

**LAND QUALITY ASSESSMENT
OF
LAND AT KINGS CLOSE, YAPTON
FOR
PLOTLIFE SPV3 LTD**

G6308

24 March 2017



Ground Management Ltd
Civil and Geotechnical Engineering Services

DOCUMENT CONTROL

Report Title: Land Quality Assessment of Land at Kings Close, Yapton

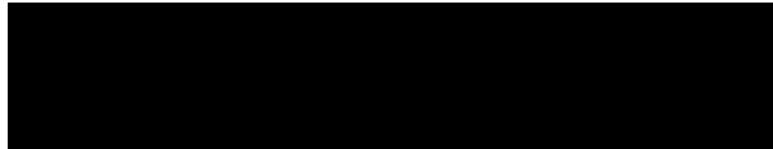
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(Landmark Sitecheck Report and Groundsure Historical Mapping under separate cover)
- Appendix 2: Laboratory Test Results
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1.0 INTRODUCTION

- 1.1 Ground Management Ltd have undertaken a pre-purchase Land Quality Assessment of land at Kings Close, Yapton where residential development is proposed.
- 1.2 The assessment commenced with a desk study and walkover to consider the potential for contamination from previous use and was followed by a preliminary intrusive investigation comprising a series of trial pits across the site. Contamination tests were carried out on selected soil and water samples from the trial pits and standpipes were installed within the backfill of some of the trial pits for monitoring of groundwater levels.
- 1.3 This report provides a record of the work undertaken and its findings together with a preliminary assessment of the contamination and a discussion of the implications with recommendations for further investigation. To address the associated planning conditions it will be necessary to submit the report to Arun District Council to gain approval of the assessment and proposed further investigation.
- 1.4 Recommendations are based on the conditions revealed by the investigation. Should the proposed development change or ground conditions be found to vary from those previously revealed they should be reported to Ground Management Ltd to consider the significance.
- 1.5 Geotechnical assessment and reporting will be covered in a separate report.
- 1.6 The work was carried out for Plotlife SPV3 Ltd and nothing in this report confers or purports to confer on any third party, any benefit or any right to enforce any term of this report pursuant to the Contract (Rights of Third Parties) Act 1999.
- 1.7 The site has previously been infested with Japanese Knotweed. Precautions were taken during the work to prevent the spread of the plant on or off site. This was overseen by a specialist third party, TCM, engaged by the Client and responsible for reporting and assessing all related issues. This report does not provide records or guidance relating to the control of Japanese Knotweed that will need to comply with current regulations.

2.0 PROPOSED DEVELOPMENT

- 2.1 The proposed development will comprise the residential development and ancillary works as indicated on the attached Figure 3.

3.0 PRELIMINARY CONTAMINATION ASSESSMENT

3.1 The desk study and walkover report is presented within Appendix 1. This identified a number of areas of concern regarding the site including:

- Use as a former works (including an engineering works and a joinery) in the northern part of the site
- Use as a former brickworks (both on site and adjacent to the west) mainly in the southern part of the site
- Raised areas of made ground in the southern part of the site

3.2 Based on this desk study data, a preliminary investigation scope was developed: The investigation comprised.

- One shallow hand dug trial pit (TP1A) excavated on 17th February 2017 to install a standpipe for the purpose of groundwater level monitoring
- Eight machine excavated trial pits (TP1 to TP8) across the site on 24th February 2017, some within the works area and some within suspected areas of made ground
- Two additional pits (TPSP1 and TPSP2) were excavated into the raised mounds
- Installation of three additional standpipes within the backfill of trial pits in which groundwater was encountered (TP1, 3 and 8)
- Contamination testing of soil samples
- Groundwater sampling and contamination testing
- Groundwater monitoring within standpipes

4.0 GROUND CONDITIONS

- 4.1 Descriptions of the soils encountered are presented on the attached trial pit logs. The findings can be summarised as follows:

Strata	Thickness (m)	Depth to base of strata (m bgl)
TOPSOIL / MADE GROUND (Made Ground variable (see below) and only absent from TP3)	0.25 – 2.3	0.25 – 2.3
Firm orange brown silty CLAY with occasional gravel. Locally sandy. (not encountered in TP2 or TP8)_	>0.35 – 1.75	> 1.2 – 2.8
Loose to medium dense slightly clayey/slightly silty fine SAND (TP3 and TP8 only)	0.2 – 0.35	1.9 – 2.80
Off white / buff and yellow brown clayey SILT with much gravel of chalk and flint	> 0.80 – > 1.50	> 2.5 - > 2.7

- 4.2 Much of the made ground comprises reworked natural silty clay soils often with some brick and concrete rubble and occasionally bituminous/tar bound material and some metal, plastic and other rubbish. In some locations the Made Ground includes significant volume of ash and clinker materials. Within TP4 and TP8 previous concrete foundations were encountered.
- 4.3 By reference to topographic survey and site observation it is noted that the ground levels off site adjacent to the south and west boundary are generally lower than the site. This is indicative of previous widespread excavation carried out during the time that the site operated as a brickworks, followed by subsequent placing of fill to return level across much of the site to the original the site to return levels bring levels.
- 4.4 Current development proposals indicate a proposed retaining wall around much of the south and west boundary to accommodate the drop in levels along the site boundary.

5.0 ASSESSMENT OF LAND QUALITY – SOILS

5.1 The desk study established that the site had been used previously as a Works and as a brickworks.

5.2 Samples were taken from near surface soils (both made ground and natural soils) for contamination testing. The testing suite varied. In the southern area where made ground was thicker the testing suite normally comprised:

- Total petroleum hydrocarbons (CWG methodology)
- Benzene, toluene, ethylbenzene, xylenes (BTEX)
- Methyl-tert-butyl ether (MTBE)
- Speciated polyaromatic hydrocarbons (PAH)
- Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc)
- pH, sulphates and soil organic matter

In the northern area of the site, which may have been affected by the Works the following tests were added:

- Volatile organic compounds (VOCs)
- Semi- volatile organic compounds (sVOCs)

In addition, where samples were taken from made ground, asbestos screening was undertaken. In a few cases, fragments of suspected asbestos-containing-material were noted at the ground surface and sampled for identification. The results of all the soils testing undertaken are included in Appendix 2.

5.3 The results of the testing were compared with:

- Provisional C4SL levels (available for arsenic, benzene, benzo-a-pyrene (a type of PAH), cadmium, chromium VI, lead)
- Environment Agency Soil Guideline Values (SGV) where available
- Generic Assessment Criteria (GAC) developed using the Environment Agency CLEA (Contaminated Land Exposure Assessment model) default values

In all cases, a Residential Development with Potential Plant uptake scenario has been adopted for the assessment, consistent with the proposed development as houses with gardens.

- 5.4 Widespread contamination within the made ground was noted across the site. The following exceedances of relevant criteria were noted:

Trial Pit	Sample Depth (m)	Contaminants in excess of criteria
TPSP1	0.5	PAHs
TPSP2	1.0	Lead, PAHs, Asbestos present
TP1	1.0	PAH- benzo-a-pyrene B(a)P
TP2	0.1	Lead, B(a)P
	0.6	B(a)P
	1.2	Lead, B(a)P
TP3	0.1	Lead, B(a)P
TP4	0.0	Lead, PAHs, Asbestos present
	0.4	PAHs
	1.0	Arsenic, lead
	1.2	Arsenic, lead, PAHs, TPH (C16-35)
TP5	0.4	Lead, B(a)P
TP6	0.4	Lead, PAHs
TP7	0.0	Copper, lead, Asbestos present
	0.4	Arsenic, lead, PAHs
	1.0	Lead

- 5.5 The contamination was limited to the made ground. No exceedances were noted from samples in the underlying natural soils. Asbestos presence was only confirmed for those samples that were suspect. Seven other random samples were tested but no asbestos detected.
- 5.6 The presence of elevated PAH concentrations did not correlate particularly well with log descriptions of the presence of ash, but it is likely that the ash is the cause of elevated levels of PAH. The elevated aromatic TPH concentrations in TP4 are due to a thin layer of black soils with a tarry odour.
- 5.7 With regard to the installation of mains water pipes, because of the presence of substantial PAHs within the made ground, most samples tested exceeded the Portsmouth Water screening criteria for the use of PE Pipes, which for PAHs is 10.0mg/kg total PAH. It will be important to discuss with Portsmouth Water what alternative materials they may accept, such as protected PE pipes or ductile iron pipes. The use of the latter will require further testing of the ground for pH, conductivity and redox potential.

6.0 ASSESSMENT OF LAND QUALITY –GROUNDWATER

- 6.1 Groundwater was encountered in four of the trial pits (TP1A, TP1, TP3 and TP8). In three of these pits (TPs 1, 3 and 8) a sample of the groundwater was taken from the trial pit. Subsequently standpipes were installed in all four pits in order to monitor groundwater levels.
- 6.2 The groundwater levels obtained during the investigation indicated that the groundwater flow across the site was in an easterly direction, with a gradient of about 1:100. Subsequent monitoring on 5th and 22nd March indicated a similar flow direction (E.N.E) but with a reduced gradient of about 1:500. A copy of the groundwater level monitoring up to 22/3/17 is presented in Appendix 3.
- 6.3 Groundwater contaminant concentrations have been compared to Environmental Quality Standards issued by the UK Environment Agency and where possible those that relate to groundwater and/or surface water quality. Where such an EQS is not available, other reputable standards have been used.
- 6.4 Groundwater contaminant concentrations in TP3 were generally low and within EQS criteria. However the groundwater in TP1 showed elevated concentrations of PAHs, and that in TP8 showed very elevated PAH concentrations together with xylene and aromatic petroleum hydrocarbons.
- 6.5 The individual PAH concentrations in the two trial pits TP1 and TP8 are different, indicating somewhat different sources. In TP8 it is noticeable that there is a very high proportion of naphthalene, which is absent from TP1.
- 6.6 **Groundwater in TP1**
- 6.6.1 TP1 is near the southwest corner of the site. During the investigation groundwater was found at a depth of 2.4m, and a sample was taken. There was no obvious smell from the groundwater and no obvious free-phase/sheen. A number of PAHs exceeded EQS (or other) criteria, as shown in the table below:

PAH	LOD (µg/l)	TP1 (µg/l)	EQS (µg/l)	Source of criteria
Anthracene	0.01	0.87	0.1	WFD EQS
Fluoranthene	0.01	6.26	0.1	WFD EQS
Benzo(a)anthracene	0.01	5.09	0.03	USEPA RSL
Chrysene	0.01	3.21	2.9	USEPA RSL
Benzo(b)fluoranthene	0.01	4.96	0.2	UK DWS
Benzo(k)fluoranthene	0.01	3.78	0.2	UK DWS
Benzo(a)pyrene	0.01	6.6	0.05	WFD EQS
Indeno(1,2,3-cd)pyrene	0.01	3.57	0.2	UK DWS
Dibenzo(ah)anthracene	0.01	1.11	0.03	USEPA RSL
Benzo(ghi)perylene	0.01	3.35	0.2	UK DWS

- 6.6.2 It is suggested that the source of the PAHs in TP1 is possibly the ash within the made ground. However, TP1 does not have ash recorded in its trial pit log and there was no ash recorded in TP1A, just downstream to the east. It is therefore possible that the contamination in the groundwater in TP1 is derived from off-site sources to the west of the site, where it is known that the brickworks extended to.

6.7 Groundwater in TP8

- 6.7.1 The groundwater within TP8 was noted to have a sheen/free-phase present on its surface and had a considerable organic odour. Most individual PAH species exceeded their EQS criteria, and some by a considerable margin. Those with the greatest exceedance are listed below.

PAH	LOD (µg/l)	TP8 (µg/l)	EQS (µg/l)	Source
Napthalene	0.01	9740	2.4	WFD EQS
Benzo(a)anthracene	0.01	74.9	0.03	USEPA RSL
Benzo (ghi)perylene	0.01	49.8	0.02	UK DWS
Fluoranthene	0.01	207	0.1	WFD EQS
Benzo(a)pyrene	0.01	77.3	0.05	WFD EQS

- 6.7.2 In addition xylene exceeded its criteria (134µg/l compared to 30µg/l) and aromatic petroleum hydrocarbons were also high, particularly C10 – C12 (3270µg/l) and C12 – c16(2620µg/l). VOCs were generally low (apart from naphthalene and xylenes). The sample taken contained some of the free-phase material and it is noticeable that some of the concentrations of the

PAHs exceeded their maximum solubility in water, indicating that the recorded concentrations may be unrealistically high.

- 6.7.3 The testing laboratory have been asked for their opinion of the source of contamination, based on the GCMS records and have identified it as having a coal tar base. Coal tars were once used as the basis for some wood preservatives, and it is therefore possible that when the works were a joinery business, some wood preservation processes were carried out on the site, leading to leaks or spills
- 6.7.4 The groundwater was noted within sandy and/or clayey silts within TP8 (ie generally low permeability layers). TP8 appears to be located in the south eastern corner of the southernmost Works building. TP5 and TP6 also within the Works were not deep enough to intercept the groundwater, and therefore the extent of groundwater contamination is not known.
- 6.7.5 With regard to potential groundwater receptors, there are no nearby groundwater abstractions. On the EA website, the nearest groundwater abstractions are to the northeast near Arundel which are about 7km away and on the north side of a syncline. It is unlikely that such abstractions could be affected. The sitecheck datasheet records no abstractions within 500m. Arun DC knew of no nearby abstractions either.
- 6.7.6 Given the groundwater flow direction indicated by current monitoring the most likely water receptor to be affected by any contamination on the site would be a shallow stream or watercourse somewhere to the east of the site. However, it is unclear where the nearest surface water feature is in this area. The River Arun is some 2.5km away.

6.8 Preliminary Groundwater Risk Assessment

- 6.8.1 A very preliminary groundwater assessment has been undertaken for two of the contaminants found in TP8 – naphthalene and benzo(a)anthracene, in order to gain an understanding of the possible environmental risks that the contamination poses. These two were chosen as they represented the PAHs which had concentrations most in excess of their Environmental Quality Standards (EQS).
- 6.8.2 The groundwater assessment method used is that proposed by the Environment Agency, called the Remedial Targets Methodology. As groundwater flows away from a source, it dilutes and disperses, such that at a certain distance, dependent on initial concentrations, groundwater permeability and hydraulic gradient, the concentrations of contaminants drop to below critical levels. If this happens before a critical receptor is intercepted then there is no significant risk.

- 6.8.3 Because site specific data is not available, estimates needed to be made for a number of parameters used for the assessment, some of which influence greatly the results of the assessment.
- 6.8.4 The assessment indicated that for a range of inputs, naphthalene concentration attenuated such that it fell below its EQS level at a distance of about 70m. However for benzo(a)anthracene, the attenuation rate was much slower and significant concentrations of benzo(a)anthracene may remain in the groundwater at distances over 250m. Assessments on other contaminants may result in wider areas potentially being affected.

7.0 ASSESSMENT OF LAND QUALITY – GROUND GAS

- 7.1 The only potential source of ground gas (eg methane and carbon dioxide) identified at the site is the made ground which is present on the site and presumably also in the former brickpits to the west.
- 7.2 Soil organic matter tests were conducted on the made ground to determine the percentage of organic material present that could lead to the generation of ground gasses. In the made ground the results showed a range of SOM between 0.2 and 14%, with a mean of 4.4% (19 results). The made ground depth varies between 0.25 and 2.3m.
- 7.3 It is unlikely that the made ground will give rise to a significant generation of ground gasses. However, since a number of gas/groundwater standpipes have been recommended for installation across the site during a subsequent phase of investigation (see below), these can be monitored for ground gasses and appropriate action taken if ground gas generation is significant.

8.0 IMPLICATIONS FOR FURTHER INVESTIGATION AND DEVELOPMENT

8.1 Groundwater around TP1

8.1.1 In order to decide whether any remediation could be effective for the groundwater in TP1, it will be necessary to gain more information about the extent and the source of the contamination. If the contamination is emanating from land adjacent to the west, it may not be feasible (or desirable) to attempt any remediation of it from the site. Therefore further investigation is proposed:

- 4 to 6 additional holes around and to the north of TP1 (possible window sample holes or cable percussion holes) to extend to 4 to 6m depth (just into the top of the weathered chalk.)
- Installation of gas/groundwater standpipes
- Groundwater sampling and testing
- Testing of made ground above water table for PAHs
- Groundwater level monitoring

8.2 Groundwater around TP8

8.2.1 Because of the very elevated levels of contaminants so far obtained in TP8, and the preliminary assessment undertaken, there is a risk that contamination on site could be causing significant issues off site. It is likely that the local authority would want to see a realistic groundwater assessment undertaken, which would determine whether or not groundwater remediation would be required prior to development. In order to undertake a realistic and site specific assessment, further investigation and assessment would be required. The main elements of such an investigation would be as follows:

- 6 to 8 additional holes in and around TP8 (possibly window sample holes or alternatively cable percussive holes) to extend deeper into the aquifer (5 to 6m) into the top of the weathered chalk, and to delineate, if possible the extent of the contamination.
- Installation of gas/groundwater standpipes
- Groundwater sampling from below any surface free phase for contaminant testing
- Vapour/gas and groundwater level monitoring
- Soil sampling from the groundwater interface level for contaminant testing
- Soil sampling from the aquifer level for PSD, natural moisture content and density testing
- Permeability testing of the aquifer

8.2.2 The investigation would provide sufficient information to then undertake a realistic ground water risk assessment. It will also be necessary to identify the critical receptor (ie the nearest stream, pond or watercourse that could be affected by the contamination) and agree a compliance point with the regulator.

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- 8.2.3 A groundwater remediation specialist should be consulted at an early stage to determine possible requirements for investigation or installations and to consider the most appropriate time for such work.

8.3 Remediation across the rest of the site

- 8.3.1 The results of the contamination testing on the made ground across the site indicate that there is widespread contamination by lead and PAHs, with subsidiary copper, arsenic and petroleum hydrocarbons. The concentrations of the contaminants are such that it would cause a significant risk to proposed residents.
- 8.3.2 It is suggested that in order to break the pollution linkage between the contamination present and the residents, a soil cover system is used wherever soft landscaping is to be undertaken within the development (eg within private gardens and public open space). The soil cover system should be at least 600mm thick, comprising an upper topsoil layer of 200mm and a lower sub-soil layer of 400mm. The cover system should be underlain by a textile marker layer. The use of a cover system will effectively raise site levels over much of the site, and it may be necessary to re-grade the site and remove some of the made ground off-site in order to achieve an acceptable final development level.
- 8.3.3 Significant groundwater contamination was noted in TP8 consisting of elevated concentrations of PAHs, and TPH . It is conjectured that it results from spillage or leakage within the former Works area. The exact location of the spill/leak area itself has not yet been identified, but it is likely to consist of soils contaminated with similar contaminants to those in the groundwater. When the location is identified (either during subsequent phases of investigation or during groundworks), the soils will need to be removed and replaced.
- 8.3.4 The placed topsoil and subsoil should be uncontaminated and conform to the criteria such as set out in Appendix 4. These criteria and the amount of pre-supply and in-situ testing of materials will need to be agreed with Arun District Council.
- 8.3.5 No ground gas or vapour testing has yet been undertaken on the site. The potential for significant ground gas generation is considered to be low, but during the second phase of investigation, gas/groundwater standpipes can be monitored for ground gasses/vapours and an assessment made regarding any remedial requirements.

8.4 General

- 8.4.1 To comply with the Planning Conditions attached to the site and to ensure the assessment is accepted by the Regulators it will be necessary to submit a report on the desk study and the preliminary investigation (this report) to Arun District Council and to gain their approval prior to undertaking further investigation and remedial work.
- 8.4.2 The potential for Japanese Knotweed to influence the site and the proposed development will need to be considered by reference to third party reporting. Remediation of the site will need to consider both contamination and Japanese Knotweed.
- 8.4.3 Any soils removed from the site as part of the remedial works, and destined for waste disposal should be tested for Waste Acceptance Criteria, to ensure that they are disposed of at a suitable landfill site. The soils would need to be transported to the landfill site by a registered waste carrier.
- 8.4.4 If during excavation or construction additional ground or groundwater contamination comes to light, it will be necessary to investigate it, and to determine what remedial actions are required, in conjunction with Arun District Council.
- 8.4.5 Soakaway drainage is not recommended for the site due to the presence of contaminated groundwater beneath the site. If groundwater remediation is carried out, discussions with the regulator could be undertaken to decide whether soakaway drainage is appropriate for the remediated site.
- 8.4.6 All remedial works, and the results of any monitoring, waste testing or verification testing, should be documented and contained within a Verification Report which will need to be submitted to Arun District Council on completion of the remedial works.
- 8.4.7 All works should be conducted in a safe manner. Appropriate risk assessments and method statements should be prepared prior to start of works, site staff appropriately briefed, and appropriate protective clothing worn. In particular, because of the presence of fragments of asbestos containing material on the ground surface, the movement of soils at the site may be governed by the Control of Asbestos Regulations.

DATE: Mar 2017



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PROJECT NO: G6308

FIGURE REF: Figure 2

PROJECT: Land at Kings Close Yapton

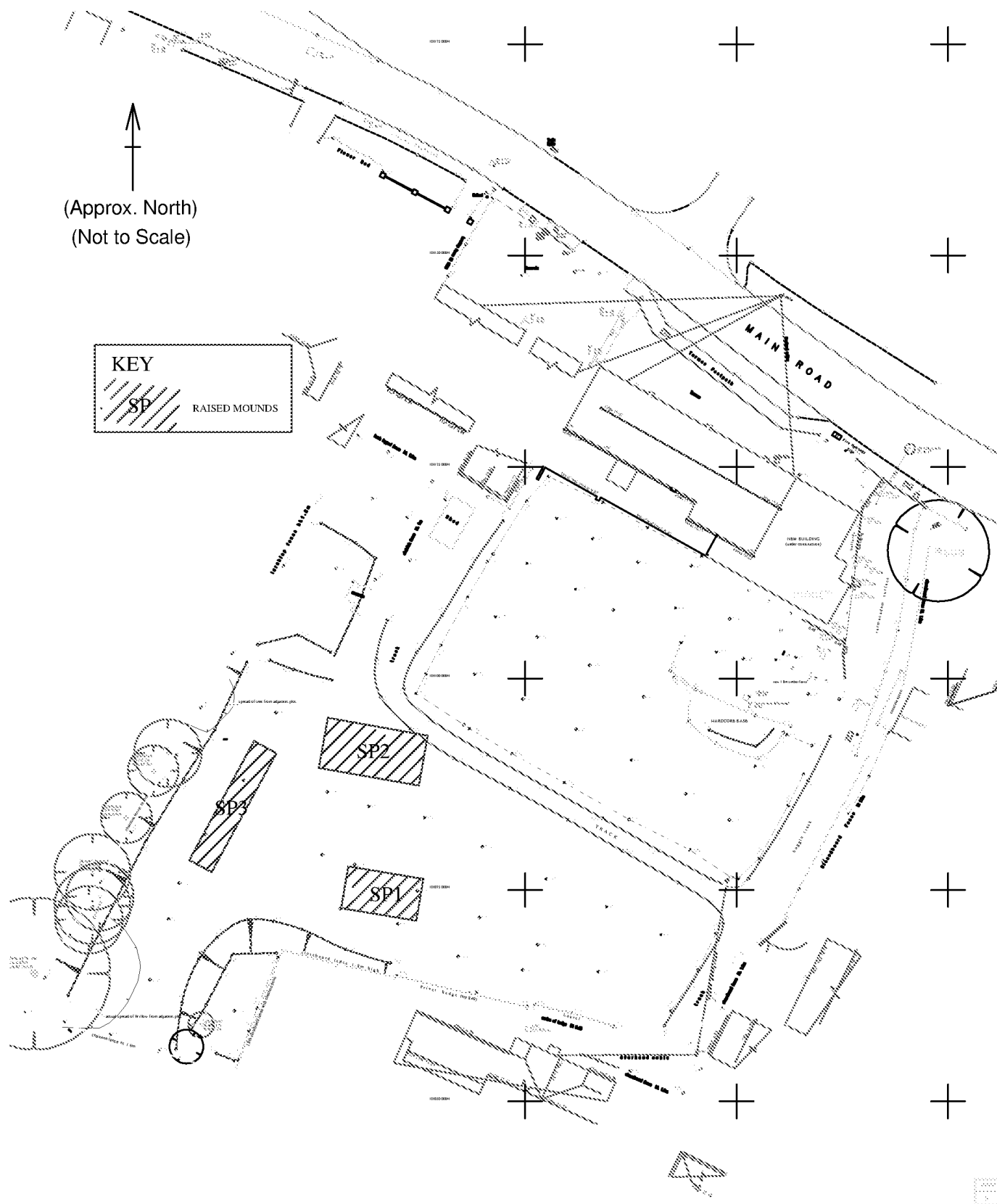
PREPARED: AJHT

SECTION: Land Quality Assessment

CHECKED: AJHT

TITLE: Existing Site Layout

DATE: Mar 2017



BASED ON TOPOGRAPHIC SURVEY DATED Nov 2014 BY ACAD MAPPING LTD

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PROJECT NO: G6308

FIGURE REF: Figure 4

PROJECT: Land at Kings Close Yapton

PREPARED: AJHT

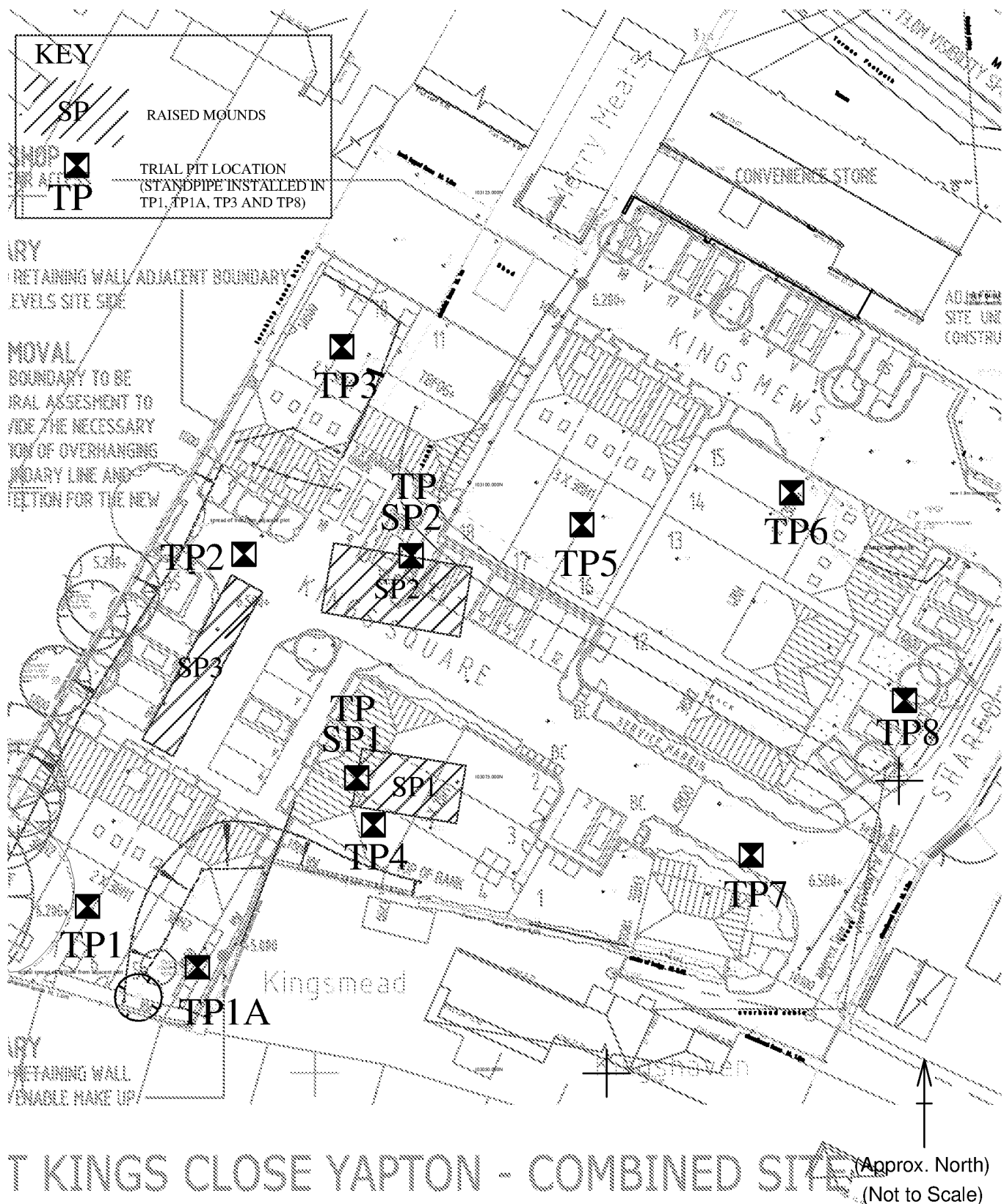
SECTION: Land Quality Assessment

CHECKED: AJHT

TITLE: Exploratory Hole Location Plan

DATE: Mar 2017

HOLE LOCATIONS SHOWN ARE INDICATIVE ONLY UNLESS DIMENSIONED



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Site

Land at Kings Close, Yapton

**Trial Pit
Number
TP1**

Excavation Method

Machine excavated using
Takeuchi TB145 (5 tonne)

Dimensions

0.45m x 2.5m

Ground Level (mOD)

6.20

Client

Plotlife SPV3 Ltd

**Job
Number
G6308**

Location

See Location Plan

Dates

24/02/2017

Engineer

Archibald Shaw LLP

**Sheet
1/1**

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00 1.00	HV D1		gravel obstructions/Av.	6.15	0.05	MADE GROUND of slightly moist brown silt (topsoil) with occasional flint gravel and occasional brick fragment. Many roots.		
					(1.15)	MADE GROUND of variable brown and orange brown silty clay with some brick and concrete. Occasional metal and plastic.		
1.50	D2			5.00	1.20	MADE GROUND of variable brown very silty clay with occasional fine brick fragment and charcoal.		
					(0.60)			
2.00	D3			4.40	1.80	Firm orange brown silty CLAY with occasional flint gravel and cobble.		
					(1.00)			
2.40	W4			3.40	2.80	Off white / buff well graded coarse, medium and fine GRAVEL of chalk and some cominuted (pulverised) chalk silt		
				3.15	3.05	Complete at 3.05m		

Plan

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Remarks

Moderate groundwater inflow at 2.6m. Water level rose to 2.4m in 20mins
Some instability of pit sides below groundwater level.
A probe test was carried out from 1.0m using the Perth Penetrometer. The
blow count for each 50mm penetration was recorded as 1,1,1,1,0,0,1,1,1,2,
2,1,1,2,1,2,2.
Ground level estimated from topographic survey by ACad Mapping Ltd
dated November 2014

Scale (approx)

1:25

Logged By

AT

Figure No.

G6308.TP1

Civil and Geotechnical Engineering Services

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Site

Land at Kings Close, Yapton

**Trial Pit
Number**
TP2

Excavation Method

Machine excavated using
Takeuchi TB145 (5 tonne)

Dimensions

0.45m x 2.5m

Ground Level (mOD)

6.50

Client	
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Plotlife SPV3 Ltd

Job	Rate	Time	Cost
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Number
G6308

Location

See Location Plan

Dates

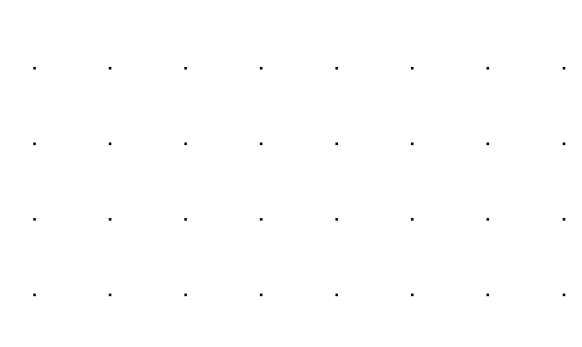
24/02/2017

Engineer

Archibald Shaw LLP

Sheet

1/1

Plan 	Remarks Groundwater was not encountered Pit sides stable and vertical during excavation Ground level estimated from topographic survey by ACad Mapping Ltd dated Nov 2014		
	Scale (approx) 1:25	Logged By AT	Figure No. G6308.TP2

Ground Management Ltd

Civil and Geotechnical Engineering Services

Robin Hill Farm Clay Lane Fishbourne
CHICHESTER West Sussex PO18 8AB
Phone/Fax: 01243 575073
mail@groundmanagement.com

Site

Land at Kings Close, Yapton

**Trial Pit
Number
TP3**

Excavation Method

Machine excavated using
Takeuchi TB145 (5 tonne)

Dimensions

0.45m x 2.5m

Ground Level (mOD)

6.40

Client

Plotlife SPV3 Ltd

**Job
Number
G6308**

Location

See Location Plan

Dates

24/02/2017

Engineer

Archibald Shaw LLP

**Sheet
1/1**

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1			6.15	(0.25) 0.25	Moist brown silty TOPSOIL with occasional flint gravel. Many roots up to 20mm dia		
						Firm orange brown silty CLAY with occasional flint gravel.		
1.00	HV 68.33kPa		75,70,60/Av. 68.33					
1.20	D2				(1.75)	... occasional fine chalk gravel below 1.3m		
						... with some sand below 1.6m		
2.50	D3			4.40	2.00 (0.60)	Firm yellow brown clayey SILT with much off white fine and medium chalk gravel		
				3.80	2.60 (0.20)	Loose to medium dense orange brown and buff slightly silty fine SAND with some subrounded flint gravel.		
3.00	W4			3.60	2.80 (0.40)	Firm orange brown and buff slightly sandy SILT with a little fine flint gravel and occasional coarse nodular flint gravel and cobbles. ... locally some fine to medium chalk gravel		
				3.20	3.20	Complete at 3.20m		

Plan

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Remarks

Slight to moderate seepage below 2.9m. Water level rose to 2.9m in 20minutes
Pit sides stable and vertical during excavation
A probe test was carried out from 0.9m using the Perth Penetrometer. The blow count for each 50mm penetration was recorded as 1,1,1,1,1,2,1,2,4.
Ground level estimated from topographic survey by ACad mapping Ltd dated Nov 2014

Scale (approx)

1:25

Logged By

AT

Figure No.

G6308.TP3

Ground Management Ltd

Civil and Geotechnical Engineering Services

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mail@groundmanagement.com

Site

Land at Kings Close, Yapton

**Trial Pit
Number
TP4**

Excavation Method

Machine excavated using
Takeuchi TB145 (5 tonne)

Dimensions

0.45m x 2.5m

Ground Level (mOD)

6.20

Client

Plotlife SPV3 Ltd

**Job
Number
G6308**

Location

See Location Plan

Dates

24/02/2017

Engineer

Archibald Shaw LLP

**Sheet
1/1**

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.05	D1			6.15	0.05	MADE GROUND of moist dary brown slightly sandy silt (topsoil) with a little flint gravel, occasional brick, glass and possible asbetos cement fragment. Many roots.		
0.40	D2			5.70	(0.45)	MADE GROUND of moderately compact brown silty clay with much gravel of flint and chalk and occasional gravel and cobble size bituminous/tar bound material and brick.		
1.00	D3				0.50	MADE GROUND of variable brown and dark grey /black sandy silt / clay locally with much ash and clinker and some coarse medium and fine gravel of flint, brick and glass. Occasioanl rusty metal objects .		
1.20-1.40	D4 PID 3.8 ppm				(1.20)	... east end of pit : tin sheet at 1.2m over 0.2m thick dark grey / black hard / strong laminated fine grained material with tar odour (sample D4)		
				4.50	1.70	... concrete foundation exposed in west of of pit founding at 1.7m bgl.		
					(0.70)	Firm orange brown silty CLAY with occasional subangular flint gravel and cobble.		
2.20	D5			3.80	2.40	Complete at 2.40m		

Plan

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Remarks

Groundwater was not encountered
Pit sides stable and vertical during excavation
concrete strip foundation exosed in west end of pit founding at 1.7m bgl
Ground level estimated from topographic survey by ACad Mapping dated Nov2014

Scale (approx)

1:25

Logged By

AT

Figure No.

G6308.TP4

Ground Management Ltd

Civil and Geotechnical Engineering Services

Robin Hill Farm Clay Lane Fishbourne
CHICHESTER West Sussex PO18 8AB
Phone/Fax: 01243 575073
mail@groundmanagement.com

Site

Land at Kings Close, Yapton

**Trial Pit
Number
TP5**

Excavation Method

Machine excavated using
Takeuchi TB145 (5 tonne)

Dimensions

0.45m x 2.5m

Ground Level (mOD)

6.20

Client

Plotlife SPV3 Ltd

**Job
Number
G6308**

Location

See Location Plan

Dates

24/02/2017

Engineer

Archibald Shaw LLP

**Sheet
1/1**

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1			6.10	0.10	Rough grass over variable brown slightly sandy silt (topsoil) with much brick and occasional flint gravel		
0.40	D2				(0.70)	MADE GROUND of orange brown slightly sandy silty clay with a little brick and concrete rubble.		
				5.40	0.80	Orange brown firm silty CLAY with occasional flint gravel.		
1.20	D3			5.00	1.20	Complete at 1.20m		

Plan

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Remarks

Groundwater was not encountered
Pit sides stable and vertical during excavation
Root samples taken between 0 and 0.3m for identification (confirmed NOT Japanese Knotweed)
Ground level estimated from topographic survey by ACad Mapping dated Nov 2014

Scale (approx)

1:25

Logged By

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Figure No.

G6308.TP5

Ground Management Ltd

Civil and Geotechnical Engineering Services

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mail@groundmanagement.com

Site

Land at Kings Close, Yapton

**Trial Pit
Number
TP6**

Excavation Method

Machine excavated using
Takeuchi TB145 (5 tonne)

Dimensions

0.45m x 2.5m

Ground Level (mOD)

6.30

Client

Plotlife SPV3 Ltd

**Job
Number
G6308**

Location

See Location Plan

Dates

24/02/2017

Engineer

Archibald Shaw LLP

**Sheet
1/1**

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1			6.20	0.10 (0.10)	Rough grass over variable brown slightly sandy silt (topsoil) with much brick and occasional flint gravel		
				6.10	0.20 (0.10)	Concrete slab		
0.40	D2			6.00	0.30 (0.30)	MADE GROUND of yellow brown compact sandy gravel		
						MADE GROUND of dark grey / black compact sandy gravel and firm grey silty clay		
				5.70	0.60 (0.25)	Compact brick rubble		
				5.45	0.85 (0.35)	Orange brown firm silty CLAY with occasional flint gravel.		
1.00	D3			5.10	1.20	Complete at 1.20m		

Plan

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Remarks

Groundwater was not encountered
Pit sides stable and vertical during excavation
Ground level estimated from topographic survey by ACad Mapping Ltd dated Nov 2014

Scale (approx)

1:25

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AT

Figure No.

G6308.TP6

Civil and Geotechnical Engineering Services

Robin Hill Farm Clay Lane Fishbourne
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mail@groundmanagement.com

Site	Land at Kings Close, Yapton
-------------	-----------------------------

**Trial Pit
Number**
TP7

Excavation Method Machine excavated using Takeuchi TB145 (5 tonne)	Dimensions 0.45m x 2.5m	Ground Level (mOD) 6.20	Client Plotlife SPV3 Ltd	Job Number G6308
	Location See Location Plan	Dates 24/02/2017	Engineer Archibald Shaw LLP	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00 0.00-0.20	D1 D2					MADE GROUND of moist dark brown slightly sand silt (topsoil) with a little mainly coarse flint gravel and occasional flint cobble and wood fragment (Poaabile asbesto cement fragments on surface in vicinity of TP7 (sampleD1))		
0.40	D3			6.00	(0.20) 0.20	MADE GROUND of variable brown, dark grey/black and orange brown slightly sandy silt and ash with some flint gravel and occasional brick and tile fragment.		
0.75	HV 41.67kPa		50,40,35/Av. 41.67	5.50	0.70	MADE GROUND of orange brown silty clay with fine to medium gravel size brick fragments and occasional charcoal and flint.		
1.00	D4				(0.90)			
				4.60	1.60	Firm orange brown sandy CLAY ? SILT with a little coarse medium and fine flint gravel		
2.00	D5				(1.00)	... locally very sandy		
				3.60	2.60	Complete at 2.60m		

Plan	Remarks		
	Groundwater was not encountered Pit sides stable and vertical during excavation A probe test was carried out from 0.9m using the Perth Penetrometer. The blow count for each 50mm penetration was recorded as 1,0,0,0,1,0,1,0,1,2,1,1,2,2,1,2,1,1,2. A second probe test was carried out from 1.8m using the Perth Penetrometer. The blow count for each 50mm penetration was recorded as 1,0,1,2,2,2,2,3. Ground level estimated from topographic survey bu ACad Mapping Ltd dated Nov 2014		
	Scale (approx)	Logged By	Figure No.
	1:25	AT	G6308.TP7

Ground Management Ltd

Civil and Geotechnical Engineering Services

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CHICHESTER West Sussex PO18 8AB
Phone/Fax: 01243 575073
mail@groundmanagement.com

Site

Land at Kings Close, Yapton

**Trial Pit
Number
TP8**

Excavation Method

Machine excavated using
Takeuchi TB145 (5 tonne)

Dimensions

0.45m x 2.5m

Ground Level (mOD)

6.20

Client

Plotlife SPV3 Ltd

**Job
Number
G6308**

Location

See Location Plan

Dates

24/02/2017

Engineer

Archibald Shaw LLP

**Sheet
1/1**

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	D1					Rough grass over MADE GROUND of firm to stiff orange brown silty clay with a little flint gravel and occasional brick fragment and charcoal.		
1.00	D2				(1.55)	... locally cobble and small boulder4 size concrete lumps (Concrete obstruction across trench at 1.2m - moved west to avoid)		
1.80	D3			4.65	1.55 (0.35)	Orange brown loose to medium dense slightly clayey silty fine to medium SAND		
				4.30	1.90	... locally firm slightly sandy silty clay with occasional flint gravel		
3.20	W5					Firm to stiff yellow brown / buff slightly sandy clayey SILT with a little coarse medium and fine gravel of chalk and occasionally flint.		
3.20	D4 PID 68ppm				(1.45)	... increasing chalk with depth		
						... organic / fuel odour below 3.2m with oily residue and dark grey staining of the soil (soil and water samples D4 and W5)		
				2.85	3.35	Complete at 3.35m		

Plan

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Remarks

Moderate seepage below 3.2m. Water level rose to 3.2m in 20 minutes
Pit sides stable and vertical during excavation
A probe test was carried out from 1.8m using the Perth Penetrometer. The blow count for each 50mm penetration was recorded as 1,1,2,1,1,2,2,1,2,1.
Ground level estimated from topographic survey by ACad Mapping Ltd dated Nov 2014

Scale (approx)

1:25

Logged By

AT

Figure No.

G6308.TP8

Ground Management Ltd

Civil and Geotechnical Engineering Services

Robin Hill Farm Clay Lane Fishbourne
CHICHESTER West Sussex PO18 8AB
Phone/Fax: 01243 575073
mail@groundmanagement.com

Site

Land at Kings Close, Yapton

**Trial Pit
Number
TPSP1**

Excavation Method

Machine excavated using
Takeuchi TB145 (5 tonne)

Dimensions

1.5m x 2.0m

Ground Level (mOD)

6.70

Client

Plotlife SPV3 Ltd

**Job
Number
G6308**

Location

Into raised mound - see
location plan

Dates

24/02/2017

Engineer

Archibald Shaw LLP

**Sheet
1/1**

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1			5.90	(0.80) 0.80	MADE GROUND of variable dark brown slightly sandy silt (including topsoil) with some brick and concrete rubble and occasional wood / timber. Many roots Complete at 0.80m		

Plan

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Remarks

Groundwater was not encountered
Pit sides stable and vertical during excavation
Trial pit excavated into raised mound for specialist to check for Japanese Knotweed (Live Japanese Knotweed identified at west end of the mound)
Ground level estimated from topographic survey by ACad Mapping Ltd dated Nov 2014

Scale (approx)

1:25

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Figure No.

G6308.TPSP1

APPENDIX 1

GEOLOGY AND AQUIFER DESIGNATIONS

Based on the British Geological Survey (BGS) website, accessed on 18th February, the underlying geology consists of River Terrace Deposits overlying Upper Chalk. The terrace deposits are described as consisting of sands, silts and clays. The Upper Chalk is a soft white calcareous rock.

There are two BGS recorded boreholes in the vicinity. About 500m to the north a borehole recorded Brickearth (a very sandy clay) to about 1.4m, underlain by Chalk. About 600m to the east another borehole recorded a clayey, silty Brickearth to 1.9m underlain by Raised Beach Deposits (a silty clay followed by a clayey sandy gravel) to 3.9m, underlain by Chalk.

SITE HISTORY AND ENVIRONMENTAL INFORMATION

The history of the site has been obtained by reference to historical map data provided by Groundsure together with other information obtained from the client or from other sources, including a walkover survey conducted on 17th February 2017 and information from Arun DC.

The earliest Ordnance Survey map of 1876 show the site to be mainly agricultural land to the south side of the main road and close to the Arundel Canal. Two buildings are shown on the north side of the site close to the road. The main part of the village of Yapton is to the west. By 1897-98 the site and the area to the west of it is labelled as a Brickyard and the canal is shown as being disused. There are now four buildings on site. In 1912 Brickworks are shown mainly to the west of the site but encroaching into the south west of the site area. The buildings to the north are still shown. By 1937-38 the Brickworks to the west are no longer present, having been replaced by residential houses/gardens and there has been some landscaping of the southern part of the site. The building fronting the road is now labelled as a Hall.

In the 1973-74 maps there appear to three buildings on the northernmost part of the site labelled as a Works and another building in the southwest corner. Housing has been built to the south of the site and beyond the housing to the west is a caravan park. By 1978-82 one of the buildings have been demolished. There is no significant changes until 1994 by which time another building in the north of the site has been demolished together with that in the south west. The building in the north continues to be labelled as a Works until the latest map edition of 2014.

A Landmark Sitecheck Assessment has been undertaken for the site (dated 8th February 2017). In addition to the Brickworks and the Works noted on the site, it also notes the following issues:

- Landfills between 250 and 500m away
- A major aquifer beneath the site (the Upper Chalk)

- Potentially contaminative trades on site and nearby. That on site (presumably occupying the Works) was named as Barnly Engineering. Other engineering and cleaning services are located some 100 to 150m away in Canal Road and Park Road.

Information from Arun DC confirms the above uses of the site and indicates that the last use of the Works site was as a Joinery Works. They consider the site to be potentially contaminated and would apply standard conditions relating to contamination issues on any planning determination.

Information from West Sussex CC trading Standards Petroleum Officer indicates that there was fuel storage on the site, described as a dead can store. The Petroleum Officer subsequently clarified that this would have been a room/cupboard/building, probably bunded, containing petroleum based products. Fuel was also stored 210m to the east at Nobles Garage, but this site has now been remediated.

The Environment Agency website (accessed 19th February 2017) show two landfills in the vicinity, both consisting of infills to the disused Arundel Canal, one about 600m west of the site, and the other about 350m east. The website indicates that inert waste was placed in each. Arun DC also note that a waste management facility is located about 320m east of the site at Northwood Farm.

The Environment Agency website also confirms the major aquifer beneath the site. However the site is not within any Groundwater Protection Zones. Arun DC are not aware of any local water abstractions.

The Client has advised that areas of the site have previously been infested with Japanese Knotweed that was treated by a specialist. The Client has provided a plan prepared by TCM R&D dated 13/3/07 indicating the affected areas. Some viable / growing Japanese Knotweed plants have been identified on the site and are the subject of ongoing investigation and reporting by the specialist.

PRELIMINARY CONCLUSIONS

Based on the above data there is the potential for ground contamination to be on site. The main issues are:

- The former presence of an engineering company on the site. If metal engineering took place on site, there is the potential for the underlying ground to be contaminated by metals, fuels and solvents.
- The presence of a former brickworks on site/nearby and filled ground on site. The nature of the filled ground is unknown, but could contain a number of contaminants.

- Building demolition has occurred on site: there is therefore the potential for asbestos to be present in near surface fill.
- Waste materials on site: the walkover highlighted a number of mounds where waste materials were present.
- Japanese Knotweed

RISK ASSESSMENT

The following table outlines the source-pathway-receptor analysis for the site and indicates the likely risks of significant contamination at the site:

Source	Contamination	Pathway	Receptor	Overall risk	Comment
Brickworks Infill	Soil Oils/solvents Ground gas	Ingestion	Residents	Low- moderate	Backfill present for many years
		Dissolution	Groundwater	Low-moderate	
		Permeation	Mains water	Low-moderate	
		Inhalation	Residents	Low	
Former Engineering Works/ Joinery Works	Soil Oils/solvents	Ingestion	Residents	Moderate locally	
		Inhalation	Residents	Moderate locally	
		Permeation	Mains water	Moderate locally	
		Dissolution	Groundwater	Low-moderate	
Demolition Materials/ Backfill	Asbestos	Inhalation	Residents	Moderate	

(NOTE: Risks associated with the Japanese Knotweed is subject of third party specialist investigation and not included within this assessment).

All contaminants could also pose a risk to construction workers on the site, and to nearby neighbours, particularly during the groundworks phase of the construction.

RATIONALE FOR INVESTIGATION

It is intended to undertake a preliminary (pre-purchase) ground investigation on the site including an investigation for potential contamination. Following this initial investigation there is likely to be a further phase of investigation. Based on the likely sources of contamination and the above risk assessment, the following rationale for investigation of contamination should be adopted.

1. To comply with relevant regulations and avoid spread of Japanese Knotweed contamination on and off site, all work, in particular any excavation, is to be in accordance with procedures defined by the third party specialist, TCM.
2. A mixture of boreholes and trial pits should be used, as it is not clear to what depth the backfill/made ground will extend. The walkover survey indicates that ground levels have been built up compared to the surrounding ground in some southern parts of the site. During the initial investigation it is suggested that a number of trial pits (about 8) are excavated across the site to provide an initial indication of the thickness and nature of the fill materials/made ground and their contaminative potential.
3. For these trial pits, in the vicinity of the main backfilled areas, a general screen for contaminants should be undertaken of the made ground materials. The potential contaminants tested should therefore include a suite of metals, speciated total petroleum hydrocarbons (TPH), speciated PAH, sulphates and pH.
4. In the vicinity of the former Works (at the northern end of the site), the above suite of tests should also be used together with tests for Volatile Organic Compounds (VOCs) and semi-VOCs.
5. Testing for asbestos quantification should be undertaken on near surface samples across the site and particularly if suspected asbestos containing material is noted during any excavation works.
6. Either in the initial investigation or at a later stage, testing for contaminants that may affect plastic mains water pipes should be undertaken at depths down to 1m below final ground level along the line of the mains water supply. It may be necessary to check with the testing laboratory to ensure that the additional tests that Portsmouth Water require (BTEX/MTBE, phenols, creosols and chlorinated phenols) are covered by the testing laboratory's VOC/sVOC testing. The detection limits should also be checked to ensure that they conform to Portsmouth Water's requirements.
7. During the initial investigation, the amount of organic material within the made ground/fill should be assessed to determine whether the fill has any ground gas generation potential. If significant thicknesses of made ground with organic materials are found, groundwater/gas standpipes should be installed in a second phase of investigation, and monitored. Likewise, if significant VOCs are found, consideration should also be given to installing a groundwater/gas standpipe in the area where they have been found.
8. If groundwater is encountered during the initial phase of work, groundwater levels should be checked and where feasible, groundwater samples taken. During the subsequent

investigation work at least three groundwater standpipes should be installed so that groundwater levels can be established and groundwater contamination can be tested for. The groundwater suite should include metals, speciated TPH, speciated PAH, sulphates, pH and relevant VOC and sVOC where appropriate.

Any contamination investigation of a site where either heterogeneous fill materials or localised contamination is present will not necessarily identify and quantify all the contamination (if any) on site, since the volume of soil sampled is only a small proportion of that present on site. It is likely therefore that as groundworks on the site proceed during the construction phase, previously unknown contamination may be revealed and will need to be dealt with.

21st Feb 2017

Desk Study Enquiry -Yapton

Matthew Kennett [Matthew.Kennett@arun.gov.uk]

Sent: 03 February 2017 13:56

To: Al Tyler

Attachments: a j h tyler receipt.docx (15 KB) ; 399E3C2E-4957-4BA1-AF60-19~1.jpg (3 MB)

Hi Al,

Please find below answers to your information request, receipt attached;

1. Historical land use for the site and surrounding areas

The site was adjacent to the Arundel Canal (north of site) and made up part of a brickworks in the early 19th Century. It was then developed as a works with the most recent use as a Joinery Works. The site has now been cleared and is vacant with some piles of waste that have been there longer enough for grass to grow over them (pic).

2. relevant details on the site or land adjacent to the property collected/held under the Council's Part IIA strategy

The site is considered potentially contaminated land but we have not investigated the site formally under Part IIA therefore the information we hold is covered in the other questions.

3. details of any conditions relating to contamination that have been attached to previous development in the area or that may be attached to future applications for development of the site or surrounding area

These conditions or similar, are very likely to be attached any planning permission in the future;

ENV3 Universal condition for development on land affected by contamination

Environmental Health position

We consider that planning permission should only be granted to the proposed development as submitted if the following planning condition is imposed as set out below. Without this condition, the proposed development on this site poses an unacceptable risk to the environment and we would wish to object to the application.

Condition: Prior to the commencement of development (parts 1, 2) and prior to occupation (parts 3, 4) approved by this planning permission (or such other date or stage in development as may be agreed in writing with the Local Planning Authority), the following components of a scheme to deal with the risks associated with contamination of the site shall each be submitted to and approved, in writing, by the local planning authority:

1. A preliminary risk assessment which has identified:
 - all previous uses
 - potential contaminants associated with those uses
 - a conceptual model of the site indicating sources, pathways and receptors
 - potentially unacceptable risks arising from contamination at the site.
2. A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all

receptors that may be affected, including those off site.

3. The site investigation results and the detailed risk assessment (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.
4. A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.

Any changes to these components require the express consent of the local planning authority. The scheme shall be implemented as approved.

Reason

To ensure that the development complies with approved details in the interests of protection of the environment and prevention of harm to human health in accordance with policy DEV1 of the West Sussex Structure Plan and policies GEN7 and GEN31 of the Arun District Local Plan .

ENV 5 Unsuspected contamination

Environmental Health position

We consider that planning permission should only be granted to the proposed development as submitted if the following planning condition is imposed as set out below. Without this condition, the proposed development on this site poses an unacceptable risk to the environment and we would wish to object to the application.

Condition: If, during development, contamination not previously identified is found to be present at the site then no further development (unless otherwise agreed in writing with the Local Planning Authority) shall be carried out until the developer has submitted, and obtained written approval from the Local Planning Authority for, an amendment to the remediation strategy detailing how this unsuspected contamination shall be dealt with.

Reason

To ensure that the development complies with approved details in the interests of protection of the environment and prevention of harm to human health in accordance with policy DEV1 of the West Sussex Structure Plan and policies GEN7 and GEN31 of the Arun District Local Plan

ENV 6 Verification report

Environmental Health position

We consider that planning permission should only be granted to the proposed development as submitted if the following planning condition is imposed as set out below. Without this condition, the proposed development on this site poses an unacceptable risk to the environment and we would wish to object to the application.

Condition: Prior to occupation of any part of the permitted development, a verification report demonstrating completion of the works set out in the approved remediation strategy and the effectiveness of the remediation shall be submitted to and approved, in writing, by the local planning authority. The report shall

include results of sampling and monitoring carried out in accordance with the approved verification plan to demonstrate that the site remediation criteria have been met. It shall also include any plan (a "long-term monitoring and maintenance plan") for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action, as identified in the verification plan, and for the reporting of this to the local planning authority.

REASON

To ensure that the development complies with approved details in the interests of protection of the environment and prevention of harm to human health in accordance with policy DEV1 of the West Sussex Structure Plan and policies GEN7 and GEN31 of the Arun District Local Plan.

4. location/details of any previous excavations such as gravel pits

There may have been a cutting on the site as it previously was a brick yard and the previously mentioned Arundel Canal to the immediate north.

5. details of landfill sites in the area that may impact on the site, in particular any within 250m of the site, including where available details on the nature of fill, age, extent, gas/leachate generation and contamination records

300m to the east is the disused canal continues, this area was landfilled with inert waste between 1980-81.

6. details of any waste management facilities

The closest waste management facilities to the site is located Northwood Farm (Hanger No8) Burndell Road Yapton West Sussex BN18 0HR 320m to the east.

7. details of any recorded pollution incidents on or near the site

There are no significant of major pollution incidents recorded near the site, according to the Environment Agency webpage.

8. summary of any relevant groundwater and gas monitoring in the area

We hold no records of monitoring.

9. Details of any fuel storage in the vicinity of the site

Data we hold from WSCC Trading Standards Petroleum Officer indicates there was fuel storage on the site and the tank is classed as a dead can, we hold no further details. 210m to the east fuel was stored at nobles garage but this has been residential developed and remediated.

10. identification of any sensitive receptors including local water abstractions.

Not aware of any sensitive receptors

Kind Regards

Matthew Kennett

Pollution Officer

Environmental Health Department

01903 737696 (direct line)

Arun Civic Centre, Maltravers Road, Littlehampton BN17 5LF

<http://www.arun.gov.uk/eh>



Matthew Kennett

Pollution Officer

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APPENDIX 2



Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 17-10911

Issue: 1

Date of Issue: 06/03/2017

Contact: Alistair Tyler

Customer Details: Ground Management Ltd
Robin Hill Farm
Clay Lane
Chichester
West Sussex PO18 8AN

Quotation No: Q16-00620

Order No: G6308

Customer Reference: G6308

Date Received: 28/02/2017

Date Approved: 06/03/2017

Details: land at Kings Close Yapton

Approved by:

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

Sample Summary

Report No.: 17-10911

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
90829	TP SP1 0.50	24/02/2017	28/02/2017	Silty loam	
90830	TP SP2 1.00	24/02/2017	28/02/2017	Silty loam	
90831	TP1 1.00	24/02/2017	28/02/2017	Silty loam	
90832	TP1 1.50	24/02/2017	28/02/2017	Silty clayey loam	
90833	TP1 2.00	24/02/2017	28/02/2017		
90834	TP1 2.40	24/02/2017	28/02/2017		
90835	TP2 0.10	24/02/2017	28/02/2017	Silty loam	
90836	TP2 0.60	24/02/2017	28/02/2017	Silty loam + Chalk	
90837	TP2 1.20	24/02/2017	28/02/2017	Silty loam	
90838	TP2 2.00	24/02/2017	28/02/2017		
90839	TP3 0.10	24/02/2017	28/02/2017	Silty loam	
90840	TP3 1.20	24/02/2017	28/02/2017	Silty loam	
90841	TP3 3.00	24/02/2017	28/02/2017		
90842	TP4 0.00 - 0.05	24/02/2017	28/02/2017	Silty loam	
90843	TP4 0.40	24/02/2017	28/02/2017	Silty loam	
90844	TP4 1.00	24/02/2017	28/02/2017	Sandy silty loam	
90845	TP4 1.20 - 1.40	24/02/2017	28/02/2017	Sandy silty loam + Stones	
90846	TP4 2.20	24/02/2017	28/02/2017		
90847	TP5 0.10	24/02/2017	28/02/2017		
90848	TP5 0.40	24/02/2017	28/02/2017	Silty loam	
90849	TP5 1.20	24/02/2017	28/02/2017	Silty loam	
90850	TP6 0.10	24/02/2017	28/02/2017		
90851	TP6 0.40	24/02/2017	28/02/2017	Sandy silty loam	
90852	TP6 1.00	24/02/2017	28/02/2017	Silty loam	
90853	TP7 0.00	24/02/2017	28/02/2017		
90854	TP7 0.00 - 0.20	24/02/2017	28/02/2017	Silty loam	
90855	TP7 0.40	24/02/2017	28/02/2017	Sandy silty loam	
90856	TP7 1.00	24/02/2017	28/02/2017	Silty loam	
90857	TP8 0.10	24/02/2017	28/02/2017		
90858	TP8 1.00	24/02/2017	28/02/2017	Silty clayey loam	
90859	TP8 1.80	24/02/2017	28/02/2017		
90862	TP8 0.50	24/02/2017	28/02/2017		



Results Summary

2683

Report No.: 17-10911

ELAB Reference	90829	90830	90831	90832	90835	90836
Customer Reference						
Sample ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP SP1	TP SP2	TP1	TP1	TP2	TP2
Sample Depth (m)	0.50	1.00	1.00	1.50	0.10	0.60
Sampling Date	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD						
Metals									
Arsenic	M	mg/kg	1	12.5	10.0	7.7	14.9	14.6	^ 7.4
Cadmium	M	mg/kg	0.5	0.7	2.0	< 0.5	< 0.5	0.7	^ < 0.5
Chromium	M	mg/kg	5	30.7	22.9	20.9	44.9	31.2	^ 15.2
Copper	M	mg/kg	5	49.9	108	19.4	21.8	66.3	^ 22.5
Lead	M	mg/kg	5	113	321	45.9	24.0	170	^ 42.8
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	^ < 0.5
Nickel	M	mg/kg	5	22.0	20.5	14.9	28.6	22.8	^ 12.3
Selenium	M	mg/kg	1	1.4	1.3	< 1.0	1.1	1.0	^ < 1.0
Zinc	M	mg/kg	5	261	501	97.2	73.0	230	^ 66.6
Anions									
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	0.06	n/t	n/t	n/t
Inorganics									
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Water Soluble Boron	N	mg/kg	0.5	2.4	1.6	< 0.5	1.2	1.6	0.5
Miscellaneous									
pH	M	pH units	0.1	8.4	7.8	8.6	8.2	8.6	^ 8.9
Soil Organic Matter	U	%	0.1	9.8	8.8	1.6	0.2	4.8	1.1
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	0.1	0.2	< 0.1	< 0.1	< 0.1	^ < 0.1
Acenaphthylene	M	mg/kg	0.1	0.4	0.7	0.1	< 0.1	0.1	^ 0.1
Acenaphthene	M	mg/kg	0.1	0.1	0.6	< 0.1	< 0.1	< 0.1	^ 0.2
Fluorene	M	mg/kg	0.1	0.1	0.7	< 0.1	< 0.1	< 0.1	^ 0.2
Phenanthrene	M	mg/kg	0.1	1.8	9.1	1.3	< 0.1	0.9	^ 1.7
Anthracene	M	mg/kg	0.1	0.7	2.7	0.5	< 0.1	0.3	^ 0.5
Fluoranthene	M	mg/kg	0.1	6.6	17.5	3.3	< 0.1	2.8	^ 3.2
Pyrene	M	mg/kg	0.1	5.8	14.7	2.9	< 0.1	2.5	^ 2.7
Benzo(a)anthracene	M	mg/kg	0.1	3.8	8.3	1.7	< 0.1	1.5	^ 1.5
Chrysene	M	mg/kg	0.1	4.0	9.0	1.8	< 0.1	1.8	^ 1.7
Benzo (b) fluoranthene	M	mg/kg	0.1	3.7	7.5	1.8	< 0.1	1.7	^ 1.5
Benzo(k)fluoranthene	M	mg/kg	0.1	4.1	8.1	2.0	< 0.1	1.8	^ 1.6
Benzo (a) pyrene	M	mg/kg	0.1	4.1	8.2	1.9	< 0.1	1.8	^ 1.6
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	3.2	6.2	1.5	< 0.1	1.4	^ 1.3
Dibenzo(a,h)anthracene	M	mg/kg	0.1	1.0	1.6	0.4	< 0.1	0.4	^ 0.3
Benzo[g,h,i]perylene	M	mg/kg	0.1	2.5	5.2	1.3	< 0.1	1.2	^ 1.1
Total PAH(16)	M	mg/kg	0.4	42.1	100	20.9	< 0.4	18.2	^ 19.3

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Results Summary

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Report No.: 17-10911

ELAB Reference	90829	90830	90831	90832	90835	90836
Customer Reference						
Sample ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP SP1	TP SP2	TP1	TP1	TP2	TP2
Sample Depth (m)	0.50	1.00	1.00	1.50	0.10	0.60
Sampling Date	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	^ < 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	^ < 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	^ < 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	^ < 10.0
MTBE	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	1.4	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	7.2	12.7	6.2	< 1.0	< 1.0	1.9
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	8.1	8.5	3.4	< 1.0	3.3	3.9
>C21-C35 Aromatic	N	mg/kg	1	75.4	68.3	37.4	< 1.0	24.9	31.1
>C35-C40 Aromatic	N	mg/kg	1	8.3	5.2	2.6	< 1.0	2.0	2.4
Total (>C5-C40) Ali/Aro	N	mg/kg	1	99.0	96.2	49.6	< 1.0	30.1	39.3

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Results Summary

2683

Report No.: 17-10911

ELAB Reference	90837	90839	90840	90842	90843	90844
Customer Reference						
Sample ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP2	TP3	TP3	TP4	TP4	TP4
Sample Depth (m)	1.20	0.10	1.20	0.00 - 0.05	0.40	1.00
Sampling Date	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD						
Metals									
Arsenic	M	mg/kg	1	12.1	12.4	n/t	14.4	n/t	42.3
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	n/t	1.3	n/t	0.9
Chromium	M	mg/kg	5	19.0	22.4	n/t	37.9	n/t	34.0
Copper	M	mg/kg	5	133	65.9	n/t	91.2	n/t	1110
Lead	M	mg/kg	5	276	189	n/t	207	n/t	1020
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	n/t	< 0.5	n/t	0.5
Nickel	M	mg/kg	5	15.3	15.6	n/t	25.5	n/t	55.7
Selenium	M	mg/kg	1	< 1.0	1.2	n/t	1.9	n/t	2.6
Zinc	M	mg/kg	5	221	121	n/t	254	n/t	800
Anions									
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	0.03	n/t	n/t	n/t
Inorganics									
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	n/t	< 0.8	n/t	< 0.8
Water Soluble Boron	N	mg/kg	0.5	1.0	0.9	n/t	1.6	n/t	1.2
Miscellaneous									
pH	M	pH units	0.1	8.0	7.6	7.8	8.2	n/t	7.9
Soil Organic Matter	U	%	0.1	3.2	2.2	n/t	6.8	n/t	6.3
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	0.1	< 0.1	n/t	0.1	1.0	0.2
Acenaphthylene	M	mg/kg	0.1	0.3	0.1	n/t	0.7	1.9	0.6
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	n/t	0.2	1.4	0.3
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	n/t	0.2	1.6	0.5
Phenanthrene	M	mg/kg	0.1	1.4	1.3	n/t	3.2	20.1	3.1
Anthracene	M	mg/kg	0.1	0.4	0.2	n/t	0.7	6.9	2.0
Fluoranthene	M	mg/kg	0.1	4.2	2.8	n/t	7.9	53.3	5.1
Pyrene	M	mg/kg	0.1	3.6	2.2	n/t	6.8	47.4	5.0
Benzo(a)anthracene	M	mg/kg	0.1	2.2	0.9	n/t	4.2	28.6	3.1
Chrysene	M	mg/kg	0.1	2.6	1.6	n/t	5.0	28.2	4.1
Benzo (b) fluoranthene	M	mg/kg	0.1	2.5	1.7	n/t	4.8	24.1	4.7
Benzo(k)fluoranthene	M	mg/kg	0.1	2.7	1.7	n/t	5.1	24.5	4.3
Benzo (a) pyrene	M	mg/kg	0.1	2.7	1.6	n/t	5.1	28.7	3.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	2.0	1.3	n/t	3.9	19.5	3.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	0.5	0.3	n/t	1.2	4.7	0.8
Benzo[g,h,i]perylene	M	mg/kg	0.1	1.6	1.1	n/t	3.2	16.3	2.6
Total PAH(16)	M	mg/kg	0.4	26.8	16.9	n/t	52.4	309	43.0

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Results Summary

2683

Report No.: 17-10911

ELAB Reference	90837	90839	90840	90842	90843	90844
Customer Reference						
Sample ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP2	TP3	TP3	TP4	TP4	TP4
Sample Depth (m)	1.20	0.10	1.20	0.00 - 0.05	0.40	1.00
Sampling Date	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD						
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	n/t	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	n/t	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	n/t	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	n/t	< 10.0
MTBE	N	ug/kg	10	< 10.0	< 10.0	n/t	< 10.0	n/t	< 10.0
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	n/t	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	n/t	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	n/t	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	n/t	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	n/t	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	n/t	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	1.8	< 1.0	n/t	7.2	n/t	44.7
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	n/t	11.6
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	n/t	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	< 0.01	n/t	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	n/t	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	n/t	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	< 1.0	n/t	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	4.1	< 1.0	n/t	7.3	n/t	12.4
>C21-C35 Aromatic	N	mg/kg	1	23.9	4.4	n/t	46.6	n/t	133
>C35-C40 Aromatic	N	mg/kg	1	1.3	< 1.0	n/t	3.7	n/t	49.4
Total (>C5-C40) Ali/Aro	N	mg/kg	1	31.1	4.4	n/t	64.9	n/t	251

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Results Summary

2683

Report No.: 17-10911

ELAB Reference	90845	90848	90849	90851	90852	90854
Customer Reference						
Sample ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP4	TP5	TP5	TP6	TP6	TP7
Sample Depth (m)	1.20 - 1.40	0.40	1.20	0.40	1.00	0.00 - 0.20
Sampling Date	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD						
Metals									
Arsenic	M	mg/kg	1	^ 36.4	14.0	14.7	19.4	14.2	7.7
Cadmium	M	mg/kg	0.5	^ 0.5	< 0.5	< 0.5	0.7	< 0.5	14.4
Chromium	M	mg/kg	5	^ 26.3	34.2	41.7	34.2	43.2	46.1
Copper	M	mg/kg	5	^ 286	66.0	23.4	1360	46.9	2340
Lead	M	mg/kg	5	^ 665	1310	54.7	2800	58.8	729
Mercury	M	mg/kg	0.5	^ 0.7	< 0.5	< 0.5	0.9	< 0.5	< 0.5
Nickel	M	mg/kg	5	^ 36.1	23.5	28.8	29.8	31.9	18.9
Selenium	M	mg/kg	1	^ 1.7	1.1	< 1.0	1.8	1.2	2.2
Zinc	M	mg/kg	5	^ 271	164	68.7	1810	90.8	1150
Anions									
Water Soluble Sulphate	M	g/l	0.02	n/t	n/t	n/t	0.35	n/t	n/t
Inorganics									
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Water Soluble Boron	N	mg/kg	0.5	2.4	1.1	< 0.5	3.8	< 0.5	0.7
Miscellaneous									
pH	M	pH units	0.1	^ 7.7	8.1	7.4	7.8	6.9	7.5
Soil Organic Matter	U	%	0.1	14	1.5	0.6	6.3	0.7	8.3
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	^ 3.8	< 0.1	< 0.1	0.7	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	^ 6.7	0.1	< 0.1	0.6	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	^ 2.3	< 0.1	< 0.1	0.4	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	^ 8.6	< 0.1	< 0.1	0.6	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	^ 79.5	0.9	< 0.1	6.8	< 0.1	0.3
Anthracene	M	mg/kg	0.1	^ 17.0	0.3	< 0.1	1.7	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	^ 81.2	2.3	< 0.1	12.9	< 0.1	0.8
Pyrene	M	mg/kg	0.1	^ 60.8	2.2	< 0.1	10.8	< 0.1	0.6
Benzo(a)anthracene	M	mg/kg	0.1	^ 37.5	2.0	< 0.1	6.7	< 0.1	0.4
Chrysene	M	mg/kg	0.1	^ 36.7	2.1	< 0.1	9.2	< 0.1	0.7
Benzo (b) fluoranthene	M	mg/kg	0.1	^ 24.7	2.6	< 0.1	7.2	< 0.1	0.6
Benzo(k)fluoranthene	M	mg/kg	0.1	^ 27.0	2.2	< 0.1	8.2	< 0.1	0.7
Benzo (a) pyrene	M	mg/kg	0.1	^ 27.9	3.5	< 0.1	6.9	< 0.1	0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	^ 16.4	1.5	< 0.1	5.3	< 0.1	0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.1	^ 5.5	0.4	< 0.1	1.8	< 0.1	0.2
Benzo[g,h,i]perylene	M	mg/kg	0.1	^ 13.4	1.1	< 0.1	4.3	< 0.1	0.4
Total PAH(16)	M	mg/kg	0.4	^ 449	21.4	< 0.4	84.2	< 0.4	6.0

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Results Summary

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Report No.: 17-10911

ELAB Reference	90845	90848	90849	90851	90852	90854
Customer Reference						
Sample ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP4	TP5	TP5	TP6	TP6	TP7
Sample Depth (m)	1.20 - 1.40	0.40	1.20	0.40	1.00	0.00 - 0.20
Sampling Date	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD						
BTEX									
Benzene	M	ug/kg	10	^ 90.1	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	^ 28.4	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	^ 19.3	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
MTBE	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	10.5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	45.2	< 1.0	< 1.0	24.1	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	76.6	< 1.0	< 1.0	236	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	3.2	< 1.0	< 1.0	14.6	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	0.09	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	27.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	85.8	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	498	1.3	< 1.0	28.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	1090	4.5	< 1.0	266	< 1.0	1.9
>C35-C40 Aromatic	N	mg/kg	1	57.2	< 1.0	< 1.0	22.1	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	1900	5.8	< 1.0	591	< 1.0	1.9

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Results Summary

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Report No.: 17-10911

ELAB Reference	90855	90856	90858
Customer Reference			
Sample ID			
Sample Type	SOIL	SOIL	SOIL
Sample Location	TP7	TP7	TP8
Sample Depth (m)	0.40	1.00	1.00
Sampling Date	24/02/2017	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD			
Metals						
Arsenic	M	mg/kg	1	36.2	14.0	14.1
Cadmium	M	mg/kg	0.5	7.5	1.1	< 0.5
Chromium	M	mg/kg	5	59.5	33.6	39.2
Copper	M	mg/kg	5	808	142	37.0
Lead	M	mg/kg	5	1660	287	44.6
Mercury	M	mg/kg	0.5	1.0	< 0.5	< 0.5
Nickel	M	mg/kg	5	52.2	24.3	29.0
Selenium	M	mg/kg	1	2.5	1.2	1.1
Zinc	M	mg/kg	5	1100	132	80.7
Anions						
Water Soluble Sulphate	M	g/l	0.02	0.06	n/t	0.04
Inorganics						
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8
Water Soluble Boron	N	mg/kg	0.5	0.9	1.0	0.8
Miscellaneous						
pH	M	pH units	0.1	8.1	8.1	8.1
Soil Organic Matter	U	%	0.1	7.2	0.9	0.6
Polyaromatic hydrocarbons						
Naphthalene	M	mg/kg	0.1	0.4	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	0.6	< 0.1	0.3
Acenaphthene	M	mg/kg	0.1	0.2	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	3.1	< 0.1	0.2
Anthracene	M	mg/kg	0.1	0.4	< 0.1	0.1
Fluoranthene	M	mg/kg	0.1	4.9	< 0.1	0.9
Pyrene	M	mg/kg	0.1	5.9	< 0.1	1.1
Benzo(a)anthracene	M	mg/kg	0.1	2.9	< 0.1	1.2
Chrysene	M	mg/kg	0.1	5.1	< 0.1	1.1
Benzo (b) fluoranthene	M	mg/kg	0.1	4.4	< 0.1	1.5
Benzo(k)fluoranthene	M	mg/kg	0.1	4.3	< 0.1	1.7
Benzo (a) pyrene	M	mg/kg	0.1	4.1	< 0.1	1.9
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	3.4	< 0.1	1.2
Dibenzo(a,h)anthracene	M	mg/kg	0.1	1.1	< 0.1	0.4
Benzo[g,h,i]perylene	M	mg/kg	0.1	3.3	< 0.1	1.1
Total PAH(16)	M	mg/kg	0.4	44.1	< 0.4	12.7

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Results Summary

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Report No.: 17-10911

ELAB Reference	90855	90856	90858
Customer Reference			
Sample ID			
Sample Type	SOIL	SOIL	SOIL
Sample Location	TP7	TP7	TP8
Sample Depth (m)	0.40	1.00	1.00
Sampling Date	24/02/2017	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD			
BTEX						
Benzene	M	ug/kg	10	23.5	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0
MTBE	N	ug/kg	10	< 10.0	< 10.0	< 10.0
TPH CWG						
>C5-C6 Aliphatic	N	mg/kg	0.01	0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	1.3	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	86.8	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	6.4	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	0.02	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	4.7	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	75.2	< 1.0	4.1
>C35-C40 Aromatic	N	mg/kg	1	9.3	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	184	< 1.0	4.1

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Results Summary

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Report No.: 17-10911

ELAB Reference	90836	90845	90848	90849	90851	90855
Customer Reference						
Sample ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP2	TP4	TP5	TP5	TP6	TP7
Sample Depth (m)	0.60	1.20 - 1.40	0.40	1.20	0.40	0.40
Sampling Date	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD						
VOC									
Heptane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Octane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Nonane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Benzene	M	ug/kg	10	^ < 10.0	^ 90.1	< 10.0	< 10.0	< 10.0	23.5
Toluene	M	ug/kg	10	^ < 10.0	^ 28.4	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
m-p-xylene	M	ug/kg	10	^ < 10.0	^ 12.4	< 10.0	< 10.0	< 10.0	< 10.0
o-xylene	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
cis-1,2-dichloroethene	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1-Dichloroethane	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Chloroform	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Tetrachloromethane	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1,1-Trichloroethane	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Trichloroethylene	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Tetrachloroethylene	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1,1,2-Tetrachloroethane	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1,2,2-Tetrachloroethane	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Chlorobenzene	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bromobenzene	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bromodichloromethane	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Methylethylbenzene	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1-Dichloro-1-propene	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Trans - 1-2 -dichloroethylene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
2,2-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	10.1
Bromochloromethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dichloroethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Dibromomethane	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dichloropropane	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
cis-1,3-Dichloro-1-propene	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
trans-1,3-Dichloro-1-propene	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,1,2-Trichloroethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Dibromochloromethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,3-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-dibromoethane	M	ug/kg	10	^ < 10.0	^ < 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Styrene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Propylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
2-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2,4-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
4-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
t-butylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,3,5-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1-methylpropylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
o-cymene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,3-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Butylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dibromo-3-chloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Hexachlorobutadiene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2,3-Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Naphthalene	N	ug/kg	10	< 10.0	824	< 10.0	< 10.0	< 10.0	< 10.0
1,2,4-Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,4-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
1,2-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Bromoform	N	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

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Results Summary

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Report No.: 17-10911

ELAB Reference	90858
Customer Reference	
Sample ID	
Sample Type	SOIL
Sample Location	TP8
Sample Depth (m)	1.00
Sampling Date	24/02/2017

Determinand	Codes	Units	LOD	
VOC				
Heptane	N	ug/kg	10	< 10.0
Octane	N	ug/kg	10	< 10.0
Nonane	N	ug/kg	10	< 10.0
Benzene	M	ug/kg	10	< 10.0
Toluene	M	ug/kg	10	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0
m+p-xylene	M	ug/kg	10	< 10.0
o-xylene	M	ug/kg	10	< 10.0
cis-1,2-dichloroethene	M	ug/kg	10	< 10.0
1,1-Dichloroethane	M	ug/kg	10	< 10.0
Chloroform	M	ug/kg	10	< 10.0
Tetrachloromethane	M	ug/kg	10	< 10.0
1,1,1-Trichloroethane	M	ug/kg	10	< 10.0
Trichloroethylene	M	ug/kg	10	< 10.0
Tetrachloroethylene	M	ug/kg	10	< 10.0
1,1,1,2-Tetrachloroethane	M	ug/kg	10	< 10.0
1,1,2,2-Tetrachloroethane	M	ug/kg	10	< 10.0
Chlorobenzene	M	ug/kg	10	< 10.0
Bromobenzene	M	ug/kg	10	< 10.0
Bromodichloromethane	M	ug/kg	10	< 10.0
Methylethylbenzene	M	ug/kg	10	< 10.0
1,1-Dichloro-1-propene	M	ug/kg	10	< 10.0
Trans - 1,2 -dichloroethylene	N	ug/kg	10	< 10.0
2,2-Dichloropropane	N	ug/kg	10	< 10.0
Bromochloromethane	N	ug/kg	10	< 10.0
1,2-Dichloroethane	N	ug/kg	10	< 10.0
Dibromomethane	M	ug/kg	10	< 10.0
1,2-Dichloropropane	M	ug/kg	10	< 10.0
cis-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0
trans-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0
1,1,2-Trichloroethane	N	ug/kg	10	< 10.0
Dibromochloromethane	N	ug/kg	10	< 10.0
1,3-Dichloropropane	N	ug/kg	10	< 10.0
1,2-dibromoethane	M	ug/kg	10	< 10.0
Styrene	N	ug/kg	10	< 10.0
Propylbenzene	N	ug/kg	10	< 10.0
2-Chlorotoluene	N	ug/kg	10	< 10.0
1,2,4-Trimethylbenzene	N	ug/kg	10	< 10.0
4-Chlorotoluene	N	ug/kg	10	< 10.0
t-butylbenzene	N	ug/kg	10	< 10.0
1,3,5-Trimethylbenzene	N	ug/kg	10	< 10.0
1-methylpropylbenzene	N	ug/kg	10	< 10.0
o-cymene	N	ug/kg	10	< 10.0
1,3-Dichlorobenzene	N	ug/kg	10	< 10.0
Butylbenzene	N	ug/kg	10	< 10.0
1,2-Dibromo-3-chloropropane	N	ug/kg	10	< 10.0
Hexachlorobutadiene	N	ug/kg	10	< 10.0
1,2,3-Trichlorobenzene	N	ug/kg	10	< 10.0
Naphthalene	N	ug/kg	10	< 10.0
1,2,4-Trichlorobenzene	N	ug/kg	10	< 10.0
1,4-Dichlorobenzene	N	ug/kg	10	< 10.0
1,2-Dichlorobenzene	N	ug/kg	10	< 10.0
Bromoform	N	ug/kg	10	< 10.0

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Results Summary

2683

Report No.: 17-10911

ELAB Reference	90836	90848	90849	90851	90855	90858
Customer Reference						
Sample ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP2	TP5	TP5	TP6	TP7	TP8
Sample Depth (m)	0.60	0.40	1.20	0.40	0.40	1.00
Sampling Date	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD						
SVOC									
Phenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.01	< 0.01
Aniline	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bis(2-chloroethyl)ether	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2-Chlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-Dichlorobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,4-Dichlorobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzyl Alcohol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-Dichlorobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2-Methylphenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bis(2-chloroisopropyl)ether	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
3 and 4-methylphenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	0.05	< 0.01	< 0.01
N-Nitrosodi-n-propylamine	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachloroethane	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Isophorone	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2-Nitrophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dimethylphenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01
Bis(2-chloroethoxy)methane	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3,5-Trichlorobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	N	mg/kg	0.01	0.14	0.16	0.01	0.80	0.45	0.03
3-Chloroaniline	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachloro-1,3-butadiene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
4-Chloro-3-methylphenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2-Methylnaphthalene	N	mg/kg	0.01	0.05	0.08	< 0.01	0.49	0.36	< 0.01
1-Methylnaphthalene	N	mg/kg	0.01	0.05	0.06	< 0.01	0.39	0.29	< 0.01
Hexachlorocyclopentadiene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4,6-Trichlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4,5-Trichlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1-Chloronaphthalene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2-Nitroaniline	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,4-Dinitrobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dimethyl phthalate	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1-3-dinitrobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,6-dinitrotoluene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	N	mg/kg	0.01	0.29	0.21	< 0.01	0.68	1.02	0.05
1,2-Dinitrobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
3-Nitroaniline	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	N	mg/kg	0.01	0.18	0.03	< 0.01	0.12	0.12	< 0.01
4-nitrophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzofuran	N	mg/kg	0.01	0.10	0.07	< 0.01	0.53	0.21	< 0.01
2,3,5,6-Tetrachlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,3,4,6-Tetrachlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Diethyl phthalate	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1-chloro-4-phenoxybenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	N	mg/kg	0.01	0.16	0.07	< 0.01	0.62	0.13	< 0.01
4-Nitroaniline	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dinitro-o-cresol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Diphenylamine	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1-bromo-4-phenoxybenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pentachlorophenol	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

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Results Summary

2683

Report No.: 17-10911

ELAB Reference	90836	90848	90849	90851	90855	90858
Customer Reference						
Sample ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP2	TP5	TP5	TP6	TP7	TP8
Sample Depth (m)	0.60	0.40	1.20	0.40	0.40	1.00
Sampling Date	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD						
SVOC									
Phenanthrene	N	mg/kg	0.01	1.61	1.59	< 0.01	7.26	5.67	0.03
Anthracene	N	mg/kg	0.01	0.42	0.26	< 0.01	1.50	0.75	0.02
Carbazole	N	mg/kg	0.01	0.09	0.19	< 0.01	0.81	0.31	< 0.01
Dibutyl phthalate	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	N	mg/kg	0.01	4.88	5.64	0.04	16.2	10.4	0.10
Pyrene	N	mg/kg	0.01	4.34	4.91	0.04	12.6	11.9	0.12
Butyl benzyl phthalate	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bis-2-ethylhexyladipate	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	N	mg/kg	0.01	2.10	2.42	0.02	7.21	6.39	< 0.01
Chrysene	N	mg/kg	0.01	2.32	2.92	0.02	8.74	8.90	< 0.01
Bis(2-ethylhexyl)phthalate	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	N	mg/kg	0.01	1.89	3.10	0.01	9.23	7.88	0.10
Benzo(k)fluoranthene	N	mg/kg	0.01	2.19	2.64	0.02	7.01	6.71	0.08
Benzo(a)pyrene	N	mg/kg	0.01	2.79	2.88	< 0.01	8.59	8.45	0.12
Indeno(1,2,3-cd)pyrene	N	mg/kg	0.01	1.56	1.91	< 0.01	5.23	6.12	0.08
Dibenz(ah)anthracene	N	mg/kg	0.01	0.63	0.72	< 0.01	2.16	2.23	< 0.01
Benzo(g,h,i)perylene	N	mg/kg	0.01	1.88	2.32	< 0.01	5.66	7.20	0.13

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Results Summary

2683

Report No.: 17-10911

ELAB Reference	90834	90841
Customer Reference		
Sample ID		
Sample Type	WATER	WATER
Sample Location	TP1	TP3
Sample Depth (m)	2.40	3.00
Sampling Date	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD		
Dissolved Metals					
Arsenic	U	ug/l	5	< 5	< 5
Boron	N	ug/l	5	91	100
Cadmium	U	ug/l	1	< 1	< 1
Chromium	U	ug/l	5	< 5	< 5
Copper	U	ug/l	5	< 5	< 5
Mercury	U	ug/l	0.1	< 0.1	< 0.1
Nickel	U	ug/l	5	< 5	< 5
Lead	U	ug/l	1	< 1	< 1
Selenium	U	ug/l	5	< 5	< 5
Zinc	U	ug/l	5	< 5	< 5
Inorganics					
Hexavalent Chromium	U	ug/l	100	< 100	< 100
Miscellaneous					
pH	U	pH units	0.1	7.4	7.2
Polyaromatic hydrocarbons					
Naphthalene GCMS	N	ug/l	0.01	0.26	0.06
Acenaphthylene GCMS	N	ug/l	0.01	0.61	0.15
Acenaphthene GCMS	N	ug/l	0.01	0.11	0.01
Fluorene GCMS	N	ug/l	0.01	0.17	< 0.01
Phenanthrene GCMS	N	ug/l	0.01	2.06	0.04
Anthracene GCMS	N	ug/l	0.01	0.87	0.02
Fluoranthene GCMS	N	ug/l	0.01	6.26	0.05
Pyrene GCMS	N	ug/l	0.01	5.57	0.05
Benzo (a) anthracene GCMS	N	ug/l	0.01	5.09	0.03
Chrysene GCMS	N	ug/l	0.01	3.21	0.03
Benzo (b) fluoranthene GCMS	N	ug/l	0.01	4.96	0.04
Benzo (k) fluoranthene GCMS	N	ug/l	0.01	3.78	0.01
Benzo (a) pyrene GCMS	N	ug/l	0.01	6.60	0.04
Indeno (1,2,3-cd) pyrene GCMS	N	ug/l	0.01	3.57	0.02
Dibenzo(a,h)anthracene GCMS	N	ug/l	0.01	1.11	< 0.01
Benzo(ghi)perylene GCMS	N	ug/l	0.01	3.35	0.02
Total PAH(16) GCMS	N	ug/l	0.01	47.6	0.59



Results Summary

2683

Report No.: 17-10911

ELAB Reference	90834	90841
Customer Reference		
Sample ID		
Sample Type	WATER	WATER
Sample Location	TP1	TP3
Sample Depth (m)	2.40	3.00
Sampling Date	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD		
BTEX					
Benzene	U	ug/l	1	< 1.00	< 1.00
Toluene	U	ug/l	1	< 1.00	< 1.00
Ethylbenzene	U	ug/l	1	< 1.00	< 1.00
Xylenes	U	ug/l	1	< 1.00	< 1.00
MTBE	U	ug/l	1	< 1.00	< 1.00
TPH CWG					
>C5-C6 Aliphatic	N	ug/l	1	< 1.0	< 1.0
>C6-C8 Aliphatic	N	ug/l	1	< 1.0	< 1.0
>C8-C10 Aliphatic	N	ug/l	5	< 5.0	< 5.0
>C10-C12 Aliphatic	N	ug/l	5	< 5.0	< 5.0
>C12-C16 Aliphatic	N	ug/l	5	< 5.0	< 5.0
>C16-C21 Aliphatic	N	ug/l	5	5.2	< 5.0
>C21-C35 Aliphatic	N	ug/l	5	10.8	5.8
>C35-C40 Aliphatic	N	ug/l	5	< 5.0	< 5.0
Total (>C5-C40) Aliphatic	N	ug/l	5	16.0	5.8
>C5-C7 Aromatic	N	ug/l	1	< 1.0	< 1.0
>C7-C8 Aromatic	N	ug/l	1	< 1.0	< 1.0
>C8-C10 Aromatic	N	ug/l	5	< 5.0	< 5.0
>C10-C12 Aromatic	N	ug/l	5	< 5.0	< 5.0
>C12-C16 Aromatic	N	ug/l	5	< 5.0	< 5.0
>C16-C21 Aromatic	N	ug/l	5	6.4	6.1
>C21-C35 Aromatic	N	ug/l	5	11.6	< 5.0
>C35-C40 Aromatic	N	ug/l	5	< 5.0	< 5.0
Total (>C5-C40) Aromatic	N	ug/l	5	18.0	6.1
Total (>C5-C40) Ali/Aro	N	ug/l	5	34.0	11.9

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Results Summary

2683

Report No.: 17-10911

ELAB Reference:	90834	90841
Customer Reference:		
Sample ID:		
Sample Type:	WATER	WATER
Sample Location:	TP1	TP3
Sample Depth (m):	2.40	3.00
Sampling Date:	24/02/2017	24/02/2017

Determinand	Codes	Units	LOD		
VOC					
MTBE	U	ug/l	1	< 1	< 1
Heptane	N	ug/l	1	< 1	< 1
Octane	N	ug/l	1	< 1	< 1
Nonane	N	ug/l	1	< 1	< 1
Benzene	U	ug/l	1	< 1	< 1
Toluene	U	ug/l	1	< 1	< 1
Ethylbenzene	U	ug/l	1	< 1	< 1
m+p-xylene	U	ug/l	1	< 1	< 1
o-xylene	U	ug/l	1	< 1	< 1
cis-1,2-dichloroethene	U	ug/l	1	< 1	< 1
1,1-Dichloroethane	U	ug/l	1	< 1	< 1
Chloroform	U	ug/l	1	< 1	< 1
Tetrachloromethane	U	ug/l	1	< 1	< 1
1,1,1-Trichloroethane	U	ug/l	1	< 1	< 1
Trichloroethylene	N	ug/l	1	< 1	< 1
Tetrachloroethylene	U	ug/l	1	< 1	< 1
1,1,1,2-Tetrachloroethane	U	ug/l	1	< 1	< 1
1,1,2,2-Tetrachloroethane	N	ug/l	1	< 1	< 1
Chlorobenzene	U	ug/l	1	< 1	< 1
Bromobenzene	U	ug/l	1	< 1	< 1
Bromodichloromethane	U	ug/l	1	< 1	< 1
Methylethylbenzene	U	ug/l	1	< 1	< 1
1,1-Dichloro-1-propene	U	ug/l	1	< 1	< 1
Trans - 1,2 - dichloroethylene	U	ug/l	1	< 1	< 1
2,2-Dichloropropane	N	ug/l	1	< 1	< 1
Bromochloromethane	N	ug/l	1	< 1	< 1
1,2-Dichloroethane	U	ug/l	1	< 1	< 1
Dibromomethane	U	ug/l	1	< 1	< 1
1,2-Dichloropropane	U	ug/l	1	< 1	< 1
cis-1,3-Dichloro-1-propene	U	ug/l	1	< 1	< 1
trans-1,3-Dichloro-1-propene	U	ug/l	1	< 1	< 1
1,1,2-Trichloroethane	U	ug/l	1	< 1	< 1
Dibromochloromethane	U	ug/l	1	< 1	< 1
1,3-Dichloropropane	U	ug/l	1	< 1	< 1
Dibromooethane	U	ug/l	1	< 1	< 1
Styrene	U	ug/l	1	< 1	< 1
Propylbenzene	U	ug/l	1	< 1	< 1
2-Chlorotoluene	U	ug/l	1	< 1	< 1
1,2,4-Trimethylbenzene	U	ug/l	1	< 1	< 1
4-Chlorotoluene	U	ug/l	1	< 1	< 1
i-butylbenzene	U	ug/l	1	< 1	< 1
1,3,5-Trimethylbenzene	U	ug/l	1	< 1	< 1
1-methylpropylbenzene	U	ug/l	1	< 1	< 1
o-cymene	U	ug/l	1	< 1	< 1
1,3-Dichlorobenzene	U	ug/l	1	< 1	< 1
Butylbenzene	U	ug/l	1	< 1	< 1
1,2-Dibromo-3-chloropropane	U	ug/l	1	< 1	< 1
Hexachlorobutadiene	U	ug/l	1	< 1	< 1
1,2,3-Trichlorobenzene	U	ug/l	1	< 1	< 1
Naphthalene	U	ug/l	1	< 1	< 1
1,2,4-Trichlorobenzene	U	ug/l	1	< 1	< 1
1,4-Dichlorobenzene	U	ug/l	1	< 1	< 1
1,2-Dichlorobenzene	U	ug/l	1	< 1	< 1
Bromoform	U	ug/l	1	< 1	< 1

Results Summary

Report No.: 17-10911

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
90829	0.50	TP SP1	Brown soil, stones, glass, brick	No asbestos detected	n/t	n/t	n/t	n/t
90830	1.00	TP SP2	Brown soil, stones	Chrysotile (Cement fragments)	n/t	n/t	n/t	n/t
90831	1.00	TP1	Brown soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
90835	0.10	TP2	Brown soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
90839	0.10	TP3	Brown soil, brick, clinker, stones	No asbestos detected	n/t	n/t	n/t	n/t
90842	0.00 - 0.05	TP4	Brown soil, stones, glass	Chrysotile (Cement fragments)	n/t	n/t	n/t	n/t
90847	0.10	TP5	Brown soil, stones, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
90851	0.40	TP6	Brown soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
90853	0.00	TP7	Cement fragments	Chrysotile	n/t	n/t	n/t	n/t
90854	0.00 - 0.20	TP7	Brown soil, brick, stones	No asbestos detected	n/t	n/t	n/t	n/t
90857	0.10	TP8	Brown soil	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 17-10911

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Hexavalent chromium	N	As submitted sample	02/03/2017	110	Colorimetry
pH	M	Air dried sample	03/03/2017	113	Electromeric
Aqua regia extractable metals	M	Air dried sample	02/03/2017	118	ICPMS
PAH (GC-FID)	M	As submitted sample	02/03/2017	133	GC-FID
SVOC in solids	N	As submitted sample	02/03/2017	167	GC-MS
Water soluble anions	M	Air dried sample	02/03/2017	172	Ion Chromatography
VOC in solids	M	As submitted sample	02/03/2017	181	GC-MS
BTEX in solids	M	As submitted sample	03/03/2017	181A	GC-MS
Water soluble boron	N	Air dried sample	02/03/2017	202	Colorimetry
Aliphatic hydrocarbons in soil	N	As submitted sample	02/03/2017	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	06/03/2017	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	02/03/2017	214	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	03/03/2017	214	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	03/03/2017	214	GC-MS
Soil organic matter	U	Air dried sample	03/03/2017	BS1377:P3	Titrimetry
Asbestos identification	U	As submitted sample	02/03/2017	PMAN	Microscopy
Water					
Aliphatic/Aromatic hydrocarbons in water	N		03/03/2017		GC-FID
Aromatic hydrocarbons in water	N		03/03/2017		GC-FID
Dissolved metals by ICP in waters	U		02/03/2017	101	ICPMS
pH of waters	U		02/03/2017	113	Electromeric
Chromium Hexavalent in waters	U		03/03/2017	123	Colorimetry
PAHs and/or PCBs in waters	N		02/03/2017	135	GC-MS
VOC in waters	U		02/03/2017	200	GC-MS
BTEX in waters	U		03/03/2017	200A	GC-MS
Aliphatic hydrocarbons in water	N		02/03/2017	215	GC-FID
Aromatic hydrocarbons in water	N		02/03/2017	215	GC-FID
Low range Aliphatic hydrocarbons water	N		03/03/2017	215	GC-MS
Low range Aromatic hydrocarbons water	N		03/03/2017	215	GC-MS

Tests marked N are not UKAS accredited



Report Information

Report No.: 17-10911

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C)

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage



2683

Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY



THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 17-10912

Issue: 2

Date of Issue: 07/03/2017

Contact: Alistair Tyler

Customer Details: Ground Management Ltd
Robin Hill Farm
Clay Lane
Chichester
West Sussex PO18 8AN

Quotation No: Q16-00620

Order No: G6308

Customer Reference: G6308

Date Received: 28/02/2017

Date Approved: 07/03/2017

Details: land at Kings Close Yapton

Approved by:



John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)



Sample Summary

Report No.: 17-10912

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
90860	TP8 3.20	24/02/2017	28/02/2017	Silty clayey loam + Chalk	
90861	TP8 3.20	24/02/2017	28/02/2017		



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Results Summary

Report No.: 17-10912

ELAB Reference	90860
Customer Reference	
Sample ID	
Sample Type	SOIL
Sample Location	TP8
Sample Depth (m)	3.20
Sampling Date	24/02/2017

Determinand	Codes	Units	LOD	
Metals				
Arsenic	M	mg/kg	1	^ 4.9
Cadmium	M	mg/kg	0.5	^ < 0.5
Chromium	M	mg/kg	5	^ 16.6
Copper	M	mg/kg	5	^ 14.5
Lead	M	mg/kg	5	^ 11.7
Mercury	M	mg/kg	0.5	^ < 0.5
Nickel	M	mg/kg	5	^ 11.9
Selenium	M	mg/kg	1	^ < 1.0
Zinc	M	mg/kg	5	^ 33.0
Inorganics				
Hexavalent Chromium	N	mg/kg	0.8	< 0.8
Water Soluble Boron	N	mg/kg	0.5	< 0.5
Miscellaneous				
pH	M	pH units	0.1	^ 8.7
Soil Organic Matter	U	%	0.1	0.3
Polyaromatic hydrocarbons				
Naphthalene	M	mg/kg	0.1	^ < 0.1
Acenaphthylene	M	mg/kg	0.1	^ < 0.1
Acenaphthene	M	mg/kg	0.1	^ < 0.1
Fluorene	M	mg/kg	0.1	^ < 0.1
Phenanthrene	M	mg/kg	0.1	^ < 0.1
Anthracene	M	mg/kg	0.1	^ < 0.1
Fluoranthene	M	mg/kg	0.1	^ < 0.1
Pyrene	M	mg/kg	0.1	^ < 0.1
Benzo(a)anthracene	M	mg/kg	0.1	^ < 0.1
Chrysene	M	mg/kg	0.1	^ < 0.1
Benzo (b) fluoranthene	M	mg/kg	0.1	^ < 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	^ < 0.1
Benzo (a) pyrene	M	mg/kg	0.1	^ < 0.1
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	^ < 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	^ < 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	^ < 0.1
Total PAH(16)	M	mg/kg	0.4	^ < 0.4



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Results Summary

Report No.: 17-10912

ELAB Reference	90860
Customer Reference	
Sample ID	
Sample Type	SOIL
Sample Location	TP8
Sample Depth (m)	3.20
Sampling Date	24/02/2017

Determinand	Codes	Units	LOD	
BTEX				
Benzene	M	ug/kg	10	[^] < 10.0
Toluene	M	ug/kg	10	[^] 38.9
Ethylbenzene	M	ug/kg	10	[^] 50.2
Xylenes	M	ug/kg	10	[^] 1100
MTBE	N	ug/kg	10	< 10.0
TPH CWG				
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	0.04
>C8-C10 Aromatic	N	mg/kg	1	1.2
>C10-C12 Aromatic	N	mg/kg	1	1.9
>C12-C16 Aromatic	N	mg/kg	1	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	3.1



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Results Summary

Report No.: 17-10912

ELAB Reference	90860
Customer Reference	
Sample ID	
Sample Type	SOIL
Sample Location	TP8
Sample Depth (m)	3.20
Sampling Date	24/02/2017

Determinand	Codes	Units	LOD	
VOC				
Heptane	N	ug/kg	10	< 10.0
Octane	N	ug/kg	10	< 10.0
Nonane	N	ug/kg	10	42.5
Benzene	M	ug/kg	10	^ < 10.0
Toluene	M	ug/kg	10	^ 38.9
Ethylbenzene	M	ug/kg	10	^ 50.2
m+p-xylene	M	ug/kg	10	^ 542
o-xylene	M	ug/kg	10	^ 560
cis-1,2-dichloroethene	M	ug/kg	10	^ < 10.0
1,1-Dichloroethane	M	ug/kg	10	^ < 10.0
Chloroform	M	ug/kg	10	^ < 10.0
Tetrachloromethane	M	ug/kg	10	^ < 10.0
1,1,1-Trichloroethane	M	ug/kg	10	^ < 10.0
Trichloroethylene	M	ug/kg	10	^ < 10.0
Tetrachloroethylene	M	ug/kg	10	^ < 10.0
1,1,1,2-Tetrachloroethane	M	ug/kg	10	^ < 10.0
1,1,2,2-Tetrachloroethane	M	ug/kg	10	^ < 10.0
Chlorobenzene	M	ug/kg	10	^ < 10.0
Bromobenzene	M	ug/kg	10	^ < 10.0
Bromodichloromethane	M	ug/kg	10	^ < 10.0
Methylethylbenzene	M	ug/kg	10	^ 32.7
1,1-Dichloro-1-propene	M	ug/kg	10	^ < 10.0
Trans - 1,2 -dichloroethylene	N	ug/kg	10	< 10.0
2,2-Dichloropropane	N	ug/kg	10	< 10.0
Bromochloromethane	N	ug/kg	10	< 10.0
1,2-Dichloroethane	N	ug/kg	10	< 10.0
Dibromomethane	M	ug/kg	10	^ < 10.0
1,2-Dichloropropane	M	ug/kg	10	^ < 10.0
cis-1,3-Dichloro-1-propene	M	ug/kg	10	^ < 10.0
trans-1,3-Dichloro-1-propene	M	ug/kg	10	^ < 10.0
1,1,2-Trichloroethane	N	ug/kg	10	< 10.0
Dibromochloromethane	N	ug/kg	10	< 10.0
1,3-Dichloropropane	N	ug/kg	10	< 10.0
1,2-dibromoethane	M	ug/kg	10	^ < 10.0
Styrene	N	ug/kg	10	< 10.0
Propylbenzene	N	ug/kg	10	81.1
2-Chlorotoluene	N	ug/kg	10	< 10.0
1,2,4-Trimethylbenzene	N	ug/kg	10	32.7
4-Chlorotoluene	N	ug/kg	10	< 10.0
t-butylbenzene	N	ug/kg	10	< 10.0
1,3,5-Trimethylbenzene	N	ug/kg	10	920
1-methylpropylbenzene	N	ug/kg	10	< 10.0
o-cymene	N	ug/kg	10	14.1
1,3-Dichlorobenzene	N	ug/kg	10	< 10.0
Butylbenzene	N	ug/kg	10	22.8
1,2-Dibromo-3-chloropropane	N	ug/kg	10	< 10.0
Hexachlorobutadiene	N	ug/kg	10	< 10.0
1,2,3-Trichlorobenzene	N	ug/kg	10	< 10.0
Naphthalene	N	ug/kg	10	60500
1,2,4-Trichlorobenzene	N	ug/kg	10	< 10.0
1,4-Dichlorobenzene	N	ug/kg	10	< 10.0
1,2-Dichlorobenzene	N	ug/kg	10	< 10.0
Bromoform	N	ug/kg	10	< 10.0

Tests marked N are not UKAS accredited.

The Environmental Laboratory Ltd. Reg. No. 3882193



Results Summary

Report No.: 17-10912

ELAB Reference	90861
Customer Reference	
Sample ID	
Sample Type	WATER
Sample Location	TP8
Sample Depth (m)	3.20
Sampling Date	24/02/2017

Determinand	Codes	Units	LOD	
Dissolved Metals				
Arsenic	U	ug/l	5	< 5
Boron	N	ug/l	5	79
Cadmium	U	ug/l	1	< 1
Chromium	U	ug/l	5	< 5
Copper	U	ug/l	5	< 5
Mercury	U	ug/l	0.1	< 0.1
Nickel	U	ug/l	5	< 5
Lead	U	ug/l	1	< 1
Selenium	U	ug/l	5	< 5
Zinc	U	ug/l	5	< 5
Inorganics				
Hexavalent Chromium	U	ug/l	100	< 100
Miscellaneous				
pH	U	pH units	0.1	7.2
Polyaromatic hydrocarbons				
Naphthalene GCMS	N	ug/l	0.01	9740
Acenaphthylene GCMS	N	ug/l	0.01	192
Acenaphthene GCMS	N	ug/l	0.01	106
Fluorene GCMS	N	ug/l	0.01	220
Phenanthrene GCMS	N	ug/l	0.01	717
Anthracene GCMS	N	ug/l	0.01	134
Fluoranthene GCMS	N	ug/l	0.01	207
Pyrene GCMS	N	ug/l	0.01	236
Benzo (a) anthracene GCMS	N	ug/l	0.01	74.9
Chrysene GCMS	N	ug/l	0.01	93.5
Benzo (b) fluoranthene GCMS	N	ug/l	0.01	38.7
Benzo (k) fluoranthene GCMS	N	ug/l	0.01	59.6
Benzo (a) pyrene GCMS	N	ug/l	0.01	77.3
Indeno (1,2,3-cd) pyrene GCMS	N	ug/l	0.01	37.8
Dibenzo(a,h)anthracene GCMS	N	ug/l	0.01	16.3
Benzo(ghi)perylene GCMS	N	ug/l	0.01	49.8
Total PAH(16) GCMS	N	ug/l	0.01	12000



Results Summary

Report No.: 17-10912

ELAB Reference	90861
Customer Reference	
Sample ID	
Sample Type	WATER
Sample Location	TP8
Sample Depth (m)	3.20
Sampling Date	24/02/2017

Determinand	Codes	Units	LOD	
BTEX				
Benzene	U	ug/l	1	< 1.00
Toluene	U	ug/l	1	4.02
Ethylbenzene	U	ug/l	1	3.45
Xylenes	U	ug/l	1	134
MTBE	U	ug/l	1	< 1.00
TPH CWG				
>C5-C6 Aliphatic	N	ug/l	1	< 1.0
>C6-C8 Aliphatic	N	ug/l	1	< 1.0
>C8-C10 Aliphatic	N	ug/l	5	6.7
>C10-C12 Aliphatic	N	ug/l	5	48.8
>C12-C16 Aliphatic	N	ug/l	5	49.8
>C16-C21 Aliphatic	N	ug/l	5	59.9
>C21-C35 Aliphatic	N	ug/l	5	49.8
>C35-C40 Aliphatic	N	ug/l	5	< 5.0
Total (>C5-C40) Aliphatic	N	ug/l	5	215
>C5-C7 Aromatic	N	ug/l	1	< 1.0
>C7-C8 Aromatic	N	ug/l	1	4.0
>C8-C10 Aromatic	N	ug/l	5	638
>C10-C12 Aromatic	N	ug/l	5	3270
>C12-C16 Aromatic	N	ug/l	5	2620
>C16-C21 Aromatic	N	ug/l	5	882
>C21-C35 Aromatic	N	ug/l	5	603
>C35-C40 Aromatic	N	ug/l	5	< 5.0
Total (>C5-C40) Aromatic	N	ug/l	5	8010
Total (>C5-C40) Ali/Aro	N	ug/l	5	8230
Total Petroleum Hydrocarbons				
TPH Fingerprint	N	n/a	0	typical of coal tar

Results Summary

Report No.: 17-10912

ELAB Reference	90861
Customer Reference	
Sample ID	
Sample Type	WATER
Sample Location	TP8
Sample Depth (m)	3.20
Sampling Date	24/02/2017

Determinand	Codes	Units	LOD	
VOC				
MTBE	U	ug/l	1	< 1
Heptane	N	ug/l	1	< 1
Octane	N	ug/l	1	< 1
Nonane	N	ug/l	1	< 1
Benzene	U	ug/l	1	< 1
Toluene	U	ug/l	1	4
Ethylbenzene	U	ug/l	1	3
m+p-xylene	U	ug/l	1	48
o-xylene	U	ug/l	1	86
cis-1,2-dichloroethene	U	ug/l	1	< 1
1,1-Dichloroethane	U	ug/l	1	< 1
Chloroform	U	ug/l	1	< 1
Tetrachloromethane	U	ug/l	1	< 1
1,1,1-Trichloroethane	U	ug/l	1	< 1
Trichloroethylene	N	ug/l	1	< 1
Tetrachloroethylene	U	ug/l	1	< 1
1,1,1,2-Tetrachloroethane	U	ug/l	1	< 1
1,1,2,2-Tetrachloroetha	N	ug/l	1	< 1
Chlorobenzene	U	ug/l	1	< 1
Bromobenzene	U	ug/l	1	< 1
Bromodichloromethane	U	ug/l	1	< 1
Methylethylbenzene	U	ug/l	1	9
1,1-Dichloro-1-propene	U	ug/l	1	< 1
Trans - 1,2 -dichloroethylene	U	ug/l	1	< 1
2,2-Dichloropropane	N	ug/l	1	< 1
Bromochloromethane	N	ug/l	1	< 1
1,2-Dichloroethane	U	ug/l	1	< 1
Dibromomethane	U	ug/l	1	< 1
1,2-Dichloropropane	U	ug/l	1	< 1
cis-1,3-Dichloro-1-propene	U	ug/l	1	< 1
trans-1,3-Dichloro-1-propene	U	ug/l	1	< 1
1,1,2-Trichloroethane	U	ug/l	1	< 1
Dibromochloromethane	U	ug/l	1	< 1
1,3-Dichloropropane	U	ug/l	1	< 1
Dibromoethane	U	ug/l	1	< 1
Styrene	U	ug/l	1	4
Propylbenzene	U	ug/l	1	7
2-Chlorotoluene	U	ug/l	1	< 1
1,2,4-Trimethylbenzene	U	ug/l	1	9
4-Chlorotoluene	U	ug/l	1	< 1
t-butylbenzene	U	ug/l	1	< 1
1,3,5-Trimethylbenzene	U	ug/l	1	92
1-methylpropylbenzene	U	ug/l	1	< 1
o-cymene	U	ug/l	1	2
1,3-Dichlorobenzene	U	ug/l	1	< 1
Butylbenzene	U	ug/l	1	2
1,2-Dibromo-3-chloropropane	U	ug/l	1	< 1
Hexachlorobutadiene	U	ug/l	1	< 1
1,2,3-Trichlorobenzene	U	ug/l	1	< 1
Naphthalene	U	ug/l	1	382
1,2,4-Trichlorobenzene	U	ug/l	1	< 1
1,4-Dichlorobenzene	U	ug/l	1	< 1
1,2-Dichlorobenzene	U	ug/l	1	< 1
Bromoform	U	ug/l	1	< 1

Method Summary

Report No.: 17-10912

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Hexavalent chromium	N	As submitted sample	02/03/2017	110	Colorimetry
pH	M	Air dried sample	03/03/2017	113	Electromeric
Aqua regia extractable metals	M	Air dried sample	02/03/2017	118	ICPMS
PAH (GC-FID)	M	As submitted sample	02/03/2017	133	GC-FID
VOC in solids	M	As submitted sample	02/03/2017	181	GC-MS
BTEX in solids	M	As submitted sample	03/03/2017	181A	GC-MS
Water soluble boron	N	Air dried sample	02/03/2017	202	Colorimetry
Aliphatic hydrocarbons in soil	N	As submitted sample	02/03/2017	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	03/03/2017	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	02/03/2017	214	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	03/03/2017	214	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	03/03/2017	214	GC-MS
Soil organic matter	U	Air dried sample	03/03/2017	BS1377:P3	Titrimetry
Water					
Aliphatic/Aromatic hydrocarbons in water	N		03/03/2017		GC-FID
Aromatic hydrocarbons in water	N		03/03/2017		GC-FID
Dissolved metals by ICP in waters	U		02/03/2017	101	ICPMS
pH of waters	U		02/03/2017	113	Electromeric
Chromium Hexavalent in waters	U		03/03/2017	123	Colorimetry
PAHs and/or PCBs in waters	N		02/03/2017	135	GC-MS
VOC in waters	U		02/03/2017	200	GC-MS
BTEX in waters	U		03/03/2017	200A	GC-MS
Aliphatic hydrocarbons in water	N		02/03/2017	215	GC-FID
Aromatic hydrocarbons in water	N		02/03/2017	215	GC-FID
Low range Aliphatic hydrocarbons water	N		03/03/2017	215	GC-MS
Low range Aromatic hydrocarbons water	N		03/03/2017	215	GC-MS

Tests marked N are not UKAS accredited



Report Information

Report No.: 17-10912

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C)

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

APPENDIX 3

Project: Land at Kings Close Yapton
Project Number: G6308 Land at Kings Close Yapton

GROUNDWATER MONITORING

Ground Management Ltd
Civil and Geotechnical Engineering Services

Robin Hill Farm, Clay Lane, Fishbourne
CHICHESTER, West Sussex PO16 8AB
Phone/Fax: 01243 575073

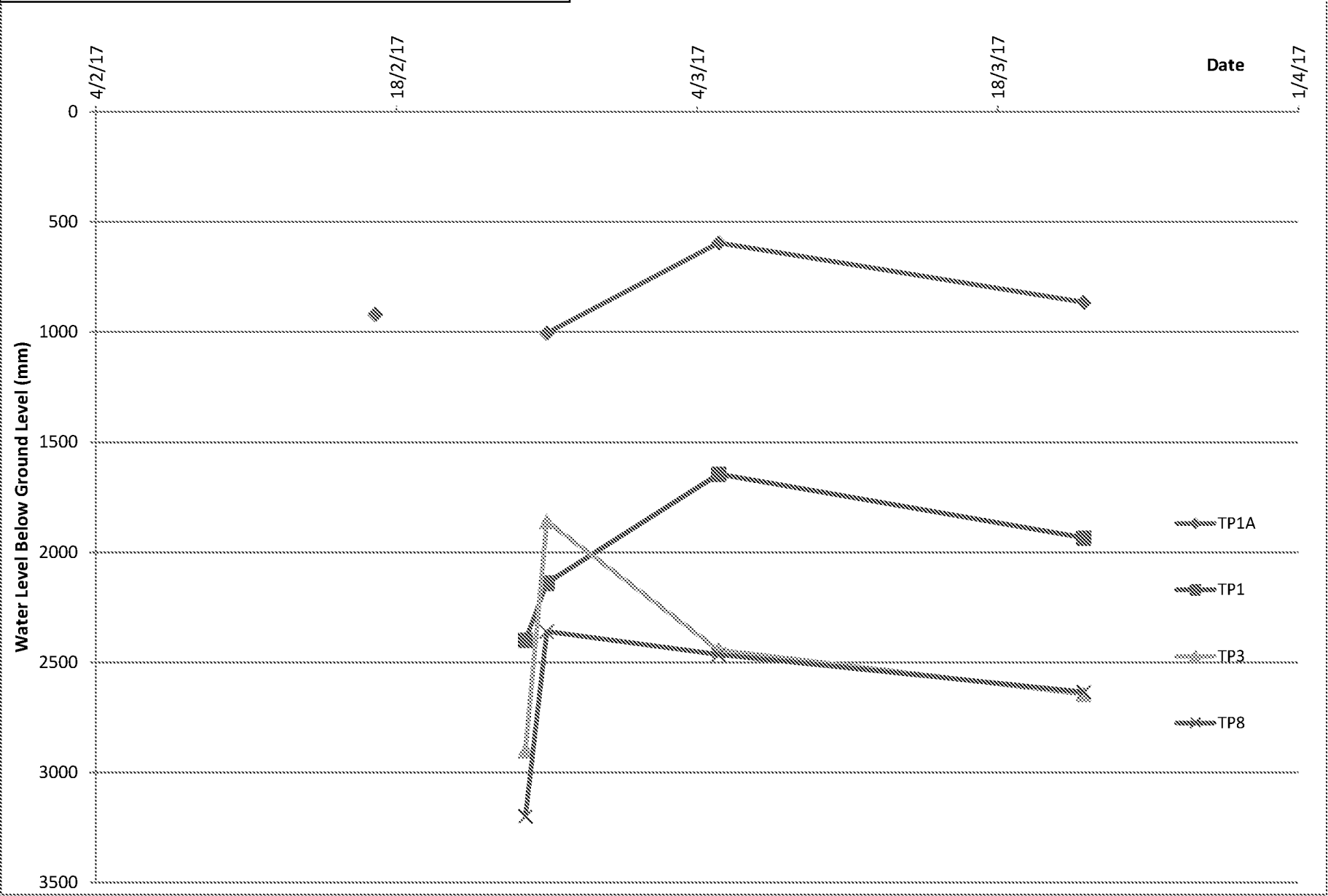
Location	Cover Upstand (mm)	Approx GL (mAOD)	GL from Levelling check			
			Topo surge	Staff Reading to GL	HPC	Level
TP1A	345	4.80	4.80	3.015		7.82 4.80
TP1	180	6.01	6.20	1.805		6.01
TP3	630	6.34	6.40	1.475		6.34
TP8	760	6.07	6.20	1.745		6.07

Date	Dip from cover level (mm)				Water level bgl (mm)				Approx Groundwater elevation (mAOD)			
	TP1A	TP1	TP3	TP8	0 TP1A	TP1	TP3	TP8	TP1A	TP1	TP3	TP8
17/02/2017	TP Obs				920				3.88			
24/02/2017		TP Obs	TP Obs	TP Obs		2400	2900	3200		3.61	3.44	2.87
25/02/2017	1350	2320	2490	3120	1005	2140	1860	2360	3.80	3.87	4.48	3.71
05/03/2017	940	1990	2790	2810	595	1645	2445	2465	4.21	4.37	3.90	3.61
22/03/2017	1210	2280	2990	2980	865	1935	2645	2635	3.94	4.08	3.70	3.44

Ground Management Ltd
Civil and Geotechnical Engineering Services

Robin Hill Farm Clay Lane Fishbourne
CHICHESTER West Sussex PO18 8AB
Phone/Fax: 01243 575073

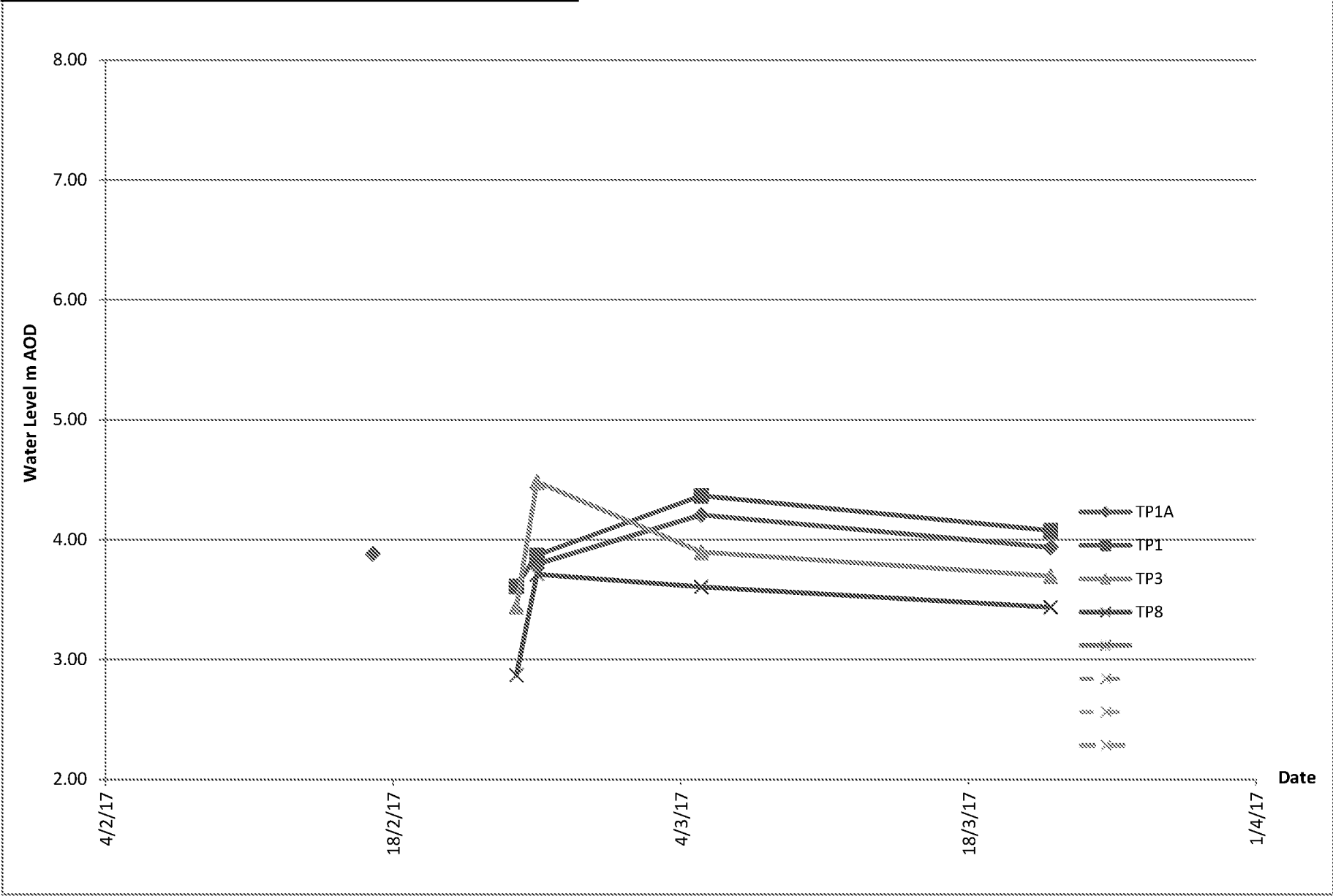
G6308 Land at Kings Close Yapton



Ground Management Ltd
Civil and Geotechnical Engineering Services

Robin Hill Farm, Clay Lane, Fishbourne
CHICHESTER, West Sussex PO18 8AB
Phone/Fax: 01243 575073

G6308 Land at Kings Close Yapton



APPENDIX 4

CRITERIA FOR IMPORTED SOILS

Potential contaminant	Criteria (mg/kg)
Arsenic	32
Cadmium	26
Chromium (III)	627
Copper	2327
Lead	210
Mercury (inorganic)	169
Nickel	130
Selenium	350
Zinc	3745
Acenaphthylene	168
Acenaphthene	205
Anthracene	2257
Benzo(a)anthracene	3.1
Benzo(a)pyrene	5.0
Benzo(b)fluoranthene	5.6
Benzo(gh)perylene	44
Benzo(k)fluoranthene	8.5
Chrysene	6.0
Dibenzo(ah)anthracene	0.76
Fluorene	163
Fluoranthene	257
Ideno(1,2,3-cd)pyrene	3.2
Naphthalene	1.5
Phenanthrene	92
Pyrene	563
TPH Aliphatic C5-C6	30
TPH Aliphatic C6-C8	73
TPH Aliphatic C8-C10	19
TPH Aliphatic C10-C12	93
TPH Aliphatic C12-C16	740
TPH Aliphatic C16-C21	45000
TPH Aliphatic C21-C35	45000
TPH Aromatic C5-C7	65
TPH Aromatic C7-C8	119
TPH Aromatic C8-C10	27
TPH Aromatic C10-C12	69
TPH Aromatic C12-C16	138
TPH Aromatic C16-C21	247
TPH Aromatic C21-C35	888
TPH Aromatic C35-C44	888
pH	5 - 8

