Description (Bulk Analysis)	Soil/Stones
					10/05/2019	Asbestos Fibres	Fibre Bundles
					10/05/2019	Asbestos ACM	Asbestos Cement
					10/05/2019	Asbestos Type	Chrysotile
					10/05/2019	Asbestos Level Screen	Asbestos level cannot be determined from Screen. Quantification required.
					15/05/2019	Total ACM Gravimetric Quantification (% Asb)	2.200 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	0.001 (mass %)
19/7324	1	TP-01	0.25	56	10/05/2019	General Description (Bulk Analysis)	soil-stones
					10/05/2019	Asbestos Fibres	NAD
					10/05/2019	Asbestos ACM	NAD
					10/05/2019	Asbestos Type	NAD
					10/05/2019	Asbestos Level Screen	NAD
19/7324	1	TP-07	0.30	58	10/05/2019	General Description (Bulk Analysis)	soil-stones
					10/05/2019	Asbestos Fibres	NAD
					10/05/2019	Asbestos ACM	NAD
					10/05/2019	Asbestos Type	NAD
					10/05/2019	Asbestos Level Screen	NAD
19/7324	1	WS-01	0.20	62	10/05/2019	General Description (Bulk Analysis)	Soil/Stones
					10/05/2019	Asbestos Fibres	Fibre Bundles
					10/05/2019	Asbestos ACM	ACM Debris
					10/05/2019	Asbestos Type	Chrysotile
					10/05/2019	Asbestos Level Screen	Asbestos level cannot be determined from Screen. Quantification required.
					15/05/2019	Total ACM Gravimetric Quantification (% Asb)	4.100 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
19/7324	1	WS-02	0.25	69	15/05/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	4.100 (mass %)
					10/05/2019	General Description (Bulk Analysis)	soil-stones
					10/05/2019	Asbestos Fibres	Fibre Bundles
					10/05/2019	Asbestos ACM	NAD
					10/05/2019	Asbestos Type	Chrysotile
19/7324	1	WS-03	2.30	79	10/05/2019	Asbestos Level Screen	less than 0.1%
					15/05/2019	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					10/05/2019	General Description (Bulk Analysis)	soil.stones
19/7324	1	WS-03	2.30	79	10/05/2019	Asbestos Fibres	NAD

Client Name: SLR Consulting Ltd

Reference:

Location: Middleton

Contact: Will Anstey

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/7324	1	WS-03	2.30	79	10/05/2019	Asbestos ACM	NAD
					10/05/2019	Asbestos Type	NAD
					10/05/2019	Asbestos Level Screen	NAD
19/7324	1	WS-04	0.25	83	10/05/2019	General Description (Bulk Analysis)	Soil/Stones
					10/05/2019	Asbestos Fibres	Fibre Bundles
					10/05/2019	Asbestos ACM	NAD
					10/05/2019	Asbestos Type	Chrysotile
					10/05/2019	Asbestos Level Screen	less than 0.1%
					15/05/2019	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)

Matrix : Solid

Reference:

Location: Middleton

Contact: Will Anstey

[illegible]

Client Name: SLR Consulting Ltd

Reference:

Location: Middleton

Contact: Will Anstey

[illegible]

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.: 19/7324

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 HCl (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 overestimate 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

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

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.

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	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 an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	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
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x10 Dilution
AB	x20 Dilution

JE Job No: 19/7324

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/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.			AR	
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
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	Yes	AR	Yes
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No
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	Yes	AD	Yes

JE Job No: 19/7324

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/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	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methylterbutylether, 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. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	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. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	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. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	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
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	Yes	AR	No
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



Exova Jones Environmental

Registered Office: Treewood House, Rowden Lane, Bradford on Avon, Wiltshire, BA15 2UA

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

SLR Consulting Ltd
Treewood House
Rowden Lane
Bradford on Avon
BA15 2UA



Attention : Will Anstey
Date : 17th May, 2019
Your reference :
Our reference : Test Report 19/7324 Batch 1 Schedule B
Location : Middleton
Date samples received : 4th May, 2019
Status : Final report
Issue : 1

Twenty seven samples were received for analysis on 4th May, 2019 of which seven 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:



Paul Boden BSc
Senior Project Manager

Client Name: SLR Consulting Ltd
Reference:
Location: Middleton
Contact: Will Anstey

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 less than 0.1%, 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
19/7324	1	TP-04	0.20	17	15/05/2019	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	0.001 (mass %)
					15/05/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	0.001 (mass %)
					16/05/2019	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					16/05/2019	Asbestos Gravimetric & PCOM Total	0.001 (mass %)
19/7324	1	TP-06	0.20	30	15/05/2019	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					16/05/2019	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					16/05/2019	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)
19/7324	1	TP-07	0.20	36	15/05/2019	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					16/05/2019	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					16/05/2019	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)
19/7324	1	TP-09	0.30	49	15/05/2019	Total ACM Gravimetric Quantification (% Asb)	2.200 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	0.001 (mass %)
					15/05/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	2.201 (mass %)
19/7324	1	WS-01	0.20	62	15/05/2019	Total ACM Gravimetric Quantification (% Asb)	4.100 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	4.100 (mass %)
19/7324	1	WS-02	0.25	69	15/05/2019	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					16/05/2019	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					16/05/2019	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)
19/7324	1	WS-04	0.25	83	15/05/2019	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					15/05/2019	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					16/05/2019	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					16/05/2019	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)

Contact: Will Anstey

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.: 19/7324

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 HCl (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 overestimate 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

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

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.

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	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 an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	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
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 19/7324

[illegible]

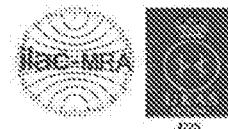


Exova Jones Environmental

Registered Office: 3rd Floor, The Brew House, Jacob Street, Bristol, BS2 0EQ. Tel: 0117 924 1014

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

SLR Consulting Ltd
3rd Floor
The Brew House
Jacob Street
Bristol
BS2 0EQ



Attention :	Will Anstey
Date :	15th May, 2019
Your reference :	402.06594.00008
Our reference :	Test Report 19/7429 Batch 1
Location :	Middleton-On-Sea
Date samples received :	8th May, 2019
Status :	Final report
Issue :	1

Four samples were received for analysis on 8th May, 2019 of which four 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:



Simon Gomery BSc
Project Manager

Client Name: SLR Consulting Ltd
 Reference: 402.06594.00008
 Location: Middleton-On-Sea
 Contact: Will Anstey
 JE Job No.: 19/7429

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

J E Sample No.	1-5	6-10	11-15	16-20									
Sample ID	WS01	WS02	WS03	MW01									
Depth													
COC No / misc													
Containers	V P G	V P G	V P G	V P G									
Sample Date	07/05/2019	07/05/2019	07/05/2019	07/05/2019									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	08/05/2019	08/05/2019	08/05/2019	08/05/2019									
											LOD/LOR	Units	Method No.
pH #	7.5	7.4	7.4	7.8							<0.01	pH units	TM73/PM0
PAH MS													
Naphthalene #	-	<0.0001	<0.0001	-							<0.0001	mg/l	TM4/PM30
Acenaphthylene #	-	<0.000013	<0.000013	-							<0.000013	mg/l	TM4/PM30
Acenaphthene #	-	<0.000013	0.000021	-							<0.000013	mg/l	TM4/PM30
Fluorene #	-	<0.000014	0.00002	-							<0.000014	mg/l	TM4/PM30
Phenanthrene #	-	0.000025	0.00007	-							<0.000011	mg/l	TM4/PM30
Anthracene #	-	<0.000013	<0.000013	-							<0.000013	mg/l	TM4/PM30
Fluoranthene #	-	0.000012	0.000052	-							<0.000012	mg/l	TM4/PM30
Pyrene #	-	<0.000013	0.000043	-							<0.000013	mg/l	TM4/PM30
Benzo(a)anthracene #	-	<0.000015	<0.000015	-							<0.000015	mg/l	TM4/PM30
Chrysene #	-	<0.000011	0.00002	-							<0.000011	mg/l	TM4/PM30
Benzo(b)fluoranthene #	-	<0.000018	0.000027	-							<0.000018	mg/l	TM4/PM30
Benzo(a)pyrene #	-	<0.000016	<0.000016	-							<0.000016	mg/l	TM4/PM30
Indeno(123cd)pyrene #	-	<0.000011	<0.000011	-							<0.000011	mg/l	TM4/PM30
Dibenzo(ah)anthracene #	-	<0.00001	<0.00001	-							<0.00001	mg/l	TM4/PM30
Benzo(ghi)perylene #	-	<0.000011	<0.000011	-							<0.000011	mg/l	TM4/PM30
PAH 16 Total #	-	<0.000195	0.000253	-							<0.000195	mg/l	TM4/PM30
Benzo(b)fluoranthene	-	<0.00001	0.00002	-							<0.00001	mg/l	TM4/PM30
Benzo(k)fluoranthene	-	<0.00001	<0.00001	-							<0.00001	mg/l	TM4/PM30
PAH Surrogate % Recovery	-	91	82	-							<0	%	TM4/PM30
Hexavalent Chromium	<0.002	<0.002	<0.002	<0.002							<0.002	mg/l	TM38/PM0

Please see attached notes for all abbreviations and acronyms

[illegible]

4 of 8

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/7429

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 HCl (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 overestimate 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

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

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.

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	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 an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	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
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 19/7429

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/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 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GC/FID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/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	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	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			
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. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GC/MS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes			

JE Job No: 19/7429

[illegible]

APPENDIX 04

Generic Risk Assessment - Soils
Lab Data Screening

SLR

	Exceeds GAC
	Exceeds LOD
Client Name	Frontier
Site Name	apton Road, Middleton-on-Sea
Job Number	402.06594.00008
Date	12:00:00 AM
Description of Data Assessment / Zoning	
Selected Screening Value and Land Use	S4UL - Residential without plant uptake

Sample ID	TP-01	TP-02	TP-02	TP-03	TP-04	TP-05	TP-05	TP-06	TP-06	TP-07	TP-07	TP-07	TP-08	TP-09	WS-01
Depth	0.25	0.2	0.8	0.15	0.2	0.1	0.6	0.2	2.30	0.2	0.3	0.8	0.2	0.3	0.2
Sample Type	Clay	Clay	Clay	Soil	Clay	Soil	Clay	Clayey Loam	Clay	Soil	Clay	Clay	Clay	Clay	Clayey Loam
Sampled Date	29/04/2019	30/04/2019	30/04/2019	29/04/2019	29/04/2019	29/04/2019	29/04/2019	30/04/2019	30/04/2019	30 April 2019	30 April 2019	30 April 2019	29 April 2019	30 April 2019	01 May 2019
Sample Received Date	04 May 2019	04 May 2019	04 May 2019	04 May 2019	04 May 2019	04 May 2019	04 May 2019	04 May 2019	04 May 2019	04 May 2019	04 May 2019	04 May 2019	04 May 2019	04 May 2019	04 May 2019
J E Sample No	53-56	4-7	8-10	11-14	15-17	21-23	24-26	27-30	31-33	34-36	57-58	37-39	40-43	46-49	59-62
Batch Number	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Strata / Zone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Test	Units	LOD	Selected GAC	No. Above GAC													
Arsenic	mg/kg	<0.5	40	0	3.8	6.3	12	-	25	-	12	-	4.9	-	8	6.3	8.8
Cadmium	mg/kg	<0.1	85	0	0.5	0.1	0.1	-	0.4	-	<0.1	-	0.5	<0.1	0.2	1.1	0.3
Chromium	mg/kg	<0.5	910	0	82	89	42	-	35	-	92	-	87	37	89	24	28
Copper	mg/kg	<1	7100	0	34	19	14	-	80	-	18	-	7	-	30	8	24
Lead	mg/kg	<5	310	0	86	18	14	-	110	-	16	-	7	-	56	11	20
Mercury	mg/kg	<0.1	56	0	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<0.7	180	0	12	17	40	-	20	-	51	-	14	-	33	18	22
Selenium	mg/kg	<1	430	0	1	<1	1	-	<1	-	1	-	<1	<1	<1	<1	<1
Zinc	mg/kg	<5	40000	0	390	120	58	-	470	-	71	-	32	-	240	47	86
Hexavalent Chromium	mg/kg	<0.3	6	0	<0.3	<0.3	<0.3	-	<0.3	-	<0.3	-	<0.3	<0.3	<0.3	<0.3	<0.3
PAH MS					-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	<0.04	2.3	0	1.3	<0.04	<0.04	-	<0.04	-	<0.04	-	<0.04	-	0.73	<0.04	<0.04
Acenaphthylene	mg/kg	<0.03	2900	0	0.89	<0.03	<0.03	-	<0.03	-	<0.03	-	<0.03	-	1.9	<0.03	<0.03
Acenaphthene	mg/kg	<0.05	3000	0	0.23	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	2.8	<0.05	<0.05
Fluorene	mg/kg	<0.04	2800	0	0.2	<0.04	<0.04	-	<0.04	-	<0.04	-	<0.04	-	1.9	<0.04	<0.04
Phenanthrene	mg/kg	<0.03	1300	0	2	<0.03	<0.03	-	<0.03	-	<0.03	-	<0.03	-	34	<0.03	120
Anthracene	mg/kg	<0.04	31000	0	0.27	<0.04	<0.04	-	<0.04	-	<0.04	-	<0.04	-	12	<0.04	<0.04
Fluoranthene	mg/kg	<0.03	1500	0	0.2	<0.03	<0.03	-	<0.03	-	<0.03	-	<0.03	-	82	<0.03	8.13
Pyrene	mg/kg	<0.03	3700	0	1.3	0.06	<0.03	-	0.18	-	<0.03	-	<0.03	-	82	<0.03	0.12
Benzo(a)anthracene	mg/kg	<0.06	11	2	2	0.07	<0.06	-	0.12	-	<0.06	-	<0.06	-	33	<0.06	0.1
Chrysene	mg/kg	<0.02	30	2	3.6	0.07	<0.02	-	0.13	-	<0.02	-	<0.02	-	34	<0.02	0.1
Benzo(b)fluoranthene	mg/kg	<0.07			1.3	0.11	<0.07	-	0.23	-	<0.07	-	<0.07	-	86	<0.07	<0.07
Benzo(a)pyrene	mg/kg	<0.04	3.2	4	3.6	0.06	<0.04	-	0.1	-	<0.04	-	<0.04	-	41	<0.04	<0.04
Indeno(123cd)pyrene	mg/kg	<0.04	45	1	3.1	<0.04	<0.04	-	0.89	-	<0.04	-	<0.04	-	29	<0.04	<0.04
Dibenzo(ah)anthracene	mg/kg	<0.04	0.31	4	0.22	<0.04	<0.04	-	<0.04	-	<0.04	-	<0.04	-	3	<0.04	<0.04
Benzo(ghi)perylene	mg/kg	<0.04	360	0	1.7	<0.04	<0.04	-	0.89	-	<0.04	-	<0.04	-	28	<0.04	<0.04
PAH 16 Total	mg/kg	<0.6			24.4	<0.6	<0.6	-	1.2	-	<0.6	-	<0.6	-	483.2	<0.6	<0.6
Benzo(b)fluoranthene	mg/kg	<0.05	3.9	4	0.2	0.08	<0.05	-	0.17	-	<0.05	-	<0.05	-	39	<0.05	<0.05
Benzo(k)fluoranthene	mg/kg	<0.02	110	0	1	0.03	<0.02	-	0.06	-	<0.02	-	<0.02	-	19	<0.02	<0.02
PAH Surrogate % Recovery	%	<0			97	94	91	-	83	-	84	-	76	-	96	95	96
Methyl Tertiary Butyl Ether	mg/kg	<0.005	ND	0	-	-	-	-	-	-	<0.005	-	<0.005	-	-	-	-
Benzene	mg/kg	<0.005	0.38	0	-	-	-	-	-	-	<0.005	-	<0.005	-	-	-	-
Toluene	mg/kg	<0.005	880	0	-	-	-	-	-	-	<0.005	-	<0.005	-	-	-	-
Ethylbenzene	mg/kg	<0.005	83	0	-	-	-	-	-	-	<0.005	-	<0.005	-	-	-	-
m & p Xylene	mg/kg	<0.005	79	0	-	-	-	-	-	-	<0.005	-	<0.005	-	-	-	-
o-Xylene	mg/kg	<0.005	88	0	-	-	-	-	-	-	<0.005	-	<0.005	-	-	-	-
Total Xylenes	mg/kg	<0.01			-	-	-	-	-	-	<0.01	-	<0.01	-	-	-	-
TPH CWG					-	-	-	-	-	-	-	-	-	-	-	-	-
Aliphatics					-	-	-	-	-	-	-	-	-	-	-	-	-
aliphatics >C5-C6	mg/kg	<0.1	42	0	-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1
aliphatics >C6-C8	mg/kg	<0.1	100	0	-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1
aliphatics >C8-C10	mg/kg	<0.1	27	0	-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1
aliphatics >C10-C12	mg/kg	<0.2	130	0	-	-	-	-	-	-	<0.2	-	<0.2	-	-	-	<0.2
aliphatics >C12-C16	mg/kg	<4	1100	0	-	-	-	-	-	-	<4	-	<4	-	-	-	<4
aliphatics >C16-C21	mg/kg	<7	-	0	-	-	-	-	-	-	<7	-	<7	-	-	-	12
aliphatics >C21-C35	mg/kg	<7	-	0	-	-	-	-	-	-	<7	-	<7	-	-	-	22
Total aliphatics C5-35	mg/kg	<19			-	-	-	-	-	-	<19	-	<19	-	-	-	34
Aromatics					-	-	-	-	-	-	-	-	-	-	-	-	-
aromatics >EC5-EC7	mg/kg	<0.1	370	0	-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1
aromatics >EC7-EC8	mg/kg	<0.1	860	0	-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1
aromatics >EC8-EC10	mg/kg	<0.1	47	0	-	-	-	-	-	-	<0.1	-	<0.1	-	-	-	<0.1
aromatics >EC10-EC12	mg/kg	<0.2	260	0	-	-	-	-	-	-	<0.2	-	<0.2	-	-	-	<0.2
aromatics >EC12-EC16	mg/kg	<4	1800	0	-	-	-	-	-	-	<4	-	<4	-	-	-	<4
aromatics >EC16-EC21	mg/kg	<7	1900	0	-	-	-	-	-	-	<7	-	<7	-	-	-	<7
aromatics >EC21-EC35	mg/kg	<7	1900	0	-	-	-	-	-	-	<7	-	<7	-	-	-	<7
Total aromatics C5-35	mg/kg	<19			-	-	-	-	-	-	<19	-	<19	-	-	-	<19
Total aliphatics and aromatics(C5-35)	mg/kg	<38			-	-	-	-	-	-	<38	-	<38	-	-	-	<38
Natural Moisture Content	%	<0.1			42.5	21.4	20.7	-	22.1	-	23.8	-	14.9	-	18.8	-	21
Sample Type	None				Clay	Clay	Clay	-	Clay	-	Clay	-	Clay	-	Clay	-	Clay
Sample Colour	None				Medium Brown vegetation	Light Brown stones and roots	Light Brown stones	-	Medium Brown roots and vegetation	-	Light Brown stones	-	Medium Brown stones, vegetation	-	Medium Brown vegetation, stones	-	Medium Brown stones, sand, loam, vegetation and brick fragment
Other Items	None				-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	<0.01			7.5	8.2	8.4	-	7.9	-	8.6	-	8	-	8.1	-	8.1
Asbestos Screen & Identification					-	-	-	-	-	-	-	-	-	-	-	-	-
General Description (Bulk Analysis) #	None				soil-stones	soil-stones	-	soil-stones	soil-stones	-	soil-stones	-	soil-stones	-	soil-stones	-	Soil/Stones
Asbestos Fibres #	None				NAD	NAD	-	NAD	Fibre Bundles	-	Fibre Bundles	-	Fibre Bundles	-	NAD	-	Fibre Bundles
Asbestos ACM #	None				NAD	NAD	-	NAD	NAD	-	NAD	-	NAD	-	NAD	-	Asbestos Cement
Asbestos Type #	None				NAD	NAD	-	NAD	Chrysotile	-	Chrysotile	-	Chrysotile	-	NAD	-	Chrysotile
Asbestos Level Screen #	0				NAD	NAD	-	NAD	less than 0.1 %	-	less than 0.1 %	-	less than 0.1 %	-	NAD	-	NAD
Asbestos Detailed Gravimetric					-	-	-	-	-	-	-	-	-	-	-	-	-
Total ACM Gravimetric Quantification (% Asb) #	mass %	<0.001			-	-	-	-	<0.001	-	-	-	<0.001	-	-	-	2.2
Total Detailed Gravimetric Quantification (% Asb) #	mass %	<0.001			-	-	-	-	0.001	-	-	-	<0.001	-	-	-	0.001
Total Gravimetric Quantification (ACM + Detailed) (% Asb) #	mass %	<0.001			-	-	-	-	0.001	-	-	-	<0.001	-	-	-	2.201
Asbestos PCOM Quantification					-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos PCOM Quantification (Fibres) #	mass %	<0.001			-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos Gravimetric & PCOM Total #	mass %	<0.001			-	-	-	-	-	-	-	-	-	-	-	-	-

Generic Risk Assessment - Soils
Lab Data Screening

SLR

	Exceeds GAC
	Exceeds LOD
Client Name	Frontier
Site Name	Capton Road, Middleton-on-Sea
Job Number	402 06594 00008
Date	12:00:00 AM
Description of Data Assessment / Zoning	
Selected Screening Value and Land Use	S4UL - Residential without plant uptake

Sample ID	WS-02	WS-02	WS-03	WS-04	WS-04
Depth	0.25	2.3	2.3	0.25	3.10
Sample Type	Clayey Loam	Clay	Clayey Sand	Sandy Loam	Clay
Sampled Date	01 May 2019	43586	43586	43586	43586
Sample Received Date	04 May 2019	04/05/2019	04/05/2019	04/05/2019	04/05/2019
J E Sample No	66-69	70-72	77-79	80-83	84-86
Batch Number	1	1	1	1	1
Strata / Zone	-	-	-	-	-

Test	Units	LOD	Selected GAC	No. Above GAC					
Arsenic	mg/kg	<0.5	40	0	5.2	-	-	6.7	-
Cadmium	mg/kg	<0.1	85	0	1.1	-	-	0.7	-
Chromium	mg/kg	<0.5	910	0	21	-	-	17	-
Copper	mg/kg	<1	7100	0	190	-	-	42	-
Lead	mg/kg	<5	310	0	93	-	-	52	-
Mercury	mg/kg	<0.1	56	0	<0.1	-	-	<0.1	-
Nickel	mg/kg	<0.7	180	0	15	-	-	13	-
Selenium	mg/kg	<1	430	0	1	-	-	<1	-
Zinc	mg/kg	<5	40000	0	570	-	-	520	-
Hexavalent Chromium	mg/kg	<0.3	6	0	<0.3	-	-	<0.3	-
PAH MS					-	-	-	-	-
Naphthalene	mg/kg	<0.04	2.3	0	<0.04	-	<0.04	0.18	-
Acenaphthylene	mg/kg	<0.03	2900	0	<0.03	-	<0.03	0.82	-
Acenaphthene	mg/kg	<0.05	3000	0	<0.05	-	<0.05	0.45	-
Fluorene	mg/kg	<0.04	2800	0	<0.04	-	<0.04	0.34	-
Phenanthrene	mg/kg	<0.03	1300	0	0.32	-	<0.03	4.1	-
Anthracene	mg/kg	<0.04	31000	0	<0.04	-	<0.04	1.8	-
Fluoranthene	mg/kg	<0.03	1500	0	2.42	-	<0.03	12	-
Pyrene	mg/kg	<0.03	3700	0	0.25	-	<0.03	1.1	-
Benzo(a)anthracene	mg/kg	<0.06	11	2	0.41	-	<0.06	5.1	-
Chrysene	mg/kg	<0.02	30	2	0.32	-	<0.02	6.8	-
Benzo(b)fluoranthene	mg/kg	<0.07	32	2	0.63	-	<0.07	15	-
Benzo(a)pyrene	mg/kg	<0.04	3.2	4	0.27	-	<0.04	9.5	-
Indeno(123cd)pyrene	mg/kg	<0.04	45	1	0.21	-	<0.04	5.8	-
Dibenzo(ah)anthracene	mg/kg	<0.04	0.31	4	<0.04	-	<0.04	1.5	-
Benzo(ghi)perylene	mg/kg	<0.04	360	0	0.21	-	<0.04	0.5	-
PAH 16 Total	mg/kg	<0.6	-	-	2.9	-	<0.6	83.5	-
Benzo(b)fluoranthene	mg/kg	<0.05	3.9	4	0.44	-	<0.05	1.1	-
Benzo(k)fluoranthene	mg/kg	<0.02	110	0	0.15	-	<0.02	4.2	-
PAH Surrogate % Recovery	%	<0	-	-	95	-	89	93	-
Methyl Tertiary Butyl Ether	mg/kg	<0.005	ND	0	-	<0.005	<0.005	<0.005	<0.005
Benzene	mg/kg	<0.005	0.38	0	-	<0.005	<0.005	<0.005	<0.005
Toluene	mg/kg	<0.005	880	0	-	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	mg/kg	<0.005	83	0	-	<0.005	<0.005	<0.005	<0.005
m & p Xylene	mg/kg	<0.005	79	0	-	<0.005	<0.005	<0.005	<0.005
o-Xylene	mg/kg	<0.005	88	0	-	<0.005	<0.005	<0.005	<0.005
Total Xylenes	mg/kg	<0.01	-	-	-	<0.01	<0.01	<0.01	<0.01
TPH CWG					-	-	-	-	-
Aliphatics					-	-	-	-	-
aliphatics >C5-C6	mg/kg	<0.1	42	0	-	<0.1	<0.1	<0.1	<0.1
aliphatics >C6-C8	mg/kg	<0.1	100	0	-	<0.1	<0.1	<0.1	<0.1
aliphatics >C8-C10	mg/kg	<0.1	27	0	-	<0.1	<0.1	<0.1	<0.1
aliphatics >C10-C12	mg/kg	<0.2	130	0	-	<0.2	<0.2	<0.2	<0.2
aliphatics >C12-C16	mg/kg	<4	1100	0	-	<4	<4	<4	<4
aliphatics >C16-C21	mg/kg	<7	-	0	-	<7	<7	<7	<7
aliphatics >C21-C35	mg/kg	<7	-	0	-	<7	<7	84	<7
Total aliphatics C5-35	mg/kg	<19	-	-	-	<19	<19	84	<19
Aromatics					-	-	-	-	-
aromatics >EC5-EC7	mg/kg	<0.1	370	0	-	<0.1	<0.1	<0.1	<0.1
aromatics >EC7-EC8	mg/kg	<0.1	860	0	-	<0.1	<0.1	<0.1	<0.1
aromatics >EC8-EC10	mg/kg	<0.1	47	0	-	<0.1	<0.1	<0.1	<0.1
aromatics >EC10-EC12	mg/kg	<0.2	250	0	-	<0.2	<0.2	<0.2	<0.2
aromatics >EC12-EC16	mg/kg	<4	1800	0	-	<4	<4	8	<4
aromatics >EC16-EC21	mg/kg	<7	1900	0	-	<7	<7	86	<7
aromatics >EC21-EC35	mg/kg	<7	1900	0	-	<7	<7	589	<7
Total aromatics C5-35	mg/kg	<19	-	-	-	<19	<19	863	<19
Total aliphatics and aromatics(C5-35)	mg/kg	<38	-	-	-	<38	<38	713	<38
Natural Moisture Content	%	<0.1	-	-	40.2	18	19.3	16.2	25
Sample Type	None				Clayey Loam	Clay	Clayey Sand	Sandy Loam	Clay
Sample Colour	None				Medium Brown	Light Brown	Light Brown	Medium Brown	Light Brown
Other Items	None				stones and roots	sand	none	stones and roots	stones, chalk, sand and water
pH	pH units	<0.01			7.4	-	-	7.8	-
Asbestos Screen & Identification					-	-	-	-	-
General Description (Bulk Analysis) #	None				soil-stones	-	soil-stones	Soil/Stones	-
Asbestos Fibres #	None				Fibre Bundles	-	NAD	Fibre Bundles	-
Asbestos ACM #	None				NAD	-	NAD	NAD	-
Asbestos Type #	None				Chrysotile	-	NAD	Chrysotile	-
Asbestos Level Screen #	0				less than 0.1%	-	NAD	less than 0.1%	-
Asbestos Detailed Gravimetric					-	-	-	-	-
Total ACM Gravimetric Quantification (% Asb) #	mass %	<0.001			<0.001	-	-	<0.001	-
Total Detailed Gravimetric Quantification (% Asb) #	mass %	<0.001			<0.001	-	-	<0.001	-
Total Gravimetric Quantification (ACM + Detailed) (% Asb) #	mass %	<0.001			<0.001	-	-	<0.001	-
Asbestos PCOM Quantification					-	-	-	-	-
Asbestos PCOM Quantification (Fibres) #	mass %	<0.001			-	-	-	-	-
Asbestos Gravimetric & PCOM Total #	mass %	<0.001			-	-	-	-	-

APPENDIX 05

Compiled Water Quality Data

Exceeds WQS
Exceeds LOD
BOLD

Exceeds WQS
Exceeds LOD
Exceeds MRV

Client Name	Frontier
Site Name	Yapton Road, Middleton-on-Sea
Job Number	402.05594-00005
Date	24/05/2019
Media	Groundwater
WQS Type	Lowest Applicable WQS

Sample ID	WS01	WS02	WS03	MW01
Depth				
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water
Sampled Date	07/05/19	07/05/19	07/05/19	07/05/19
Sample Received Date	08/05/19	08/05/19	08/05/19	08/05/19
J E Sample No	1-5	6-10	11-15	16-20
Batch Number	1	1	1	1

Test	Units (converted to mg/l)	LOD (mg/l)	Selected WQS Value (mg/l)	WQS Type	Unit Exceeding WQS				
Dissolved Arsenic	mg/l	<0.0009	0.01	UK DWS (2000)		0.0019	<0.0009	<0.0009	<0.0009
Dissolved Cadmium	mg/l	<0.00003	0.00008	UK EQS (WFD 2015) (<40mg/l CaCO3)		<0.00003	<0.00003	<0.00003	<0.00003
Total Dissolved Chromium	mg/l	<0.0002	0.0047	UK EQS (WFD 2015) (CrIII)		0.0004	0.0006	0.0005	0.0003
Dissolved Copper	mg/l	<0.003	0.001	UK EQS (WFD 2015) (mBAT)		<0.003	<0.003	<0.003	<0.003
Dissolved Lead	mg/l	<0.0004	0.0012	UK EQS (WFD 2015) (mBAT)		<0.0004	<0.0004	<0.0004	<0.0004
Dissolved Mercury	mg/l	<0.0005	0.00007	UK EQS (WFD 2015) (MAC)		<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Nickel	mg/l	<0.0002	0.004	UK EQS (WFD 2015) (mBAT)		0.002	0.0024	0.0016	0.0007
Dissolved Selenium	mg/l	<0.0012	0.01	UK DWS (2000)		<0.0012	<0.0012	<0.0012	<0.0012
Dissolved Zinc	mg/l	<0.0015	0.0109	UK EQS (WFD 2015) (mBAT) plus ambient background concentration		<0.0015	<0.0015	<0.0015	<0.0015
Methyl Tertiary Butyl Ether	mg/l	<0.0001	0.015	Taste / odour threshold	-	-	<0.0001	<0.0001	<0.0001
Benzene	mg/l	<0.0005	0.001	UK DWS (2000)	-	-	<0.0005	<0.0005	<0.0005
Toluene	mg/l	<0.0005	0.074	UK EQS (WFD 2015)	-	-	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	<0.001	0.02	Proposed EQS	-	-	<0.001	<0.001	<0.001
m,p-Xylene	mg/l	<0.002			-	-	<0.002	<0.002	<0.002
o-Xylene	mg/l	<0.001			-	-	<0.001	<0.001	<0.001
Total Xylenes	mg/l	<0.003	0.03	UK EQS	-	-	<0.003	<0.003	<0.003
Surrogate Recovery Toluene D8	%	<0			-	-	110	110	110
Surrogate Recovery 4-Bromofluorobenzene	%	<0			-	-	100	100	110
TPH CWG					-	-			
Aliphatics					-	-			
Aliphatics >C5-C6	mg/l	<0.01	0.01	Typical LoD	-	-	<0.01	<0.01	<0.01
Aliphatics >C6-C8	mg/l	<0.01	0.01	Typical LoD	-	-	<0.01	<0.01	<0.01
Aliphatics >C8-C10	mg/l	<0.01	0.01	Typical LoD	-	-	<0.01	<0.01	<0.01
Aliphatics >C10-C12	mg/l	<0.005	0.01	Typical LoD	-	-	<0.005	<0.005	<0.005
Aliphatics >C12-C16	mg/l	<0.01	0.01	Typical LoD	-	-	<0.01	<0.01	<0.01
Aliphatics >C16-C21	mg/l	<0.01	0.01	Typical LoD	-	-	<0.01	<0.01	<0.01
Aliphatics >C21-C35	mg/l	<0.01	0.01	Typical LoD	-	-	<0.01	<0.01	<0.01
Total aliphatics C5-35	mg/l	<0.01			-	-	<0.01	<0.01	<0.01
Aromatics					-	-			
Aromatics >EC5-EC7	mg/l	<0.01	0.001	WHO DWS (2006) /	-	-	<0.01	<0.01	<0.01
Aromatics >EC7-EC8	mg/l	<0.01	0.01	Typical LoD	-	-	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	mg/l	<0.01	0.01	Typical LoD	-	-	<0.01	<0.01	<0.01
Aromatics >EC10-EC12	mg/l	<0.005	0.01	Typical LoD	-	-	<0.005	<0.005	<0.005
Aromatics >EC12-EC16	mg/l	<0.01	0.01	Typical LoD	-	-	<0.01	<0.01	<0.01
Aromatics >EC16-EC21	mg/l	<0.01	0.01	Typical LoD	-	-	<0.01	<0.01	<0.01
Aromatics >EC21-EC35	mg/l	<0.01	0.01	Typical LoD	-	-	<0.01	<0.01	<0.01
Total aromatics C5-35	mg/l	<0.01			-	-	<0.01	<0.01	0.01
Total aliphatics and aromatics (C5-35)	mg/l	<0.01			-	-	<0.01	<0.01	0.01
Nitrate as NO3	mg/l	<0.2	50	UK DWS (2000)	2	184	29	56	5.9
Ammoniacal Nitrogen as NH4	mg/l	<0.03	0.5	UK DWS 2000	2	13.1	0.05	<0.03	0.02
pH	pH units	<0.01				7.5	7.4	7.4	7.8
PAH MS					-	-			
Naphthalene	mg/l	<0.0001	0.002	UK EQS (WFD 2015)	-	-	<0.0001	<0.0001	-
Acenaphthylene	mg/l	<0.000013			-	-	<0.000013	<0.000013	-
Acenaphthene	mg/l	<0.000013			-	-	<0.000013	0.000021	-
Fluorene	mg/l	<0.000014			-	-	<0.000014	0.00002	-
Phenanthrene	mg/l	<0.000011			-	-	0.000025	0.00007	-
Anthracene	mg/l	<0.000013	0.0001	UK EQS (WFD 2015)	-	-	<0.000013	<0.000013	-
Fluoranthene	mg/l	<0.000012	0.0000063	UK EQS (WFD 2015)	2	0.000013	0.0000063	0.0000063	-
Pyrene	mg/l	<0.000013			-	-	<0.000013	0.000043	-
Benzo(a)anthracene	mg/l	<0.000015			-	-	<0.000015	<0.000015	-
Chrysene	mg/l	<0.000011			-	-	<0.000011	0.00002	-
Benzo(b)fluoranthene	mg/l	<0.000018	0.0001	UK DWS (2000)	-	-	<0.000018	0.000027	-
Benzo(a)pyrene	mg/l	<0.000016	0.00001	UK DWS (2000)	-	-	<0.000016	<0.000016	-
Indeno(123cd)pyrene	mg/l	<0.000011	0.0001	UK DWS (2000)	-	-	<0.000011	<0.000011	-
Dibenzo(a,h)anthracene	mg/l	<0.00001			-	-	<0.00001	<0.00001	-
Benzo(k)fluoranthene	mg/l	<0.000011	0.0001	UK DWS (2000)	-	-	<0.000011	<0.000011	-
PAH 15 Total	mg/l	<0.000195			-	-	<0.000195	0.000233	-
Benzo(b)fluoranthene	mg/l	<0.00001	0.0001	UK DWS (2000)	-	-	<0.00001	0.00002	-
Benzo(k)fluoranthene	mg/l	<0.00001	0.0001	UK DWS (2000)	-	-	<0.00001	<0.00001	-
PAH Surrogate % Recovery	%	<0			-	-	91	82	-
Hexavalent Chromium	mg/l	<0.002	0.0034	UK EQS (WFD 2015)		<0.002	<0.002	<0.002	<0.002

APPENDIX 06

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Borehole / Trial Pit	Depth (m)	Sample Ref	Type	Description	WC (%)	LL (%)	PL (%)	PI (%)	<425 µm (%)	Bulk Mg/m³	Dry Mg/m³	Condition	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 (g/L)	W/S Mg (mg/L)	
TP02	0.80		D	Brown fine sandy silty CLAY with rare fine gravel.	21.9	42	20	22	99										Particle Size Distribution
TP02	0.90		B	Yellowish brown slightly sandy clayey SILT.															
TP02	2.10		D	Light brown and light grey slightly gravelly fine sandy silty CLAY.	17.5	25	18	7.0	79							8.5	0.02		
TP04	0.80		B	Brown fine sandy silty CLAY with rare fine gravel.	21.3														
TP04	0.80		D	Brown fine sandy silty CLAY with rare fine gravel.	21.3	48	19	29	99										
TP04	2.00		B													8.8	<0.01		
TP04	2.10		D	Light brown slightly gravelly fine sandy clayey SILT.	10.4		NP		82										
TP05	2.00		B	Yellowish brown and light grey sandy clayey SILT with rare gravel sized chalk.															Particle Size Distribution
TP06	0.70		D	Light brown and light grey fine sandy silty CLAY with rare fine to medium gravel.	18.0	31	19	12	99							8.8	<0.01		
TP07	0.80		D	Light brown and light grey fine sandy silty CLAY with rare fine gravel.	21.7	37	20	17	99										

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

NP=Non Plastic

Checked and Approved by  S Burke - Senior Technician 31/05/2019	Project Number: Project Name: 	GEO / 29282 Middleton-on-Sea 402.06594.00008	
--	---	--	---

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Borehole / Trial Pit	Depth (m)	Sample Ref	Type	Description	WC	LL	PL	PI	<425 µm	Bulk	Dry	Condition	Cell Pressure	Deviator Stress	Shear Stress	pH	2:1 W/S SO4	W/S Mg	
					(%)	(%)	(%)	(%)	(%)	Mg/m³	Mg/m³		kPa	kPa	kPa		(g/L)	(mg/L)	
TP09	0.80		D	Light brown fine sandy silty CLAY with rare fine gravel.	20.4														
TP09	2.30		D	Cream gravelly fine sandy structureless CHALK.	13.8	20	14	6.0	58							8.6	<0.01		
WS01	1.30		D	Brown mottled light brown and light grey fine sandy silty CLAY with rare fine gravel.	21.4	38	19	19	99										

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

NP=Non Plastic

Checked and Approved by

S Burke - Senior Technician
31/05/2019

Project Number:

GEO / 29282

Project Name:

Middleton-on-Sea
402.06594.00008

GEOLABS®

PARTICLE SIZE DISTRIBUTION

BH / TP No.
Depth (m)
Sample Type

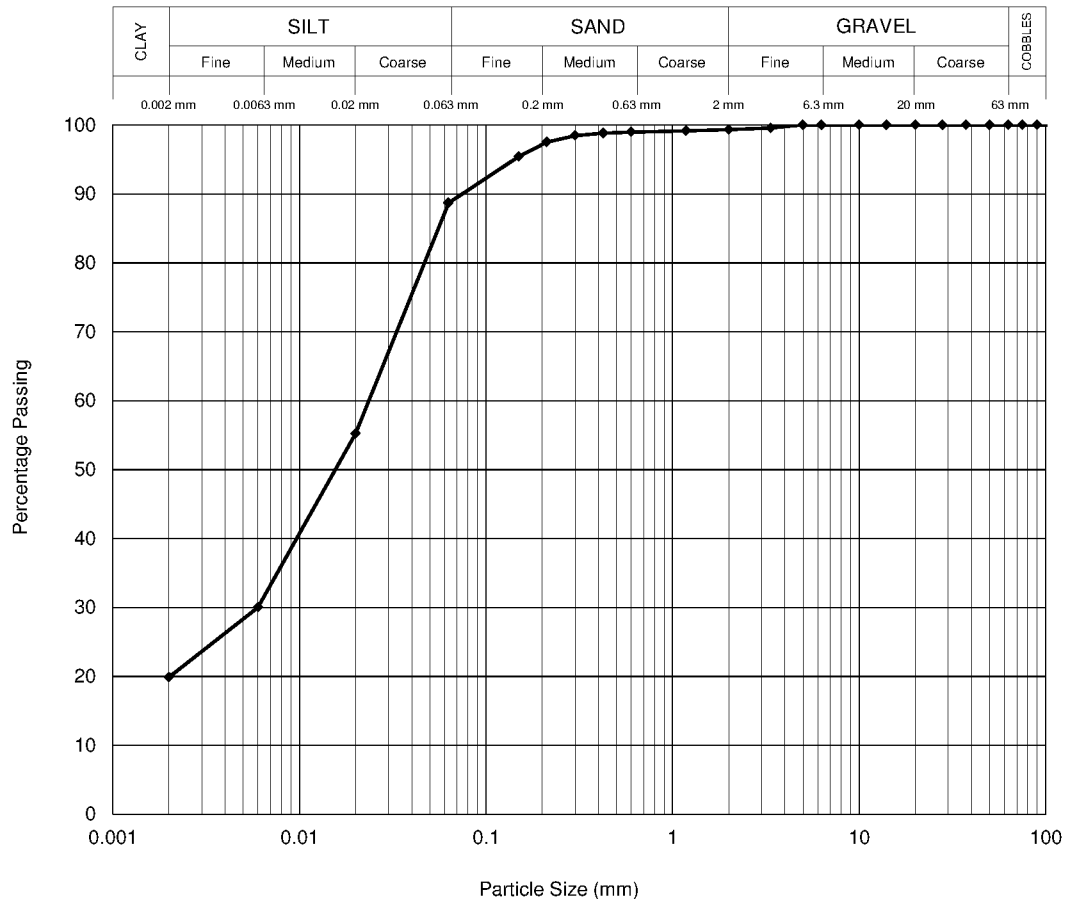
TP02
0.90
B

Description

Yellowish brown slightly sandy clayey SILT.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	100
10.0 mm	100
6.30 mm	100
5.00 mm	100
3.35 mm	100
2.00 mm	99
1.18 mm	99
600 µm	99
425 µm	99
300 µm	98
212 µm	98
150 µm	95
63 µm	89



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	55
6 µm	30
2 µm	20

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	1
Sand	11
Silt	69
Clay	19

Checked and Approved by

Project Number:

GEO / 29282

Middleton-on-Sea
402.06594.00008



Test Report By: GEOLABS Limited, Bucknalls Lane, Garston, Watford, Hertfordshire, WD25 9XX

Client: SLR Consulting Limited, 3rd Floor, The Brew House, Jacob Street, Bristol, BS2 0EQ

PARTICLE SIZE DISTRIBUTION

BH / TP No.
Depth (m)
Sample Type

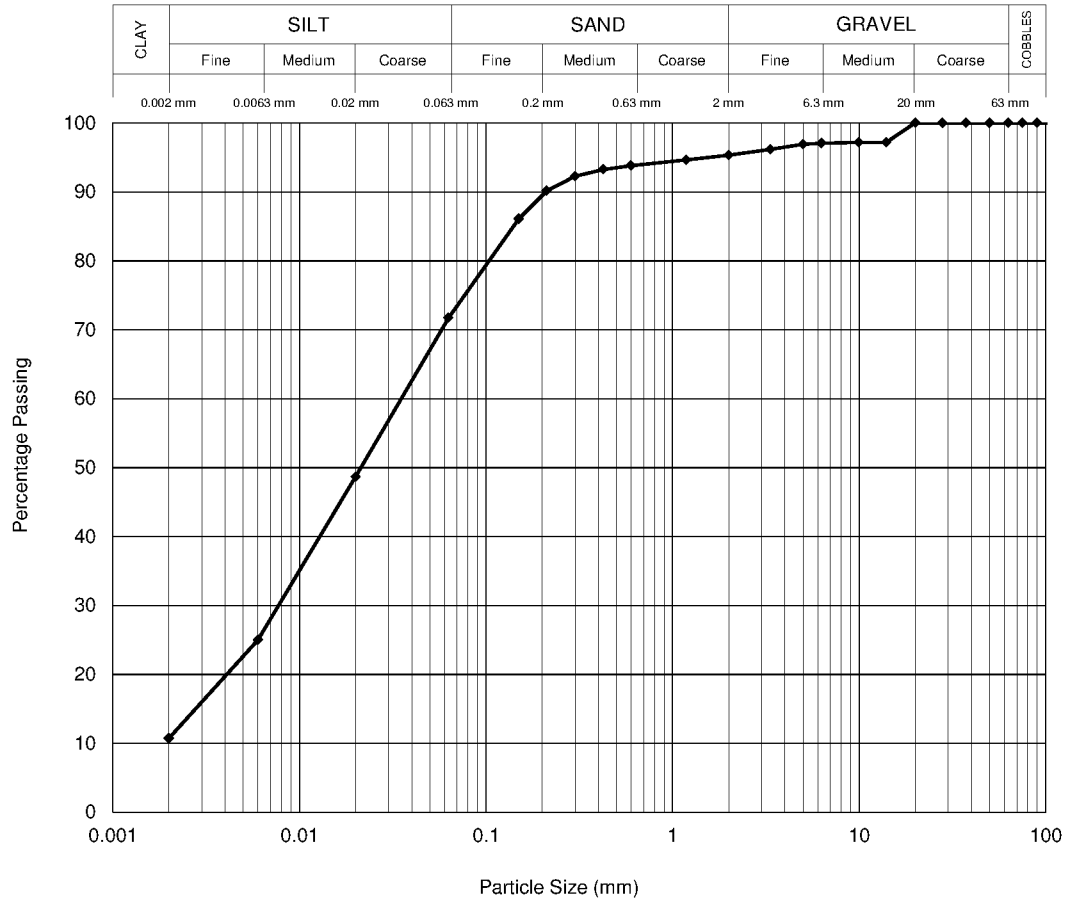
TP05
2.00
B

Description

Yellowish brown and light grey sandy clayey SILT with rare gravel sized chalk.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve
BS EN ISO 17892-4 : 2016 : Clause 5.4 - Sedimentation by Pipette

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	97
10.0 mm	97
6.30 mm	97
5.00 mm	97
3.35 mm	96
2.00 mm	95
1.18 mm	95
600 µm	94
425 µm	93
300 µm	92
212 µm	90
150 µm	86
63 µm	72



Sedimentation	
Pre-treatment used	
Temp (°C)	25
Size	% Pass
20 µm	49
6 µm	25
2 µm	11

Particle Density 2.70(A) Mg/m³

Particle Proportions	
Cobbles	0
Gravel	5
Sand	24
Silt	61
Clay	10

Checked and Approved by

Project Number:

GEO / 29282

Project Name:

Middleton-on-Sea
402.06594.00008



Test Report By: GEOLABS Limited, Bucknalls Lane, Garston, Watford, Hertfordshire, WD25 9XX

Client : SLR Consulting Limited, 3rd Floor, The Brew House, Jacob Street, Bristol, BS2 0EQ

APPENDIX 07

Waste Classification Report



JKZVY-RWYKR-ZNZ3D

Job name

Middleton

Description/Comments

Project

Site

Related Documents

#	Name	Description
None		

Waste Stream Template

JA HA Suite July 2018

Classified by

Name:

Bob Hughes

Date:

23 May 2019 08:55 GMT

Telephone:



Company:

SLR Consulting
7 Wornal Park
Menmarsh Road, Worminghall
Aylesbury
HP18 9PH

Report

Created by: Bob Hughes

Created date: 23 May 2019 08:55 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP-02	0.20	Non Hazardous		3
2	TP-02[2]	0.80	Non Hazardous		5
3	TP-04	0.20	Non Hazardous		7
4	TP-05	0.60	Non Hazardous		9
5	TP-06	0.20	Non Hazardous		11
6	TP-06[2]	2.30	Non Hazardous		13
7	TP-07	0.80	Non Hazardous		15
8	TP-08	0.20	Non Hazardous		17
9	TP-09	0.30	Non Hazardous		19
10	TP-01	0.25	Non Hazardous		21
11	TP-07[2]	0.30	Non Hazardous		23

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
12	WS-01	0.20	Non Hazardous		25
13	WS-02	0.25	Non Hazardous		27
14	WS-02[2]	2.30	Non Hazardous		29
15	WS-03	2.30	Non Hazardous		30
16	WS-04	0.25	Non Hazardous		32
17	WS-04[2]	3.10	Non Hazardous		35

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	36
Appendix B: Rationale for selection of metal species	37
Appendix C: Version	37

Classification of sample: TP-02

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

Sample details

Sample Name:	LoW Code:
TP-02	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.20 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
21.4%	
(dry weight correction)	

Hazard properties

None identified

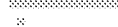
Determinands

Moisture content: 21.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	☉ pH				8.2	pH		8.2	pH	8.2 pH		
2	☉ arsenic { arsenic trioxide }				8.3	mg/kg	1.32	9.027	mg/kg	0.000903 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	☉ cadmium { cadmium sulfide }			1	0.1	mg/kg	1.285	0.106	mg/kg	0.00000824 %	✓	
	048-010-00-4	215-147-6	1306-23-6									
4	☉ chromium { ☉ chromium(III) oxide }				85	mg/kg	1.462	102.333	mg/kg	0.0102 %	✓	
		215-160-9	1308-38-9									
5	☉ copper { dicopper oxide; copper (I) oxide }				19	mg/kg	1.126	17.621	mg/kg	0.00176 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	☉ lead { lead chromate }			1	18	mg/kg	1.56	23.127	mg/kg	0.00148 %	✓	
	062-004-00-2	231-846-0	7756-97-6									
7	☉ mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
8	☉ nickel { nickel dihydroxide }				17	mg/kg	1.579	22.118	mg/kg	0.00221 %	✓	
	026-008-00-X	235-068-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
9	☉ 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
	034-002-00-8											
10	☉ zinc { zinc oxide }				120	mg/kg	1.245	123.036	mg/kg	0.0123 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
11	naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
12	☉ acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	206-96-8									
13	☉ acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9									
14	☉ fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7									

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	M/C Applied	Conc. Not Used
	CLP Index number	EC Number	CAS Number									
15	phenanthrene	201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
16	anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
17	fluoranthene	205-912-4	206-44-0		0.1	mg/kg		0.0824	mg/kg	0.00000824 %	✓	
18	pyrene	204-927-3	129-00-0		0.09	mg/kg		0.0741	mg/kg	0.00000741 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.07	mg/kg		0.0577	mg/kg	0.00000577 %	✓	
20	chrysene	601-048-00-0	205-923-4	218-01-9	0.07	mg/kg		0.0577	mg/kg	0.00000577 %	✓	
21	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-026-8	50-32-8	0.06	mg/kg		0.0494	mg/kg	0.00000494 %	✓	
22	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
23	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	benzo[ghi]perylene	205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.08	mg/kg		0.0659	mg/kg	0.00000659 %	✓	
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.03	mg/kg		0.0247	mg/kg	0.00000247 %	✓	
Total:										0.0292 %		

Key

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

Classification of sample: TP-02[2]

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

Sample details

Sample Name:	LoW Code:
TP-02[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.80 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
20.7%	
(dry weight correction)	

Hazard properties

None identified

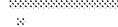
Determinands

Moisture content: 20.7% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	☉ pH				8.4	pH		8.4	pH	8.4 pH		
2	☉ arsenic { arsenic trioxide }				12	mg/kg	1.32	13.127	mg/kg	0.00131 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	☉ cadmium { cadmium sulfide }			1	0.1	mg/kg	1.285	0.106	mg/kg	0.00000829 %	✓	
	048-010-00-4	215-147-6	1306-23-6									
4	☉ chromium { ☉ chromium(III) oxide }				43	mg/kg	1.462	52.069	mg/kg	0.00521 %	✓	
		215-160-9	1308-38-9									
5	☉ copper { dicopper oxide; copper (I) oxide }				14	mg/kg	1.126	13.059	mg/kg	0.00131 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	☉ lead { lead chromate }			1	14	mg/kg	1.56	18.092	mg/kg	0.00116 %	✓	
	062-004-00-2	231-846-0	7756-97-6									
7	☉ mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
8	☉ nickel { nickel dihydroxide }				40	mg/kg	1.579	52.345	mg/kg	0.00523 %	✓	
	026-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
9	☉ selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1	mg/kg	2.554	2.116	mg/kg	0.000212 %	✓	
	034-002-00-8											
10	☉ zinc { zinc oxide }				58	mg/kg	1.245	59.812	mg/kg	0.00598 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
11	naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
12	☉ acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	206-96-8									
13	☉ acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9									
14	☉ fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7									

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	M/C Applied	Conc. Not Used
	CLP Index number	EC Number	CAS Number									
15	phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8									
16	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		204-371-1	120-12-7									
17	fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0									
18	pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0									
19	benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
		601-033-00-9	200-280-6									
20	chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-048-00-0	205-923-4									
21	benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-026-8									
22	indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		205-893-2	193-39-5									
23	dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8									
24	benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		205-883-8	191-24-2									
25	benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9									
26	benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-036-00-5	205-918-8									
Total:										0.0205 %		

Key

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

Classification of sample: TP-04

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

Sample details

Sample Name:	LoW Code:
TP-04	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.20 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
22.1%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 22.1% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	☉ pH				7.5	pH		7.5	pH	7.5 pH		
2	☉ arsenic { arsenic trioxide }				25	mg/kg	1.32	27.034	mg/kg	0.0027 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	☉ cadmium { cadmium sulfide }			1	0.4	mg/kg	1.285	0.421	mg/kg	0.0000328 %	✓	
	048-010-00-4	215-147-6	1306-23-6									
4	☉ chromium { ☉ chromium(III) oxide }				35	mg/kg	1.462	41.896	mg/kg	0.00419 %	✓	
		215-160-9	1308-38-9									
5	☉ copper { dicopper oxide; copper (I) oxide }				60	mg/kg	1.126	55.326	mg/kg	0.00553 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	☉ lead { lead chromate }			1	110	mg/kg	1.56	140.524	mg/kg	0.00901 %	✓	
	062-004-00-2	231-846-0	7756-97-6									
7	☉ mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-289-8	7487-94-7									
8	☉ nickel { nickel dihydroxide }				20	mg/kg	1.579	25.872	mg/kg	0.00259 %	✓	
	026-008-00-X	235-068-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
9	☉ 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	<0.0000255 %		<LOD
	034-002-00-8											
10	☉ zinc { zinc oxide }				470	mg/kg	1.245	479.128	mg/kg	0.0479 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
11	naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
12	☉ acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	206-98-8									
13	☉ acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9									
14	☉ fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7									

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	M/C Applied	Conc. Not Used
	CLP Index number	EC Number	CAS Number									
15	phenanthrene	201-581-5	85-01-8		0.07	mg/kg		0.0573	mg/kg	0.00000573 %	✓	
16	anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
17	fluoranthene	205-912-4	206-44-0		0.2	mg/kg		0.164	mg/kg	0.0000164 %	✓	
18	pyrene	204-927-3	129-00-0		0.18	mg/kg		0.147	mg/kg	0.0000147 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.12	mg/kg		0.0983	mg/kg	0.00000983 %	✓	
20	chrysene	601-048-00-0	205-923-4	218-01-9	0.13	mg/kg		0.106	mg/kg	0.0000106 %	✓	
21	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-026-8	50-32-8	0.1	mg/kg		0.0819	mg/kg	0.00000819 %	✓	
22	indeno[123-cd]pyrene	205-893-2	193-39-5		0.09	mg/kg		0.0737	mg/kg	0.00000737 %	✓	
23	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	benzo[ghi]perylene	205-883-8	191-24-2		0.09	mg/kg		0.0737	mg/kg	0.00000737 %	✓	
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.17	mg/kg		0.139	mg/kg	0.0000139 %	✓	
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.06	mg/kg		0.0491	mg/kg	0.00000491 %	✓	
Total:										0.0724 %		

Key

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

Classification of sample: TP-05

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

Sample details

Sample Name:	LoW Code:
TP-05	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.60 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
23.8%	
(dry weight correction)	

Hazard properties

None identified

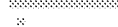
Determinands

Moisture content: 23.8% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	☉ pH				8.6	pH		8.6	pH	8.6 pH		
2	☉ arsenic { arsenic trioxide }				12	mg/kg	1.32	12.798	mg/kg	0.00128 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	☉ cadmium { cadmium sulfide }			1	<0.1	mg/kg	1.285	<0.129	mg/kg	<0.00001 %		<LOD
	048-010-00-4	215-147-6	1306-23-6									
4	☉ chromium { ☉ chromium(III) oxide }				52	mg/kg	1.462	61.39	mg/kg	0.00614 %	✓	
		215-160-9	1308-38-9									
5	☉ copper { dicopper oxide; copper (I) oxide }				18	mg/kg	1.126	16.37	mg/kg	0.00164 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	☉ lead { lead chromate }			1	15	mg/kg	1.56	18.899	mg/kg	0.00121 %	✓	
	062-004-00-2	231-846-0	7756-97-6									
7	☉ mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
8	☉ nickel { nickel dihydroxide }				51	mg/kg	1.579	65.068	mg/kg	0.00651 %	✓	
	026-008-00-X	235-068-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
9	☉ selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1	mg/kg	2.554	2.063	mg/kg	0.000206 %	✓	
	034-002-00-8											
10	☉ zinc { zinc oxide }				71	mg/kg	1.245	71.385	mg/kg	0.00714 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
11	naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
12	☉ acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	206-96-8									
13	☉ acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9									
14	☉ fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7									

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	M/C Applied	Conc. Not Used
	CLP Index number	EC Number	CAS Number									
15	phenanthrene	201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
16	anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
17	fluoranthene	205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
18	pyrene	204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
19	benzo[a]anthracene	601-033-00-9	200-280-6		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
20	chrysene	601-048-00-0	205-923-4		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
21	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-026-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
22	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
23	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	benzo[ghi]perylene	205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
25	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
26	benzo[k]fluoranthene	601-036-00-5	205-918-8		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
Total:										0.0242 %		

Key

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

Classification of sample: TP-06

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

Sample details

Sample Name:	LoW Code:
TP-06	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.20 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14.9%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 14.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	215-653-1	1634-04-4							
2	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-763-7	71-43-2							
3	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	200-625-9	108-88-3							
4	* ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-549-4	100-41-4							
5	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-6	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]							
6	* TPH (C6 to C40) petroleum group				130 mg/kg		113.142 mg/kg	0.0113 %	✓	
			TPH							
Total:								0.0113 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- * Determinand defined or amended by HazWasteOnline (see Appendix A)
- <LOD Below limit of detection

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 product observed. BTEX less than detection

Hazard Statements hit:

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



Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0113%)

Classification of sample: TP-06[2]

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

Sample details

Sample Name: TP-06[2] LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: 2.30 m Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: 18.8%
(dry weight correction)

Hazard properties

None identified

Determinands

Moisture content: 18.8% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	☉ pH		PH		9	pH		9	pH	9pH		
2	☉ arsenic { arsenic trioxide }	039-003-00-0	215-481-4	1327-53-3	4.5	mg/kg	1.32	5.001	mg/kg	0.0005 %	✓	
3	☉ cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-8	1	0.2	mg/kg	1.285	0.216	mg/kg	0.0000168 %	✓
4	☉ chromium { ☉ chromium(III) oxide }		215-160-9	1308-38-9	26	mg/kg	1.462	31.987	mg/kg	0.0032 %	✓	
5	☉ copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	7	mg/kg	1.126	6.634	mg/kg	0.000663 %	✓	
6	☉ lead { lead chromate }	062-004-00-2	231-846-0	7758-97-6	1	7	mg/kg	1.56	9.191	mg/kg	0.000589 %	✓
7	☉ mercury { mercury dichloride }	080-010-00-X	231-289-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %	<LOD
8	☉ nickel { nickel dihydroxide }	026-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]	14	mg/kg	1.579	18.614	mg/kg	0.00186 %	✓	
9	☉ 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
10	☉ zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2	32	mg/kg	1.245	33.528	mg/kg	0.00335 %	✓	
11	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %	<LOD
12	☉ acenaphthylene		205-917-1	206-98-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %	<LOD
13	☉ acenaphthene		201-469-8	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %	<LOD
14	☉ fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %	<LOD

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	M/C Applied	Conc. Not Used
	CLP Index number	EC Number	CAS Number									
15	phenanthrene	201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
16	anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
17	fluoranthene	205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
18	pyrene	204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
19	benzo[a]anthracene	601-033-00-9	200-280-6		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
20	chrysene	601-048-00-0	205-923-4		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
21	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-026-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
22	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
23	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	benzo[ghi]perylene	205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
25	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
26	benzo[k]fluoranthene	601-036-00-5	205-918-8		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
27	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-853-1		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
28	benzene	601-020-00-8	200-753-7		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
29	toluene	601-021-00-3	203-625-9		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
30	ethylbenzene	601-023-00-4	202-849-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
31	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
32	TPH (C6 to C40) petroleum group		TPH		<38	mg/kg		<38	mg/kg	<0.0038 %		<LOD
Total:										0.0143 %		

Key

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

Classification of sample: TP-07

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

Sample details

Sample Name:	LoW Code:
TP-07	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.80 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
21.4%	
(dry weight correction)	

Hazard properties

None identified

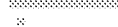
Determinands

Moisture content: 21.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	☉ pH				8.1	pH		8.1	pH	8.1 pH		
2	☉ arsenic { arsenic trioxide }				6.3	mg/kg	1.32	6.852	mg/kg	0.000685 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	☉ cadmium { cadmium sulfide }			1	<0.1	mg/kg	1.285	<0.129	mg/kg	<0.00001 %		<LOD
	048-010-00-4	215-147-6	1306-23-6									
4	☉ chromium { ☉ chromium(III) oxide }				37	mg/kg	1.462	44.545	mg/kg	0.00445 %	✓	
		215-160-9	1308-38-9									
5	☉ copper { dicopper oxide; copper (I) oxide }				8	mg/kg	1.126	7.419	mg/kg	0.000742 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	☉ lead { lead chromate }			1	11	mg/kg	1.56	14.133	mg/kg	0.000906 %	✓	
	062-004-00-2	231-846-0	7756-97-6									
7	☉ mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
8	☉ nickel { nickel dihydroxide }				14	mg/kg	1.579	18.215	mg/kg	0.00182 %	✓	
	026-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
9	☉ 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
	034-002-00-8											
10	☉ zinc { zinc oxide }				47	mg/kg	1.245	48.189	mg/kg	0.00482 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
11	naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
12	☉ acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	206-96-8									
13	☉ acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9									
14	☉ fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7									

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	M/C Applied	Conc. Not Used
	CLP Index number	EC Number	CAS Number									
15	phenanthrene	201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
16	anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
17	fluoranthene	205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
18	pyrene	204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
19	benzo[a]anthracene	601-033-00-9	200-280-6		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
20	chrysene	601-048-00-0	205-923-4		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
21	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-026-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
22	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
23	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	benzo[ghi]perylene	205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
25	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
26	benzo[k]fluoranthene	601-036-00-5	205-918-8		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
Total:										0.0138 %		

Key

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

Classification of sample: TP-08

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

Sample details

Sample Name:	LoW Code:
TP-08	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.20 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
22.4%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 22.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	☉ pH				8.1	pH		8.1	pH	8.1 pH		
2	☉ arsenic { arsenic trioxide }				8.6	mg/kg	1.32	9.277	mg/kg	0.000928 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	☉ cadmium { cadmium sulfide }			1	0.2	mg/kg	1.285	0.21	mg/kg	0.0000163 %	✓	
	048-010-00-4	215-147-8	1306-23-8									
4	☉ chromium { ☉ chromium(III) oxide }				89	mg/kg	1.462	106.273	mg/kg	0.0106 %	✓	
		215-160-9	1308-38-9									
5	☉ copper { dicopper oxide; copper (I) oxide }				15	mg/kg	1.126	13.798	mg/kg	0.00138 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	☉ lead { lead chromate }			1	20	mg/kg	1.56	25.487	mg/kg	0.00163 %	✓	
	062-004-00-2	231-846-0	7758-97-6									
7	☉ mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-289-8	7487-94-7									
8	☉ nickel { nickel dihydroxide }				18	mg/kg	1.579	23.228	mg/kg	0.00232 %	✓	
	026-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
9	☉ 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
	034-002-00-8											
10	☉ zinc { zinc oxide }				80	mg/kg	1.245	81.354	mg/kg	0.00814 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
11	naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
12	☉ acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	206-98-8									
13	☉ acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9									
14	☉ fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7									

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	M/C Applied	Conc. Not Used
	CLP Index number	EC Number	CAS Number									
15	phenanthrene	201-581-5	85-01-8		0.05	mg/kg		0.0408	mg/kg	0.00000408 %	✓	
16	anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
17	fluoranthene	205-912-4	206-44-0		0.13	mg/kg		0.106	mg/kg	0.0000106 %	✓	
18	pyrene	204-927-3	129-00-0		0.12	mg/kg		0.098	mg/kg	0.0000098 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.1	mg/kg		0.0817	mg/kg	0.00000817 %	✓	
20	chrysene	601-048-00-0	205-923-4	218-01-9	0.1	mg/kg		0.0817	mg/kg	0.00000817 %	✓	
21	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-026-8	50-32-8	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
22	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
23	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	benzo[ghi]perylene	205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
Total:										0.0254 %		

Key

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

Classification of sample: TP-09

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

Sample details

Sample Name:	LoW Code:
TP-09	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.30 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
8.4%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 8.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	☉ pH		PH4		7.7	pH		7.7	pH	7.7 pH		
2	☉ arsenic { arsenic trioxide }	039-003-00-0	215-481-4	1327-53-3		9.3	mg/kg	1.32	11.328	mg/kg	0.00113 %	✓
3	☉ cadmium { cadmium sulfide }	048-010-00-4	215-147-6	1306-23-6	1	1.1	mg/kg	1.285	1.304	mg/kg	0.000101 %	✓
4	☉ chromium { ☉ chromium(III) oxide }		215-160-9	1308-38-9		24	mg/kg	1.462	32.359	mg/kg	0.00324 %	✓
5	☉ copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		54	mg/kg	1.126	56.087	mg/kg	0.00561 %	✓
6	☉ lead { lead chromate }	062-004-00-2	231-846-0	7756-97-6	1	130	mg/kg	1.56	187.063	mg/kg	0.012 %	✓
7	☉ mercury { mercury dichloride }	080-010-00-X	231-289-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %	<LOD
8	☉ nickel { nickel dihydroxide }	026-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		22	mg/kg	1.579	32.056	mg/kg	0.00321 %	✓
9	☉ 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
10	☉ zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		510	mg/kg	1.245	585.613	mg/kg	0.0586 %	✓
11	☉ naphthalene	601-052-00-2	202-049-5	91-20-3		1.3	mg/kg		1.199	mg/kg	0.00012 %	✓
12	☉ acenaphthylene		205-917-1	206-98-8		3	mg/kg		2.768	mg/kg	0.000277 %	✓
13	☉ acenaphthene		201-469-6	83-32-9		15	mg/kg		13.838	mg/kg	0.00138 %	✓
14	☉ fluorene		201-665-5	86-73-7		10	mg/kg		9.225	mg/kg	0.000923 %	✓

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	M/C Applied	Conc. Not Used
	CLP Index number	EC Number	CAS Number									
15	phenanthrene	201-581-5	85-01-8		120	mg/kg		110.701	mg/kg	0.0111 %	✓	
16	anthracene	204-371-1	120-12-7		39	mg/kg		35.978	mg/kg	0.0036 %	✓	
17	fluoranthene	205-912-4	206-44-0		160	mg/kg		147.601	mg/kg	0.0148 %	✓	
18	pyrene	204-927-3	129-00-0		140	mg/kg		129.151	mg/kg	0.0129 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	86	mg/kg		79.336	mg/kg	0.00793 %	✓	
20	chrysene	601-048-00-0	205-923-4	218-01-9	63	mg/kg		58.118	mg/kg	0.00581 %	✓	
21	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-026-8	50-32-8	64	mg/kg		59.041	mg/kg	0.0059 %	✓	
22	indeno[123-cd]pyrene	205-893-2	193-39-5		47	mg/kg		43.358	mg/kg	0.00434 %	✓	
23	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	7.3	mg/kg		6.734	mg/kg	0.000673 %	✓	
24	benzo[ghi]perylene	205-883-8	191-24-2		43	mg/kg		39.668	mg/kg	0.00397 %	✓	
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	86	mg/kg		79.336	mg/kg	0.00793 %	✓	
26	benzo[k]fluoranthene	601-036-00-5	205-918-8	207-08-9	34	mg/kg		31.365	mg/kg	0.00314 %	✓	
Total:										0.169 %		

Key

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

Classification of sample: TP-01

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

Sample details

Sample Name: **TP-01** LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: **0.25 m** Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: **42.5%**
(dry weight correction)

Hazard properties

None identified

Determinands

Moisture content: 42.5% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	☉ pH		PH		7.5	pH		7.5	pH	7.5 pH		
2	☉ arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	3.8	mg/kg	1.32	3.521	mg/kg	0.000352 %	✓	
3	☉ cadmium { cadmium sulfide }	048-010-00-4	215-147-6	1306-23-6	1	0.5	mg/kg	1.285	0.451	mg/kg	0.0000351 %	✓
4	☉ chromium { ☉ chromium(III) oxide }		215-160-9	1308-38-9	82	mg/kg	1.462	84.104	mg/kg	0.00841 %	✓	
5	☉ copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	34	mg/kg	1.126	26.863	mg/kg	0.00269 %	✓	
6	☉ lead { lead chromate }	062-004-00-2	231-846-0	7758-97-6	1	68	mg/kg	1.56	74.433	mg/kg	0.00477 %	✓
7	☉ mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %	<LOD
8	☉ nickel { nickel dihydroxide }	026-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]	12	mg/kg	1.579	13.301	mg/kg	0.00133 %	✓	
9	☉ 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	1.792	mg/kg	0.000179 %	✓	
10	☉ zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2	390	mg/kg	1.245	340.659	mg/kg	0.0341 %	✓	
11	☉ naphthalene	601-052-00-2	202-049-5	91-20-3	1.3	mg/kg		0.912	mg/kg	0.0000912 %	✓	
12	☉ acenaphthylene		205-917-1	206-98-8	0.09	mg/kg		0.0632	mg/kg	0.00000632 %	✓	
13	☉ acenaphthene		201-469-6	83-32-9	0.23	mg/kg		0.161	mg/kg	0.0000161 %	✓	
14	☉ fluorene		201-665-5	86-73-7	0.2	mg/kg		0.14	mg/kg	0.000014 %	✓	

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	M/C Applied	Conc. Not Used
	CLP Index number	EC Number	CAS Number									
15	phenanthrene	201-581-5	85-01-8		2	mg/kg		1.404	mg/kg	0.00014 %	✓	
16	anthracene	204-371-1	120-12-7		0.27	mg/kg		0.189	mg/kg	0.0000189 %	✓	
17	fluoranthene	205-912-4	206-44-0		4.3	mg/kg		3.018	mg/kg	0.000302 %	✓	
18	pyrene	204-927-3	129-00-0		3.3	mg/kg		2.316	mg/kg	0.000232 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	2	mg/kg		1.404	mg/kg	0.00014 %	✓	
20	chrysene	601-048-00-0	205-923-4	218-01-9	3.6	mg/kg		2.526	mg/kg	0.000253 %	✓	
21	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-026-8	50-32-8	3.6	mg/kg		2.526	mg/kg	0.000253 %	✓	
22	indeno[123-cd]pyrene	205-893-2	193-39-5		3.1	mg/kg		2.175	mg/kg	0.000218 %	✓	
23	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.43	mg/kg		0.302	mg/kg	0.0000302 %	✓	
24	benzo[ghi]perylene	205-883-8	191-24-2		2.7	mg/kg		1.895	mg/kg	0.000189 %	✓	
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	5.3	mg/kg		3.719	mg/kg	0.000372 %	✓	
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	2	mg/kg		1.404	mg/kg	0.00014 %	✓	
Total:										0.0543 %		

Key

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

Classification of sample: TP-07[2]

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

Sample details

Sample Name:	LoW Code:
TP-07[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.30 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
21%	
(dry weight correction)	

Hazard properties

None identified

Determinands

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

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	☉ pH		PH4		8.1	pH		8.1	pH	8.1 pH		
2	☉ arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	6	mg/kg	1.32	6.547	mg/kg	0.000655 %	✓	
3	☉ cadmium { cadmium sulfide }	048-010-00-4	215-147-6	1306-23-6	1	0.5	mg/kg	1.285	0.531	mg/kg	0.0000413 %	✓
4	☉ chromium { ☉ chromium(III) oxide }		215-160-9	1308-38-9	67	mg/kg	1.462	80.929	mg/kg	0.00809 %	✓	
5	☉ copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	30	mg/kg	1.126	27.915	mg/kg	0.00279 %	✓	
6	☉ lead { lead chromate }	062-004-00-2	231-846-0	7756-97-6	1	56	mg/kg	1.56	72.19	mg/kg	0.00463 %	✓
7	☉ mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %	<LOD
8	☉ nickel { nickel dihydroxide }	026-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]	33	mg/kg	1.579	43.077	mg/kg	0.00431 %	✓	
9	☉ 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
10	☉ zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2	240	mg/kg	1.245	246.885	mg/kg	0.0247 %	✓	
11	naphthalene	601-052-00-2	202-049-5	91-20-3	0.75	mg/kg		0.62	mg/kg	0.000062 %	✓	
12	☉ acenaphthylene		205-917-1	206-98-8	1.9	mg/kg		1.57	mg/kg	0.000157 %	✓	
13	☉ acenaphthene		201-469-6	83-32-9	2.8	mg/kg		2.314	mg/kg	0.000231 %	✓	
14	☉ fluorene		201-665-5	86-73-7	1.9	mg/kg		1.57	mg/kg	0.000157 %	✓	

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	M/C Applied	Conc. Not Used
	CLP Index number	EC Number	CAS Number									
15	phenanthrene	201-581-5	85-01-8		34	mg/kg		28.099	mg/kg	0.00281 %	✓	
16	anthracene	204-371-1	120-12-7		12	mg/kg		9.917	mg/kg	0.000992 %	✓	
17	fluoranthene	205-912-4	206-44-0		92	mg/kg		76.033	mg/kg	0.0076 %	✓	
18	pyrene	204-927-3	129-00-0		82	mg/kg		67.769	mg/kg	0.00678 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	33	mg/kg		27.273	mg/kg	0.00273 %	✓	
20	chrysene	601-048-00-0	205-923-4	218-01-9	34	mg/kg		28.099	mg/kg	0.00281 %	✓	
21	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-026-8	50-32-8	41	mg/kg		33.884	mg/kg	0.00339 %	✓	
22	indeno[123-cd]pyrene	205-893-2	193-39-5		29	mg/kg		23.967	mg/kg	0.0024 %	✓	
23	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	3	mg/kg		2.479	mg/kg	0.000248 %	✓	
24	benzo[ghi]perylene	205-883-8	191-24-2		28	mg/kg		23.14	mg/kg	0.00231 %	✓	
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	49	mg/kg		40.496	mg/kg	0.00405 %	✓	
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	19	mg/kg		15.702	mg/kg	0.00157 %	✓	
Total:										0.0838 %		

Key

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

Classification of sample: WS-01

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

Sample details

Sample Name:	LoW Code:
WS-01	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.20 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
35.8%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 35.8% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	☉ pH		PH		8.1	pH		8.1	pH	8.1 pH		
2	☉ arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	8.3	mg/kg	1.32	8.07	mg/kg	0.000807 %	✓	
3	☉ cadmium { cadmium sulfide }	048-010-00-4	215-147-6	1306-23-6	1	0.3	mg/kg	1.285	0.284	mg/kg	0.0000221 %	✓
4	☉ chromium { ☉ chromium(III) oxide }		215-160-9	1308-38-9	26	mg/kg	1.462	27.983	mg/kg	0.0028 %	✓	
5	☉ copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	24	mg/kg	1.126	19.898	mg/kg	0.00199 %	✓	
6	☉ lead { lead chromate }	062-004-00-2	231-846-0	7756-97-6	1	15	mg/kg	1.56	17.229	mg/kg	0.0011 %	✓
7	☉ mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %	<LOD
8	☉ nickel { nickel dihydroxide }	026-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]	31	mg/kg	1.579	36.056	mg/kg	0.00361 %	✓	
9	☉ 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	<0.0000255 %		<LOD
10	☉ zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2	110	mg/kg	1.245	100.824	mg/kg	0.0101 %	✓	
11	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %	<LOD
12	☉ acenaphthylene		205-917-1	206-98-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %	<LOD
13	☉ acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %	<LOD
14	☉ fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %	<LOD

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	M/C Applied	Conc. Not Used
	CLP Index number	EC Number	CAS Number									
15	phenanthrene	201-581-5	85-01-8		0.33	mg/kg		0.243	mg/kg	0.0000243 %	✓	
16	anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
17	fluoranthene	205-912-4	206-44-0		0.49	mg/kg		0.361	mg/kg	0.0000361 %	✓	
18	pyrene	204-927-3	129-00-0		0.37	mg/kg		0.272	mg/kg	0.0000272 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.2	mg/kg		0.147	mg/kg	0.0000147 %	✓	
20	chrysene	601-048-00-0	205-923-4	218-01-9	0.42	mg/kg		0.309	mg/kg	0.0000309 %	✓	
21	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-026-8	50-32-8	0.26	mg/kg		0.191	mg/kg	0.0000191 %	✓	
22	indeno[123-cd]pyrene	205-893-2	193-39-5		0.29	mg/kg		0.214	mg/kg	0.0000214 %	✓	
23	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.07	mg/kg		0.0515	mg/kg	0.00000515 %	✓	
24	benzo[ghi]perylene	205-883-8	191-24-2		0.27	mg/kg		0.199	mg/kg	0.0000199 %	✓	
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.57	mg/kg		0.42	mg/kg	0.000042 %	✓	
26	benzo[k]fluoranthene	601-036-00-5	205-916-8	207-08-9	0.22	mg/kg		0.162	mg/kg	0.0000162 %	✓	
27	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-853-1	1634-04-4	<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
28	benzene	601-020-00-8	200-753-7	71-43-2	<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
29	toluene	601-021-00-3	203-625-9	108-88-3	<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
30	ethylbenzene	601-023-00-4	202-349-4	100-41-4	<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
31	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 106-38-3 [3] 1330-20-7 [4]	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
32	TPH (C6 to C40) petroleum group		TPH		<38	mg/kg		<38	mg/kg	<0.0038 %		<LOD
Total:										0.0248 %		

Key

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

Classification of sample: WS-02

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

Sample details

Sample Name:	LoW Code:
WS-02	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.25 m	
Moisture content:	
40.2%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 40.2% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	☉ pH		PH		7.4	pH		7.4	pH	7.4 pH		
2	☉ arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	5.2	mg/kg	1.32	4.897	mg/kg	0.00049 %	✓	
3	☉ cadmium { cadmium sulfide }	048-010-00-4	215-147-6	1306-23-6	1	1.1	mg/kg	1.285	1.008	mg/kg	0.0000785 %	✓
4	☉ chromium { ☉ chromium(III) oxide }		215-160-9	1308-38-9	21	mg/kg	1.462	21.892	mg/kg	0.00219 %	✓	
5	☉ copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	190	mg/kg	1.126	152.581	mg/kg	0.0153 %	✓	
6	☉ lead { lead chromate }	062-004-00-2	231-846-0	7758-97-6	1	93	mg/kg	1.56	103.468	mg/kg	0.00663 %	✓
7	☉ mercury { mercury dichloride }	080-010-00-X	231-289-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %	<LOD
8	☉ nickel { nickel dihydroxide }	026-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]	15	mg/kg	1.579	16.899	mg/kg	0.00169 %	✓	
9	☉ 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	1.821	mg/kg	0.000182 %	✓	
10	☉ zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2	870	mg/kg	1.245	772.397	mg/kg	0.0772 %	✓	
11	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %	<LOD
12	☉ acenaphthylene		205-917-1	206-98-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %	<LOD
13	☉ acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %	<LOD
14	☉ fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %	<LOD

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	M/C Applied	Conc. Not Used
	CLP Index number	EC Number	CAS Number									
15	phenanthrene	201-581-5	85-01-8		0.22	mg/kg		0.157	mg/kg	0.0000157 %	✓	
16	anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
17	fluoranthene	205-912-4	206-44-0		0.43	mg/kg		0.307	mg/kg	0.0000307 %	✓	
18	pyrene	204-927-3	129-00-0		0.38	mg/kg		0.271	mg/kg	0.0000271 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.21	mg/kg		0.15	mg/kg	0.000015 %	✓	
20	chrysene	601-048-00-0	205-923-4	218-01-9	0.32	mg/kg		0.228	mg/kg	0.0000228 %	✓	
21	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-026-8	50-32-8	0.27	mg/kg		0.193	mg/kg	0.0000193 %	✓	
22	indeno[123-cd]pyrene	205-893-2	193-39-5		0.21	mg/kg		0.15	mg/kg	0.000015 %	✓	
23	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	benzo[ghi]perylene	205-883-8	191-24-2		0.21	mg/kg		0.15	mg/kg	0.000015 %	✓	
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.45	mg/kg		0.321	mg/kg	0.0000321 %	✓	
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.18	mg/kg		0.128	mg/kg	0.0000128 %	✓	
Total:										0.104 %		

Key

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

Classification of sample: WS-02[2]

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

Sample details

Sample Name:	LoW Code:
WS-02[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
2.30 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
18%	
(dry weight correction)	

Hazard properties

None identified

Determinands

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

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	215-653-1	1634-04-4							
2	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-763-7	71-43-2							
3	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	200-625-9	108-88-3							
4	* ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-549-4	100-41-4							
5	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-6	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]							
6	* TPH (C6 to C40) petroleum group				<38 mg/kg		<38 mg/kg	<0.0038 %		<LOD
			TPH							
Total:								0.0038 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- * Determinand defined or amended by HazWasteOnline (see Appendix A)
- <LOD Below limit of detection

Classification of sample: WS-03

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

Sample details

Sample Name: **WS-03** LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: **2.30 m** Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: **19.3%**
(dry weight correction)

Hazard properties

None identified

Determinands

Moisture content: 19.3% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
2	acenaphthylene 205-917-1	209-96-8			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
3	acenaphthene 201-469-6	83-32-9			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
4	fluorene 201-695-5	86-73-7			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
5	phenanthrene 201-581-5	85-01-8			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
6	anthracene 204-371-1	120-12-7			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
7	fluoranthene 205-912-4	206-44-0			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
8	pyrene 204-927-3	129-00-0			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
9	benzo[a]anthracene 601-053-00-9	200-250-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
10	chrysene 601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
11	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
12	indeno[123-cd]pyrene 205-933-2	193-39-5			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
13	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
14	benzo[ghi]perylene 205-983-8	191-24-2			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
15	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
16	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-06-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
17		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		603-181-00-X	216-653-1	1634-04-4							
18		benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2							
19		toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3							
20	*	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4							
21		xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-595-7 [4]	95-47-6 [1] 106-42-3 [2] 108-98-3 [3] 1330-20-7 [4]							
22	*	TPH (C6 to C40) petroleum group				<38 mg/kg		<38 mg/kg	<0.0038 %		<LOD
			TPH								
Total:									0.00386 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
*	Determinand defined or amended by HazWasteOnline (see Appendix A)
<LOD	Below limit of detection

Classification of sample: WS-04

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

Sample details

Sample Name:	LoW Code:
WS-04	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.25 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
16.2%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 16.2% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	∞ pH				7.8	pH		7.8	pH	7.8 pH		
2	arsenic { arsenic trioxide }				6.7	mg/kg	1.32	7.613	mg/kg	0.000761 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	cadmium { cadmium sulfide }			1	0.7	mg/kg	1.285	0.774	mg/kg	0.0000602 %	✓	
	048-010-00-4	215-147-8	1308-23-6									
4	chromium { ∞ chromium(III) oxide }				17	mg/kg	1.462	21.382	mg/kg	0.00214 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				42	mg/kg	1.126	40.695	mg/kg	0.00407 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	62	mg/kg	1.56	83.226	mg/kg	0.00534 %	✓	
	062-004-00-2	231-848-0	7753-97-6									
7	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	090-010-00-X	231-299-8	7487-94-7									
8	nickel { nickel dihydroxide }				13	mg/kg	1.579	17.671	mg/kg	0.00177 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
9	selenium { selenium compounds with the exception of cadmium selenide and those specified elsewhere in this Annex }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	034-002-00-8											
10	zinc { zinc oxide }				520	mg/kg	1.245	557.015	mg/kg	0.0557 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
11	naphthalene				0.19	mg/kg		0.164	mg/kg	0.0000164 %	✓	
	601-052-00-2	202-049-5	91-20-3									
12	acenaphthylene				0.63	mg/kg		0.542	mg/kg	0.0000542 %	✓	
		205-917-1	208-96-8									
13	acenaphthene				0.45	mg/kg		0.387	mg/kg	0.0000387 %	✓	
		201-489-8	83-32-9									
14	fluorene				0.34	mg/kg		0.293	mg/kg	0.0000293 %	✓	
		201-695-5	98-73-7									

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
15	* phenanthrene	201-581-5	85-01-8		4.1	mg/kg		3.528	mg/kg	0.000353 %	✓	
16	* anthracene	204-371-1	120-12-7		1.6	mg/kg		1.377	mg/kg	0.000138 %	✓	
17	* fluoranthene	205-912-4	206-44-0		12	mg/kg		10.327	mg/kg	0.00103 %	✓	
18	* pyrene	204-927-3	129-00-0		11	mg/kg		9.466	mg/kg	0.000947 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-260-6		8.1	mg/kg		6.971	mg/kg	0.000697 %	✓	
20	chrysene	601-048-00-0	205-923-4		6.6	mg/kg		5.68	mg/kg	0.000568 %	✓	
21	benzo[a]pyrene; benzo[def]chrysene	601-052-00-3	200-028-5		9.1	mg/kg		7.831	mg/kg	0.000783 %	✓	
22	* indeno[123-cd]pyrene	205-883-2	193-39-5		6.6	mg/kg		5.68	mg/kg	0.000568 %	✓	
23	dibenz[a,h]anthracene	601-041-00-2	200-181-8		1.5	mg/kg		1.291	mg/kg	0.000129 %	✓	
24	* benzo[ghi]perylene	205-883-8	191-24-2		6.6	mg/kg		5.68	mg/kg	0.000568 %	✓	
25	benzo[b]fluoranthene	601-034-00-4	205-911-9		11	mg/kg		9.466	mg/kg	0.000947 %	✓	
26	benzo[k]fluoranthene	601-036-00-5	205-916-8		4.2	mg/kg		3.614	mg/kg	0.000361 %	✓	
27	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
28	benzene	601-020-00-8	200-753-7		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
29	toluene	601-021-00-3	203-625-9		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
30	* ethylbenzene	601-023-00-4	202-849-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
31	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
32	* TPH (C6 to C40) petroleum group		TPH		719	mg/kg		618.761	mg/kg	0.0619 %	✓	
Total:										0.139 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because No free phase product observed. BTEX less than detection

Hazard Statements hit:

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



Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0619%)

Classification of sample: WS-04[2]

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

Sample details

Sample Name:	LoW Code:
WS-04[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
3.10 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
25%	
(dry weight correction)	

Hazard properties

None identified

Determinands

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

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	215-653-1	1634-04-4							
2	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-763-7	71-43-2							
3	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	200-625-9	108-88-3							
4	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-549-4	100-41-4							
5	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-6	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 106-38-3 [3] 1330-20-7 [4]							
6	TPH (C6 to C40) petroleum group				<38 mg/kg		<38 mg/kg	<0.0038 %		<LOD
			TPH							
Total:								0.0038 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- * Determinand defined or amended by HazWasteOnline (see Appendix A)
- <LOD Below limit of detection

Appendix A: Classifier defined and non CLP determinands

* pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

* 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 Jul 2015
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

* acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: 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
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
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

* fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Aquatic 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 Aug 2015
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 Jul 2015
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

* fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: 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 Aug 2015
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 Aug 2015

Hazard Statements: Carc. 2 H351

✧ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic 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 Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s)/Risk Phrase(s):

03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

✧ **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: 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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on risk phrases

cadmium {cadmium sulfide}

Worst case species based on risk phrases

chromium {chromium(III) oxide}

Worst case species based on risk phrases

copper {dicopper oxide; copper (I) oxide}

Most likely common species

lead {lead chromate}

Worst case

mercury {mercury dichloride}

Worst case species based on risk phrases

nickel {nickel dihydroxide}

Worst case species based on risk phrases

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Worst case species based on risk phrases

zinc {zinc oxide}

Chromate levels low

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018

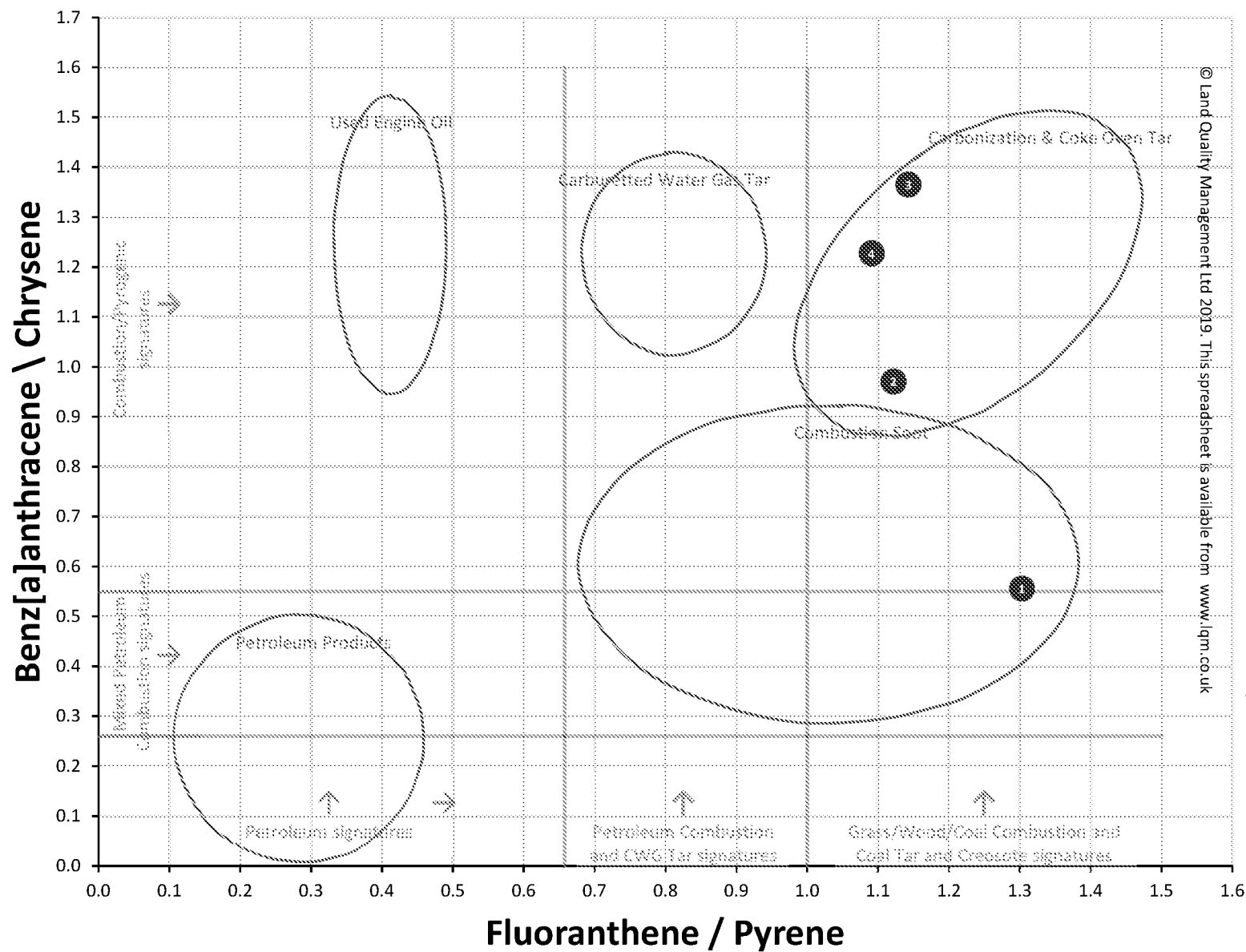
HazWasteOnline Classification Engine Version: 2019.142.3866.7875 (22 May 2019)

HazWasteOnline Database: 2019.142.3866.7875 (22 May 2019)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
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
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
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

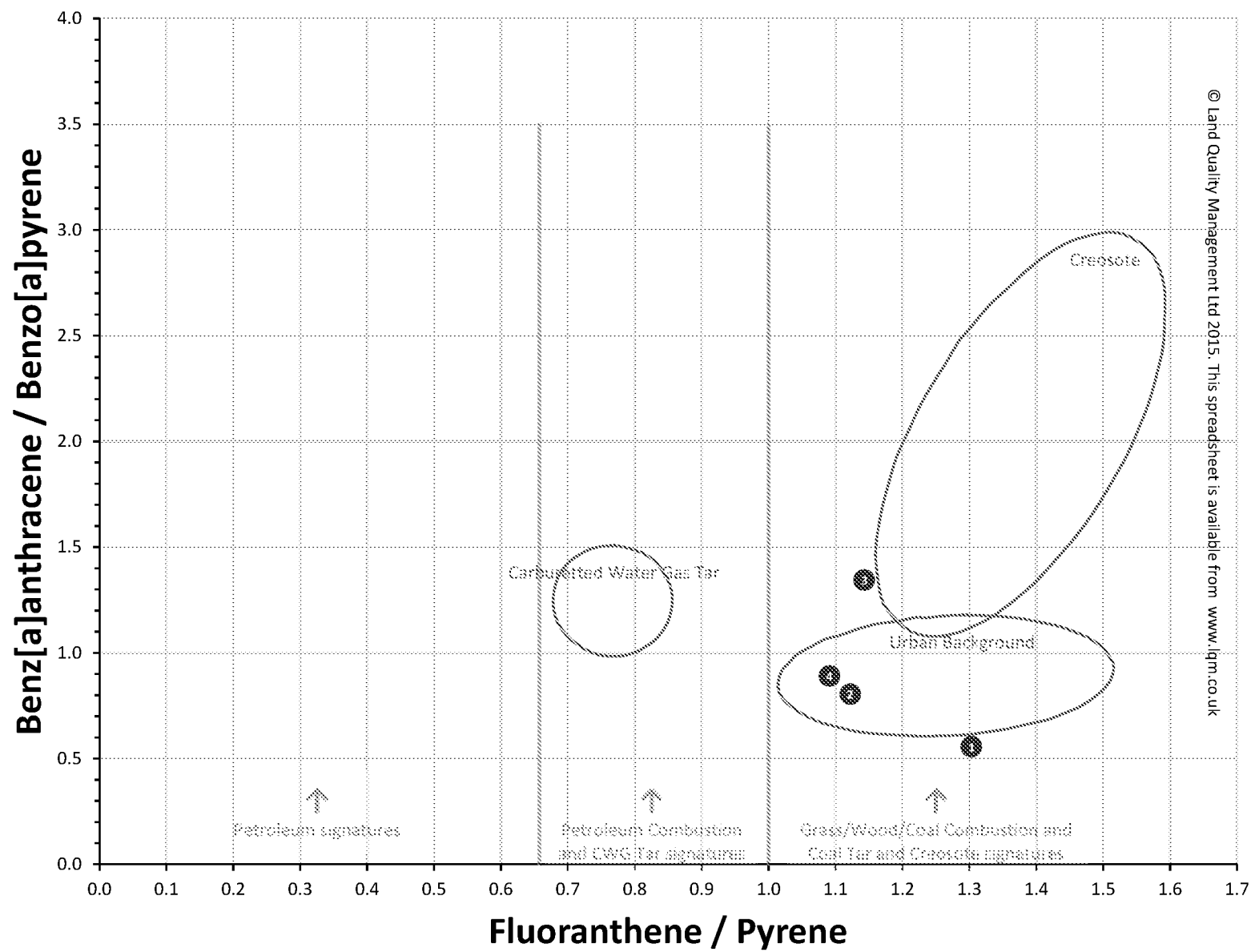
APPENDIX 08



© Land Quality Management Ltd 2019. This spreadsheet is available from www.lqm.co.uk

Based on Figure 6 in Costa & Sauer (2005) with additional details based on a conference presentation by Costa (2005) in San Diego. The potential sources shown are indicative only.

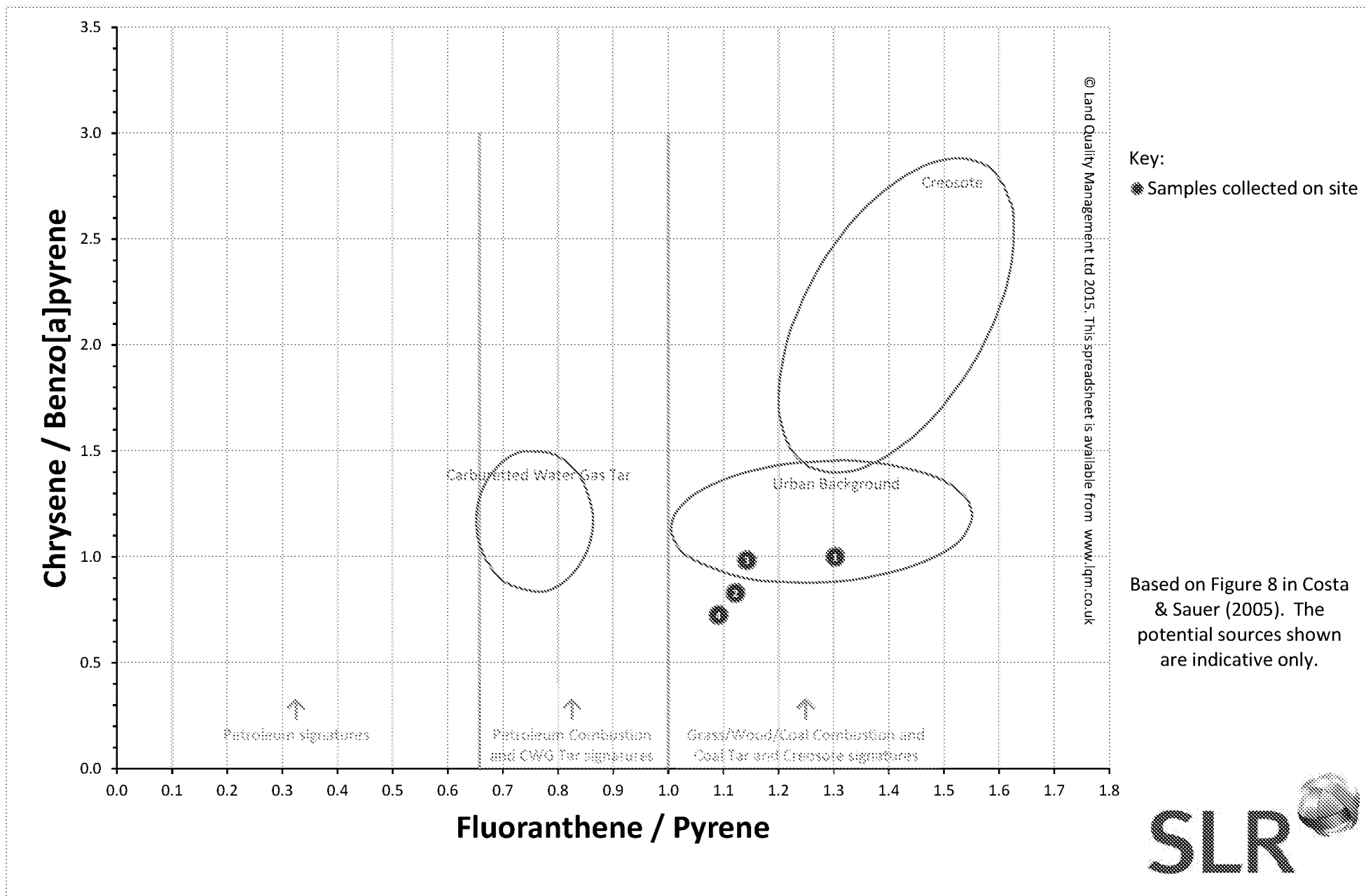




Key:

● Samples collected on site

Based on Figure 7 in Costa & Sauer (2005). The potential sources shown are indicative only.



APPENDIX 09

ASBESTOS QUANTITATIVE RISK ASSESSMENT

Yapton Road, Middleton-on-Sea

1.0 Background

In the UK, there is no published Soil Guidelines Value, Category 4 Screening Level or other Generic Assessment Criteria for asbestos that would allow screening.

Although strictly not applicable in a UK context, a concentration of <0.001% is utilised in other countries as a conservative screening criteria. In Western Australia 0.001% is utilised as a screening criteria for friable asbestos in all land usesⁱ, and the Dutch adopt a value of 0.01% as an intervention valueⁱⁱ. It should be noted that these values should be used with caution as they were derived for a different regulatory framework/climate/soil conditions to those present within the UK. In the absence of alternative values, and provided significant visible asbestos is not present within the ground, asbestos concentrations at >0.001% wt/wt SLR considers further investigation or assessment is required.

Where asbestos concentrations are revealed that exceed the limit of quantification of the laboratory, more detailed quantitative risk assessment may be necessary to inform risk assessment for both the proposed end users of the site, and the risk posed to construction workers who may be exposed to airborne asbestos during earthworks/groundworks. Risk assessment has been carried out in accordance with current UK Guidanceⁱⁱⁱ

2.0 Contaminants of Concern (CoC)

The term “asbestos” refers mainly to six fibrous minerals known to cause harm to human health when inhaled. There are three main commercially exploited forms of asbestos commonly analysed by laboratories: Chrysotile (white asbestos), amosite (brown asbestos) and crocidolite (blue asbestos).

Chrysotile asbestos is a serpentine mineral. It is a magnesium silicate, and the fibres are typically flexible and curved. Amosite and crocidolite are amphiboles, and the fibres have a rod or needle shaped appearance.

Asbestos was widely used in the construction industry throughout the 20th century, but most widely used in the 1960s to the 1980s. Due to the known toxicological effects of asbestos its use was phased out, until the use of chrysotile asbestos was prohibited in 1999. Common uses for asbestos include spray coatings, lagging, insulation board, rope, gaskets, textile, ceiling and floor tile and fibre cement sheeting, amongst others.

The exposure pathway of concern with regards to asbestos is the inhalation of airborne free fibres. Both indoor and outdoor exposure should be considered, due to the potential for asbestos containing soils being tracked back into buildings, drying and generating indoor dust.

Exposure to airborne asbestos can lead to respiratory diseases including mesothelioma, lung cancer and asbestosis (it should be noted asbestosis usually only occurs as a result of heavy industrial exposure to airborne asbestos, and is not considered to be a concern at environmental exposure levels). With regards to asbestos type, it is generally accepted that chrysotile asbestos poses a lower risk than the amphiboles.

Asbestos is a non-threshold substance (that is to say there is no “safe” level of airborne asbestos fibre exposure).

3.0 Exposure estimate

The risks associated with asbestos are linked to the inhalation of airborne asbestos fibres. Due to the physical and toxicological nature of asbestos, assessment of potential harm from asbestos should be based on either measured or predicted airborne fibre concentration, usually expressed as fibres/ml.

The ease that asbestos within the soil becomes airborne is linked to a number of factors including:

- ✧ Nature of asbestos
 - Asbestos form
 - Asbestos type
 - Degree of weathering
 - Quantity in the soil
- ✧ Soil Conditions
 - Soil type
 - Moisture content of the soil
 - Composition of the soil (i.e. construction demolition rubble, granular Made Ground, cohesive Made Ground etc.)
 - Vegetation cover
- ✧ Local climatic factors
 - Prevailing rainfall
 - Wind direction
 - Number of dry days
- ✧ Proposed End Use
 - Hardstanding, communal soft landscaping, private gardens etc.

The risks to human health from airborne asbestos fibres are related to cumulative exposure, which is dictated by the magnitude and duration of exposures. Cumulative exposure is expressed as fibre/ml.hours or fibre/ml.years.

In order to calculate the cumulative exposure, first we must calculate the annual exposure, using the following equation:

Figure 3-1
Calculation for Annual Exposure

$$E_i = C_i \times F_i \times T_i$$

Where E_i =annual exposure. C_i =estimated fibre concentration for an event. F_i =Frequency of the event per year. T_i =Period of time the event lasts per hour.

Where air monitoring data is unavailable, estimated fibre concentrations for an event is derived from modelled free fibre release based on predictive modelling. The study used to estimate risk is Addison et al, 1988^{iv}, where laboratory based data is published on the relationship between the release of free fibres and asbestos in soil concentration for dry soils (0% moisture).

Using the predicted annual exposure, the cumulative exposure can then be calculated using the following equation:

Figure 3-2
Calculation for Cumulative Exposure

$$CE_i = E_i \times Y_i$$

Where CE_i =cumulative exposure. E_i =annual exposure. Y_i =number of years that the event will occur.

The toxicological studies used to estimate risk from airborne asbestos are based on the number of hours in an occupational working year, fibre/ml.hours must be expressed as fibre/ml years. This is done by dividing by the number of working hours in a year, normally assumed to be 2000 hours.

4.0 Risk Estimation and Evaluation

In order to interpret the significance of exposure to airborne asbestos, it is necessary to make an estimate of extra lifetime risk that may result from exposure to asbestos within the Made Ground on a site.

In terms of acceptable risk within a UK context, the level of risk will depend on the regulatory framework in which the assessment is being carried out (i.e. significant possibility of significant harm under Part 2A of the Environmental Protection Act (1990), safe and suitable for use under the National Planning Policy Framework etc.)

The Soil Guideline Values produced by the Environment Agency for other contaminants adopt an acceptable excess lifetime cancer risk of 1 in 100,000 for a minimal risk threshold. For consistency, SLR has also adopted 1 in 100,000.

Asbestos is unusual in there is an abundance of data on the relationship between exposure and incidence of disease. Quantitative assessment of risk from asbestos typically derives two figures; one for risk of lung cancer and one for risk of mesothelioma. A generally accepted approach is to draw upon tabulated risk summaries generated from models to estimate risk at the relevant cumulative exposure (f/ml.years)^Y.

As the Hodgson & Darnton studies show risk to a 30 year old, the identified risk must be adjusted to account for the age of the critical receptor. These are provided in Table 2. It is normal practice to assume that risks persist for 80 years.

At this stage an assessment must be made as to the critical receptor onsite. For residential land use it is generally accepted that the most sensitive receptor is a child (aged 0-6). The large correction factors applied to younger people (provided in Table 2), are indicative of uncertainty in extrapolating exposures below 20 years of age, as the Hodgson and Darnton Study did not include children.

Table 4-1
 Risk Summary Table – Mesothelioma (Hodgson and Darnton, 2000)

Cumulative Exposure (from age 30, over 5 years)	Mesothelioma – Lifetime risk per 100,000 exposed		
	Fibre/ml.years	Crocidolite	Amosite
100	40000 (up to 2-fold uncertainty)	6500 (up to 2-fold uncertainty)	200 (up to 3-fold uncertainty)
10	4000 (up to 2 fold uncertainty)	650 (up to 2-fold uncertainty)	20 (up to 3-fold uncertainty)
1	650 (highest arguable estimate 1500, lowest 250)	90 (highest arguable estimate 300, lowest 15)	5 (highest arguable estimate 20, lowest 1)
0.1	100 (highest arguable estimate 350, lowest 2)	15 (highest arguable estimate 80, lowest 2)	(highest 4)
0.01	20 (highest arguable estimate 100, lowest 2)	3 (highest 20)	
0.005	About 10 (highest arguable estimate 55, lowest insignificant)	About 2 (highest arguable about 15)	Insignificant
0.00007		Highest arguable becomes insignificant	
0.000006	Highest arguable becomes insignificant		

- 1) Cumulative exposures (fibre/ml.years) are expressed in terms of occupational years which are assumed to be about 2000 hours.
- 2) The risks all apply to exposure starting at age 30, for exposures starting at younger ages the appropriate age adjustment factor from Table 2 should be applied
- 3) The term insignificant is used in a colloquial rather than legal sense by Hodgson and Darnton (2000).

Table 4-2
 Age Adjustment Factors – Mesothelioma (Adapted from HEI, 1991)

Age at Which Exposure Commences	Factor – to adjust from Table 1	
	(taking risk as persisting for 60 years)	(taking risk as persisting for 80 years)
0	2.8	6.6
5	2.7	5.2
10	2.6	4
15	2.5	3

Age at Which Exposure Commences	Factor – to adjust from Table 1	
	(taking risk as persisting for 60 years)	(taking risk as persisting for 30 years)
20	2.1	2.1
25	1.5	1.5
30	1	1
35	0.6	0.6
40	0.4	0.4
45	0.3	0.3
50	0.2	0.2
55	0.1	0.1

Table 4-3
 Risk Summary Table – Lung Cancer (Hodgson and Darnton, 2000)

Cumulative Exposure (from age 30, over 5 years)	Mesothelioma – Lifetime risk per 100,000 exposed		
	Fibre/ml.years	Crocidolite	Amosite
100	35000 (55000 to 25000)	Same as for crocidolite	Chrysotile
10	1500 (1000 to 2500)	Same as for crocidolite	500, perhaps 3000, in exceptional circumstances 10000
1	85 (20 to 250)	Same as for crocidolite	50, perhaps 300, in exceptional circumstances 1000
0.1	4 (<1 to 25)	Same as for crocidolite	2 perhaps 30, in exceptional circumstances 100
0.01	1 to 3 (mesothelioma now dominant)	Same as for crocidolite	Probably insignificant, perhaps 3, in exceptional circumstances 10

5.0 Site Specific Assessment

5.1 Site Data

Quantifiable asbestos fibre bundles have been identified within the shallow topsoil in two locations (albeit at a very low concentration of 0.001% wt/wt). Visible asbestos cement sheet has also been identified in in localised areas, likely to be present as a result of the construction and demolition of agricultural buildings.

Table 5-1 details the asbestos found during the investigation:

Table 5-1
 Summary of Soil Data – Asbestos

BH/TP	Depth (m BGL)	Visible Asbestos		Asbestos in Soil Result		
		Type	Description	Type		Quantity (% wt/wt)
TP04	0.20	NAD	-	Chrysotile bundles	fibre	0.001
TP06	0.20	NAD	-	Chrysotile bundles	fibre	<0.001
TP07	0.20	NAD	-	NAD		-
TP09	0.30m	Asbestos cement sheet	Multiple cement sheet fragments. Good condition, limited weathering. Sheet in sample weighs 23.5grams (2.2% of sample).	Chrysotile bundles	fibre	0.001
WS01	0.20	Asbestos cement sheet	Single cement sheet fragment. Good condition, weighs 48.6 grams (4.1% of sample)	Chrysotile bundles	fibre	<0.001
WS02	0.25	NAD	-	Chrysotile bundles	fibre	<0.001
WS04	0.25	NAD	-	Chrysotile bundles	fibre	<0.001

NAD=No asbestos detected. Asbestos quantified using detailed gravimetric analysis and phase contract optical microscopy.

5.2 Assessment– Unbound Asbestos

Assessment of chronic asbestos exposure has been made in accordance with CIRA 733 - Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risk. Exposure is estimated by modelling possible free fibre release, assessing exposure to estimate chronic risk.

Although some exposure would be expected from direct exposure from gardening activities, exposure is transient and infrequent. It is considered likely a much higher exposure would be expected indoors; where asbestos contaminated soil is tracked inside on shoes and clothing.

Having referenced the proposed land use, SLR consider there to be two sensitive receptors on-site; the proposed workers, and the elderly residents. Assessment criteria have therefore been calculated for both, and the lowest will be adopted as a site criterion.

The trace concentrations (<0.001%) of free fibre chrysotile asbestos are unlikely to pose a significant risk to human health.

In order to calculate annual exposure (E_i) the estimated fibre release concentration is required. This has been estimated from predictive exposure modelling based on the Addison et al (1988) study. The soil type is assumed to be a sand with 0% moisture content; representative of indoor dust.

Figure 5-1
 Predicted Fibre Release –Chrysotile Asbestos in Sandy Soil (Addison et al (1988))

The below graph indicates the predicted normalised fibre concentration would be 0.01 f/ml per mg/m^3 . The concentration of soil dust in homes is assumed at $50 \text{ ug}/\text{m}^3$ (CLEA assumption). C_i is therefore estimated at 0.0005 f/ml.

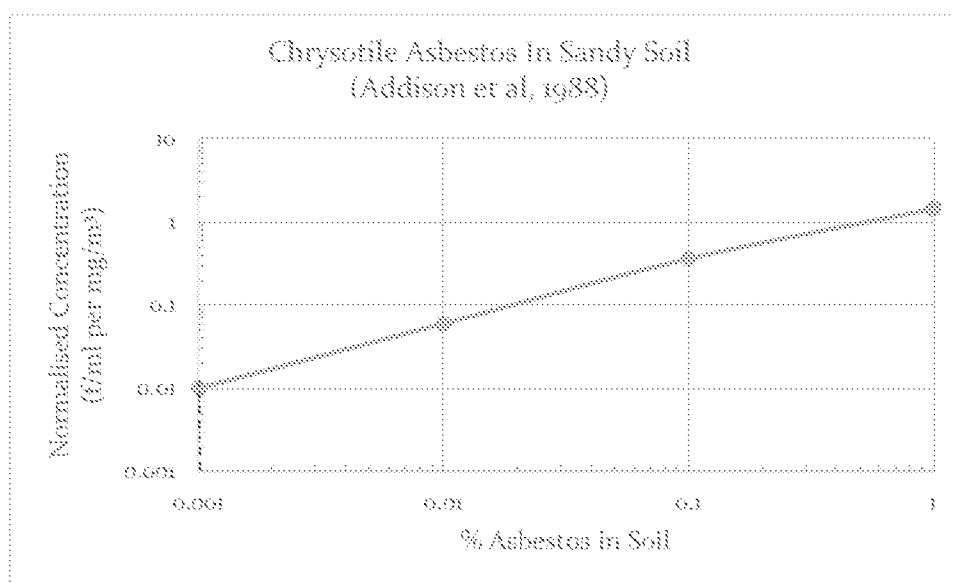


Table 5-2 below summarises the exposure frequencies adopted for this assessment. These have been sourced from default assumptions made within the CLEA model.

Table 5-2
 Summary of Soil Data – Asbestos

Parameter	Value		Unit
	Commercial	Elderly Resident	
Exposure Frequency (F_i)	230	365	Day yr
Occupancy Period (T_i)	8.3	23	Hr day

Parameter	Value		Unit
	Commercial	Elderly Resident	
Years of exposure (Y_i)	49	10	Years

Using the input parameters above, the calculations for annual and cumulative exposure are provided below:

Commercial

Annual Exposure

$$E_i = C_i \times F_i \times T_i$$

$$E_i = 0.01 \times 230 \times 8.3$$

$$E_i = 0.95 \text{ f/ml.hour/year}$$

Cumulative Exposure

$$CE_i = E_i \times Y_i$$

$$CE_i = 0.95 \times 49$$

$$CE_i = 46.55 \text{ fibre/ml.hours}$$

$$CE_i = 0.023 \text{ fibre/ml years}$$

Using the correction factor as shown in table 2, it is assumed exposure may occur from 20 years old, so a corrected cumulative exposure of **0.048 fibre/ml.years** has been adopted.

Using the risk estimated tables (Tables 1 & 3), the lifetime risk to commercial workers from mesothelioma & lung cancer is **insignificant**.

The excess lifetime risk is the sum of the mesothelioma and lung cancer risk, which equals **~110 per 100,000 exposed**. This is an order of magnitude higher than the acceptable level of 1 per 100,000, therefore **remediation in relation to asbestos within the shallow Made Ground in TP3 is necessary**.

Residents

Annual Exposure

$$E_i = C_i \times F_i \times T_i$$

$$E_i = 0.0005 \times 365 \times 23$$

$$E_i = 4.2 \text{ f/ml.hour/year}$$

Cumulative Exposure

$$CE_i = E_i \times Y_i$$

$$CE_i = 4.2 \times 10$$

$$CE_i = 42 \text{ fibre/ml.hours}$$

$$CE_i = 0.021 \text{ fibre/ml years}$$

No correction factor is required given the age of the residents, so a cumulative exposure of **0.021 fibre/ml.years** has been adopted.

Using the risk estimated tables (Tables 1 & 3), the lifetime risk to commercial workers from mesothelioma & lung cancer is **insignificant**.

5.3 Assessment-- Cement Bound Asbestos

The application of the above approach for cement bound asbestos is not appropriate due to the lack of consideration of the potentially significant difference in free fibre release from asbestos bound in cement when compared with free fibres in soil.

The unbound assessment has found that free fibres at a concentration of 0.001% do not pose a risk to the proposed redevelopment. SLR has therefore adopted a criterion of 0.1% (two orders of magnitude higher) for cement bound asbestos. This is supported by evidence published by RIVM¹ and Swartjes and Tromp (2008)^{vi}.

References:

- ¹ Western Australia (2009). *Guidance for the assessment, remediation and management of asbestos contaminated sites in Western Australia*, Environmental Health Directorate, Department of Health, Perth, Australia.
- ¹ RIVM (2003) *Assessment of the risks of soil contamination with asbestos*, RIVM Report 711701034, National Institute of Public Health and Environment, RIVM, Bilthoven, the Netherlands.
- ¹ CIRIA (2014) *Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risk*. Report C733.
- ¹ Addison J, Davies LST, Robertson A & Willey RJ (1988). *The Release of Dispersed Asbestos Fibres from Soils*. Institute of Occupational Medicine.
- ¹ Hodgson, J T and Darnton, A (2000), *The Quantitative Risks of Mesothelioma and Lung Cancer in Relation to Asbestos Exposure*. Annals of Occupational Hygiene, vol 44, 8, Oxford Journals, Oxford, UK, pp 565-601.
- ¹ Swarjes, F A and Tromp, P (2008). *"a tiered approach for the assessment of the human health risks of asbestos in soils"*. Soil and Sediment Contamination, vol 17, 2, Taylor & Francis Online, UK. pp 17-149.

EUROPEAN OFFICES

United Kingdom

