Planning Application for the Aylesbury Estate Regeneration

Plot 18 Reserved Matters Application

Ground Investigation Report

WSP

v1

Notting Hill Housing · Southwark Council · hta · DUGGAN MORRIS ARCHITECTS · GL Hearn Part of Capita plc · WSP · AECOM · Tamla Trees consulting arborists

AYLESBURYNOW

REPORT N^{O} 70009682

PLOT 18 AYLESBURY ESTATE PLOT 18, SOUTHWARK

GROUND INVESTIGATION REPORT

CONFIDENTIAL

DECEMBER 2015

WSP | PARSONS BRINCKERHOFF

AYLESBURY ESTATE PLOT 18

GROUND INVESTIGATION REPORT

On behalf of Notting Hill Housing Trust

Ground Investigation Report (V1.0)
Confidential

Project no: 70009682
Date: December 2015

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1 EXECUTIVE SUMMARY

WSP | Parsons Brinckerhoff (WSP) was instructed by Notting Hill Housing (the Client), to undertake a Ground Investigation Report (GIR) at Plot 18, Aylesbury Estate, Walworth, Southwark, London, SE17 2BJ (the site).

Objectives	The objectives of the ground investigation works are to develop a conceptual ground model for the site and to identify potential constraints and opportunities with respect to ground contamination and geotechnical design which may impact the proposed scheme. To partially satisfy Planning Condition 10.
Ground Investigation	WSP undertook a ground investigation comprising ten window sampling and one cable percussive borehole. Laboratory testing was conducted for chemical analysis of soil and groundwater samples. A groundwater level and ground gas monitoring programme has also been undertaken.
Environmental Conclusions and Recommendations	→ The risk to human health receptors is considered to be **LOW** to **MODERATE** on the basis of locally elevated concentrations of lead and PAHs in Made Ground and the potential for asbestos in the near surface soils. It is considered that the risk to human health receptors could be mitigated during development and this should be addressed through an outline remediation method statement; The presence of hard cover will prevent exposure to human health receptors as part of the future development; areas of soft landscaping will require the placement of a clean soil cover system of a suitable thickness. A non-woven geotextile may be required to separate the clean soil from the underlying existing ground. → The risk to controlled waters is considered to be **LOW**, no specific precautions are deemed necessary. Should shallow groundwater be encountered during development, however, further analytical testing would need to be undertaken to confirm this low risk rating; and → The risk to the built environment is considered to be **LOW**. However, this may include the design of clean service corridors (to be discussed with relevant providers) and the use of barrier pipes for potable water supply.
Geotechnical Conclusion and Recommendations	→ Assuming that the proposed development will comprise two residential blocks of up to fifteen storeys, a piled foundation solution is recommended for this development. → It is recommended that an additional geotechnical ground investigation is undertaken following the demolition and decommission of existing buildings and services. It is anticipated that these will extend to at least 40m bgl and will fully characterise the Lambeth Group and Thanet Sand Formation. → Groundwater was encountered within the Lambeth Group, at 6.5m below ground level (m bgl). Consideration towards groundwater ingress should therefore be made when considering pile design. → Made Ground is present to a maximum depth of 2.55m bgl, and was located within all exploratory boreholes which penetrated to sufficient depth. The stability

	of Made Ground should not be relied upon in excavations and does not comprise suitable engineering material. → Below ground obstructions are present across the site (refer to massing study[1]) and may comprise historic foundations. Additional obstructions are expected to be present following the demolition of the existing site buildings. → Sulphate concentrations and pH at the site indicate that concrete would need to satisfy Design Class 1 and Aggressive Chemical Environment for Concrete 2 standards.
Further Work	→ Following the demolition and decommissioning of existing site buildings and services, an additional ground investigation is recommended to fully assess the geotechnical properties of the Lambeth Group and Thanet Sand Formation. It is anticipated that this will comprise a number of boreholes extending to at least 40m bgl. → Exceedances have been found in the Made Ground with respect to lead, benzo(a)anthracene, benzo(a)pyrene and asbestos. It is recommended that an outline remediation method statement be prepared for the site (including verification plan) which will recommend the input of clean cover in areas of landscaping, the verification of basement extractions, waste classification of site won soils prior to disposal and construction of clean service corridors.

[1]Aylesbury: Plot 18 Massing and Capacity Study, Aylesbury Estate, Southwark, Notting Hill Housing HTA and Southwark Council, December 2014

2 INTRODUCTION & OBJECTIVES

2.1 AUTHORISATION

WSP| Parsons Brinckerhoff (WSP) was instructed by Notting Hill Housing Trust (the Client), to undertake a Ground Investigation Report (GIR) at Plot 18, Aylesbury Estate, Walworth, Southwark, London, SE17 2BJ (the site) as shown on **Figure 1**.

The GIR has been undertaken in broad accordance with the scope agreed between WSP and the Client as set out in our proposal dated 13h November 2015 (Ref 70009682).

2.2 DEVELOPMENT PROPOSAL

The site currently comprises temporary community facilities including a sports area and children's club. A residential block also currently occupies the south-western corner of the site. WSP | Parsons Brinckerhoff understands that the Client proposes to demolish and redevelop the site for a mixed use scheme, consisting of residential and community facilities.

Current development proposals for the site are shown on **Figure 2** and comprise two blocks referred to as the South Block and the North Block which are arranged around an area of public open space (Aylesbury Square).

The South Block will be a stand-alone building with a maximum of 4 storeys including a basement level. The North Block will be based around a courtyard comprising 3 buildings, two mid-rise, of up to 6 storeys, and one tall building with a maximum of 15 storeys (Special Tower). The North Block will also include a basement level for the Energy Centre, which is understood to be circa 6m below ground level.

WSP | Parsons Brinckerhoff has undertaken an early stage discussion with AECOM, the structural engineer for the scheme, who has estimated maximum column loads for the proposed blocks would be in the order of 10,000kN.

2.3 OBJECTIVES

The objectives of the GIR are to develop a conceptual ground model for the site and to identify potential constraints and opportunities with respect to ground contamination and geotechnical design which may impact on the proposed scheme. This report is intended to partially discharge planning condition 10, which is stated as:

> *Prior to the commencement of works associated with a Plot, 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 site investigation scheme, based on the submitted geo-environmental and geotechnical preliminary risk assessment by WSP UK Ltd (dated 22nd September 2014 with reference 50600304) to provide information for a detailed assessment of the risk to all receptors which may be affected, including those off site.*
>
> 2) *The results of the site investigation and detailed risk assessment referred to in (1) 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.

3) *A verification plan providing details of the data which will be collected in order to demonstrate that the works set out in the remediation strategy in (2) are complete and identifying any requirements for a longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.*

2.4 SCOPE OF WORKS

To meet the objectives detailed in **Section 2.3**, above the scope of works undertaken comprised the following:

- The progression of 2 No. 10m deep cable percussion boreholes to assess material in the proposed basement areas, groundwater levels and soil parameters at basement formation level. The boreholes were installed with standpipes to monitor groundwater elevations at the level of the proposed basements;
- The progression of 10 No. window sampler boreholes across the site to assess the shallow soils for potential contamination and ground gas. Five of the window sampler boreholes were installed with shallow standpipes to monitor ground gas levels;
- The logging of each exploratory hole in accordance with BS EN ISO 14688-1:2002;
- In-situ geotechnical Standard Penetration Tests (SPTs);
- Collection of soil samples for subsequent geotechnical and chemical laboratory analysis;
- Chemical testing of 15 soil and a maximum of 8 groundwater samples for a suite of chemical analysis including metals, hydrocarbons, volatile organics, asbestos, pH and sulphate;
- Waste Acceptance Criteria (WAC) testing of 5 samples to assess the implications for off-site disposal of arisings from basement areas; and
- 4 rounds of groundwater and ground gas monitoring.

2.5 PREVIOUS REPORTS AND REFERENCES

The following references have been reviewed and summarised where appropriate in the preparation of this report and should be referred to for more detailed information relating to earlier phases of work undertaken at the site:

- Geo-Environmental and Geotechnical Preliminary Risk Assessment, Aylesbury Estate (Wider site), Southwark WSP, Ref 50600304, September 2014
- Aylesbury: Plot 18 Massing and Capacity Study, Aylesbury Estate, Southwark, Notting Hill Housing HTA and Southwark Council, December 2014
- Aylesbury Estate – First Development site: Ground Investigation Report, Ref 50600304, July 2015

Information was also gathered from:

- Environment Agency

- 'What's in your backyard?' website[2]

→ British Geological Survey

- Geology Viewer[3]
- Lexicon[4]

2.6 REGULATORY CONTEXT AND GUIDANCE

This GIR has been prepared with due regard to Contaminated Land Guidance documents issued by the Department for Environment, Food and Rural Affairs (and its predecessors) including Contaminated Land Report 11 (CLR 11), and in general accordance with the British Standard "Investigation of potentially contaminated sites - Code of practice" BS EN 10175 2011. The methods used follow a risk-based approach, with the potential environmental risk assessed qualitatively using the 'source-pathway-receptor contaminant linkage' concept to assess risk as introduced in the Environmental Protection Act 1990 (EPA, 1990).

Legislation and guidance on the assessment of contaminated sites acknowledges the need for a tiered risk based approach. This assessment represents a Generic Quantitative Risk Assessment (GQRA) being a comparison of site contaminant levels against generic standards and compliance criteria including an assessment of risk using the source-pathway-receptor model.

This report forms a GIR as described in Part 2 of Eurocode 7 (BS EN 1997-2), however, it is not intended to fulfil the requirements of a Geotechnical Design Report as detailed in Part 2 of Eurocode 7 (BS EN 1997-2).

Further details relating to the WSP assessment approach are provided in Appendix B.

2.7 CONFIDENTIALITY STATEMENT AND LIMITATIONS

This report is addressed to and may be relied upon by the following party:-

Notting Hill Housing Trust

This assessment has been prepared for the sole use and reliance of the above named party. This report has been prepared in line with the WSP proposal and associated notes. This report shall not be relied upon or transferred to any other parties without the express written authorisation of WSP. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

This report needs to be read and used in full.

General limitations of the assessment are included in Appendix C.

[2] viewed 03/12/15: http://maps.environment-agency.gov.uk
[3] viewed 03/12/15: http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html
[4] viewed 03/12/15: http://bgs.ac.uk/Lexicon/

3 SITE INFORMATION

For full details of desk study sources of information and a preliminary conceptual site model (CSM), refer to the Wider Site Preliminary Geo-Environmental and Geotechnical Risk Assessment (50600304 September 2014 – Wider Site PRA) produced by WSP.

A summary of the pertinent information is presented below.

3.1 SITE DETAILS

TABLE 3.1 SITE DETAILS

Site Address	Plot 18, Aylesbury Estate, Walworth, Southwark, London, SE17 2BJ
Grid Reference	532997, 178243
Site Area	Approx. 1.02 ha
Site Location	The Aylesbury Estate is located at the junction of Thurlow St and Inville Rd. Plot 18 is located towards the northern edge of the larger Aylesbury Estate (see **Figure 1**).
Current Site Use	The site currently comprises community facilities; including a sports area with a basketball court, and children's club. A residential block occupies the south-western corner of the site.
Historical Site Use	The earliest available maps (1896) indicate that the site consisted of residential dwellings comprising terraced housing and gardens. The south western corner of the site underwent significant bomb damage during World War II (WWII). The site was redeveloped after WWII, and again in the 1960s to include a youth club and community centre as part of the Aylesbury Estate development.

3.2 ENVIRONMENTAL SETTING

GEOLOGY

The British Geological Survey (BGS) Map No. 270 (South London) (1:50,000 Series) has been reviewed and the underlying geology and aquifer designations are presented in Table 3.2.

TABLE 3.2 SUMMARY OF MAPPED GEOLOGY

GEOLOGICAL UNIT	LOCATION ON SITE	TYPICAL DESCRIPTION*	AQUIFER DESIGNATION**
Made Ground	Expected to be present across the whole site	Not available.	Not designated.
Kempton Park Gravel	Expected to be present across the whole site	Dense brown fine, medium and coarse SAND and fine, medium and coarse GRAVEL.	Secondary (A) Aquifer
Lambeth Group	Underlying the London Clay Formation	Vertically and laterally variable sequences mainly of CLAY, some silty or sandy, with some SANDS and GRAVELS, minor LIMESTONES and LIGNITES.	Secondary (A) Aquifer.
Thanet Sand Formation	Underlying the Lambeth Group	Glauconite-coated, nodular flint at base, overlain by pale yellow-brown, fine-grained SAND that can be clayey and glauconitic.	Secondary (A) Aquifer.
White Chalk***	Underlying the Thanet Formation	CHALK with FLINTS.	Principal Aquifer.

***Descriptions provided by BGS Lexicon.**

****Aquifer designations were provided by the EA "What's in your backyard?" website**

*****The White Chalk unit has been subdivided, the BGS Geological Viewer indicates that the White Chalk present underlying the site is now named the Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation (undifferentiated).**

Publicly available BGS borehole records, associated with the 1960's Aylesbury Estate development, were reviewed and the recorded geology in the vicinity of the site is summarised in **Table 3.3**. The logs are provided in **Appendix D**.

TABLE 3.3 GEOLOGICAL SUMMARY FROM PUBLISHED BGS LOGS

REGISTERED BOREHOLE NUMBER	SUMMARY OF GEOLOGY				
	STRATUM	DESCRIPTION	DEPTH TO TOP OF STRATUM (M BGL)*	RECORDED THICKNESS (M)	GROUNDWATER STRIKES (M BGL)*
TQ37NW/832 TQ37NW/833 TQ37NW/834 TQ37NW/836 TQ37NW/837	Made Ground	Brick rubble, black CLAY, SANDS, GRAVELS, STONES and ASH.	0.0	0.20 – 3.05	

TQ37NW/838 TQ37NW/839 TQ37NW/840 TQ37NW/842 TQ37NW/844 TQ37NW/845 TQ37NW/851 TQ37NW/962 TQ37NW/963	Kempton Park Gravel	Dense brown fine, medium and coarse SAND and fine, medium and coarse GRAVEL. In some boreholes brown sandy CLAY recorded at surface of unit.	0.20-3.05	1.83 – 5.19	2.44 TQ37NW/963
	Lambeth Group	Lambeth Group is vertically and laterally variable sequence mainly of CLAY, some silty or sandy, with some SANDS.	4.42 – 6.71	1.52 – 11.88	4.26-5.79 TQ37NW/834 TQ37NW/836 TQ37NW/837 TQ37NW/838 TQ37NW/839 TQ37NW/840 TQ37NW/842 TQ37NW/844 TQ37NW/845 TQ37NW/851 TQ37NW/962
TQ37NW/832 TQ37NW/833 TQ37NW/834	Thanet Sand Formation	Dense SAND and GRAVEL.	7.47 – 17.37	NOT PROVEN, base of unit not encountered	

***m bgl = metres below ground level**

It should be noted that borehole logs were interpreted by WSP to determine which geological strata soil descriptions related to.

All logs analysed were located within a 175m radius of the site. Borehole TQ37NW/851 is located directly on the site. The TQ37NW/900 borehole sequence is located southwest of the site, boreholes TQ37NW/834 through to TQ37NW/838 are found to the east and southeast of the site and the remainder of boreholes are to the north of the site, a plan of the borehole locations is presented in Appendix D.

GROUNDWATER

Made Ground is not classified in the aquifer system however the underlying Kempton Park Gravels are a potentially locally important Secondary (A) Aquifer. Underlying the Kempton Park Gravels is the Lambeth Group and Thanet Sand Formation, both of which are designated Secondary (A) Aquifers, these overlie the White Chalk Group Principle Aquifer.

The BGS borehole logs predominantly encountered groundwater at depths of 4.36 to 5.79m bgl, within the Lambeth Group. However, one borehole located south-west of the site struck groundwater at 2.44m bgl, within the Kempton Park Gravels; due to inconsistencies within the borehole records it is possible that this represents a depth to standing water. These records are supported by information provided by the EA within the Wider Site PRA. In April 2010 groundwater was recorded in the superficial deposits between 5 and 9m bgl, and between 4 and

7m bgl in June 2007. Groundwater mapping in the region records groundwater within the Thanet Sands at 12m bgl.

The nearest Environment Agency Source Protection Zone is over 2km from the site. One groundwater abstraction is located within 500m of the site as detailed in **Table 3.4** below:

TABLE 3.4 GROUNDWATER ABSTRACTION LOCATIONS

Abstraction Licence No.	Abstraction Use	Distance (m)	Direction
28/39/42/0076	Commercial/ Industrial/ Public Services: Drinking; cooking; sanitary; and washing	500m	North

SURFACE WATER

The River Thames is located approximately 2.7km to the west, 2.2km to the north and 2.3km to the north-east of the site. The only surface water feature within a 1km radius is a lake associated with Burgess Park which is situated 550m southeast of the site.

The entire site is located within an Environment Agency Flood Zone 3 – Flooding from Rivers or Sea without defences.

UXO

A report was undertaken by Bactec for the overall Aylesbury Estate site as discussed in **Section 4.1** and attached as **Appendix E**. The site and surrounding area were subject to heavy bombing during WWII and Bactec designated the risks associated with UXO at the site as Medium-High and Medium in the south-west with the remainder of the site considered to be within a Low Risk Zone.

JAPANESE KNOTWEED

No Japanese Knotweed was identified during the site walkover. A Japanese Knotweed investigation however has not been undertaken by a specialist within the site.

LANDFILL

No landfills were identified at or within 500m of the site.

GROUND HAZARDS

Information provided in the Wider Site PRA on ground hazards has been reviewed and is summarised in **Table 3.4**.

TABLE 3.4 SUMMARY OF GROUND HAZARDS

FEATURE	HAZARD/POTENTIAL
Radon Affected area	The ground conditions are considered by the health protection agency to be in an intermediate probability radon area as between 1 and 3% of homes are above the action level. However, it has been stated that no radon protective measures are necessary in the construction of new dwellings or extensions.
Landslide	Very Low
Compressibility of soils	Very Low
Collapsible Ground Stability Hazards	Very Low
Ground Dissolution Hazards	No Hazard
Running Sand Ground Stability Hazards	Very Low
Shrinking or Swelling Clay Ground Stability Hazards	Moderate

3.3 PRELIMINARY CONCEPTUAL SITE MODEL

Following review of the relevant background geo-environmental information relating to the site and on the basis of the site walkover survey the following potential on-site sources of contamination have been identified:

- The nature and extent of Made Ground is currently unknown;
- Potential Asbestos Containing Materials (ACMs) could be present due to the age of buildings on-site and unknown composition of the Made Ground;
- UXOs may be present;
- An electrical sub-station borders the south-eastern site boundary; and
- Potential presence of underground tanks.

Potential off-site contaminant sources within 500m of the site include a number of current and disused commercial/industrial buildings. There are active contemporary trade directory entries comprising sectors including commercial and domestic cleaning services, dry cleaners, car

dealers, garages and petrol stations. Inactive trade directory entries include clothing and fabric manufactures, servicing and repairs of refrigerators and freezers, servicing and repair of boilers, commercial and domestic cleaning services, builders merchants and petrol stations. During the site walkover an underground tank and a cooling tower were identified 50m and 100m south of the site boundary.

Given the nature of the underlying geology at the site, there is the potential for lateral migration of contaminants both on and off-site within the Kempton Park Gravels and the Lambeth Group across the entire site. There is potential for vertical migration of contaminants to occur between the Kempton Park Gravels, Lambeth Group, Thanet Sands and the Chalk.

Due to the unknown composition of the Made Ground the presence of Ground Gas cannot be discounted.

The Bactec report suggests that the south-west of the site was subject to extensive bombing during WWII. Therefore, there is the potential for unexploded bombs/ordnance to be present on or immediately adjacent to the site.

Based on the preliminary conceptual site model (CSM), WSP considers that the site represents a **LOW** to **MEDIUM** risk with respect to potential impacts to future site users and controlled waters, given the current site use and geo-environmental setting.

4 SITE INVESTIGATION AND ASSESSMENT RATIONALE

4.1 UNEXPLODED ORDNANCE (UXO) DESK STUDY

Prior to the commencement of the GIR fieldwork, an unexploded ordnance desk study was commissioned by WSP and undertaken by Bactec (**Appendix E**).

The south-western corner of the site was moderately to seriously damaged by bombing in WWII. Part of the site was therefore assigned as Medium-High and Medium Risk regarding the presence of UXOs. Bactec recommended the presence of an Explosive Ordnance Disposal (EOD) Engineer on site to support shallow intrusive works. Intrusive Magnetometer Surveying (and target investigation) of all borehole and pile locations down to a maximum bomb penetration depth was also recommended.

As stated in the Health and Safety plan prepared for the site, In order to ensure that all contractors were aware of the potential risks posed by UXO, Bactec provided an on-site safety briefing attended by all contractors prior to breaking ground on site and were present during the works to undertake Magnetometer surveying.

4.2 FIELDWORKS

An intrusive ground investigation was completed and overseen by WSP. The actual works completed was revised from the proposed scope planned at the outset (as detailed in **Section 2.4**). Borehole BH102 was omitted from the investigation due to access restrictions.

In accordance with the requirements of the Health and Safety Plan each location was hand pitted to 1.2m bgl as part of a service avoidance exercise. A plan of the boreholes is provided as **Figure 3**. A summary of the ground investigations undertaken is presented in **Table 4.1**, below.

TABLE 4.1 FIELDWORK SUMMARY

METHOD	NUMBER	LOCATIONS	DEPTH (MBGL)
Cable Percussion (Dando 1750)	1	BH101	10.00
Window Sampler (Competitor Rig)	6	WS101, WS102, WS103A, WS107, WS108, WS110	2.00 – 4.00
Hand Dug Pit	15	WS103, WS104, WS105, WS106, WS109	0.70 – 1.20

Exploratory holes WS101, WS102, WS103a, WS108 and WS110 were terminated on very dense granular material. WS103, WS104-106 and WS109 were terminated due to obstructions,

including a water pipe in WS105. WS107 was terminated at 4.0m bgl due to hole collapse. Three of the exploratory locations were installed with wells for monitoring and sampling of ground gas and groundwater. A summary of the monitoring wells installed is presented in **Table 4.2**. Details of ground and groundwater conditions, in-situ testing and well installation details are included in the exploratory hole records presented in **Appendix F**.

TABLE 4.2 SUMMARY OF MONITORING INSTALLATIONS

Exploratory Hole	Ground Level (MAOD)	Standpipe / Piezometer Diameter	Screen Top And Base Depth (MBGL)	Screen Top And Base Elevation (MAOD)	Strata Targeted
BH101	2.18	50mm	7.00 to 10.00	-4.82 to -7.82	Lambeth Group
WS101	3.15	50mm	1.00 to 3.00	2.15 to 0.15	Made Ground/Kempton Park Gravel
WS110	2.32	50mm	0.50 to 3.00	1.82 to -0.68	Made Ground

mAOD – metres above ordnance datum

4.3 IN-SITU & FIELD SOIL TESTING

STANDARD PENETRATION TESTS

Standard Penetration Tests (SPTs) were performed within certain boreholes (BH101) and window sample holes (WS101, WS102, WS103A, WS107, WS108, WS110), the results are presented on the exploratory hole records (**Appendix F**).

A plot of all SPT 'N' values with depth is presented as **Figure 4**.

4.4 SAMPLING AND LABORATORY CHEMICAL ANALYSIS & GEOTECHNICAL TESTING

The analytical strategy was designed to determine the engineering parameters of the underlying soils and provide sufficient data to undertake an assessment of potential contamination/contaminant linkages identified in the Preliminary Conceptual Model (PCM - see **Section 3.3**).

Chemical laboratory analysis comprised metals, total petroleum hydrocarbons (TPHs), polycyclic-aromatic hydrocarbons (PAH), poly-chlorinated biphenyls (PCBs), volatile organic compounds (VOC), semi-volatile organic compounds (SVOCs), cyanide, soil organic matter (SOM), pH, sulphate tests and asbestos identification and quantification.

Water analysis was conducted to determine the risks to controlled waters as identified in the PCM. The chemical analysis comprised metals, TPHs, PAHs, VOCs, SVOCs, cyanide, sulphate and pH.

All analysis was undertaken at a UKAS and MCERTS accredited laboratory and field sampling was undertaken in accordance with industry guidance.

4.5 GROUNDWATER AND GAS MONITORING

Four monitoring visits were undertaken between the 29th October 2015 and the 16th November 2015.

Groundwater level monitoring and sampling (where possible) together with ground gas monitoring were undertaken at BH101, WS101 and WS110 during all four visits with the results and analysis presented within **Section 7.3**.

5 REVISED GROUND MODEL

Ground conditions encountered during the ground investigation are described in this section.

5.1 GROUND CONDITIONS ENCOUNTERED

Exploratory hole records are provided in **Appendix F** with a summary of the strata encountered presented in **Table 5.1**, below..

TABLE 5.1 SUMMARY OF STRATA ENCOUNTERED DURING SITE INVESTIGATION

Stratum Name	Depth to Base of Strata (mbgl)	Elevation of Base of Strata (maod)	Thickness (m)	Typical Description
Concrete WS109	0.10	2.10	0.10	Strong grey CONCRETE. 60% aggregate of angular flint, 40% matrix rebar.
Macadam BH101 WS107 WS108	0.10	2.10 to 2.08	0.10	Not Applicable.
Paving slab WS110	0.05	2.27	0.05	Not Applicable.
Made ground BH101 WS101 WS102 WS103 WS103A WS104 WS105 WS106 WS107 WS108 WS109 WS110	0.50 to 2.55	1.82 to -0.31	0.45 to 2.55	Grass and roots and rootlets present in some excavations. Orange brown to dark brown and black clayey, silty and gravelly SAND. Occasional cobbles in some boreholes. Sand is fine to coarse, gravel is angular to subrounded; fine to coarse macadam, brick and flint. Cobbles are angular of brick. Hard grey CONCRETE at base of Made Ground in WS110.

Stratum Name	Depth to Base of Strata (mbgl)	Elevation of Base of Strata (maod)	Thickness (m)	Typical Description
Kempston Park Gravel BH101 WS101 WS102 WS103A WS107 WS108 WS110	4.70	-2.52	3.90	Orange brown to brown sandy gravelly CLAY, clayey gravelly SAND and sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded.
Lambeth Group BH101	NOT PROVEN	NOT PROVEN	>5.30	Grey SAND and very stiff light to dark grey slightly gravelly CLAY. Sand is fine to medium. Gravel is subangular to rounded, fine to coarse flint.

Made Ground was encountered at all locations. Kempton Park Gravels were encountered in 7 of the 11 exploratory holes; the remaining boreholes were terminated prior to reaching the Kempton Park Gravels. One exploratory hole, BH101, penetrated to sufficient depth to encounter the Lambeth Group.

Ground conditions encountered during the fieldwork were as anticipated by the preliminary ground model.

5.2 GROUNDWATER CONDITIONS

Groundwater was encountered during drilling at one location during the site investigation. Details are presented in **Table 5.2**, below, with full details presented on the relevant exploratory hole log in **Appendix F**.

TABLE 5.2 SUMMARY OF GROUNDWATER STRIKES ENCOUNTERED DURING SITE INVESTIGATION

Exploratory Hole	Depth Groundwater Encountered (Strike) (mbgl)	Elevation Groundwater Encountered (Strike) (maod)	Remarks
BH101	6.50	-4.32	Lambeth Group

A summary of groundwater levels recorded during the monitoring period is presented in **Table 5.3**, with full monitoring records presented in **Appendix G**.

TABLE 5.3 GROUNDWATER MONITORING RECORDS

Exploratory Hole	Elevation of Screen Top (mAOD)	Elevation of Screen Base (mAOD)	Geology of Response Zone	Groundwater Elevations recorded (mAOD)		
				Min	Mean	Max
BH101	-4.82	-7.82	Lambeth Group	**-1.84**	**-1.87**	**-1.90**
WS101	2.15	0.15	Made Ground/Kempton Park Gravel	**DRY**	**DRY**	**DRY**
WS110	1.82	-0.68	Made Ground	**DRY**	**DRY**	**DRY**

Groundwater is shown to be present within the Lambeth Group. At the time of monitoring no groundwater was detected within the Made Ground or Kempton Park Gravel. An inferred groundwater flow cannot be confirmed at this time as only one installation contained groundwater.

5.3 OBSERVATIONS OF CONTAMINATION

No visual or olfactory contamination was noted during the site investigation.

6 ENVIRONMENTAL RESULTS AND RISK ASSESSMENT

6.1 OVERVIEW

The presence of contaminated materials on a site is generally only of concern if an actual or potentially unacceptable risk exists. Part 2A of the Environmental Protection Act (EPA), its accompanying regulations and Statutory Guidance contained in DEFRA Circular 01/2012 present the statutory definition of "contaminated land". For the purposes of Part 2A, contaminated land is defined as: "any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on, or under the land that:

- Significant harm is being caused or there is a significant possibility of such harm being caused;
- Contamination of controlled waters is being, or is likely to be caused.

The Part 2A regime was designed and intended to encourage voluntary remediation rather than regulatory action and to work with the established role of planning and building control in those cases where the land is suitable for or scheduled for redevelopment.

DEFRA Circular 01/2012 makes clear that, where new development is taking place, it is the responsibility of the developer to ensure that redevelopment is safe and suitable for use for the purpose for which it is intended and thus to carry out any necessary remediation. In most cases the enforcement of remediation requirements is therefore through planning conditions and building control rather than through a Remediation Notice under Part 2A. The National Planning Policy Framework (NPPF) Section 121, states that *'After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the EPA 1990'*.

A developer will need to satisfy the local authority that unacceptable risk from contamination will be successfully addressed through remediation without undue environmental impact during and following the development.

The term contaminant linkage has been described in the Preliminary Conceptual site Model (**Section 3.3**) as an assessment of Sources, Pathways and Receptors. Each of these three elements can exist independently, but they create a risk only where they are linked together, so that a particular contaminant affects a particular receptor through a particular pathway. Without a contaminant linkage, there is not a risk – even if a contaminant is present. Even where there is a contaminant linkage and therefore some measure of risk, the question still needs to be asked as to whether the level of risk justifies remediation. In the context of land contamination, 'risk' is a combination of the probability, or frequency, of occurrence of a defined hazard and the magnitude of the consequences of the occurrence.

6.2 FRAMEWORK

Our approach is consistent with that established in the publication Model Procedures for the Management of Land Contamination (CLR11) (Environment Agency 2004a). This establishes a tiered approach including:

- Stage 1 – Preliminary Risk Assessment (e.g. the establishment of potential contaminant linkages);

- Stage 2 – Generic Quantitative Risk Assessment (GQRA) (e.g. the comparison of contaminant concentrations against Soil Guideline Values (SGV) or other Generic Assessment Criteria (GAC)); and
- Stage 3 – Detailed Quantitative Risk Assessment (DQRA) (e.g. the comparison of contaminant concentrations against site specific assessment criteria).

Stage 1 (Preliminary Risk Assessment) has been completed for the wider site, and has been reviewed, summarised and focussed in **Section 2** of this report. A ground investigation has been completed and soil laboratory analysis results are available. Therefore the assessment can proceed to Stage 2 (Generic Quantitative Risk Assessment). As part of this exercise, the results are compared to generic screening criteria for the protection of human health receptors. If exceedances of these generic criteria are identified then the assessment proceeds to the next, and more detailed, level of assessment (Stage 3, Detailed Quantitative Risk Assessment). This detailed level of assessment uses modelling algorithms and site specific data to assess the significance of the potential contaminant linkages. If, after the detailed modelling, a potential significant risk is still identified then some form of further action may be required – and could comprise mitigation or some form of further assessment or remediation.

7 GENERIC QUANTITATIVE RISK ASSESSMENT (GQRA)

7.1 HUMAN HEALTH GQRA

In order to undertake a GQRA (Stage 2), contaminant concentrations need to be compared to appropriate generic assessment criteria. Current UK industry practice is to use, as first preference, UK SGVs which are generic assessment criteria published by the Environment Agency and derived using the Contaminated Land Exposure Assessment model (CLEA). Where these are not available and in order to provide a consistent methodology for the assessment of various contaminants, a series of Generic Assessment Criteria (GAC) screening values have been calculated by WSP using CLEA V1.06, a computer modelling tool designed to assess human health related risks posed by contaminated soil.

The contaminant concentrations have also been screened against Category 4 Screening Levels (C4SL) as outlined by Defra. The C4SLs provide a less conservative toxicological/exposure assumption. The impact assessment was agreed during the revision of the Part 2A Statutory Guidance and was developed on the basis that C4SLs could be used under the planning regime as well as within Part 2A.

COMPLIANCE CRITERIA

The future use of the site is proposed to be residential properties with shared public open space/landscaping. Therefore, soil contaminant concentrations detected have been compared against SGV/GAC values for a residential without plant uptake land use scenario. C4SL GAC for public open space have been used as when available and applicable.

SOIL SAMPLE ANALYSIS

Nineteen soil samples were submitted for chemical analysis at a UKAS and MCERTS accredited laboratory and were analysed for a range of inorganic and organic determinands as detailed in **Section 4.4**. Fourteen samples were taken from Made Ground and five samples from the Kempton Park Gravel.

Asbestos soil screen and quantification testing was also undertaken in Made Ground (WS101, WS102, WS103A, WS104, WS105, WS106, WS108, WS109, WS110, BH101) and the Kempton Park Gravels (WS107, BH101).

ANALYSIS OF DATA

The ground investigation comprised the excavation of boreholes and window samples across the site. A direct comparison of the GAC/SGV/C4SLs to the analytical results of selected soil samples has been undertaken.

Five samples were tested for soil organic matter (SOM). The underlying soils had an average soil organic matter of 2.09%. However, once the outlier of 10.7% was removed the average quantity of SOM was 1.5%. As a result, the samples from the site have been compared to the GAC values relating to a SOM of 1%.

ASBESTOS

Twelve samples were screened for the presence of Asbestos. Asbestos has been identified and quantified within six of these samples at the following locations.

TABLE 7.1 ASBESTOS QUALIFICATION AND QUANTIFICATION

Exploratory Hole	Depth (mbgl)	Stratum	Fibre type	Quantification (%)
WS101	0.1	Made Ground	Chrysotile and amosite asbestos (lagging, free fibres)	NADIS
WS102	0.2	Made Ground	Chrysotile asbestos (bitumen)	NADIS
WS104	0.7	Made Ground	Chrysotile and crocidolite asbestos (lagging, free fibres and cement)	<0.001
WS105	0.5	Made Ground	Amosite asbestos (free fibres)	0.004
WS106	0.5	Made Ground	Amosite asbestos (free fibres)	NADIS
WS109	0.2	Made Ground	Chrysotile asbestos (cement, lagging and free fibres)	<0.001

ENVIRONMENTAL ANALYSIS

The exceedances of Generic Assessment Criteria (GACs) have been identified within soil samples at the site and are detailed in **Table 7.2**, below.

TABLE 7.2 EXCEEDANCES OF GENERIC ASSESSMENT CRITERIA (SOIL)

Analyte	**Made Ground**			**Natural Ground**			**All Samples**						
	Min	Mean	Max	Min	Mean	Max	A/C*	Units	No. of Locations	No. of Samples	No. Samples >LOD**	No. Locations >A/C*	Location(s) failing screening
Metals													
Lead	0.74	211.88	934.00	0.05	38.89	120.80	310.00	mg/kg	11	14	14	3	WS101 WS103 WS104
PAHs													
Benzo (a) anthracene	0.14	0.79	4.19	<0.08	n/a	0.14	3.7	mg/kg	11	18	11	1	WS108
Benzo (a) pyrene	0.14	0.68	3.32	<0.08	n/a	0.11	1.00 (5.00***)	mg/kg	11	18	11	1	WS108

***A/C: Assessment Criteria**

****LOD: Limit of Detection**

***** C4SL GAC for public open space**

7.2 CONTROLLED WATERS GQRA

The controlled water receptors beneath and within the vicinity of the site have been identified and a sample of groundwater has been analysed for a range of potential contaminants.

Based on the 'prevent and limit' approach of the Water Framework Directive (2000/60/EC) and the identified receptors, the following Water Quality Standards (WQS) have been considered for use in this assessment:

- UK Drinking Water Quality Standards (DWQS) 2000 (Amended 2004).
- Guidelines for Drinking Water Quality, Fourth Edition, Volume 1, World Health Organisation, 2011.
- World Health Organisation (WHO) Petroleum Products in Drinking Water.
- The River Basin District Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales), Directions, 2010.
- Environmental Quality Standards, Directive, 2008/105/EC.

COMPLIANCE CRITERIA

The water contaminant concentrations were screened against UK Drinking Water Quality GAC (UK DQWS) as first preference. For contaminants which have no UK DQWS values provided by the World Health Organisation (WHO) standards have been adopted.

WATER SAMPLE ANALYSIS

One (1 No.) sample was submitted for chemical analysis at a UKAS and MCERTS accredited laboratory and was analysed for a range of inorganic and organic determinands as detailed in **Section 4.4**.

ANALYSIS OF DATA

Water sampling was undertaken within BH101. No groundwater was encountered within the other exploratory holes advanced on site. During the site investigation the groundwater strike occurred at -4.32m AOD, in the Lambeth Group. The monitoring well installed in BH101 is screened in the Lambeth Group and standing water within BH101 was present at an average depth of -1.87m AOD. A direct comparison of the GAC to the analytical results of the water sample has been undertaken.

ENVIRONMENTAL ANALYSIS

No exceedances were identified; laboratory results are presented in **Appendix H**.

7.3 GROUND GAS ASSESSMENT

Following completion of the intrusive investigation four ground gas monitoring visits were undertaken between the 29th October 2015 and the 16th November 2015.

Results of the gas monitoring are presented in **Appendix I**, and are summarised in **Table 7.3**, below.

TABLE 7.3 GAS MONITORING RESULTS

Monitoring Point	Methane (%v/v)		Carbon Dioxide (%v/v)		Oxygen (%v/v)		Flow (L/hr)	
	Min	Max	Min	Max	Min	Max	Min	Max
BH101	<0.1	<0.1	<0.1	0.7	19.8	21.0	-0.4	0.5
WS101	<0.1	<0.1	<0.1	1.0	20.2	20.9	-0.1	0.1
WS110	<0.1	<0.1	<0.1	1.0	19.8	21.0	-0.5	0.2

Methane was not present above the limit of detection in any of the monitoring wells, and has therefore been excluded from **Table 7.4,** which summarises the representative gas screening values. The maximum flow detected was 0.5 L/hr in BH101.

TABLE 7.4 GAS SCREENING VALUES

	Carbon Dioxide
GSV Max Per Hole* (l/h)	0.0035 (BH101)
GSV based on Max Values** (l/h)	0.005
Max values (% v/v)	1.0 (WS101 and WS110)

***The maximum calculated GSV using data specific to each borehole over the monitoring period.**

****A worst case estimate of the GSV using Maximum Concentration and Maximum Flow for the whole data set.**

Based on the gas monitoring results described above and the proposed residential without plant uptake end use, the site would be classified in terms of ground gas risk as described in **Table 7.5,** below.

TABLE 7.5 GROUND GAS RISK ASSESSMENT

Ground Gas Risk Assessment Scheme	Site Classification
CIRIA	Characteristic Situation 1 (CS1)

NHBC	Green

Atmospheric pressure during monitoring varied between 1015 and 1026mb. Water levels recorded in standpipes during gas monitoring are summarised in **Table 5.3** within **Section 5.2**.

Based on the above assessment no special precautions with regard to ground gas are deemed necessary.

7.4 CONCRETE ASSESSMENT

The average of the highest 20% of soil sulphate concentrations was calculated to be 587mg/L, and the groundwater sample identified the water soluble sulphate concentration as 28mg/L. The lowest pH identified at the site was 7.2. Using the methods identified in BRE Special Digest 1:2005 3rd edition guidance soil at the site is classified as Design Sulphate Class 1 (DS1) and aggressive chemical environment for concrete class AC-2.

7.5 SUMMARY OF CONTAMINATION ASSESSMENT

Concentrations of lead and polyaromatic hydrocarbons (PAHs) in excess of the GQRA screening criteria together with quantifiable asbestos have been identified in Made Ground.

- Lead exceedances were identified in WS101, WS103, and WS104. located in the north of the site, with the highest concentration observed in WS101.
- PAHs were identified in WS108 which is located in the east of the site;
- Asbestos fibres have been identified within the Made Ground with a maximum concentration of amosite in WS105 of 0.004%. Asbestos was also identified in WS101, WS02, WS104, WS105 and WS106; indicating that asbestos may be widespread in the north of the site although at low concentrations.

No exceedances were identified during groundwater testing at the site. Sampling was only possible in one exploratory hole (BH101) due to a general absence of groundwater within monitoring wells. The presence of significant or widespread impacts to groundwater are considered unlikely given the findings of the soil investigation however, presence of groundwater contamination in other areas of the site cannot be fully discounted.

Ground Gas classification determined that the site fell within CS1 and protective measures are therefore not required.

8 REVISED CONCEPTUAL SITE MODEL

As a result of the GQRA the preliminary CSM (**Section 3.3**) has been revised in the context of risks to Human Health (assuming a residential without plant uptake end use) and controlled waters.

The preliminary CSM identified potential on-site sources of contamination comprising Made Ground, ACMs, UXOs, an electrical substation on the south-eastern site boundary and the potential presence of underground tanks beneath the site.

The site investigation has identified contamination within the Made Ground. Contaminant concentrations within soils were found to exceed assessment criteria for lead and PAHs (specifically benzo(a)anthracene and benzo(a)pyrene). Asbestos has also been identified at locations across the site within the Made Ground. No exceedances of the assessment criteria were identified within the underlying natural soils.

Elevated levels of ground gas were not detected within monitoring wells.

The presence of significant or widespread impact to groundwater is considered unlikely given the findings of the soil investigation. The single groundwater sample analysed returned results below the adopted GQRA criteria. Risks to groundwater are therefore considered low, however, given only a single sample has been analysed the presence of groundwater contamination in other areas of the site cannot be fully discounted.

No exceedances of PCBs were noted on site.

Ground gas classification determined that the site fell within CS1 and protective measures are not required.

Regarding the risk to concrete building structures at the site, soil is classified as DS1 and AC-2.

No evidence suggesting the presence of an underground tank was encountered; however, the site investigation did not penetrated below 3m in the majority of the site.

Potential contaminant pathways include the inhalation/ingestion of contamination within the Made Ground and dermal contact by construction workers and future site residents. Migration of contaminants from Made Ground to controlled waters is likely to be negligible as shallow groundwater is absent beneath much of the site and Made Ground lies within the unsaturated zone. Following development infiltration of rainwater will be isolated to areas of soft landscaping with the majority of the development being occupied by the footprint of the proposed buildings and by hardstanding.

9 CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of the assessment and the limitations provided in **Appendix C** the following conclusions and recommendations are made.

9.1 CONTAMINATION CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this GIR, WSP make the following conclusions with regards to identified contaminated land constraints and contaminant linkages which may pose a risk during the proposed mixed use (residential and community) development

- The risk to human health receptors is considered to be **LOW** to **MODERATE** on the basis of locally elevated concentrations of lead and PAHs in Made Ground and the potential for asbestos in the near surface soils. It is considered that the risk to human health receptors could be mitigated during development and this should be addressed through an outline remediation method statement;

  The presence of hard cover will prevent exposure to human health receptors as part of the future development; areas of soft landscaping will require the placement of a clean soil cover system of a suitable thickness. A non-woven geotextile may be required to separate the clean soil from the underlying existing ground.
- The risk to controlled waters is considered to be **LOW**, no specific precautions are deemed necessary. Should shallow groundwater be encountered during development, however, further analytical testing would need to be undertaken to confirm this low risk rating; and
- The risk to the built environment is considered to be **LOW**. However, this may include the design of clean service corridors (to be discussed with relevant providers) and the use of barrier pipes for potable water supply.

9.2 GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS

Based on interpretation of the ground conditions encountered, the in-situ geotechnical testing and proposed development plans, the following conclusions are made:

- Assuming that the proposed development will comprise two residential blocks of up to fifteen storeys, a piled foundation solution is considered appropriate for this development;
- It is recommended that an additional geotechnical ground investigation is undertaken following the demolition and decommissioning of existing buildings and services. It is anticipated that these will need to extend to at least 40m bgl and to fully characterise the Lambeth Group and Thanet Sand Formation and inform foundation design;
- Groundwater was encountered within the Lambeth Group, at 6.5m below ground level (m bgl). Consideration towards groundwater ingress within Lambeth Group strata should therefore be made when considering pile design;
- Made Ground is present to a maximum depth of 2.55m bgl, and was located across the majority of the site. The stability of Made Ground should not be relied upon in excavations and does not comprise suitable engineering material;

- Below ground obstructions are present across the site (refer to massing study[5]) and may comprise historic foundations. Additional obstructions are expected to be present following the demolition of the existing site buildings; and
- Sulphate concentrations and pH at the site indicate that concrete would need to satisfy Design Class 1 and Aggressive Chemical Environment for Concrete 2 standards.

9.3 FURTHER WORK RECOMMENDATIONS

- Following the demolition and decommissioning of existing site buildings and services, an additional ground investigation is recommended to fully assess the geotechnical properties of the Lambeth Group and Thanet Sand Formation. It is anticipated that this will comprise a number of boreholes extending to at least 40m bgl.
- Exceedances have been found in the Made Ground with respect to lead, benzo(a)anthracene, benzo(a)pyrene and asbestos. It is recommended that an outline remediation method statement be prepared for the site (including verification plan) which will recommend the input of clean cover in areas of landscaping, the verification of basement extractions, waste classification of site won soils prior to disposal and construction of clean service corridors.

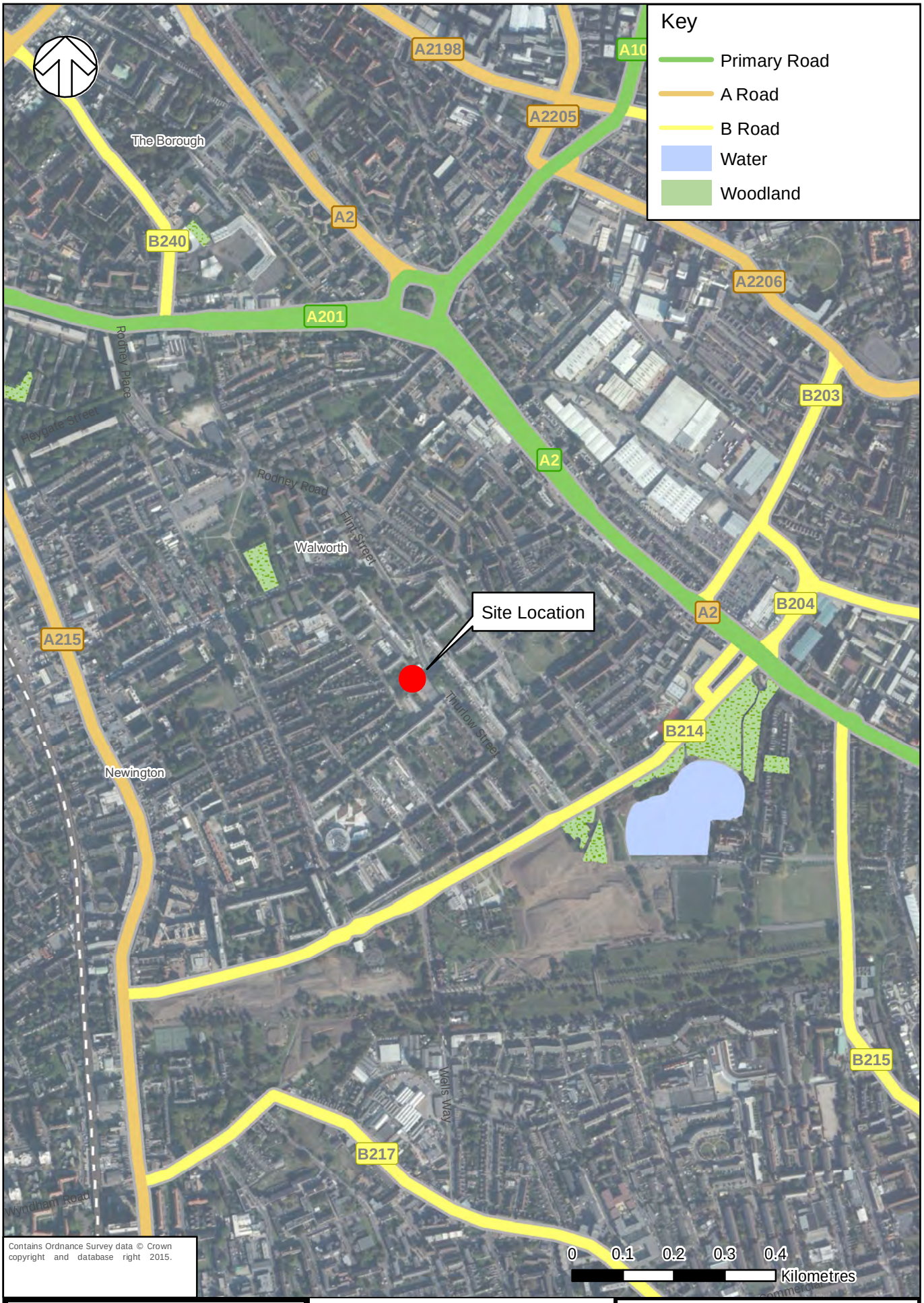
[5]Aylesbury: Plot 18 Massing and Capacity Study, Aylesbury Estate, Southwark, Notting Hill Housing HTA and Southwark Council, December 2014

Appendix A

FIGURES

APPENDIX A-1

FIGURE 1 – SITE LOCATION PLAN



File: Z:\#Projects\70000000\70009682 - Aylesbury Estate Plot 18, Southwark\(8) Report\Appendices\Figures\Figure 1 SLP.pdf

Drawn By: UKAJA912 Date Modified: November 2015

WSP | PARSONS BRINCKERHOFF

TITLE:

Aylesbury Estate
Plot 18
Site Location Plan

FIGURE No:

50600304 - Figure 1

APPENDIX A-2

FIGURE 2 – PROPOSED DEVELOPMENT

Date Modified:

Drawn By:

File:

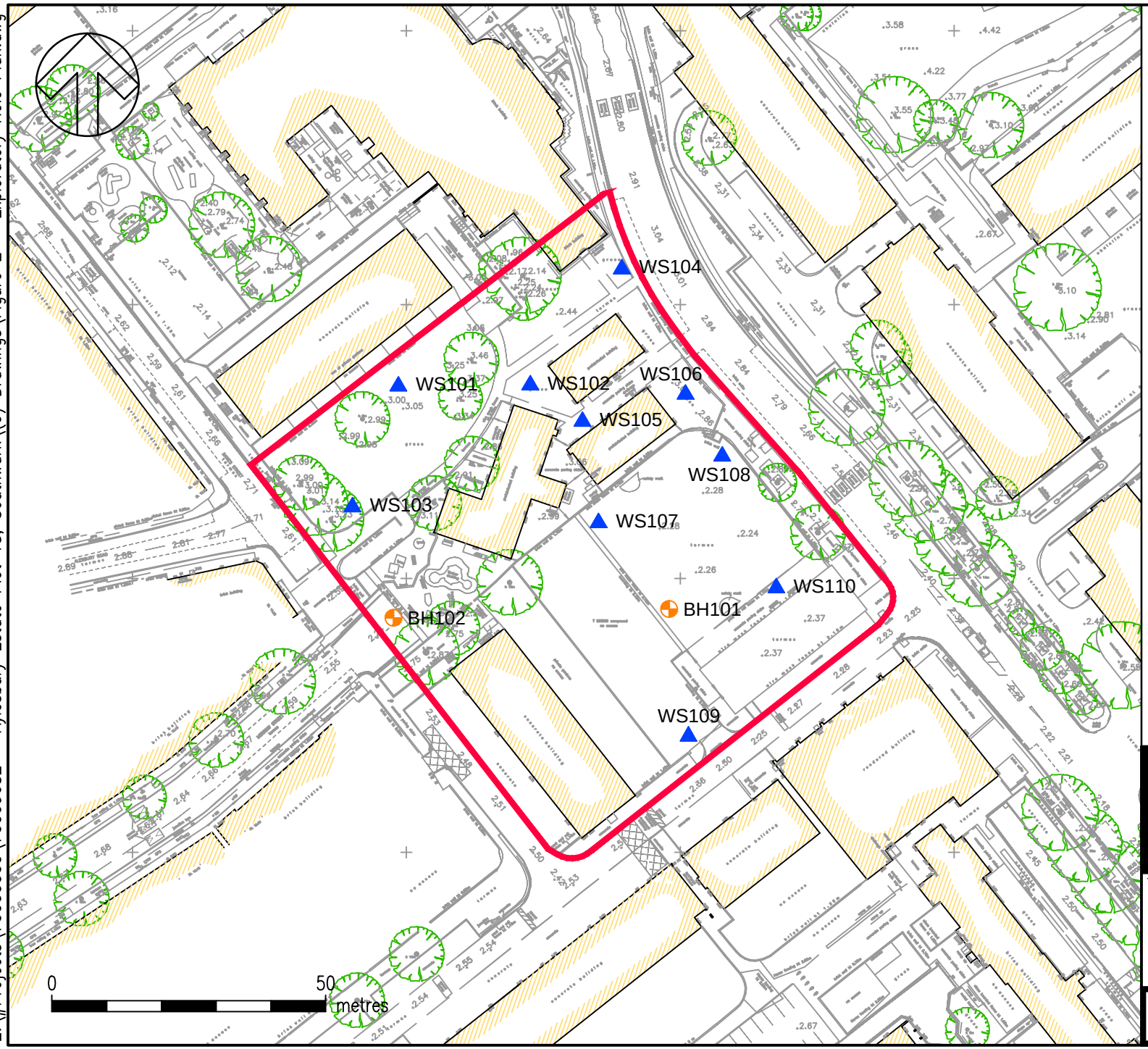
WSP | PARSONS BRINCKERHOFF

TITLE:
AYLESBURY ESTATE PLOT 18
DEVELOPMENT PLAN

FIGURE No:
FIGURE 2

APPENDIX A-3

FIGURE 3 - EXPLORATORY HOLE LOCATIONS



Key

- Site Boundary
- Cable Percussive Borehole (up to 10m below ground level)
- Window Sample Borehole (up to 6m below ground level)

WSP | PARSONS BRINCKERHOFF

TITLE:

Aylesbury Estate

Plot 18

Exploratory Hole Plan

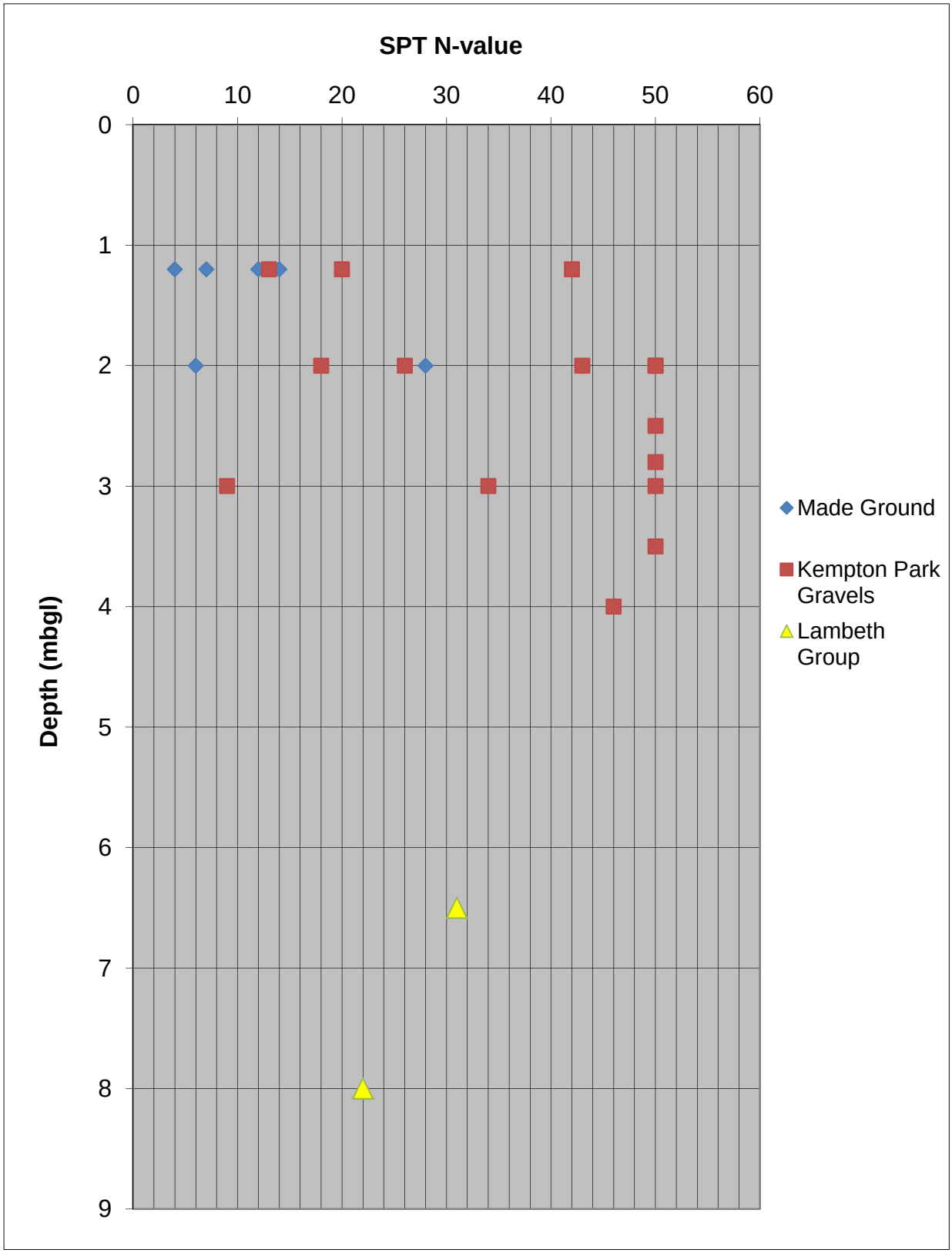
FIGURE No:

70009682 - Figure 2

Z:\#Projects\70000000\70009682 – Aylesbury Estate Plot 18, Southwark\(9) Drawings\Figure 2 – Exploratory Hole Plan.dwg

APPENDIX A-4

FIGURE 4 – SPT N-VALUES WITH DEPTH



Made By:	**ECN**	**Job:**	**70009682**	**Site:**	Aylesbury Estate
Chk.	**AEM**	**Scale:**	**NTS**		Plot 18
App.	**AEM**	**Date**	**Dec-15**	**Title:**	Plot of SPT 'N' versus Depth
WSP				**Figure**	**4**

Appendix B

THE REGULATORY FRAMEWORK AND OUR SCREENING CRITERIA

The Regulatory Framework for our Assessment

Our assessment is made within the framework of the Contaminated Land Regime defined by Part 2A of the Environmental Protection Act and the Contaminated Land Statutory Guidance 2012.

We have considered the contaminated land guidance documents issued by the Department for Environment, Food and Rural Affairs (DEFRA) including Model Procedures for the Management of Land Contamination (CLR11) (Environment Agency 2004a).

Our method is to create a clear conceptual model of the potential Pollutant Linkages present on site, consider the Sources (potential contaminants on site) which may cause harm, via Pathways, to Receptors such as human health (e.g. that of site users), the water environment (groundwater, surface water) and the built environment (buildings, services). Contaminated Land has a precise definition, and does not include all land which contains contaminants, but only land where there is a Pollutant Linkage causing (or giving rise to a significant risk of) a degree of harm.

Our approach to the assessment of risks to Human Health is consistent with that established in CLR11. This establishes a tiered approach including:

- Preliminary Risk Assessment (e.g. the establishment of potential pollutant linkages) – normally through desk based work;
- Generic Quantitative Risk Assessment (GQRA) (e.g. the comparison of contaminant concentrations against Soil Guideline Values (SGV) or other Generic Assessment Criteria (GAC)); and
- Detailed Quantitative Risk Assessment (DQRA) (e.g. the comparison of contaminant concentrations against site specific assessment criteria).

Our approach to Generic Quantitative Risk Assessment (GQRA) is described in outline in the following section.

In addition to the Contaminated Land Regime, where appropriate, we have considered

- The Environmental Damage Regulations (2009). These implement the European Environmental Liability Directive and provide that, for certain activities, where there is an imminent risk of environmental damage, steps must be taken to prevent such damage, and if environmental damage has already occurred, the operator of the activity must prevent further damage.
- Common Law Liability. This remains an important aspect of contaminated land law, particularly for third parties harmed by, or suffering loss as a result of, contaminated land. Through Nuisance a person may be liable if he owns or occupies land and behaves in a way so as to cause foreseeable injury, loss or damage by creating a nuisance, for example by allowing contamination to migrate off-site either over a period of time or as a one-off event. By Negligence, where the owner of contaminated land owes a duty of care (to a claimant) which was breached. In Trespass where the contamination on a defendant's land has directly interfered with the property of a claimant.

Our Approach to GQRA

Once we have an initial understanding of the site and the potential pollutant linkages in place we plan our investigation, soil sampling regime and analytical suites. Our plan is informed by documentation such as

- The available desk study/preliminary risk assessment reports available for the site;
- CLR 8 ‘Priority Contaminants for the Assessment of Land’ (Environment Agency 2002a); and,
- The Department of the Environment’s Industry Profiles (DoE 1995-95).

In order to undertake a GQRA, contaminant concentrations need to be compared to appropriate generic assessment criteria. Current UK industry practice is to use, as first preference, UK Soil Guideline Values (SGV)s which are generic assessment criteria published by the Environment Agency and derived using the Contaminated Land Exposure Assessment model (CLEA).

The CLEA model provides an approach for the assessment of chronic risks to human health from concentrations of a substance within soil; where appropriate. However, the SGVs published to date are limited to only a small number of contaminants. Consequently, where published SGV do not exist, other GAC can be used including:

- GAC prepared in accordance with the CLEA V1.06 model by authoritative bodies (e.g. Chartered Institute of Environmental Health (CIEH), Environment Industries Commission (EIC)); or in their absence
- WSP in-house GAC prepared in accordance with the CLEA V1.06 model and associated documents.

The approach adopted by WSP has been to generate GAC for chronic risks to human health using CLEA V1.06. In generating GAC, input parameters consistent with Environment Agency publications have been adopted by WSP. In generating GAC, the default CLEA assumptions have been applied to a range of likely human health exposure models and associated critical age receptor groups including:

- Residential with Plant Uptake;
- Residential without Plant Uptake;
- Allotments;
- Parks;
- Open Spaces; and,
- Commercial/Industrial.

Cyanides

The primary risk to human receptors from free cyanide in soils is an acute risk (i.e. a single dose could have a lethal affect as opposed to adverse effects from cumulative intake (chronic affect)). There is no current UK guidance available for calculating acute risks from free cyanide, therefore an in-house methodology has been used to derive an acute GAC of 60 mg/kg for all exposure scenarios.

Volatile Hydrocarbons from Groundwater and Impacts to Human Health.

The CLEA model does not explicitly consider the potential for chronic impact to Human Health from indoor inhalation of concentrations of volatile vapours from dissolved phase contamination. The potential exists for this to be an important exposure route for a limited number of highly volatile contaminants. GAC have been calculated for volatile contaminants for volatilisation from groundwater using an in-house implementation of the Johnson and Ettinger model (WSP In-house Groundwater Model V1.1) which has been adapted to account for a dissolved phase source through consideration of (a) partitioning from groundwater to soil vapour, and, (b) transport through the capillary zone.

Generic Quantitative Risk Assessment - Controlled Waters

Our approach to the assessment of plausible pollutant linkages with respect to the pollution of Controlled Waters is consistent with UK guidance. The guidance identifies that for the pollution of the water environment to occur; poisonous, noxious, polluting or solid waste matter must be entering such waters or must be considered more likely than not to enter the water environment in the future. The assessment of whether the pollution of the water environment is likely to occur in the future requires consideration of those contaminants at source, which are present in a mobile form, at such a concentration that they will reach a receptor at concentrations considered to be poisonous, noxious, polluting or solid waste matter.

Our adopted approach for GQRA assessment therefore typically comprises the following:

- Consideration of soil concentrations of organic substances in the context of soil saturation to assess the potential for migration under gravity;
- Comparison of soil leachate/pore water concentrations against appropriate GAC; and
- Comparison of groundwater concentrations against appropriate GAC.

This approach is equivalent to Tier 1 / Level 1 Assessment as undertaken using ConSim (2009) / Environment Agency Remedial Targets Methodology V3.1 (2006).

Effectively, for the majority of sites, contaminant concentrations are compared to both drinking water standards and environmental quality standards to identify the need for further consideration/DQRA.

Further Work

Where a GAC is exceeded further work and/or remediation is normally required. For moderate exceedances further work may include progression to a Detailed Quantitative Risk Assessment (DQRA) which is likely to require further data collection. The outcome of the DQRA may be that the risk is not significant or, if the risk is identified as being significant, the generation of site-specific remedial targets.

Where significant exceedances of GAC are identified or there is evidence of potential acute risks remedial measures may be immediately required.

Ground Gas

Gas results have been assessed with regard to *Assessing Risks Posed by Hazardous Gases to Buildings*, CIRIA Report C665, 2007 (CIRIA C665) and, where a residential end use is being considered, *Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present, Edition 4*, NHBC, 2007 (NHBC 2007).

The method in CIRIA C665 uses both gas concentrations and borehole flow rates to define a characteristic situation for a site based on the gas screening value for methane and carbon dioxide. Gas screening value = borehole flow rate (litres of gas per hour) x gas concentration (%). The calculation is carried out for both methane and carbon dioxide and the worse-case value adopted.

If necessary, more detailed information on our approach to risk assessment can be provided on request.

Appendix C

GENERAL LIMITATIONS

LIMITATIONS FOR WSP LAND RESTORATION AND GROUND ENGINEERING DIVISION

General

WSP has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed and outlined in the body of the report. Unless explicitly agreed otherwise, in writing, this report has been prepared under WSP standard Terms and Conditions, as included within our proposal to the Client.

Project specific appointment documents may be agreed on a project by project basis, at our discretion. A charge may be levied for both the time to review and finalise appointments documents and also for associated changes to the appointment terms. WSP reserve the right to amend the fee should any changes to the appointment terms create an increase risk to WSP

The report needs to be considered in the light of the WSP proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report. The report is only valid for its originally intended purpose as set out in either our report or the proposal.

Phase 1 Geo Environmental and Preliminary Risk Assessments

The works undertaken to prepare this report comprised a study of available and easily documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the Site and correspondence with relevant authorities and other interested parties. Due to the short timescales associated with these projects responses may not have been received from all parties. It is not standard, due to the timescales, to visit archives and local libraries as part of these works. WSP cannot be held responsible for any disclosures that are provided post production of our report and will not automatically update our report.

The opinions given in this report have been dictated by the finite data on which they are based and are relevant only for the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, WSP reserves the right to review such information and, if warranted, to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed. Actual risks can only be assessed following intrusive investigations of the Site.

WSP does not warrant work / data undertaken / provided by others.

This section covers reports with the following titles or combination of titles: phase 1; Desk top study; geo environmental assessment; development appraisal; preliminary environmental risk assessment; constraints report; due diligence report; geotechnical development review; environmental statement; environmental chapter; geotechnical development risk register or baseline environmental assessment. The limitations associated with preliminary works apply when they are reported within an intrusive investigation report.

Intrusive Investigation Reports

The investigation has been undertaken to provide information concerning the type and degree of contamination present at the Site in order to allow a generic risk assessment to be undertaken or identification of the soil properties to allow for geotechnical development constraints to be identified.

The objectives of the investigation are limited to establishing the risks associated with potential contamination sources with the potential to cause harm to human health, building materials, the environment (including adjacent land), or controlled waters. For Geotechnical investigations the purpose is to broadly identify the development constraints associated with the physical property of the soils underlying the site.

The amount of exploratory work, soil property and chemical testing undertaken has necessarily been restricted by various factors which may include accessibility, the presence of services; existing buildings; current site usage or short timescales. The exploratory holes completed assess only a small percentage of the area in relation to the overall size of the Site, and as such can only provide a general indication of conditions. The number of sampling points and the methods of sampling and testing do not preclude the possible existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered or ground conditions that vary from those identified. In addition, there may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report. For example these include spatial variations in soil properties; the varying thickness and physical nature of the strata identified and changes in groundwater levels or flow rates.

The inspection; testing and monitoring records relate specifically to the investigation points and the timeframe that the works were undertaken. They will also be limited by the techniques employed. WSP has interpreted between these points based upon assumptions to develop our interpretation and conclusions. The assumption made in forming our conclusions is that the ground and groundwater conditions (both chemically and physically) are the same as have been encountered during the works undertaken at the specific points of investigation.

On 1st April 2010, BS EN 1997-1:2004 (Eurocode 7: Geotechnical Design – Part 1) became the mandatory baseline standard for geotechnical ground investigations.

In terms of geotechnical design for foundations, slopes, retaining walls and earthworks, EC7 sets guidance on design procedures including specific guidance on the numbers and spacings of boreholes for geotechnical design, there are limits to methods of ground investigation and the quality of data obtained and there are also prescriptive methods of assessing soil strengths and methods of design. Unless otherwise explicitly stated, the work has not been undertaken in accordance with EC7. A standard geotechnical interpretative report will not meet the requirements of the Geotechnical Design Report (GDR) under Eurocode 7. A GDR can strictly only be prepared following confirmation of all structural loads and serviceability requirements. The design process requires close co-operation between the geotechnical engineer and the structural engineer and is iterative. Where a GDR is prepared using preliminary or assumed loadings and/or serviceability limits it should only be considered as an interim report and should not be relied upon for the procurement or construction of the works it describes.

During any build programme WSP should be consulted if alternative ground conditions are encountered. It assumes during any site works that the contractor will use their best endeavours to manage and control groundwater and other unforeseen ground conditions. WSP will not be liable for actions taken prior to consultation.

The scope of the investigation was selected on the basis of the specific development and land use scenario proposed by the Client and may be inappropriate to another form of development or scheme. If the development layout was not known at the time of the investigation the report findings may need revisiting once the development layout is confirmed.

The risk assessment and opinions provided are based on currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values. Specific assumptions associated with the WSP risk assessment process have been outlined within the body or associated appendix of the report.

Additional investigations may be required in order to satisfy relevant planning conditions or to resolve any engineering and environmental issues.

If costs have been included in relation to additional site works, and / or site remediation works these must be considered as indicative only and must, be confirmed by a qualified quantity surveyor.

The following report titles (or combination) may cover this category of work: geo environmental site investigation; geotechnical assessment; GIR (Ground Investigation reports); preliminary environmental and geotechnical risk assessment; geotechnical risk register.

Detailed Quantitative Risk Assessments and Remedial Strategy Reports

These reports either use primary data or build upon previous report versions and associated notes. The scope of the investigation; further testing and monitoring and associated risk assessments were selected on the basis of the specific development and land use scenario proposed by the Client and may not be appropriate to another form of development or scheme layout. The risk assessment and opinions provided are based on currently available approaches in the generation of Site Specific Assessment Criteria relating to contamination concentrations and are not considered to represent a risk in a specific land use scenario to a specific receptor. No liability can be accepted for the retrospective effects of any future changes or amendments to these values, associated models or associated guidance.

The outputs of the Detailed Quantitative Risk Assessments are based upon WSP manipulation of standard risk assessment models. Models are simulations based on the available data set and should not be used as predictions.

Where a remediation strategy is proposed, this is based on our interpretation of the risk assessment criteria and is specific to a particular location and a particular intended land use and configuration / layout. Prior to adoption they will need discussing and agreeing with the Regulatory Authorities prior to adoption on site. The regulatory discussion and engagement process may result in an alternative interpretation being determined and agreed. The process and timescales associated with the Regulatory Authority engagement are not within the control of WSP. All costs and programmes presented as a result of this process should be validated by a quantity surveyor and should be presumed to be indicative.

Geotechnical Design Report (GDR)

A GDR can strictly only be prepared following confirmation of all structural loads and serviceability requirements. The design process requires close co-operation between the geotechnical engineer and the structural engineer and is iterative. Where a GDR is prepared using preliminary or assumed loadings and/or serviceability limits it should only be considered as an interim report and should not be relied upon for the procurement or construction of the works it describes. A GDR will be a standalone specifically entitled report.

Monitoring (including Remediation Monitoring reports)

These reports are factual in nature and comprise monitoring, normally groundwater and ground gas and data provided by contractors as part of an earthworks or remedial works.

The data is presented and will be compared with assessment criteria.

Asbestos in soils

Unless explicitly included for in our proposal, our investigation does not include for a formal asbestos assessment. The inspection for asbestos, either as asbestos containing materials (ACMs) lying on the surface or as ACMs and/or as loose asbestos fibres within made ground / stockpiles are excluded. Our report will include for the factual reporting of any soil screens that are collected. These results should be treated cautiously and should not be relied upon to provide detailed and representative information on the delineation, type and extent of bulk ACMs and/or trace loose asbestos fibres within the soil matrix at the site.

Where we indicate in our proposal that we will consider asbestos we will undertake screening of representative soil samples for the presences / absence of loose asbestos fibres. If these are found a further and more detailed specific investigation into asbestos in soils, will need to be undertaken which will include asbestos quantification testing. These investigations are associated with more rigorous monitoring of asbestos and health and safety provisions.

Appendix D

BGS BOREHOLE LOGS

TQ37NW832

Surface Level ? 8.85 ft AOD

SHEET No. 1 OF 2.

DATE STARTED: 14-6-66 DATE COMPLETED: 18-6-66 SCALE: 1|5" TO 1FT

WATER LEVEL & DATE SURFACE LEVEL RELATED TO BM (9.89) AT CORNER OF ALVEY ST AND SURREY SQUARE AS SHOWN ON SITE PLAN DRW 2394|19

REMARKS: Nº OF BLOWS TO DRIVE U4 SHOWN IN BRACKETS

GE 151

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	SPT	REMARKS
(FILL) BRICK RUBBLE AND BLACK CLAY	1 ●	3' 0"				DATE / BH DEPTH / CASING DEPTH / GROUND WATER DEPTH
						14/6 PM 9'0" 9'0" NIL
						15/6 AM 9'0" 9'0" NIL
						15/6 PM 34'0" 34'0" 17'0"
BROWN SANDY CLAY WITH F.M.C. GRAVEL	▼	5' 0"		6' 6"		16/6 AM 34'0" 34'0" 21'6"
		6' 0"			N=5	16/6 PM 51'6" 41'0" 48'9"
SOFT BROWN SANDY SILTY CLAY	2 ●	7' 0"		8' 0"		17/6 AM 51'6" 41'0" 50'0"
	▼	8' 0"				17/6 PM 60'0" 58'0" 20'0"
		9' 0"			N=45	18/6 AM 60'0" 58'0" 22'0"
DENSE BROWN F.M.C. GRAVEL AND F.M.C. SAND	3 ●	9' 6"				
	4 ↕					AFTER CASING WITHDRAWN 17'0"
	▼	11' 0"				
	5 ●	12' 0"			N=70	
	6 ↕					5/7 WATER LEVEL IN STANDPIPE 17'0"
	▼	14' 0"				
		15' 0"			N=72	
	7 ●	16' 0"				WATER SAMPLE TAKEN AT 22'0"
	▼	17' 0"				
		18' 0"			N=34	
	8 ●	18' 6"		18' 0"		STAND PIPE INSERTED TO 35'0" BELOW GROUND LEVEL
FIRM TO STIFF BROWN AND GREY SILTY CLAY				-9'0D		
		21' 6"				6" CASING INSERTED ON 18/6 WHEN BOREHOLE WAS AT 29'0"
	9 O	22' 0"				
		23' 0"			(36)	
	10 ●	25' 0"				
		26' 6"				
	11					
		28' 0"			(45)	
				24' 0"		
DENSE GREY SILTY FINE SAND	12 ●	30' 0"				
		32' 0"				50 BLOWS FOR 4"
	13 ↕	32' 4"				
	▼	34' 0"				
				35' 0"		
FIRM BROWN SILTY CLAY WITH LAYERS OF FINE GREY SAND	14 ●	35' 6"				
	15 ↕	36' 6"				
	▼	37' 0"			N=37	
		38' 0"		38' 0"		
FIRM BROWN SILTY CLAY WITH SEA SHELLS	16 ●	38' 6"				
	17 ↕	39' 6"				
				41' 0"		
						CONT'D ON SHEET 2

UNDISTURBED SAMPLE | DISTURBED SAMPLE ● | WATER SAMPLE O | BULK SAMPLE ↕ | STANDARD PENETRATION TEST ▼

AYLESBURY ROAD DEVELOPMENT SOUTHWARK

B.H. No. 1

INVESTIGATION No. F3|P|2661

Ground Engineering Limited
Manor Way, Boreham Wood, Herts.

GE 780

STRATA	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	SPT	REMARKS
						CONT'D FROM SHEET 1
HARD GREY CLAY CONTAINING BONE SHELLS FLINTS AND F. GRAVEL	18	41' 6"		41' 0"		
	19	42' 0" – 43' 6"			(250)	
				46' 0"		
STIFF GREY AND BROWN SILTY CLAY	20	45' 6"				
	21	47' 0" – 48' 6"			(150)	
	22	50' 0"		51' 0"		U4 ATTEMPTED NO RECOVERY
DENSE BROWN F.M.C. SAND AND F.M.C. GRAVEL	23	51' 6"				
	24 25	53' 0" – 54' 0"				
HARD GREY SANDY & SILTY CLAY WITH F.M.C. GRAVEL	26	55' 0" – 56' 0"		55' 0"	N=110	
	27	57' 0"		57' 0"		
DENSE F.M.C. SAND AND F.M.C. GRAVEL WITH A BINDER OF GREEN SANDY & SILTY CLAY	28	57' 6" – 58' 0"				
	29 30	58' 6" – 59' 0" – 60' 0"		60' 0"	N=128	
						BOREHOLE COMPLETE

AYLESBURY RD DEVELOPMENT SOUTHWARK

B.H. No. 1

INVESTIGATION No. RBP/2661

Ground Engineering Ltd.,
Manor Way,
Boreham Wood, Herts.

TQ37NW833

BOREHOLE RECORD

SURFACE LEVEL: 10·06 9.89 NOMINAL B.H. DIA.: 8" AND 6" SHEET No: 1 OF 2

DATE STARTED: 20·6·66 DATE COMPLETED: 23·6·66 SCALE: 1/5" TO 1FT

WATER LEVEL & DATE SURFACE LEVEL RELATED TO 6m (9.89) AT CORNER OF ALVEY ST AND SURREY SQUARE AS SHOWN ON SITE PLAN DRW 2394/1A

REMARKS: N° OF BLOWS TO DRIVE U4 SHOWN IN BRACKETS

GE 151

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	SPT	REMARKS
BRICK RUBBLE AND BLACK CLAY, SAND AND ASHES (FILL)	1	3' 0"				DATE / BH DEPTH / CASING DEPTH / GROUND WATER DEPTH 20/6 AM 11'0" 10'0" NIL 21/6 AM 11'0" 10'0" NIL 21/6 PM 34'0" 21'0" 24'0" 22/6 AM 34'0" 21'0" 18'0" 22/6 PM 54'6" 45'0" NIL 23/6 AM 54'6" 45'0" NIL 23/6 PM 60'0" 38'0" *30'0 AFTER CASING WITHDRAWN 18'0" 5/7 WATER LEVEL IN STANDPIPE 17'6" STAND PIPE INSERTED TO 42'0" BELOW GROUND LEVEL 5" CASING INSERTED ON 22/6 WHEN BOREHOLE WAS AT 34'0" AND 8" CASING AT 21'0" * GROUND WATER ENCOUNTERED AGAIN AT 56'0" AND ROSE TO 30'0". WATER SAMPLE TAKEN AT 30'0" 80 BLOWS FOR 9" 80 BLOWS FOR 9"
FIRM BROWN CLAYEY F.M. SAND	2	6' 6"		5' 0"		
FINE BROWN SLIGHLY CLAYEY AND SILTY SAND	3	6' 6"		6' 6"		
DENSE F.AND M. GRAVEL AND BROWN SAND		8' 0"		8' 0"		
MEDIUM DENSE TO DENSE F.M.C. SAND AND F.M.C. GRAVEL	4	9' 0"		9' 0"	N=119	
	5	10' 0"				
	6	10' 6"				
		11' 0"				
		13' 0"			N=43	
		14' 6"				
		15' 0"				
	7	16' 0"		-8'	N=60	
		17' 0"		18' 0"		
FIRM DARK GREY CLAY WITH SHELLS	8	19' 0"				
FIRM GREY/BLUE CLAY	9	21' 0"		20' 6"		
	10			22' 0"	(20)	
	11	22' 6"				
FIRM TO STIFF MOTTLED GREY AND BROWN CLAY	12	24' 6"				
	13	26' 0"			(20)	
	14	27' 6"				
	15	29' 6"				
	0	30' 0"				
	16	31' 0"			(25)	
	17	32' 6"				
VERY DENSE SANDY SILT	18	36' 0"		34' 6"		
	19	37' 0"				
		37' 9"				
		39' 0"				
	20	40' 0"				
		40' 9"				
		42' 0"		42' 6"		

CONT'D ON SHEET 2.

UNDISTURBED SAMPLE | DISTURBED SAMPLE ● | WATER SAMPLE O | BULK ↕ | STANDARD PENETRATION TEST ▼

AYLESBURY ROAD DEVELOPMENT SOUTHWARK

B.H. No. 2

INVESTIGATION No. P3/P/2661

Ground Engineering Limited
Manor Way, Borehamwood, Herts.

TQ37NW/833

GE 780

STRATA	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	SPT	REMARKS
				42'6"		
FIRM DARK BROWN SILTY CLAY WITH SEA SHELLS	21	43'0"		43'6"		
FIRM GREY AND BROWN CLAY WITH SHELLS	22	45'0"		46'3"		
FIRM BROWN RED AND GREY CLAY	23	46'3"		47'9"	(300)	
	24	47'9"				
FIRM TO STIFF MOTTLED RED AND GREY CLAY	25	49'0"				
		51'0"				
	26				(300)	
	27	52'6"				
DENSE FINE GREY SAND AND F.M. GRAVEL				54'0"	✓	
	28	54'6"		55'0"	✓	
DENSE F.M. GRAVEL WITH BROWN SAND	29	55'6"				
		56'0"		56'6"	N=61	
DENSE CLAYEY F.M. GREEN SAND	30	56'6"				
	31	57'0"				
	32	58'0"				
		59'0"			N=180	
	33	60'0"		60'0"		BOREHOLE COMPLETE

54.0
LP.0
56.0

46.25
18.00
28.25

47.75
18.00
29.75

AYLESBURY ROAD DEVELOPMENT
SOUTHWARK

B.H. No. 2

INVESTIGATION No.
F3 | P | 2661

Ground Engineering Ltd.,
Manor Way,
Boreham Wood, Herts.

TQ37NW834

SURFACE LEVEL: 8·42 A.O.D. NOMINAL B.H. DIA.: 8" AND 6" SHEET No.: 1 OF 2

DATE STARTED: 13-6-66 DATE COMPLETED: 21-6-66 SCALE: 1/2" TO 1FT

WATER LEVEL & DATE SURFACE LEVEL RELATED TO B.M. (9·89) AT CORNER OF ALWEY ST. AND SURREY SQUARE AS SHOWN ON SITE PLAN 2394/1A

REMARKS: N° OF BLOWS TO DRIVE U4 SHOWN IN BRACKETS

BOREHOLE CASED TO 34' 6"

GE 151

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	SPT	REMARKS
				0' 0"		GROUND WATER WAS AT 15' 6" AFTER CASING WITHDRAWN
BRICK SOIL STONE ETC (FILL)	1					WATER SAMPLE TAKEN AT 15' 6"
		5' 0"		5' 0"		
FIRM BROWN SANDY CLAY	2	5' 6"		6' 0"	(140)	STAND PIPE INSERTED TO 17' 6" BELOW GROUND LEVEL
	3	7' 0"				
	4	7' 6" 8' 6"			N=68	
DENSE BROWN F.M.C. SAND AND F.M.C. GRAVEL	6 5	10' 6				
		12' 0"				
	7	12' 6" 13' 6"			N=43	
	8	15' 0"				WATER ADDED TO ASSIST DRILLING IN THE SAND AND GRAVEL
	0 10	15' 6"				
	9	17' 6" 18' 6"		-11½ (-12)	N=42	6" CASING INSERTED ON 18/6 WHEN BOREHOLE WAS AT 32'0", AND 8" CASING AT 28' 6"
		20' 0"		20' 0"		
STIFF BROWN CLAY	11	20' 6"		20' 6"		
STIFF GREY SILTY CLAY WITH SEA SHELLS AND THIN LAYERS OF SILT AND SAND	12 13	21' 0" 22' 6"		24' 0"	(69)	
VERY STIFF GREY AND RED MOTTLED CLAY WITH LAYERS OF SEA SHELLS	14 15	25' 0" 26' 6"			(68)	
	16	28' 6"		28' 6"		
VERY STIFF GREY AND RED MOTTLED CLAY	17	30' 0"			(300)	NO RECOVERY LAST 6" OF U4 IN SAND
COMPACT BROWN SAND WITH SOME GRAVEL	18	31' 6" 32' 6"		31' 0" 32' 6"	N=57	
VERY STIFF GREY AND GREEN CLAY	19	33' 6"				
	20	36' 6"		36' 6"	(115)	
DENSE CLAY BOUND GRAVEL AND SAND	21 23	37' 0"				
	22	39' 6" 40' 6"			N=78	
	24	41' 0"			(120)	
	25	42' 6"		42' 6"		CONT'D ON SHEET 2

UNDISTURBED SAMPLE | DISTURBED SAMPLE | WATER SAMPLE | BULK SAMPLE | STANDARD PENETRATION TEST

AYLESBURY ROAD DEVELOPMENT SOUTHWARK

B.H. No. 3

INVESTIGATION No. F3 | P | 2661

Ground Engineering Limited
Manor Way, Boreham Wood, Herts.

TQ3/NW/834

GE 780

STRATA	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	R.L.	REMARKS
CONT'D FROM SHEET 1						
		42'6"		42'6"	-78	
DENSE GREENISH GREY SILTY FINE SAND WITH THIN CLAY LAYERS						
	▼26	46'6" 47'0" 47'6"			N=138	
	28			49'6"	-41	
DENSE SILTY FINE GREENISH GREY SAND	▼29	51'0" 51'6"				61 BLOWS FOR 6"
	●31	54'0"				
	▼32	56'0" 56'3"				50 BLOWS FOR 3"
	34 ●33	58'0"				
	▼27	59'6" 59'11"		60'0"		81 BLOWS FOR 5"
						BOREHOLE COMPLETE

T.S on ca -39'?
Chalk

or -72

-41
-38
-79

-34
-38
-72

AYLESBURY ROAD DEVELOPMENT SOUTHWARK

B.H. No. 3

INVESTIGATION No. F3/P/2661

Ground Engineering Ltd.,
Manor Way,
Boreham Wood, Herts.

TQ37NW836

SURFACE LEVEL: 8·18 A·O·D NOMINAL B.H. DIA.: 8" SHEET No.: 2

DATE STARTED: 24-6-66 DATE COMPLETED: 27-6-66 SCALE: 1/5" = 1FT

WATER LEVEL & DATE SURFACE LEVEL RELATED TO BM (9·89) AT CORNER OF ALVEY ST AND BURREY SQUARE AS SHOWN ON SITE PLAN DRW 2894/1A

REMARKS: Nº OF BLOWS TO DRIVE U4 SHOWN IN BRACKETS

GE 148

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	SPT	REMARKS
CLAY, SAND, BROKEN BRICK ETC. (FILL)	1					DATE / B.H DEPTH / CASING DEPTH / GROUND WATER DEPTH
						24/6 PM 13'0" 11'6" NIL
						25/6 AM 13'0" 11'6" NIL
						25/6 PM 24'6" 22'0" 16'6"
						26/6 AM 24'6" 22'0" 15'6"
						26/6 PM 26'0" 24'6" 15'6"
		4' 0"		4' 0"		
FIRM BROWN SANDY CLAY		5' 0"				
	2			6' 0"	(20)	
	3	6' 6"				
MEDIUM DENSE TO DENSE BROWN F.M.G. SAND AND F.M.C. GRAVEL		7' 0"				
		8' 0"			N=30	
	4 & 5	10' 0"				
		12' 0"				
		13' 0"			N=87	
	6	15' 0"			-8	
	O	15' 6"		16' 6"		WATER SAMPLE TAKEN AT 15' 6"
STIFF BROWN SANDY CLAY		17' 0"				
		18' 0"			N=38	
MEDIUM DENSE BROWN SILTY FINE SAND WITH TRACES OF DARK SOIL	7	19' 0"		18' 6"		
		20' 3"				
		21' 3"			N=34	
	8	22' 0"		22' 0"		
STIFF LAMINATED GREY CLAY WITH THIN LAYERS OF SAND		23' 0"		22' 9"		
	9				(115)	
		24' 6"				
MEDIUM DENSE BROWN FINE SILTY SAND		25' 0"				
		26' 0"		26' 0"	N=20	
						BOREHOLE COMPLETE

UNDISTURBED SAMPLE | DISTURBED SAMPLE ● | WATER SAMPLE O | BULK SAMPLE ↕ | STANDARD PENETRATION TEST ▼

AYLESBURY ROAD DEVELOPMENT
SOUTHWARK

B.H. No. 5

INVESTIGATION No. F3/P/2661

Ground Engineering Limited
Manor Way, Boreham Wood, Herts.

DATE STARTED: [redacted] DATE COMPLETED: 23-6-66 SCALE: 1/5" TO 1FT

WATER LEVEL & DATE SURFACE LEVEL RELATED TO B.M. (9.89) AT CORNER OF ALVEY ST. AND SURREY SQUARE AS SHOWN ON SITE PLAN DRW. 2594/1A

REMARKS: Nº OF BLOWS TO DRIVE U4 SHOWN IN BRACKETS

GE 15

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	SPT	REMARKS
SAND CLAY AND BRICKS (FILL).	1					DATE BH DEPTH / CASING DEPTH / GROUP WATER DEPT 22/6 PM 8'6" NIL NIL 23/6 AM 8'6" NIL NIL 23/6 PM 29'0" 25'0" 16'3
		5' 0"		5' 0"		
FIRM BROWN SANDY CLAY	2	5' 6"				
	3	7' 0"		6' 6"	(12)	
		7' 6"			N=27	
MEDIUM DENSE BROWN F.M.C. SAND AND F.M.C GRAVEL	4	8' 6"				
	5	10' 6"				
		12' 6"			N=40	
		13' 6"				
	6	16' 0"				
	7	16' 3"				WATER SAMPLE TAKEN AT 16' 3"
		17' 6"			N=29	
		18' 6"				
					-13	
	8	22' 0"		22' 0"		
DENSE BROWN FINE SAND		22' 8"				100 BLOWS FOR 6"
	9	23' 2"				
		25' 0"		25' 0"		
STIFF GREY CLAY WITH THIN LAYERS OF SAND						
	10	27' 6"				
	11	29' 0"		29' 0"	(43)	
						BOREHOLE COMPLETE

UNDISTURBED SAMPLE | DISTURBED SAMPLE | WATER SAMPLE | BULK SAMPLE | STANDARD PENETRATION TEST

AYLESBURY ROAD DEVELOPMENT
SOUTHWARK

B.H. No. 6

INVESTIGATION No. 52/P/2661

Ground Engineering Limited
Manor Way, Boreham Wood, Herts.

TQ37NW838

DATE STARTED: 1-7-66 DATE COMPLETED: 4-7-66 SCALE: 1/5" TO 1FT

WATER LEVEL & DATE SURFACE LEVEL RELATED TO B.M.(9.89) AT CORNER OF ALLEY ST. AND SURREY SQUARE AS SHOWN ON SITE PLAN DRW. 2394/1A

REMARKS: Nº OF BLOWS TO DRIVE U4 SHOWN IN BRACKETS

GE 151

STRATA.	SAMPLE No	SAMPLE DEPTH	B.H.	DEPTH	SPT	REMARKS
						DATE / B.H. DEPTH / CASING DEPTH / GROUND WATER DEPTH
SAND CLAY BROKEN BRICK ETC. (FILL)	1					1/7 PM 10'6" NIL NIL 2/7 AM 10'6" NIL NIL 2/7 PM 21'6" 20'0" NIL 4/7 AM 21'6" 20'0" 14'9" 4/7 PM 25'0" 25'6" 13'3"
		10' 0"		10'0"		
DENSE BROWN F.M.C. SAND AND F.M.C. GRAVEL	2 (3)	11' 0"			N=90	
		12' 0"				
		13' 0"				
	4	13' 6"				WATER SAMPLE TAKEN AT 14'9"
	(5) 6	14' 9"				
		16' 0"		16' 0"	N=31	6" CASING INSERTED ON 2/7 WHEN 8" CASING WAS AT 16' 6"
STIFF GREY AND BROWN SILTY CLAY	7	17' 0"				
		18' 0"				
	8	19' 6"		19' 0"	(26)	
DENSE BROWN FINE SAND	9	20' 6"			N=101	
		21' 6"				
	10	24' 0"				
	11	25' 0"		25'0"	N=117	
						BOREHOLE COMPLETE

UNDISTURBED SAMPLE	DISTURBED SAMPLE	WATER SAMPLE	BULK SAMPLE	STANDARD PENETRATION TEST
I	•	O	↕	▼

AYLESBURY ROAD DEVELOPMENT
SOUTHWARK

B.H. No. 7

INVESTIGATION No. TQ3 | F | 2661

Ground Engineering Limited
Manor Way, Boreham Wood, Herts.

TQ37NW839

BOREHOLE RECORD

SURFACE LEVEL: 6·58 A·O·D NOMINAL B.H. DIA.: 8" SHEET No.: 1

DATE STARTED: 30-6-66 DATE COMPLETED: SCALE: 1/5" = 1 FT

REMARKS: SURFACE LEVEL RELATED TO B.M. (9·89) AT CORNER OF ALLEY BT. AND SURREY SQUARE AS SHOWN ON SITE PLAN ORD. 2394/18

NP OF BLOWS TO DRIVE 1/4 SHOWN IN BRACKETS

FS 179-1

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	SPT	REMARKS
CLAY SAND & BROKEN BRICK (FILL)	1	2' 6"		3'0"		DATE / BOREHOLE DEPTH / CASING DEPTH / GROUND WATER DEPTH 30/6 PM 18'0" 15'0" NIL 1/7 AM 18'0" 15'0" NIL 1/7 PM 25'0" 15'0" 13'0" WHEN CASING WITHDRAWN
FIRM GREY AND BROWN SANDY SILTY CLAY	2	4' 6"		5' 6"	(31)	
MEDIUM DENSE TO DENSE BROWN F.M.C. GRAVEL AND F.M.C. SAND	3	6' 0"				
	4	6' 9"			N=45	
		7' 9"				
	5	10' 0"				WATER SAMPLE TAKEN AT 21' 6"
		11' 6"			N=113	
	6	12' 6"				
		14' 6"		14' 6"		
STIFF GREY AND RED MOTTLED SILTY CLAY	7	15' 6"			(18)	
	8	17' 0"		18'0"		
STIFF GREY SILTY CLAY	9	19' 6"				
	10	20' 6"				
	11	21' 6"		21' 6"	(45)	GROUND WATER ENCOUNTERED AT 21' 6" RISING TO 14' 9"
		22' 0"				
DENSE GREY SILTY FINE SAND	12	23' 9"		23'9"	(160)	
VERY DENSE SILTY FINE SAND	13	25' 0"		25' 0"		BOREHOLE COMPLETE

UNDISTURBED SAMPLE | DISTURBED SAMPLE ● | WATER SAMPLE ○ | BULK SAMPLE ↕ | STANDARD PENETRATION TEST ▼

AYLESBURY RD. DEVELOPMENT SOUTHWARK

B.H. No. 8

INVESTIGATION No. FSP/2661

JOHN LAING AND SON LIMITED
RESEARCH AND DEVELOPMENT CENTRE
SOIL MECHANICS DEPARTMENT
BOREHAM WOOD, HERTS.

SHEET NO. 1

TQ37NW840

DATE STARTED: 4-7-66 DATE COMPLETED: 5-7-66 SCALE: 1/5 = 1 FT

WATER LEVEL & DATE SURFACE LEVEL RELATED TO B.M (9.89) AT CORNER OF ALLEY ST. AND SURREY SQUARE AS SHOWN ON SITE PLAN DRW. 2396/1A

REMARKS: N° OF BLOWS TO DRIVE U4 SHOWN IN BRACKETS

GE 151

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	SPT	REMARKS
BRICK RUBBLE (FILL)						DATE / B.H. DEPTH / CASING DEPTH / GROUND WATER DEPTH
		3' 0"		3' 0"		4/7 PM 15'6" 15'0" NIL
FIRM BROWN SANDY CLAY	1	3' 6"				5/7 AM 15'6" 15'0" NIL
	2	5' 0"				5/7 PM 25'6" 15'0" 15'6"
		5' 6"		5' 6"	N=39	
	3	6' 0"				
MEDIUM DENSE TO DENSE BROWN F.M.C. SAND AND F.M.C. GRAVEL	4	6' 6"				
		8' 0"			N=26	
	5	8' 6"				
		9' 0"				
		9' 6"				
		11' 0"				
	6	11' 6"			N=98	
		12' 6"				
	7	15' 0"				
	8	14' 6"		14' 6"		
STIFF GREY AND BROWN SILTY CLAY	9	15' 0"			N=14	WATER SAMPLE TAKEN AT 15'6"
		15' 6"				
	10	17' 6"				
	11	19' 0"			(60)	
	12	21' 0"				
	13	22' 6"		22' 0"		
FIRM GREY CLAY WITH LAYERS OF SAND		23' 0"		23' 0"		
	14	24' 6"				
DENSE BROWN SILTY FINE SAND	15	26' 0"				100 BLOWS FOR 6"
	16	25' 6"		25' 6"		BOREHOLE COMPLETE

UNDISTURBED SAMPLE | DISTURBED SAMPLE ● | WATER SAMPLE ○ | BULK SAMPLE ↕ | STANDARD PENETRATION TEST ▼

AYLESBURY ROAD DEVELOPMENT SOUTHWARK

B.H. No. 9

INVESTIGATION No. TQ3 | P | 2661

Ground Engineering Limited
Manor Way, Boreham Wood, Herts.

TQ37NW842

SURFACE 10.25' AOD SHEET No.: 1

DATE STARTED: 1-7-66 DATE COMPLETED: 2-7-66 SCALE: 1/8" = 1FT.

REMARKS: SURFACE LEVEL RELATED TO B.M. (9.89) AT CORNER OF ALLEY AT AND SQUARED SQUARE AS SHOWN ON SITE PLAN ORD. 2284/10

No. OF BLOWS TO DRIVE 4" SHOWN IN BRACKETS

FS 179-1

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	SPT.
GRAVEL AND BRICKS CLAY ETC. (FILL)		3' 0"		3' 0"	
FIRM BROWN SANDY CLAY	1 ●	3' 6"			
	2 ▼	6' 0"			N=13
		7' 0"			
COMPACT BROWN SAND WITH LAYERS OF BROWN SANDY CLAY AND F.M. GRAVEL	3 ●	9' 6"		9' 0"	
	4	10' 6"			N=58
		11' 6"		11' 0"	
MEDIUM DENSE TO DENSE F.M.G. SAND AND F.M.C. GRAVEL.	5 ▼	12' 0" 12' 6" 13' 6" 14' 0"			N=29
	6 ▼	15' 0" 15' 6" 16' 0" 16' 6"			N=48
	7	18' 0" 18' 6"			
	8 ▼	19' 0" 19' 6" 20' 0"		-10	N=60
DENSE GREY SANDY SILT	9 ●	20' 6"		20' 0"	
	10 ▼	21' 6" 22' 3"		22' 0"	
HARD BROWN CONGLOMERATED SAND WITH CLAY-STONE	11	22' 6" 24' 0"		24' 0"	
HARD GREY CLAY WITH SEA SHELLS	12 ●	24' 6"		25' 0"	
FIRM GREY AND BROWN SILTY CLAY.	13 ●	25' 6"			
		26' 6"		26' 6"	
FIRM GREY AND BROWN SILTY CLAY	14	28' 0"		28' 0"	(50)

REMARKS

DATE	SH DEPTH	CASING DEPTH	GROUND WATER DEPTH
1/7 pm	15'0"	15'0"	NIL
2/7 am	15'0"	15'0"	NIL
2/7 am	28'0"	25'0"	NIL
4/7	28'0"	20'0"	17'0"

GROUND WATER ENCOUNTERED AT 19'0" WAS SEALED OFF AND ENCOUNTERED AGAIN AT 22'0"

WATER SAMPLE TAKEN AT 19'0"

80 BLOWS FOR 9"

BOREHOLE COMPLETE

UNDISTURBED SAMPLE | DISTURBED SAMPLE ● | WATER SAMPLE ○ | BULK SAMPLE ↕ | STANDARD PENETRATION TEST ▼

AYLESBURY RD. DEVELOPMENT SOUTHWARK

B.H. No. 11

INVESTIGATION No. RB/2661

JOHN LAING AND SON LIMITED
RESEARCH AND DEVELOPMENT CENTRE
SOIL MECHANICS DEPARTMENT
BOREHAM WOOD, HERTS.

SURFACE LEVEL: 10'.71.000 NOMINAL B.H. DIA.: 8" SHEET No.: 2

DATE STARTED: 21-6-66 DATE COMPLETED: 25-6-66 SCALE: 1/2" = 2FT

REMARKS: SURFACE LEVEL RELATED TO O.D. (A.O.D.) AT CORNER OF ALLEY ST. AND SURVEY SQUARE AS SHOWN ON SITE PLAN DRG. 2394/1A

BOREHOLE CASED TO 21'0" — NO GROUND WATER ENCOUNTERED

FS 1721

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	R.L.	REMARKS
BRICK RUBBLE AND BLACK CLAY (FILL)	1	3' 0"		4' 6"		
FIRM BROWN SANDY CLAY	2	5' 0"				
	3	6' 0"			N=10	
		7' 0"		8' 0"		
DENSE BROWN F.M.C. SAND AND F.M.C. GRAVEL	4	8' 6"				80 BLOWS FOR 8"
		9' 0"				
		9' 8"				
	5	11' 0"				
		12' 0"			N=85	
		13' 0"				
	6	15' 0"			N=65	
		16' 0"				
		17' 0"				
	7	18' 0"			N=25	
		19' 0"		-10'		
				20' 6"		
FIRM BROWN SILTY CLAY	8	21' 0"				
		22' 0"		22' 0"		
FIRM BROWN AND GREY SILTY CLAY	9				(30)	
	10	23' 6"				
	11	25' 6"			(45)	
	12	27' 0"		27' 0"		
						BOREHOLE COMPLETE

UNDISTURBED SAMPLE | DISTURBED SAMPLE ● | WATER SAMPLE ○ | BULK SAMPLE ↕ | STANDARD PENETRATION TEST ▼

AYLESBURY RD DEVELOPMENT SOUTHWARK

B.H. No. 13

INVESTIGATION No. F3P/2661

JOHN LAING AND SON LIMITED
RESEARCH AND DEVELOPMENT CENTRE
SOIL MECHANICS DEPARTMENT
BOREHAM WOOD, HERTS.

3290.7836

Sheet No. 1 of 2

TQ37NW845

+ to 5'0D ?

DATE STARTED: 22·4·67 ... DATE COMPLETED: 24·4·67 ... SCALE: 1" to 1'

WATER LEVEL & DATE ... See table. Water sample taken at 16' 6"

REMARKS: N° of blows to drive U4 shown in brackets.

GE 148

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	S.P.T.	REMARKS
(FILL) Mixture of ash, brick, stones & soil.	1 •	2' 6"		3' 0"		
Firm brown CLAYEY SAND with some M. GRAVEL.	2	3' 6"				
	3	5' 0"		5' 0"		
	•					
	4	7' 0"				
Medium dense brown F.M.C. GRAVEL with F.M.C. SAND.	•	7' 6"				
	6	8' D			N=31	
	5	10' D				
	•	10' 6" D				
		11' D			N=24	
	7					
	•	13' 0"				
		14' 0"			N=36	
		15' 6"				
	9	16' 0"				
	•	17' 0"			N=23	
	11					
	10	18' 6"		-10'		
	•	19' 6"				
Glacial Erratic BOULDER	12	20' D		20' 0"		
Firm dark grey SILTY CLAY with shells & some FGM GRAVEL.	13	20' 6"		20' 3"	N=29	
	14	21' 6"		21' 9"		
	15				(60)	
Stiff to hard grey & brown mottled CLAY.	•	23' 0"				
	16	23' 6"			(36)	
	17					
	•	25' 0"		25' 0"		

Date	B.H. Depth	Casing Depth	Depth to Water
22.4pm	14' 0"	14' 0"	NIL
24.4am	14' 0"	14' 0"	-
24.4	Encountered at 16' 6"		
24.4pm	25' 0"	20' 6"	16' 6"

Borehole Completed.

UNDISTURBED SAMPLE | DISTURBED SAMPLE • | WATER SAMPLE ○ | BULK SAMPLE ↕ | STANDARD PENETRATION TEST V

AYLESBURY ROAD DEVELOPMENT

SOUTHWARK.

B.H. No. 14

INVESTIGATION No. F3P 2986

Ground Engineering Limited
Manor Way, Boreham Wood, Herts.

3300. 7824

TQ37NW851

SURFACE LEVEL: 0·7 NOMINAL B.H. DIA.: 8" SHEET No.: 1 of 1

DATE STARTED: 1·5·67 DATE COMPLETED: 2·5·67 SCALE: 1" = 1'

WATER LEVEL & DATE: See table. Water sample taken at 13' 6"

REMARKS: No of blows to drive U4 shown in brackets

GE 148

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	S.P.T.
FILL MATERIAL					
TOPSOIL, STONES & BRICKS.	1 •	2' 6"			
	2 •	5' 0"			
		5' 6"		5' 6"	
F.M.C. SAND &		6' 0"			
		7' 0"			N=60
	5 • 3	7' 6"			
F.M. GRAVEL		9' 0"			
	4 •	10' 0"			N=24
		10' 6"			
	6 •	12' 0"			
		12' 6"			N=42
		13' 0"			
	8 7 •	15' 0"		-10	
		15' 6"			N=60
		16' 0"		16' 6"	
Stiff brown & red mottled CLAY					
	9	17' 6"		17' 6"	
Stiff brown & grey	10 •	19' 0"			(26)
mottled CLAY					
	11 •	22' 6"			
		23' 6"			(45)
Stiff dark grey CLAY	13 12				
	•	25' 0"		25' 0"	

REMARKS

Date	BH Depth	Casing Depth	Depth to Water
1·5am	–	–	–
1·5am	16' 0"	16' 0"	14' 0"
2·5am	16' 0"	16' 0"	
2·5pm	25' 0"	17' 0"	
	25' 0"	0	18' 6"

- 10' dry

Borehole Completed

UNDISTURBED SAMPLE | DISTURBED SAMPLE • | WATER SAMPLE ▽ | BULK SAMPLE ↕ | STANDARD PENETRATION TEST ▽

AYLESBURY ROAD DEVELOPMENT
SOUTHWARK

B.H. No. 20

INVESTIGATION No. FAP 2986

Ground Engineering Limited
Manor Way, Boreham Wood, Herts.

TQ37NW962

TQ37NW/962.

BOREHOLE RECORD

N.G.R. 3294. 7812.

SURFACE LEVEL: 5·56 NOMINAL B.H. DIA.: 8" SHEET No.: 1 of 1

DATE STARTED: 12·6·68 DATE COMPLETED: 18·6·68 SCALE: 1" to 5'

REMARKS:

GE 151

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	S.P.T. or C.p.s.f.Ø	DETAILS OF GROUND WATER & REMARKS
Hardcore FILL				0' 3"		
Medium dense to dense F.M.C. FLINTY GRAVEL with a trace of F.M.C. yellow-brown SAND	V_c 1	1' 6"			N=47	
		2' 0"				
		3' 0"				
	V_c 2	4' 6"			N=43	
		5' 0"				
		6' 0"				
	V_c 3	7' 6"			N=42	
		8' 0"				
		9' 0"				
	V_c 4	10' 6"			N=35	
		11' 0"				
		12' 0"				
		12' 6"				
		13' 6"				
	V_c 5	14' 0"			N=25	
		15' 0"		-10 OD		
				16' 0"		
Firm becoming very stiff grey blue laminated SANDY SILTY CLAY	7 (26)	18' 0"				
	8 9 (44)	19' 6"				
				20' 6"		
Stiff dark grey-brown fissured SILTY CLAY with many white fossil shells	10	21' 0"				
	11	22' 6"				
Very stiff yellow & blue mottled SANDY SILTY CLAY	12 (44)	23' 6"		23' 6"		
				24' 0"		
Very dense white & yellow calcareous SILT.	13	24' 6"		24' 6"		

DATE 1968	B.H. DEPTH	CASING DEPTH	GROUND WATER DEPTH
12·6	16' 6"	16' 0"	16' 0"
12·6	16' 6"	16' 0"	12' 6"
13·6	24' 6"	18' 0"	12' 6"
14·6	Dry hole collapsed to 12' 0"		

Water added to assist drilling between 1' 6" & 15' 0"

Borehole Completed

FLOOD PLAIN TERRACE GRAVEL

WOOLWICH & READING BEDS

UNDISTURBED SAMPLE (No. Blows) | DISTURBED SAMPLE ● | WATER SAMPLE ○ | BULK SAMPLE ↕ | STANDARD PENETRATION TEST V_c

AYLESBURY ROAD DEVELOPMENT : SOUTHWARK

INVESTIGATION No. F2P 9430

B.H. No. 21

Ground Engineering Limited
Manor Way, Boreham Wood, Herts.

TQ37 NW/963.
NGR 3291 7810

BOREHOLE RECORD

SURFACE LEVEL: 8·84 NOMINAL B.H. DIA.: 8" SHEET No.: 1 of 1
DATE STARTED: 10·6·68 DATE COMPLETED: 11·6·68 SCALE: 1" to 5'
REMARKS:

GE 151

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	S.P.T. or C.p.s.f.@
MADE UP GROUND consisting of Sandy Clay Bricks & Topsoil.		3' 6"		4' 6"	
FLOOD PLAIN TERRACE GRAVEL: Medium dense to very dense F.M.C. GRAVEL & some F.M.C. yellow. brown SAND.	1 (D)				
	2	5' 0" – 6"			
	3	6' 0" – 6"			N = 106
	4	8' 0" – 9' 3"			N > 80 22 blows for 9" penetration
	5	11' 0" – 12' 6"			N = 49
	6	14' 0" – 15' 9"		~7' OD	N = 80
Medium dense F.M.C. GRAVEL with a little F.M.C. brown SAND & some SANDY CLAY	7	17' 0" – 18' 0"		16' 0"	N = 14
Stiff blue green SILTY SANDY CLAY & some F.M.C. GRAVEL		19' 0" – 19' 6"		18' 6"	
Stiff grey-green fine SAND becoming SILTY CLAY with many fossil shells.	9 (D)			19' 6"	
	10	21' 0"			
	11	25' 0"			
White, yellow & black calcareous SILT.	12 (D)	25' 0" – 6"		25' 6"	
				26' 0"	

DATE 1968	B.H. DEPTH	CASING DEPTH	GROUND WATER DEPTH
10·6	10' 0"	10' 0"	8' 0"
11·6	10' 0"	10' 0"	8' 8"
11·6	Water met at		19' 6"
11·6	25' 0"	NIL	15' 9"
12·6	"	"	"
12·6	"	"	"
13·6	"	"	"
13·6	"	"	"
14·6	"	"	16' 0"
14·6	"	"	"
15·6	"	"	"

Water added to assist drilling between 4' 6" & 18' 6"

Boreholes Completed

UNDISTURBED SAMPLE (No. Blows) | DISTURBED SAMPLE ● | WATER SAMPLE ○ | BULK SAMPLE ↕ | STANDARD PENETRATION TEST SPT

INVESTIGATION No. FSP 3480

AYLESBURY ROAD DEVELOPMENT : SOUTHWARK

B.H. No. 22

Ground Engineering Limited
Manor Way, Boreham Wood, Herts.

Appendix E

BACTEC UNEXPLODED ORDNANCE REPORT

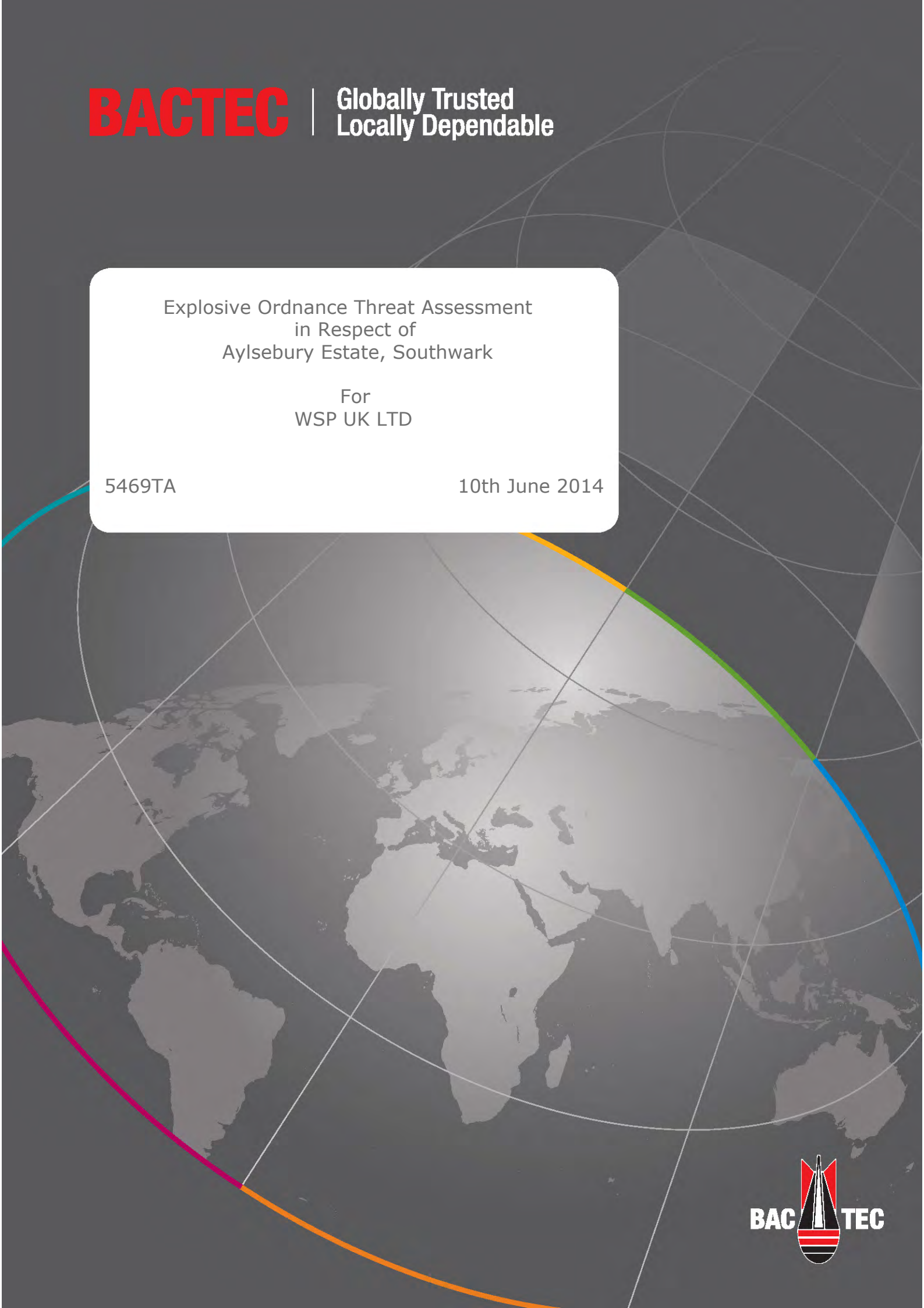
BACTEC | Globally Trusted Locally Dependable

Explosive Ordnance Threat Assessment in Respect of Aylsebury Estate, Southwark

For
WSP UK LTD

5469TA

10th June 2014



BACTEC

Explosive Ordnance Threat Assessment

in respect of

Aylesbury Estate, Southwark

for

WSP UK Limited

5469TA 10th June 2014

BACTEC International Limited
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Date of Issue: 10th June 2014 Copy no. 1

Originator: DK / OTB

This Report has been produced in compliance with the Construction Industry Research and Information Association guidelines for the preparation of Detailed Risk Assessments in the management of UXO risks in the construction industry.

Glossary of Terms

AAA	Anti-Aircraft Artillery
ARP	Air-raid Precautions
BDO	Bomb Disposal Officer
EOD	Explosive Ordnance Disposal (current term for "bomb" disposal)
HE	High Explosive
HG	Home Guard
IB	Incendiary Bomb
kg	Kilogram
LCC	London County Council
LM	Land Mine
LSA	Land Service Ammunition (includes grenades, mortars, etc.)
Luftwaffe	German Air Force
m bgl	Metres Below Ground Level
MoD	Ministry of Defence
OB	Oil Bomb
PM	Parachute Mine
RAF	Royal Air Force
SI	Site Investigation
SAA	Small Arms Ammunition (small calibre cartridges used in rifles & machine guns)
UXB	Unexploded Bomb
UXO	Unexploded Ordnance
V-1	"Doodlebug" the first cruise type missile, used against London from June 1944. Also known as 'Flying Bomb'.
V-2	The first ballistic missile, used against London from September 1944
WWI	First World War (1914 -1918)
WWII	Second World War (1939 – 1945)

Executive Summary

The Site: The site, centred on the approximate OS Grid Reference: 533007, 178145, is located directly north of Burgess Park in the London Borough of Southwark. It is bound to the south by Albany Road, to the north by East Street, to the east by Avery Street and Bagshot Street, and to the west by Red Lion Row. The north-east of the site is bounded by Westmoreland Road, Portland Street, Merrow Street and Dawes Street.

The site is currently occupied by the Aylesbury Estate, a 28.5 hectare residential estate containing 2,704 dwellings, built between 1963 and 1977. It mainly comprises several large multi-storey blocks of flats interspersed with roads, car parks and public gardens as well as a more recently constructed school.

Proposed Works: Aylesbury Estate will be demolished and redeveloped over a period of several years, with some 4,200 new homes proposed. The new buildings will require either shallow or piled foundations. Prior to construction works, soakaway testing (requiring trenching to 5m bgl) is also proposed.

Risk Assessment Methodology: In accordance with CIRIA guidelines this assessment has carried out research, analysed the evidence and considered the risks that the site has been contaminated with unexploded ordnance; that such items remained on site; that they could be encountered during the proposed works and the consequences that could result. Appropriate risk mitigation measures have been proposed.

Explosive Ordnance Risk Assessment: Taking into consideration the findings of this study, BACTEC considers the risk on the site to be heterogeneous and can therefore be divided into **Low, Medium** and **Medium-High Risk Zones.** This is based on the following factors:

- The site is located within one of the central London boroughs and therefore the local area was subjected to a high bombing density during WWII, as confirmed by official statistics and mapping.
- The available London ARP bomb census maps record one oil bomb and 25 HE bomb strikes (including two UXBs) within the study area, with a further 17 HEs plotted immediately adjacent to the site boundary. In addition, five 1kg incendiary bomb showers are partially drawn over the site, suggesting it is highly likely that at least some 1kg IBs landed within the study area.
- Furthermore, both a V1 Bomb and a V2 Rocket detonated on site during 1944. They fell on the central school and the south-eastern corner respectively, both delivering 1,000kg HE warheads.
- These V1 bomb, V2 rocket, and HE bombs strikes, as well as likely fires caused by concentrated incendiary bombing, resulted in numerous buildings on site sustaining serious damage, damage beyond repair and some were even completely destroyed. Following this, these ruins would have been abandoned and therefore the possibility that a UXB fell unobserved and unrecorded within these areas is heightened.
- Furthermore, had such an incident occurred, the resulting evidence is likely to have remained undetected in these conditions. Note that the entry hole of an SC 50 (the most commonly deployed German HE bomb) may have been as little as 20cm in diameter and therefore easily obscured in rubble and debris.
- The largest sections of most severe damage are shown to correspond with the 1944 V1 bomb and V2 rocket strikes, both of which occurred after the cessation of Luftwaffe bombing in the capital. Note however some pre-1944 HE bomb strikes and IB showers were recorded in these areas and therefore the aforementioned possibility of UXO contamination within ruins applies to these localities also.
- During WWII, a small public garden fronting Albany Road (just south of Boundary Lane) and interspersed gardens within the Newington Institute complex, occupied the site. Therefore the possibility that a UXB fell within any dense vegetation and remained undetected in these locations cannot be completely discounted, but is considered unlikely.
- The remaining, lightly or completely undamaged portion of the site was an urbanised, nearly exclusively built-up area which would have remained inhabited/in-use and therefore frequently accessed. Consequently had a UXB fallen here it will likely have been observed, especially since such a strike to buildings or tarmac would have caused obvious damage.
- Note also that even if the numerous residential backyards were vegetated, their small size and likelihood of regular access by their owners suggests any UXB strike would not have gone unnoticed, although this possibility cannot be entirely ruled out.
- There is no evidence that the site formerly had any military occupation or usage that could have led to contamination with Allied/British items of ordnance.

Within the parts of the site that have been redeveloped/re-surfaced post-war, the risk from shallow-buried UXO (especially 1kg German incendiaries and British AA shells) remaining, will have been largely mitigated as any such items may have been encountered/removed during initial excavations.

The risk from deep buried HE UXBs will only have been mitigated beneath the footprints of the Aylesbury Estate buildings, within the volumes of any post-war bulk excavations and pile foundations. This risk will remain within virgin geology, beneath any basement levels and amongst the existing pile layout, down to the maximum bomb penetration depth.

Large areas of the site however are occupied by grass landscaping and have not been subject to post-war redevelopment or any significant intrusive work. Consequently, in these locations, the risk from both shallow and deep buried UXBs has not been mitigated to any significant degree.

Bomb Penetration Assessment: It has been assessed that a 500kg bomb would have had a maximum bomb penetration depth of up to 10m below WWII ground level. Penetration depth could potentially have been greater if the UXB was larger (though only 4% of German bombs used in WWII over Britain were of that size). Note that UXBs may be found at any depth between just below the WWII ground level and the maximum penetration depth. This assessment has been made using generic geological information.

Risk Mitigation Measures: The following risk mitigation measures are recommended to support the proposed works at the Aylesbury Estate site.

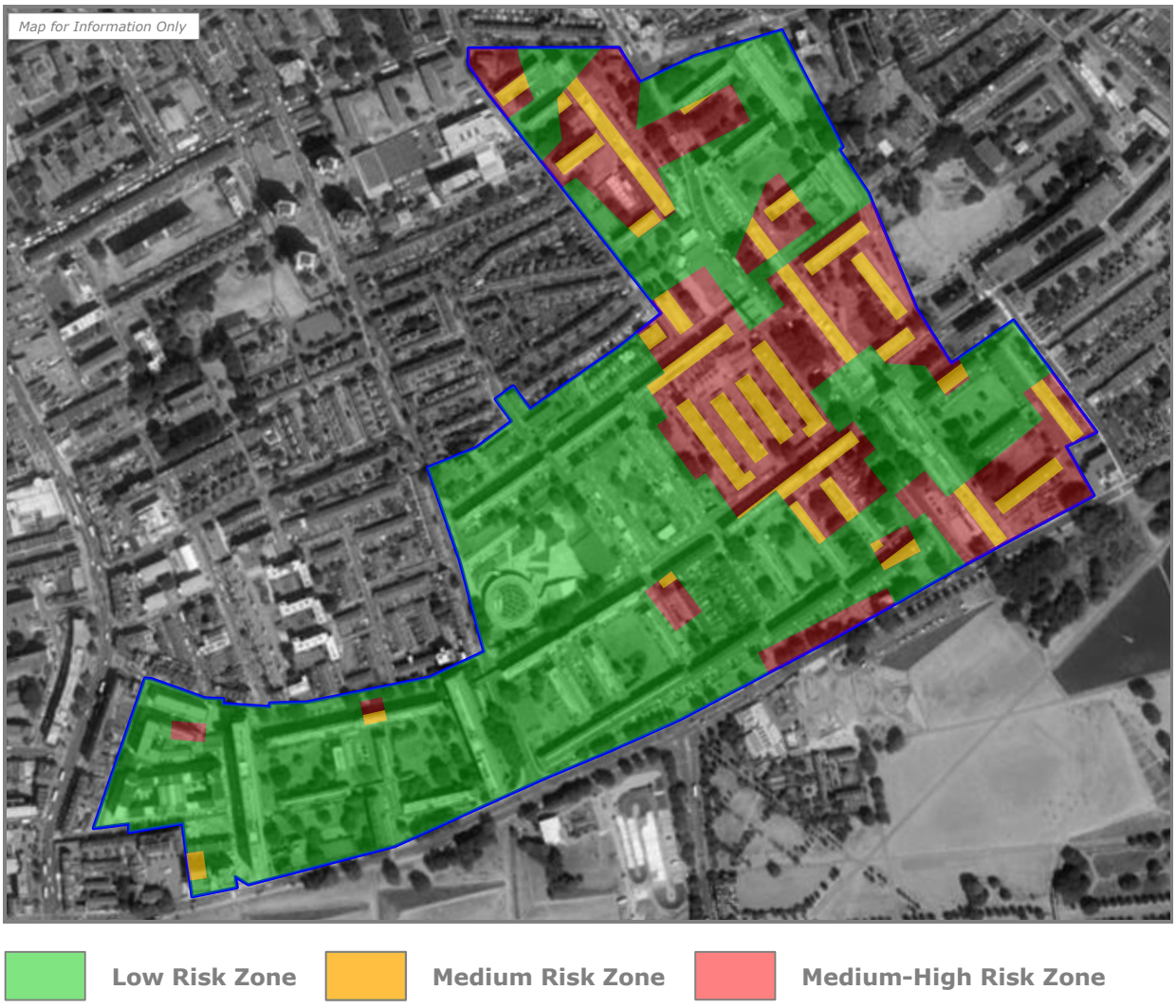
All Risk Zones:

- Explosive Ordnance Safety and Awareness Briefings to all personnel conducting intrusive works
- The provision of Unexploded Ordnance Site Safety Instructions

Medium and Medium-High Risk Zones Only:

- Explosive Ordnance Disposal (EOD) Engineer presence on site to support shallow intrusive works
- Intrusive Magnetometer Survey (and target investigation) of all borehole and pile locations down to a maximum bomb penetration depth

Risk Map



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Explosive Ordnance Threat Assessment

In Respect of

Aylesbury Estate, Southwark

1. Introduction

1.1. Background

WSP UK Limited has commissioned BACTEC International Limited to conduct an Explosive Ordnance Threat Assessment for the Aylesbury Estate site, London.

Unexploded Ordnance (UXO) presents a significant threat to construction projects in parts of the UK as a result of enemy actions during the two 20th Century World Wars and historic British and Allied military activity. It is estimated that over 20% of the UK landmass has been used for military training at some point and between 2006 and 2009, over 15,000 items of ordnance (excluding small arms ammunition) were found on UK construction sites (CIRIA).

The most intensive period of bombing over London was the nine months between October 1940 and May 1941 which became known as "The Blitz". During this period the Luftwaffe attempted to overwhelm Britain's air defences, destroy key industries and infrastructure and break the country's morale ahead of invasion. After mid-1941 the bombing strategy changed to include a number of other British cities and towns but, although intensity of attacks over the capital lessened, it still remained a focus of bombing raids throughout WWII. A total of 18,000 tons of bombs were dropped on London between 1940 and 1945.

One of the legacies of this conflict is buried unexploded air-dropped bombs or anti-aircraft projectiles resulting from the failure of a proportion of the weapons to function as designed. It is commonly accepted that the failure rate of these munitions was approximately 10% and, depending on their shape, weight, velocity and ground conditions many penetrated the ground and came to rest at depth. Intensive efforts were made during and after the war to locate and render safe all UXO but, unsurprisingly, not all were found and dealt with. This is evidenced by the regular, on-going discoveries of unexploded ordnance during construction-related intrusive ground works.

The UK was also bombed during WWI, though to a much lesser extent, and it is thought that a similar proportion of these weapons also malfunctioned. There have been occasional finds of unexploded WWI bombs in recent years but the risk of encountering them today is generally very low.

As a result of a generally increased risk awareness amongst professionals involved in ground engineering works and proactive health and safety measures, the threat to life and limb from unexploded ordnance has been minimised. However even the simple discovery of a suspected device during on-going works can cause considerable disruption to production and cause unwanted delays and expense.

Such risks can be more fully addressed by a better understanding of the site-specific threat and the implementation of appropriate risk mitigation measures.

2. Construction Industry Duties and Responsibilities

2.1. The UK Regulatory Environment

There is no specific legislation covering the management and control of the UXO risk in the UK construction industry but issues regarding health and safety are addressed under a number of regulatory instruments, as outlined below.

In practice the regulations impose a responsibility on the construction industry to ensure that they discharge their obligations to protect those engaged in ground-intrusive operations (such as archaeology, site investigation, drilling, piling or excavations) from any reasonably foreseeable UXO risk.

2.2. The Health and Safety at Work Act, 1974

The Act places a duty of care on an employer to put in place safe systems of work to address, as far as is reasonably practicable, all risks (to employees and the general public) that are reasonably foreseeable.

2.3. Construction (Design and Management) Regulations 2007

This legislation defines the responsibilities of all parties (primarily the Client, the CDM Co-ordinator, the Designer and the Principal Contractor) involved with works.

Although UXO issues are not specifically addressed the regulations effectively place obligations on all these parties to:

- Ensure that any potential UXO risk is properly assessed
- Put in place appropriate risk mitigation measures if necessary
- Keep all parties affected by the risk fully informed
- Prepare a suitably robust emergency response plan

2.4. Other Legislation

Other relevant legislation includes the "Management of Health and Safety at Work Regulations 1999" and "The Corporate Manslaughter and Corporate Homicide Act 2007".

3. The Role of the Authorities and Commercial Contractors

3.1. The Authorities

The Police have the responsibilities for co-ordinating the emergency services in the case of an ordnance-related incident on a construction site. They will make an initial assessment (i.e. is there a risk that the find is ordnance or not?) and if they judge necessary impose a safety cordon and/or evacuation and call the military authorities (JSEODOC - Joint Services Explosive Ordnance Disposal Operations Centre) to arrange for investigation and/or disposal. In the absence of an EOD specialist on site many Police Officers will use the precautionary principle, impose cordon(s)/evacuation and await advice from the JSEODOC.

The priority given to the request by JSEODOC will depend on their judgement of the nature of the threat (ordnance, location, people and assets at risk) and the availability of resources. They will respond immediately or as resources are freed up. Depending on the on-site risk assessment the item of ordnance may be removed or demolished (by controlled explosion) in-situ. In the latter case additional cordons and/or evacuations may be necessary.

Note that the military authorities will only carry out further investigations or clearances in very high profile or high risk situations. If there are regular ordnance finds on a site the JSEODOC

may not treat each occurrence as an emergency and will encourage the construction company to put in place alternative procedures (i.e. the appointment of a commercial contractor) to manage the situation and relieve pressure from the JSEOD disposal teams.

3.2. Commercial Contractors

In addition to pre-construction site surveys and follow-on clearance work, a commercial contractor is able to provide a reactive service on construction sites. The presence of a qualified EOD Engineer with ordnance recognition skills will avoid unnecessary call-outs to the authorities and the Contractor will be able to arrange for the removal and disposal of low risk ordnance. If high risk ordnance is discovered actions will be co-ordinated with the authorities with the objective of causing the minimum possible disruption to site operations whilst putting immediate, safe and appropriate measures in place.

4. This Report

4.1. Aims and Objectives

The aim of this report is to examine the possibility of encountering any explosive ordnance during the proposed works at the Aylesbury Estate site, London. Risk mitigation measures will be recommended, if deemed necessary, to eliminate or reduce the threat from explosive ordnance during the envisaged works. The report follows the CIRIA Guidelines.

4.2. Risk Assessment Methodology

The following issues will be addressed in the report:

- The risk that the site was contaminated with unexploded ordnance.
- The risk that unexploded ordnance remains on site.
- The risk that ordnance may be encountered during the proposed works.
- The risk that ordnance may be initiated.
- The consequences of initiating or encountering ordnance.

Risk mitigation measures, appropriate to the assessed level of risk and site conditions, will be recommended if required.

4.3. Approach

In preparing this Explosive Ordnance Threat Assessment Report, BACTEC has considered general and, as far as possible, site specific factors including:

- Evidence of German bombing and delivery of UXBs.
- Site history, occupancy and conditions during WWII.
- The legacy of Allied military activity.
- Details of any known EOD clearance activity.
- The extent of any post war redevelopment.
- Scope of the current proposed works.

4.4. Sources of Information

BACTEC has carried out detailed historical research for this Explosive Ordnance Threat Assessment including accessing military records and archived material held in the public domain and in the MoD.

Material from the following sources has been consulted:

- The National Archives, Kew.
- London Metropolitan Archives.

- Landmark Maps.
- Relevant information supplied by WSP UK Limited.
- Available material from 33 Engineer Regiment (EOD) Archive.
- BACTEC's extensive archives built up over many years of research and hands-on Explosive Ordnance Disposal activities in the UK.
- Open sources such as published books, local historical records and the internet.

4.5. Reliability of Historical Records

4.5.1. General Considerations

This report is based upon research of historical evidence. Whilst every effort has been made to locate all relevant material BACTEC cannot be held responsible for any changes to the assessed level of risk or risk mitigation measures based on documentation or other information that may come to light at a later date.

The accuracy and comprehensiveness of wartime records is frequently difficult or impossible to verify. As a result conclusions as to the exact location, quantity and nature of the ordnance threat can never be definitive but must be based on the accumulation and careful analysis of all accessible evidence. BACTEC cannot be held responsible for inaccuracies or gaps in the available historical information.

4.5.2. Bombing Records

During WWII considerable efforts were expended in recording enemy air raids. Air Raid Precautions (ARP) wardens were responsible for making records of bomb strikes either through direct observation or by post-raid surveys. However their immediate priority was to deal with casualties and limit damage, so it is to be expected that records are often incomplete and sometimes contradictory. Record keeping in the early days of bombing was not comprehensive and details of bombing in the early part of the war were sometimes destroyed in subsequent attacks. Some reports may cover a single attack, others a period of months or the entire war.

Records of raids that took place on sparsely or uninhabited areas were often based upon third party or hearsay information and are not always reliable; records of attacks on military or strategic targets were often maintained separately from the general records and have not always survived.

5. The Site

5.1. Site Location

The site is located directly north of Burgess Park in the London Borough of Southwark. It is bound to the south by Albany Road, to the north by East Street, to the east by Avery Street and Bagshot Street, and to the west by Red Lion Row. The north-east of the site is bounded by Westmoreland Road, Portland Street, Merrow Street and Dawes Street.

The site is centred on the approximate OS Grid Reference 533007, 178145.

Site location maps are presented in Annex A.

5.2. Site Description

The site is currently occupied by the Aylesbury Estate, a 28.5 hectare residential estate containing 2,704 dwellings, built between 1963 and 1977. It mainly comprises several large multi-storey blocks of flats interspersed with roads, car parks and public gardens as well as a more recently constructed school.

A recent aerial photograph of the site is presented in Annex B.

6. Scope of the Proposed Works

Aylesbury Estate will be demolished and redeveloped over a period of several years, with some 4,200 new homes proposed. The new buildings will require either shallow or piled foundations. Prior to construction works, soakaway testing (requiring trenching to 5m bgl) is also proposed.

A current site plan is presented in Annex C.

7. Ground Conditions

Published BGS borehole data for a borehole sunk on site indicates the following geological sequence in the area: 0.9m of Made Ground (brick, rubble, sandy clay etc), 1.5m of Flood Plain gravel (dense angular gravel with sand), 10m of London Clay (stiff grey silty clay).

8. Site History

8.1. General

Pre and post WWII OS maps[1] were obtained for the site from Landmark Maps. These are presented in Annex D.

8.2. Pre-WWII

The 1916 (1:2,500 scale) OS map shows the site to be predominantly residential and mainly occupied by parallel streets fronted by terraced houses. The study area also includes three schools, some minor *Warehouses*, a *Church,* a *Mineral Water* factory (at the southern boundary) and the Newington Institution; a large residential home used for social housing. The immediate surrounding area is also residential in nature.

8.3. Post-WWII

The 1952 (1:2,500 scale) OS map shows significant changes on site. Some large sections of housing have been demolished and left clear, whereas some similar clearance sites have been redeveloped. In addition, several Ruins are labelled within the site boundary. Note that all these features are indicative of bombing on early post-war OS maps.

A 1961-66 (1:2,500 scale) OS map records the first residential units of Aylesbury Estate, constructed on the site of a large area of WWII-era clearance at the centre of the study area.

9. The Threat from Aerial Bombing

9.1. General Bombing History of London

9.1.1. First World War

During WWI London was targeted and bombed by Zeppelin Airships and by Gotha and Giant fixed-wing aircraft. An estimated 250 tons of ordnance (high explosive and incendiary bombs) was dropped on Greater London, more than half of which fell on the City of London.

WWI bombs were generally smaller than those used in WWII and were dropped from a lower altitude, resulting in limited UXB penetration depths. Aerial bombing was often such a novelty at the time that it attracted public interest and even spectators to watch the raids in progress. For these reasons there is a limited risk that UXBs passed undiscovered. When combined with the relative infrequency of attacks and an overall low bombing density the threat from WWI UXBs is considered low and will not be further addressed in this report.

[1] *Latest pre-war and earliest post-war*

9.1.2. Second World War

At the start of WWII, the Luftwaffe planned to destroy key military installations, including RAF airfields and Royal Navy bases, during a series of daylight bombing raids. After the Battle of Britain these tactics were modified to include both economic and industrial sites. Targets included dock facilities, railway infrastructure, power stations, weapon manufacturing plants and gas works. As a result of aircraft losses, daylight raids were reduced in favour of attacking targets under the cover of darkness.

As the war progressed the strategy changed to one of attempting to destroy the morale of the civilian population by the "carpet bombing" of London. By May 1941, concentrated attacks ceased as the Luftwaffe was diverted east to prepare for 'Operation Barbarossa', the invasion of the Soviet Union.

Between January and May 1944 the Luftwaffe returned to London in mass, for Operation Steinbock. These raids were less frequent and less intense when compared to the original Blitz of 1940 and therefore became known as the 'Baby Blitz'.

Between 1940 and 1945 there were a total of 71 'major' air raids on London. In this period it is estimated that a total of 190,000 bombs, equivalent to 18,000 tons, were dropped resulting in the deaths of 29,000 people.

From mid-1944 the "V-weapon" (for Vengeance) campaign, using unmanned cruise missiles and rockets, represented Hitler's final attempt to reverse Germany's imminent defeat. The V1 (Flying Bomb or Doodlebug) and the V2 (Long Range Rocket) were launched from bases in Germany and occupied Europe. Totals of 2419 V1s and 517 V2s were recorded in the London Civil Defence region.

Although these weapons caused considerable destruction their relatively low numbers allowed accurate records of strikes to be maintained and these records have mostly survived. There is a negligible risk from unexploded V-weapons on land today since even if an unexploded 1000kg warhead had survived impact the remains of the munition's body would have left incontrovertible evidence of the strike, and it would have been dealt with at the time.

9.2. Aerial Delivered Ordnance in the Second World War

9.2.1. Generic Types of WWII German Air-delivered Ordnance

The nature and characteristics of the ordnance used by the Luftwaffe allows an informed assessment of the hazards posed by any unexploded items that may remain today. Detailed illustrations of German air delivered ordnance are presented at Annex E.

- HE Bombs: In terms of weight of ordnance dropped, HE bombs were the most frequent weapon deployed. Most bombs were 50kg, 250kg or 500kg (overall weight, about half of which was the high explosive) though large bombs of up to 2000kg were also used. HE bombs had the weight, velocity and shape to easily penetrate the ground intact if they failed to explode. Post-raid surveys would not always have spotted the entry hole or other indications that a bomb penetrated the ground and failed to explode and contemporary ARP documents describe the danger of assuming that damage, actually caused by a large UXB, was due to an exploded 50kg bomb. Unexploded HE bombs therefore present the greatest risk to present–day intrusive works.
- Blast Bombs/ Parachute Mines: Blast bombs generally had a slow rate of descent and were extremely unlikely to have penetrated the ground. Non-retarded mines would have shattered on most ground types, if they had failed to explode. There have been extreme cases when these items have been found unexploded, but this was where the ground was either very soft or where standing water had reduced the impact. BACTEC does not consider there to be a significant threat from this type of munition on land.
- Large incendiary bombs: This type of bomb ranged in size from 36kg to 255kg and had a number of inflammable fill materials (including oil and white phosphorus), and a small explosive charge. They were designed to explode and burn close to the surface but their shape and weight meant that they did have penetration capability. If they penetrated the ground complete combustion did not always occur and in such cases they remain a risk to intrusive works.

- 1 kg Incendiary Bombs (IB): These bombs, which were jettisoned from air-dropped containers, were unlikely to penetrate the ground and in urban areas would usually have been located in post-raid surveys. However, if bombs did not initiate and fell in water or dense vegetation, or became mixed with rubble in bomb damaged areas they could have been overlooked. Some variants had explosive heads and these present a risk of detonation during intrusive works.
- Anti-personnel (AP) Bomblets: AP bombs had little ground penetration ability and should have been located by the post-raid survey unless they fell into water, dense vegetation or bomb rubble.
- Specialist Bombs (smoke, flare, etc): These types do not contain high explosive and therefore a detonation consequence is unlikely. They were not designed to penetrate the ground.

9.2.2. German Air-delivered Ordnance Failure Rate

Based on empirical evidence, it is generally accepted that 10% of the German HE bombs dropped during WWII failed to explode as designed. This estimate is probably based on the statistics of wartime recovered UXBs and therefore will not have taken account of the unknown numbers of UXBs that were not recorded at the time, and is probably an underestimate.

The reasons for failures include:

- Fuze or gaine malfunction due to manufacturing fault, sabotage (by forced labour) or faulty installation.
- Clockwork mechanism failure in delayed action bombs.
- Failure of the bomber aircraft to arm the bombs (charge the electrical condensers which supplied the energy to initiate the detonation sequence) due to human error or equipment defect.
- Jettison of the bomb before it was armed or from a very low altitude. Most likely if the bomber was under attack or crashing.

War Office Statistics document that a daily average of 84 bombs which failed to function were dropped on civilian targets in Great Britain between 21st September 1940 and 5th July 1941. 1 in 12 of these (probably mostly fitted with time delay fuzes) exploded sometime after they fell - the remainder were unintentional failures.

From 1940 to 1945 bomb disposal teams dealt with a total of 50,000 explosive items of 50 kg and over (i.e. German bombs), 7000 AAA shells and 300,000 beach mines. These operations resulted in the deaths of 394 officers and men. However, unexploded ordnance is still regularly encountered across the UK (see recent press articles, Annex F-1).

9.2.3. UXB Ground Penetration

9.2.3.1. General Considerations

The actual penetration depth of aerial delivered bombs into the ground will have been determined by the mass and shape of the bomb, the velocity and angle of the bomb on impact (dependent on the height of release) and the nature of the ground and ground cover; the softer the ground, the greater the potential penetration. Peat, alluvium and soft clays are easier to penetrate than gravel and sand. Bombs are brought to rest or are commonly deflected by bedrock or large boulders.

9.2.3.2. The "j" Curve Effect

An air-dropped bomb falling from normal bombing altitude (say 5000m) into homogeneous ground will continue its line of flight but turn in an upwards curve towards the surface as it comes to rest. This offset from vertical is generally thought to be about one third of the penetration depth, but can be up to 15m depending on ground conditions or the bomb's angle of impact.

9.2.3.3. Second World War Bomb Penetration Studies

During WWII the Ministry of Home Security undertook a major study on actual bomb penetration depths, carrying out statistical analysis on the measured depths of 1328 bombs as reported by Bomb Disposal, mostly in the London area. They then came to conclusions as to the likely average and maximum depths of penetration of different sized bombs in different geological strata.

The median penetration of 430 x 50kg German bombs in London Clay was 4.6m and the maximum penetration observed for the SC50 bomb was 9m.

They concluded that the largest common German bomb, 500kg, had a likely penetration depth of 6m in sand or gravel but 8.7m in clay. The maximum observed depth for a 500kg bomb was 10.2m and for a 1000kg bomb 12.7m. Theoretical calculations suggested that significantly greater penetration depths were probable.

9.2.4. Initiation of Unexploded Bombs

Unexploded bombs do not spontaneously explode. All high explosive requires significant energy to create the conditions for detonation to occur. In the case of unexploded German bombs discovered within the construction site environment, there are a number of potential initiation mechanisms:

- Direct impact onto the main body of the bomb: Unless the fuze or fuze pocket is struck, there needs to be a significant impact (e.g. from piling or large and violent mechanical excavation) to initiate a buried iron bomb. Such violent action can cause the bomb to detonate.
- Re-starting the clock timer in the fuze: Only a small proportion of German WWII bombs employed clockwork fuzes. It is probable that significant corrosion has taken place within the fuze mechanism over the last 60 years that would prevent clockwork mechanisms from functioning, nevertheless it was reported that the fuze in a UXB dealt with by 33 EOD Regiment in Surrey in 2002 did re-commence.
- Induction of a static charge, causing a current in an electric fuze: The majority of German WWII bombs employed electric fuzes. It is probable that significant corrosion has taken place within the fuze mechanism over the last 60 years such that the fuze circuit could not be activated.
- Friction impact initiating the (shock-sensitive) fuze explosive: This is the most likely scenario resulting in the bomb detonating.

Annex F-2 details UXB incidents where intrusive works have caused UXBs to detonate, resulting in death or injury and damage to plant.

9.3. Bombing of Southwark

9.3.1. Second World War Overview

The Luftwaffe's objective for the attacks on London was to paralyse the commercial life of the capital by bombing the docks, warehouses, wharves, railway lines, factories and power stations.

The study area is located within one of the central London boroughs, just 2km south of the primary Luftwaffe target area, The City of London, and therefore air raids were heavy in Southwark during the Blitz.

As well as being affected by raids aimed at The City of London, Southwark was also a target in its own right due to the presence of power stations, chemical works, food warehouses and the Waterloo terminus Station. The bridges that span the River Thames also presented strategic targets and these sustained numerous HE bomb strikes throughout the war.

Known Luftwaffe bombing targets in the local area were the Old Kent Road Gas Works and the vast Willow Walk Railway Maintenance Depot and Goods Yard, approximately 1.5km and 1.8km to the east of the site respectively.

During WWII hundreds of HE bombs, thousands of incendiary bombs and several V Weapon strikes resulted in the deaths of hundreds of people and varying degrees of damage to thousands buildings in Southwark.

Records of bombing incidents in the civilian areas of London were collected by the Air Raid Precautions wardens and collated by the Civil Defence Office. Some other organisations, such as the London Port Authority and railways, maintained separate records.

Records would be in the form of typed or hand written incident notes, maps and statistics. These various types of records of bombing incidents for Southwark are presented in the following sections

9.4. Second World War Bombing Statistics

The following table summarises the quantity of German bombs (excluding 1kg incendiaries and anti-personnel bombs) falling on the Metropolitan Borough of Southwark between 1940 and 1945:

Record of German Ordnance Dropped on the Metropolitan Borough of Southwark	
Area Acreage	1,132
High Explosive Bombs (all types)	593
Parachute Mines	9
Oil Bombs	16
Phosphorus Bombs	11
Pilotless Aircraft (V1)	15
Fire Pot	3
Long Range Rocket (V2)	3
Total	650
Items Per 1,000 Acres	**574.2**

Source: Home Office Statistics

Detailed records of the quantity and locations of the 1kg incendiary and anti-personnel bombs were not routinely maintained by the authorities as they were frequently too numerous to record. Although the incendiaries are not particularly significant in the threat they pose, they nevertheless are items of ordnance that were designed to cause damage and inflict injury and should not be overlooked in assessing the general risk to personnel and equipment. The anti-personnel bombs were used in much smaller quantities and are rarely found today but are potentially more dangerous.

This table does not include UXO found during or after WWII.

9.5. WWII Bombing Density

The bombing density map, presented at Annex G, depicts the concentration of bombs that fell on Greater London throughout WWII. The highest densities were recorded around Central and East London along the River Thames.

The London Borough of Southwark was an area of very high bombing density with between 500 and 599 bombs per 1,000 acres.

9.6. Site Specific WWII Bombing Records

9.6.1. London ARP Bomb Census Maps

A review was conducted of London ARP Bomb Census Maps for Southwark. Those showing bomb strikes on and in the immediate vicinity of the site are presented in Annex H and described below. All distances are approximate.

Consolidated Maps

Date Range	Number of Incidents	Weapon	Closest Incident to the Site
Night bombing up to 07/10/1940	Numerous	HE bombs	14 on site
Night bombing 07/10/1940 – 06/06/1941	Numerous	HE bombs	13 on site

Weekly Maps – *Weekly ARP maps covering the period 7th October 1940 – 30th May 1944 were also reviewed.*

Date Range	Number of Local Incidents	Weapon	Closest Incident to the Site
Day bombing 08/12/1940 – 31/12/1940	22	HE bombs	5 on site
14/10/1940 – 21/10/1940	6 1	HE bombs Oil bomb	25m to the south 160m to the north-west
21/10/1940 – 28/10/1940	2	IB showers	On site
28/10/1940 – 04/11/1940	1 12 1	Oil Bomb HE bombs IB shower	On site 2 on site 330m to the north-west
11/11/1940 – 18/11/1940	5 1	HE bombs IB shower	25m to the west On site
02/12/1940 – 09/12/1940	1	IB shower	On site
23/12/1940 – 30/12/1940	4 1 1	HE bombs Oil bomb IB shower	1 on site 220m to the west On site
06/01/1941 – 13/01/1941	6	HE bombs	1 on site
27/01/1941 – 03/02/1941	1	IB shower	25m to the north
03/03/1941 – 10/03/1941	3 1	HE bombs IB shower	80m to the east 310m to the east
14/04/1941 – 21/04/1941	10 2 1	HE bombs HE UXBs IB shower	25m to the north-west 295m to the west On site
05/05/1941 – 12/05/1941	28 2 4	HE bombs HE UXBs IB showers	6 on site On site 60m to the south

9.6.2. London V1 Bomb Plot Map

Following the beginning of the V1 campaign in mid-1944, a series of maps showing where these weapons fell was produced for the London Civil Defence region and these were updated as the war progressed. An extract of the map showing the site and immediate surrounding area is presented in Annex I.

The map extract records one V1 strike within the central part of the study area, with two additional strikes immediately adjacent to the western and south-western site boundaries.

9.6.3. LCC Bomb Damage Map

The LCC Bomb Damage map for the area of the site was obtained and is presented in Annex J. The maps were compiled by the Architects Department soon after the bombing of London commenced and were updated throughout the war to document levels of damage that structures sustained.

The map records a wide variation in damage across the study area. The most severe and widespread areas of damage correspond to V1 Bomb and V2 Rocket strikes, which occurred within the central area and eastern periphery respectively. At these locations, as well as within other parts of the site, many buildings have been totally destroyed (black), damaged beyond repair (purple) or seriously damaged (red). The majority of buildings however have only sustained blast damaged (yellow/orange), meaning broken windows, chipped brick work, dislodged roof tiles, etc.

Also noteworthy is that a section of pre-WWII slum clearance (pale blue) is shown at the north-eastern boundary.

9.6.4. Second World War Era Aerial Photographs

WWII-era aerial photography of the site was obtained from the National Monument Records Office and Google Earth. Images dated 1946 and *circa* 1948 are presented in Annex K.

The 1946 post-WWII photograph was taken approximately two years after the cessation of the Luftwaffe bombing campaign in London, however only shows the western half of the site. As well as the large area to the north-east, some small sections of clearance/damage are apparent however the majority of the buildings appear to have survived the war intact and several *ruins / cleared areas* on the 1952 OS map do not appear to be severely affected here. Although it should be noted that the small scale of this image makes accurate assessment of the degree of damage to properties difficult.

The second photograph is of low resolution and small scale and therefore lacks useful detail. It does however confirm some of the larger areas of severe damage and is broadly consistent with the LCC Damage Map.

9.6.5. Abandoned Bombs

A post-air raid survey of buildings, facilities and installations would have included a search for evidence of bomb entry holes. If evidence were encountered, Bomb Disposal Officer teams would normally have been requested to attempt to locate, render safe and dispose of the bomb. Occasionally evidence of UXBs was discovered but due to a relatively benign position, access problems or a shortage of resources the UXB could not be exposed and rendered safe. Such an incident may have been recorded and noted as an Abandoned Bomb.

Given the inaccuracy of WWII records and the fact that these bombs were 'abandoned', their locations cannot be considered definitive, nor the lists exhaustive. The MoD states that 'action to make the devices safe would be taken only if it was thought they were unstable'. It should be noted that other than the 'officially' abandoned bombs, there will inevitably be UXBs that were never recorded.

BACTEC holds no records of officially registered abandoned bombs at or near the site of the proposed works.

9.6.6. Site Specific Bomb Penetration Considerations

When considering an assessment of the bomb penetration at the Aylesbury Estate site, London, the following parameters would be used:

- Geology – 2.4m of Made Ground (brick, rubble, sandy clay etc), 2.2m of Flood Plain gravel (dense angular gravel with sand), 10m of London Clay (stiff grey silty clay).
- Impact Angle and Velocity – 80-90^{O} from horizontal and 267 metres per second.

- Bomb Mass and Configuration – The 500kg SC (General Purpose) HE bomb, without retarder units or armour piercing nose. This was the largest of the common bombs used against Britain.

Taking into account the above-mentioned factors it has been assessed that a 500kg bomb would have had a maximum bomb penetration depth of up to **10m** below WWII ground level. Penetration depth could potentially have been greater if the UXB was larger (though only 4% of German bombs used in WWII over Britain were of that size). Note that UXBs may be found at any depth between just below the WWII ground level and the maximum penetration depth. This assessment has been made using generic geological information.

9.7. Likelihood of Post-raid UXO Detection

Utilising the available historical bombing records as reviewed in sections 9.1 to 9.5, it is possible to make an assessment of the likelihood that evidence of unexploded ordnance would have been noted on a site during the war and the incident dealt with or recorded at the time. Factors such as bombing density, frequency of access, ground cover, damage and failure rate have been taken into consideration.

9.7.1. Density of Bombing

Bombing density is an important consideration for assessing the possibility that UXBs remain in an area. A very high density of bombs can for example result in increased levels of damage sustained to structures, greater likelihood of errors in record keeping and a higher risk that UXBs fell over the area.

The London Borough of Southwark, in which the site is historically located, sustained a high density of bombing during WWII, as confirmed by official statistics and mapping.

The available London ARP bomb census maps record 26 HE bomb strikes within the study area, with a further 17 immediately adjacent to the site boundary.

9.7.2. Damage

If structures on a site have been subject to significant bomb or fire damage, rubble and debris are likely to have been present; similarly an HE bomb strike on open ground is likely to have resulted in a degree of soil disturbance. Under such conditions there is a greater risk of the entry holes of unexploded bombs dropped during subsequent raids being obscured and going unnoticed.

A comparison of OS mapping, post-WWII aerial photography and bomb damage mapping, records varying degrees of damage to numerous buildings on site.

Some of this damage was severe and therefore ruins and quantities of rubble/debris will have persisted within parts of the study area for a time. Had a subsequent UXB fallen within these ruins, it will likely have remained undetected. Note that the entry hole of an SC 50 (the most commonly deployed German HE bomb) may have been as little as 20cm in diameter and therefore easily obscured in such conditions. This possibility is illustrated by London bomb damage photography, presented in Annex L.

The largest sections of most severe damage are shown to correspond with the 1944 V1 bomb and V2 rocket strikes, both of which occurred after the cessation of Luftwaffe bombing in the capital. Therefore much of this damage is the likely result of these strikes and consequently it is not possible that a Luftwaffe air-delivered UXB could have fallen, and remained undetected in wreckage resulting from these two incidents.

However the bomb census maps also plot some HE bomb strikes in these areas, as well as the possibility of fires started by 1kg incendiary bomb showers and therefore it is likely that these two areas sustained some damage during the initial1940/41 Blitz.

9.7.3. Frequency of Access

Unexploded ordnance at sites where human access was infrequent would have a higher chance of being overlooked than at those sites which were subject to greater occupancy. The importance of a site or facility to the war effort is also an important consideration as such sites

are likely to have been both frequently accessed and are also likely to have been subject to post-raid checks for evidence of UXO.

As a very large and complex area, the frequency of access across the site would have varied during WWII. However, generally speaking, at the beginning of the Blitz bombing campaign this was an inner-city, urbanised, densely constructed area and therefore access to the vast majority of the site would have been frequent and regular.

However numerous buildings sustained serious damage and consequently it is highly likely that large parts of the study area would have been abandoned and cordoned off to protect the public from the danger of collapsing masonry. Therefore it is conceivable that a subsequent UXB could have fallen unobserved within such ruins and remained unrecorded.

The site was home to three schools during the Blitz. The school buildings and associated hard-surfaced playgrounds are likely to have been subject to frequent access throughout the war. Even when schools closed due to evacuation, they were often still utilised as first aid posts or for emergency accommodation in the wake of an air raid. Furthermore, due to the presence of children, ARP wardens are likely to have carried out thorough post-raid checks for UXO. As a result, it is likely that any UXB strike within these areas will have been observed.

Note however two of the three schools suffered bomb damage during the Blitz and therefore they may have become disused.

9.7.4. Ground Cover

The degree and type of groundcover present during WWII would have a significant effect on the visual evidence at ground level which may have indicated the presence of buried UXO.

Across the remainder of the site, evidence of UXO will have been fairly obvious within the developed portions of the study area which suffered only blast damage or no damage at all. A UXB strike to houses, school buildings, factory buildings/hard-standing, pavements, roadways, etc will still have caused significant damage, even without detonating.

The numerous residential backyards that occupied the site were small and even if they were vegetated, they would have been frequently accessed, increasing the possibility of a UXB entry hole being discovered.

Note however there was a small public garden fronting Albany Road, just south of Boundary Lane as well as interspersed gardens within the Newington Institute complex during WWII. Therefore the possibility that a UXB fell within overgrown vegetation and remained undetected in these locations, cannot be entirely ruled out.

9.7.5. Bomb Failure Rate

There is no evidence to suggest that the bomb failure rate in the vicinity of the site would have been different from the "approximately 10%" figure normally used.

10. The Threat from Allied Military Ordnance

10.1. General

BACTEC has found no evidence to suggest that the area of the site had any other former military use which could have led to ordnance contamination.
The following potential military uses have been considered:

- Anti-Aircraft Defences
- Home Guard
- Training or firing ranges or the storage of ammunition
- Military bases
- Defensive minefields (including pipemines)
- Defensive Positions

- Manufacture of explosives or ordnance

The most likely source of Allied ordnance is from anti-aircraft fire, as discussed in the following section.

10.2. Defending London from Aerial Attack

Both passive and active defences were deployed against enemy bombers attacking targets in the Greater London region.

Passive defences included measures to hinder the identification of targets (such as a lighting blackout at night and the camouflaging of strategic installations); to mislead bomber pilots into attacking decoy sites located away from the city and to force attacking aircraft to higher altitudes with the use of barrage balloons.

Active air defence relied on a coordinated combination of fighter aircraft to act as interceptors, anti-aircraft gun batteries and later the use of rockets and missiles, in order to actively engage and oppose attacking aircraft.

10.2.1. Anti-Aircraft Artillery and Projectiles

At the start of the war two types of AAA guns were deployed: Heavy Anti-Aircraft Artillery (HAA), using large calibre weapons such as the 3.7" QF (Quick Firing) gun and Light Anti-Aircraft Artillery (LAA) using smaller calibre weapons such as 40mm Bofors gun.

During the early war period there was a severe shortage of AAA available and older WWI 3" and modified naval 4.5" guns were deployed alongside those available 3.7" weapons. The maximum ceiling height of fire at that time was around 11,000m (for the 3.7" gun and less for other weapons). As the war progressed improved variants of the 3.7" gun were introduced and, from 1942, large 5.25 inch weapons began to be brought into service. These had significantly improved ceiling heights of fire reaching over 18,000m.

The LAA batteries were intended to engage fast low flying aircraft and were typically deployed around airfields or strategic installations. These batteries were mobile and could be moved to new positions with relative ease when required. The most numerous of these was the 40mm Bofors gun which could fire up to 120 x 40mm HE shells per minute to over 1800m.

The HAA projectiles were high explosive shells, usually fitted with a time delay or barometric pressure fuze to make them explode at a pre-determined height. If they failed to explode or strike an aircraft, they would eventually fall back to earth. Details of the most commonly deployed WWII AAA projectiles are shown below:

Gun type	Calibre	Shell Weight	Shell Dimensions
3.0 Inch	76mm	7.3kg	76mm x 356mm
3.7 Inch	94mm	12.7kg	94mm x 438mm
4.5 Inch	114mm	24.7kg	114mm x 578mm
40mm	40mm	0.9kg	40mm x 311mm

Although the larger unexploded projectiles could enter the ground they did not have great penetration ability and are therefore likely to be found close to WWII ground level. These shells are frequently mistakenly identified as small German air-delivered bombs, but are differentiated by the copper driving band found in front of the base. With a high explosive fill and fragmentation hazard these items of UXO present a significant risk if encountered. The smaller 40mm projectiles are similar in appearance and effect to small arms ammunition and, although still dangerous, present a lower risk.

Numerous unexploded AAA shells were recovered during and following WWII and are still occasionally encountered on sites today.

The closest recorded AA battery to the site was situated approximately 3km to the east on Southwark Park.

10.2.2. Rocket Projector "Z" Batteries

Initially developed as a naval AA defensive weapon these were deployed at sites around the UK from 1941 and proved to be an effective addition to AA defences. They comprised groups of multiple rocket launchers, laid out in a grid formation, which could project a 2 or 3 Inch HE rocket, known as an Unrotating Projectile (UP), to an altitude of 6000m and an effective ground range of over 9000m.

The rockets were tubular in section, measuring 0.9m (for the 2") or 1.8m (for the 3") in length with four stabilising fins at the base. They were usually fitted with 3.5kg or 8.2kg high explosive warhead similar to artillery shells. The larger warhead was reputed to have an effective blast radius of up to 20m. Some variants deployed a form of aerial mine described as a "small yellow bomb" which was designed to detach from the rocket at height and descend on a parachute with the objective of becoming snagged on target aircraft and then detonating.

The rocket body from an unexploded missile would not have survived impact with the ground but the warhead could have survived and penetrated below ground level in soft geology or become lost in bomb damage rubble.

Illustrations of Anti-Aircraft artillery, projectiles and rockets are presented at Annex M.

11. Ordnance Clearance and Post-WWII Ground Works

11.1. General

The extent to which any ordnance clearance activities have taken place on site or extensive ground works have occurred is relevant since on the one hand they may indicate previous ordnance contamination but also may have reduced the risk that ordnance remains undiscovered.

11.2. EOD Clearance

BACTEC holds a number of official records of explosive ordnance disposal tasks, obtained from the 33 Engineer Regiment of the British Army. However no records could be found to indicate that any EOD tasks have taken place on or within close proximity to the site.

11.3. Post-war Redevelopment

In the post-war period, the entire site was completely demolished and redeveloped as the current Aylesbury Estate during the 1960s. No additional phases of demolition and subsequent construction are known to have taken place.

12. The Overall Explosive Ordnance Threat Assessment

12.1. General Considerations

Taking into account the quality of the historical evidence, the assessment of the overall threat to the proposed works from unexploded ordnance must evaluate the following risks:

- That the site was contaminated with unexploded ordnance
- That unexploded ordnance remains on site
- That such items could be encountered during the proposed works
- That ordnance may be activated by the works operations
- The consequences of encountering or initiating ordnance

12.2. The Risk that the Site was Contaminated with Unexploded Ordnance

For the reasons discussed in section 9.7 BACTEC believes that there is a risk that unexploded ordnance fell unnoticed and unrecorded within the site boundary.

- The site is located within one of the central London boroughs and therefore the local area was subjected to a high bombing density during WWII, as confirmed by official statistics and mapping.
- The available London ARP bomb census maps record one oil bomb and 25 HE bomb strikes (including two UXBs) within the study area, with a further 17 HEs plotted immediately adjacent to the site boundary. In addition, five 1kg incendiary bomb showers are partially drawn over the site, suggesting it is highly likely that at least some 1kg IBs landed within the study area.
- Furthermore, both a V1 Bomb and a V2 Rocket detonated on site during 1944. They fell on the central school and the south-eastern corner respectively, both delivering 1,000kg HE warheads.
- These V1 bomb, V2 rocket, and HE bombs strikes, as well as likely fires caused by concentrated incendiary bombing, resulted in numerous buildings on site sustaining serious damage, damage beyond repair and some were even completely destroyed. Following this, these ruins would have been abandoned and therefore the possibility that a UXB fell unobserved and unrecorded within these areas is heightened.
- Furthermore, had such an incident occurred, the resulting evidence is likely to have remained undetected in these conditions. Note that the entry hole of an SC 50 (the most commonly deployed German HE bomb) may have been as little as 20cm in diameter and therefore easily obscured in rubble and debris.
- The largest sections of most severe damage are shown to correspond with the 1944 V1 bomb and V2 rocket strikes, both of which occurred after the cessation of Luftwaffe bombing in the capital. Note however some pre-1944 HE bomb strikes and IB showers were recorded in these areas and therefore the aforementioned possibility of UXO contamination within ruins applies to these localities also.
- During WWII, a small public garden fronting Albany Road (just south of Boundary Lane) and interspersed gardens within the Newington Institute complex, occupied the site. Therefore the possibility that a UXB fell within any dense vegetation and remained undetected in these locations cannot be completely discounted, but is considered unlikely.
- The remaining, lightly or completely undamaged portion of the site was an urbanised, nearly exclusively built-up area which would have remained inhabited/in-use and therefore frequently accessed. Consequently had a UXB fallen here it will likely have been observed, especially since such a strike to buildings or tarmac would have caused obvious damage.
- Note also that even if the numerous residential backyards were vegetated, their small size and likelihood of regular access by their owners suggests any UXB strike would not have gone unnoticed, although this possibility cannot be entirely ruled out.

There is no evidence that the site formerly had any military occupation or usage that could have led to contamination with Allied/British items of ordnance.

12.3. The Risk that Unexploded Ordnance Remains on Site

Within the parts of the site that have been redeveloped/re-surfaced post-war, the risk from shallow-buried UXO (especially 1kg German incendiaries and British AA shells) remaining, will have been largely mitigated as any such items may have been encountered/removed during initial excavations.

The risk from deep buried HE UXBs will only have been mitigated beneath the footprints of the Aylesbury Estate buildings, within the volumes of any post-war bulk excavations and pile foundations. This risk will remain within virgin geology, beneath any basement levels and amongst the existing pile layout, down to the maximum bomb penetration depth.

Large areas of the site however are occupied by grass landscaping and have not been subject to post-war redevelopment or any significant intrusive work. Consequently, in these locations, the risk from both shallow and deep buried UXBs has not been mitigated to any significant degree.

12.4. The Risk that Ordnance may be Encountered during the Works

The most likely scenarios under which a UXO could be encountered during construction works is during piling, drilling operations or bulk excavations for basement levels. The overall risk will

depend on the extent of the works, such as the numbers of boreholes/piles (if required) and the volume of the excavations.

Since an air-dropped bomb may come to rest at any depth between just below ground level and its maximum penetration depth there is also a chance that such an item could be encountered during shallow excavations (for services or site investigations) into the original WWII ground level.

12.5. The Risk that Ordnance may be Initiated

The risk that UXO could be initiated if encountered will depend on its condition, how it is found and the energy with which it is struck. The most violent activity on most construction sites is percussive piling.

As a result items that are shallow buried present a slightly lower risk than those that are deep buried, since the force of impact is usually lower and they are more likely to be observed – when immediate mitigating actions can be taken.

12.6. The Consequences of Encountering or Initiating Ordnance

Clearly the consequences of an inadvertent detonation of UXO during construction operations would be catastrophic with a serious risk to life, damage to plant and a total site shutdown during follow-up investigations.

Since the risk of initiating ordnance is significantly reduced if appropriate mitigation measures are undertaken, the most important consequence of the discovery of ordnance will be economic. This would be particularly so in the case of high profile locations and could involve the evacuation of the public. The unexpected discovery of ordnance may require the closing of the site for any time between a few hours and a week with a potentially significant cost in lost time. Note also that the suspected find of ordnance, if handled solely through the authorities, may also involve loss of production since the first action of the Police in most cases will be to isolate the locale whilst awaiting military assistance, even if this turns out to have been unnecessary.

12.7. BACTEC's Assessment

Taking into consideration the findings of this study, BACTEC considers the risk on the site to be heterogeneous and can therefore be divided into **Low, Medium** and **Medium-High Risk Zones.** These are described below and illustrated on a Risk Map, presented in Annex N.

Low Risk Zone – WWII built-up areas that remained lightly or completely undamaged throughout the war.

	Level of Risk			
Type of Ordnance	**Negligible**	**Low**	**Medium**	**High**
German HE UXBs		*		
British AAA	*			
German 1kg incendiaries	*			
British Ordnance – LSA / SAA	*			

Medium Risk Zone – WWII built-up areas which sustained confirmed bomb strikes, subsequent significant bomb damage and which have seen significant intrusive redevelopment post-war.

	Level of Risk			
Type of Ordnance	**Negligible**	**Low**	**Medium**	**High**
German HE UXBs			*	
British AAA	*			
German 1kg incendiaries	*			
British Ordnance – LSA / SAA	*			

Medium-High Risk Zone – WWII built-up areas which sustained confirmed bomb strikes and significant bomb damage during WWII and which have not been redeveloped post-war.

	Level of Risk			
Type of Ordnance	**Negligible**	**Low**	**Medium**	**High**
German HE UXBs			*	
British AAA		*		
German 1kg incendiaries		*		
British Ordnance – LSA / SAA	*			

13. Proposed Risk Mitigation Methodology

13.1. General

BACTEC believes the following risk mitigation measures should be deployed to support the proposed works at the Aylesbury Estate site.

13.2. Recommended Risk Mitigation Measures

All Risk Zones

- ***Site Specific Explosive Ordnance Safety and Awareness Briefings to all personnel conducting intrusive works:*** A specialised briefing is always advisable when there is a possibility of explosive ordnance contamination. It is an essential component of the Health & Safety Plan for the site and conforms to requirements of CDM Regulations 2007. All personnel working on the site should be instructed on the identification of UXB, actions to be taken to alert site management and to keep people and equipment away from the hazard. Posters and information of a general nature on the UXB threat should be held in the site office for reference and as a reminder.
- ***The Provision of Unexploded Ordnance Site Safety Instructions:*** These written instructions contain information detailing actions to be taken in the event that unexploded ordnance is discovered. They are to be retained on site and will both assist in making a preliminary assessment of a suspect object and provide guidance on the immediate steps to be taken in the event that ordnance is believed to have been found.

Medium and Medium-High Risk Zones only

- ***Explosive Ordnance Disposal (EOD) Engineer presence on site to support shallow intrusive works:*** When on site the role of the EOD Engineer would include; monitoring

works using visual recognition and instrumentation and immediate response to reports of suspicious objects or suspected items of ordnance that have been recovered by the ground workers on site; providing Explosive Ordnance Safety and Awareness briefings to any staff that have not received them earlier and advise staff of the need to modify working practices to take account of the ordnance threat, and finally to aid Incident Management which would involve liaison with the local authorities and Police should ordnance be identified and present an explosive hazard.

Intrusive Magnetometer Survey (and target investigation) of all borehole and pile locations down to a maximum bomb penetration depth: BACTEC can deploy a range of intrusive magnetometry techniques to clear ahead of all the pile locations. The appropriate technique is governed by a number of factors, but most importantly the site's ground conditions. The appropriate survey methodology would be confirmed once the enabling works have been completed. A site meeting would be required between BACTEC and the client to determine the methodology suitable for this site. Target investigation or avoidance will be recommended as appropriate.

BACTEC International Limited 10th June 2014

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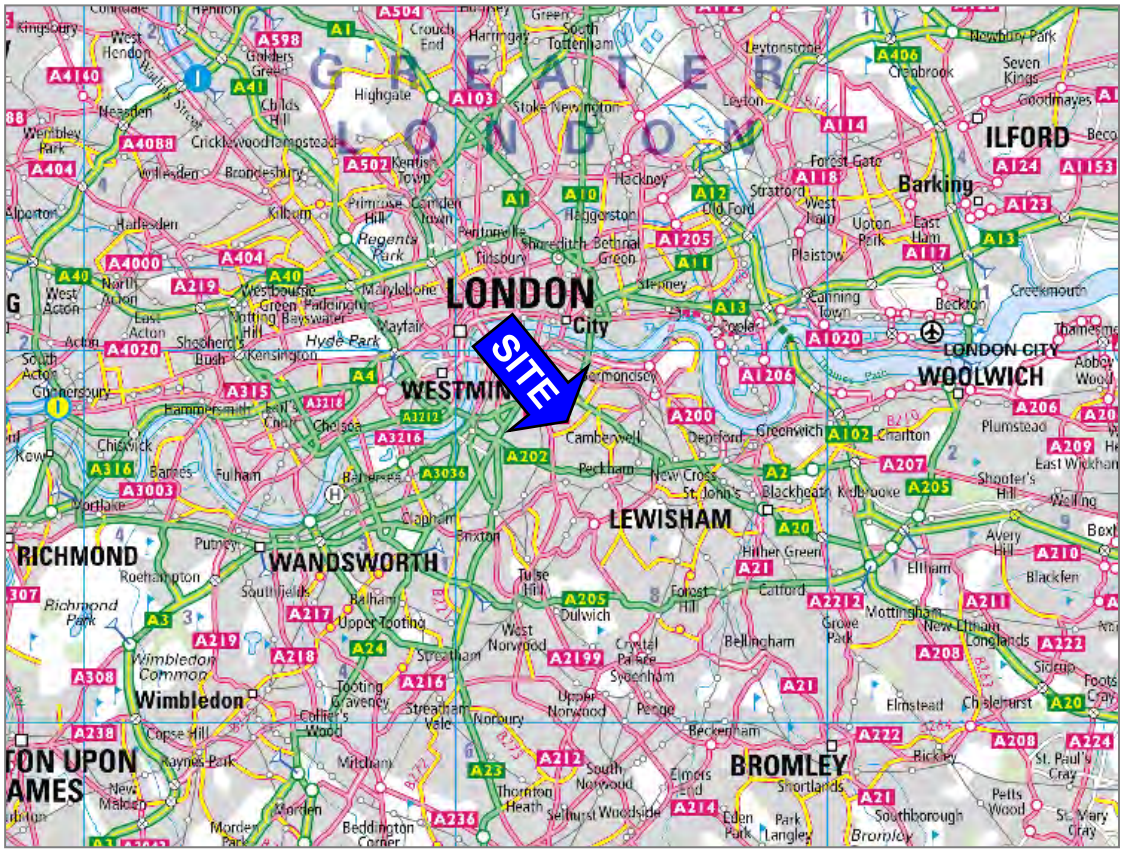
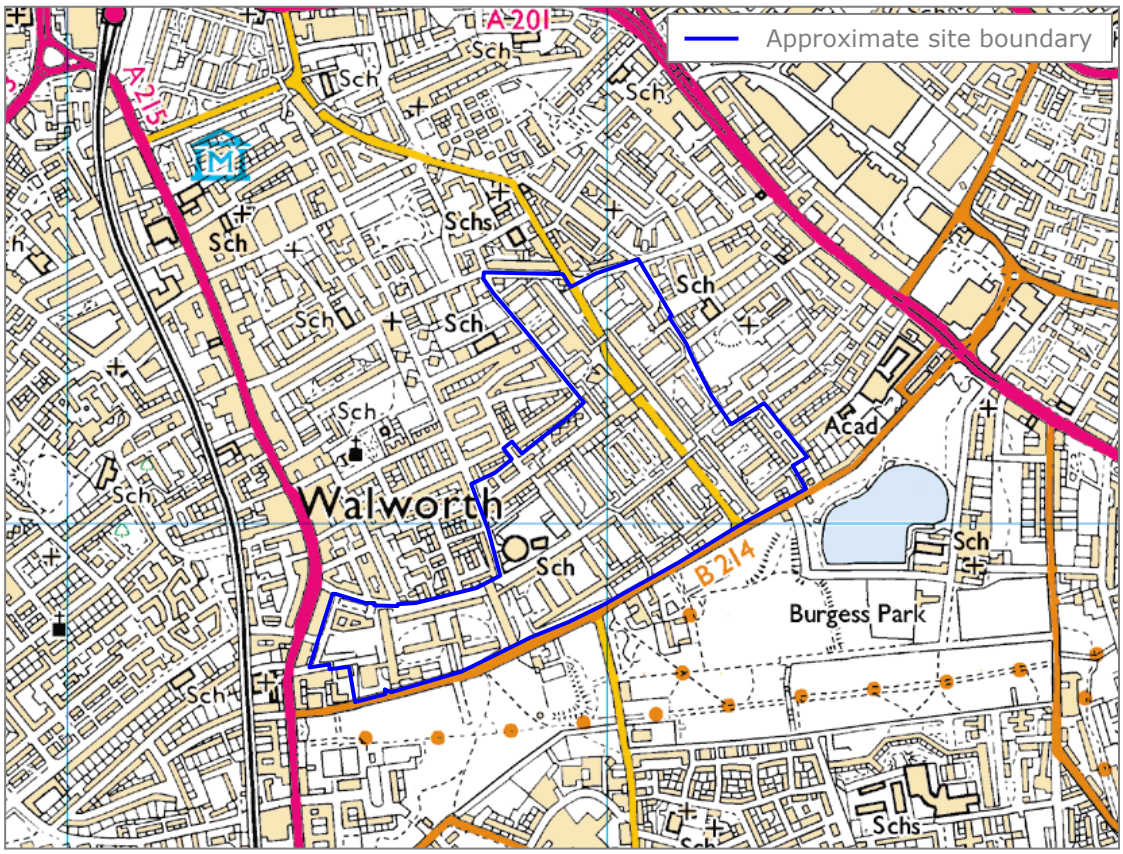




Report Reference:	Client:	
5469TA	WSP UK Limited	
	Project: Aylesbury Estate, Southwark	

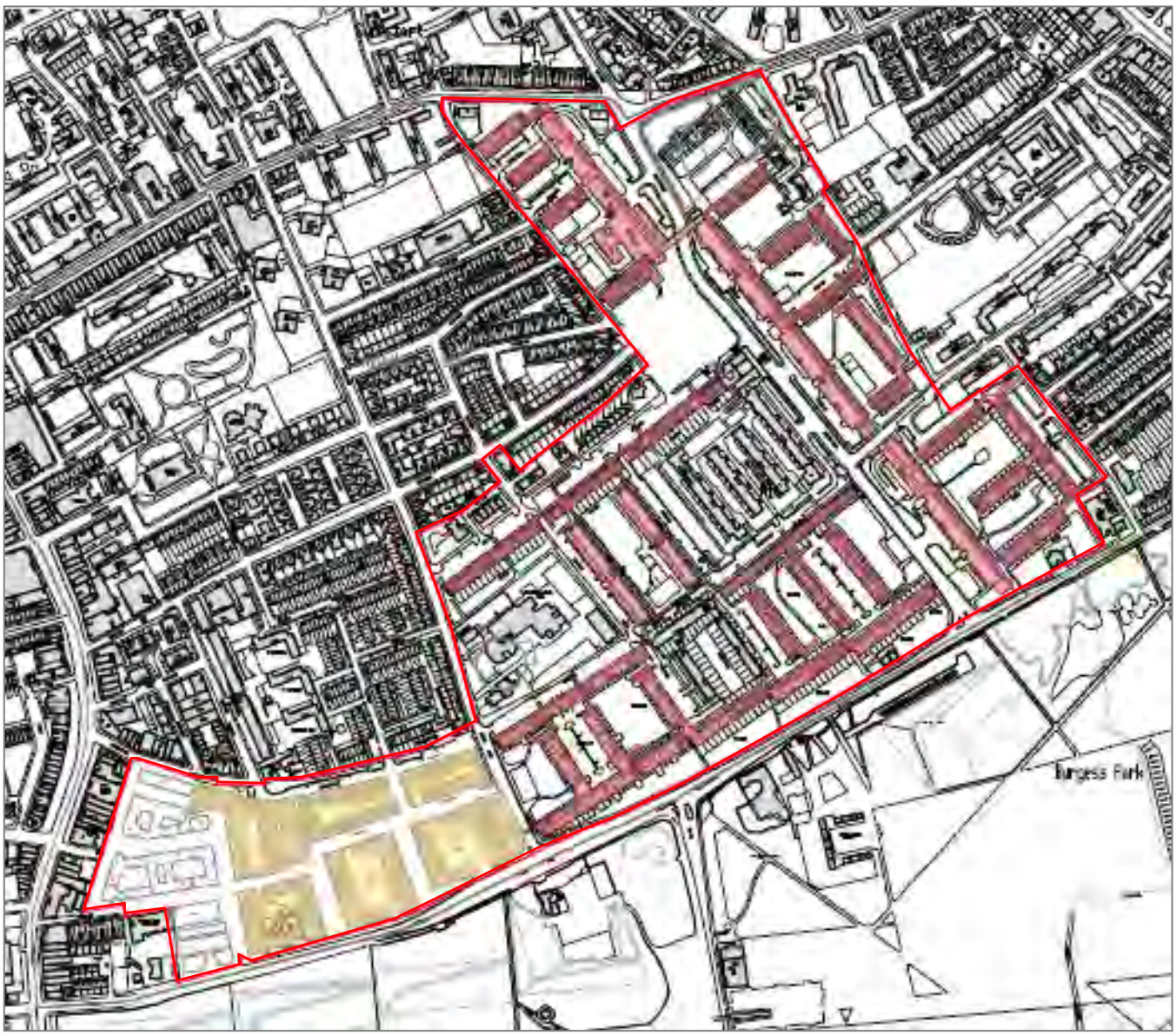
North

Approximate site boundary

Report Reference:	Client:	
5469TA	WSP UK Limited	BAC TEC
	Project: Aylesbury Estate, Southwark	

Source: Google Earth ™ Mapping Services

North



Approximate site boundary

Report Reference:	Client:	
5469TA	WSP UK Limited	BAC TEC
	Project: Aylesbury Estate, Southwark	

Source: WSP UK Limited

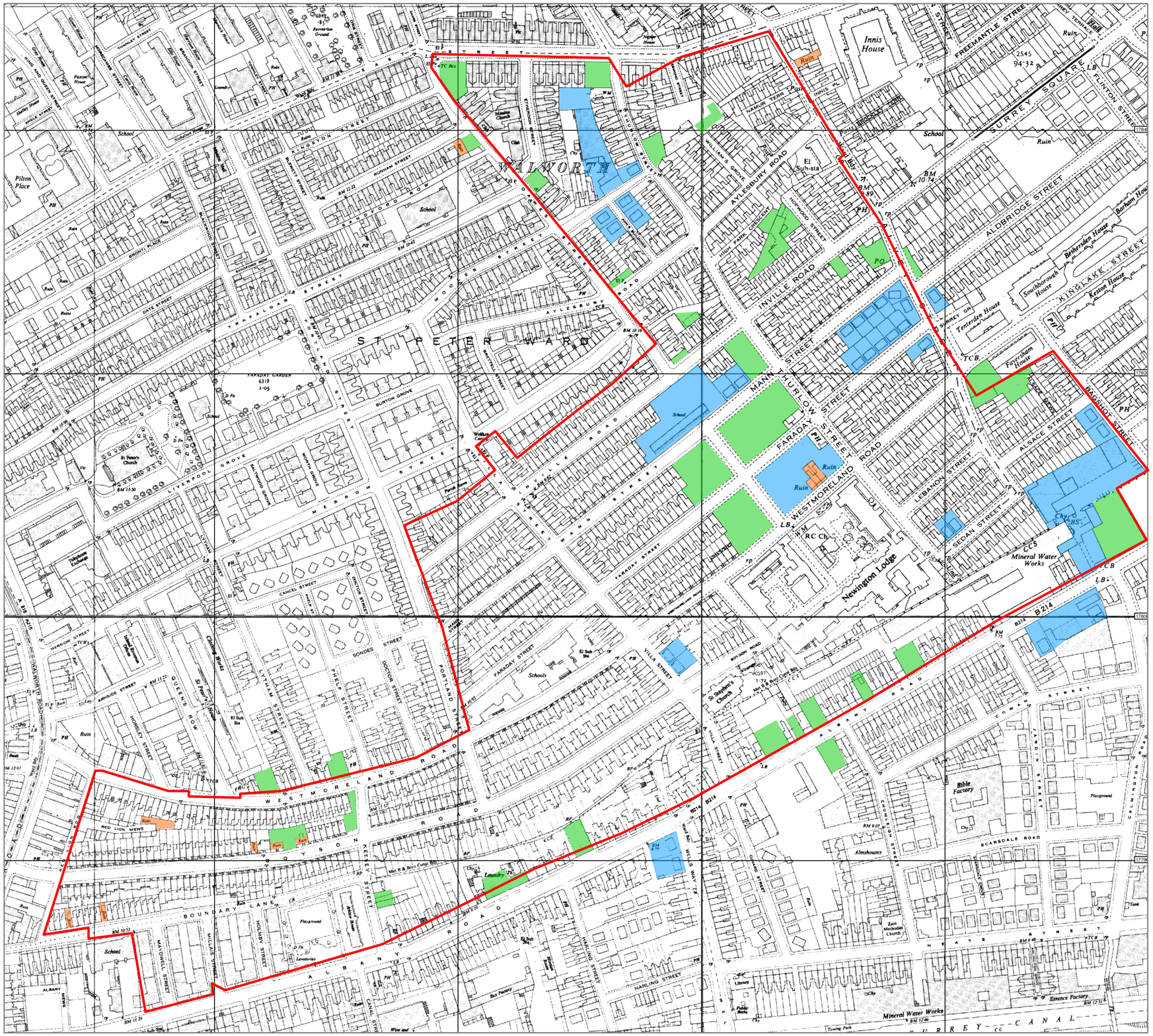
North

— Approximate site boundary

Report Reference:	Client:	
5469TA	WSP UK Limited	
	Project:	Aylsbury Estate, Southwark

Source: Landmark Maps

North



Approximate site boundary

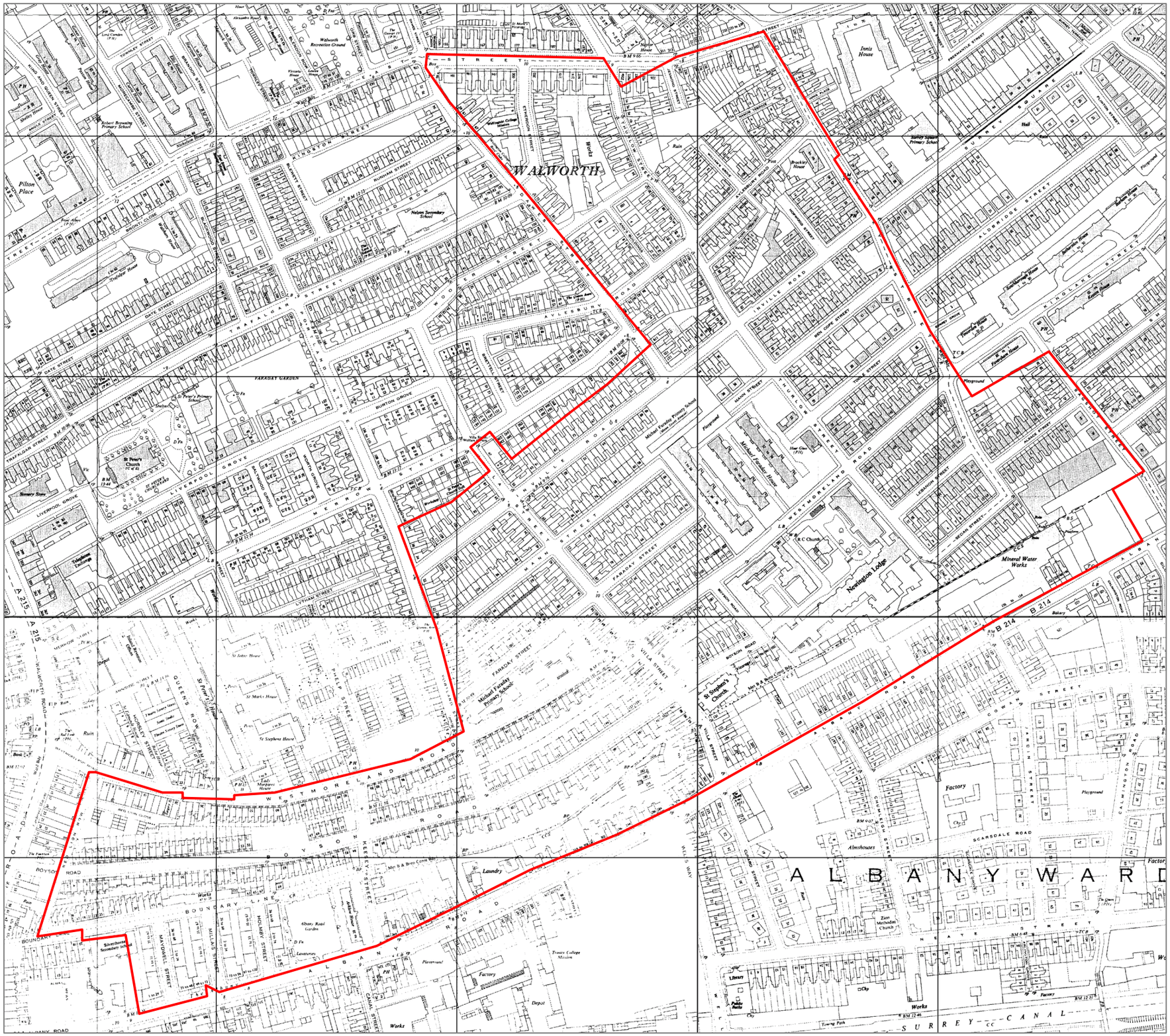
Cleared area

Redevelopment

Ruins

Report Reference:	Client:	
5469TA	WSP UK Limited	BACTEC
	Project: Aylsebury Estate, Southwark	
Source: Landmark Maps		

North



Approximate site boundary

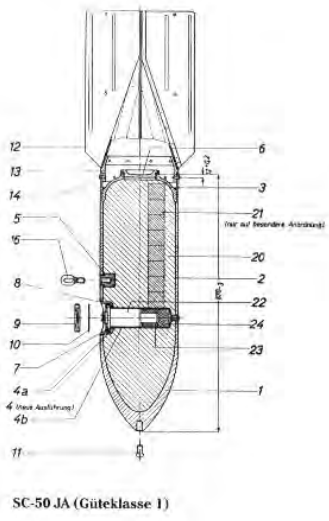
Report Reference:	Client:	
5469TA	WSP UK Limited	BACTEC
	Project: Aylesbury Estate, Southwark	
Source: Landmark Maps		

SC 50

Bomb Weight: 40-54kg (110-119lb)
Explosive Weight: c25kg (55lb)
Fuze Type: Impact fuze/electro-mechanical time delay fuze
Bomb Dimensions: 1,090 x 280mm (42.9 x 11.0in)
Body Diameter: 200mm (7.87in)
Use: Against lightly damageable materials, hangars, railway rolling stock, ammunition depots, light bridges and buildings up to three stories.
Remarks: The smallest and most common conventional German bomb. Nearly 70% of bombs dropped on the UK were 50kg.

50kg bomb, Docklands

Minus tail section

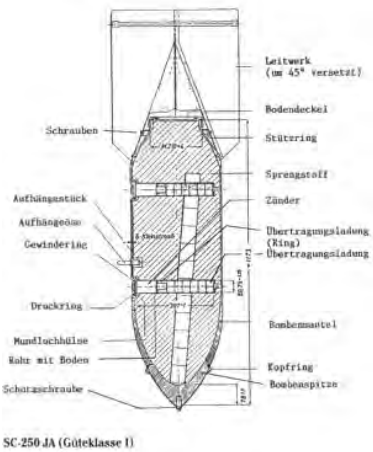


SC-50 JA (Güteklasse 1)

SC 250

Bomb weight: 245-256kg (540-564lb)
Explosive weight: 125-130kg (276-287lb)
Fuze type: Electrical impact/mechanical time delay fuze.
Bomb dimensions: 1640 x 512mm (64.57 x 20.16in)
Body diameter: 368mm (14.5in)
Use: Against railway installations, embankments, flyovers, underpasses, large buildings and below-ground installations

250kg bomb, Hawkinge

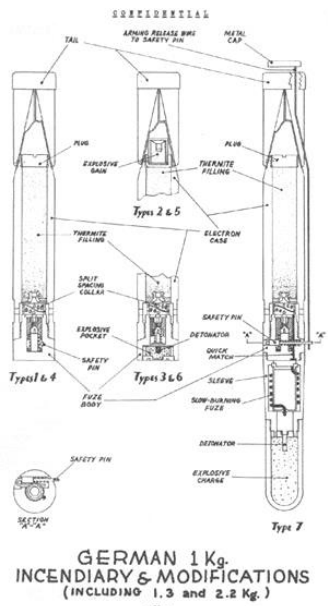


SC-250 JA (Güteklasse 1)

1kg Incendiary Bomb

Bomb weight: 1.0 and 1.3kg (2.2 and 2.87lb)
Filling: 680gm (1.3lb) Thermite
Fuze type: Impact fuze
Bomb dimensions: 350 x 50mm (13.8 x 1.97in)
Body diameter: 50mm (1.97in)
Use: As incendiary – dropped in clusters against towns and industrial complexes
Remarks: Jettisoned from air-dropped containers. Magnesium alloy case. Sometimes fitted with high explosive charge

1. Scaffold pipe
2. Incendiary 1kg bomb
3. Incendiary bomb recently found on site in UK



GERMAN 1 Kg. INCENDIARY & MODIFICATIONS (INCLUDING 1.3 and 2.2 Kg.)

Report Reference:	Client:	
5469TA	WSP UK Limited	BACTEC
	Project: Aylesbury Estate, Southwark	

Source: BACTEC International Limited and various historical sources

1st September 2012 News – **Unexploded World War II Device** detonated on Bournemouth beach

An unexploded World War II device has been detonated on Bournemouth beach, according to Dorset Police. The discovery was made on Friday at 19:11 BST near the junction of East Overcliff Drive and Manor Road.

http://www.bbc.co.uk/news/uk-england-dorset-19445172

31st August 2012 News – **Suspected Unexploded Weapon** found on Cornwall's Porthmeor beach

Lifeguards have found what is believed to be a section of an unexploded weapon on a Cornish beach.The object which witnesses have said looks like a corroded depth charge - an anti-submarine warfare weapon - has been found at Porthmeor Beach, in St Ives, Falmouth Coastguard has said.

http://www.bbc.co.uk/news/uk-england-cornwall-19440291

11th August 2012 News – **Unexploded Bomb** uncovered by workmen in Carlisle

Army bomb disposal experts have been called to Carlisle after what is thought to be an unexploded bomb was dug up. Workmen on a building site at Trinity School uncovered the device earlier. Cumbria Police said a cordon had been put in place and the sports centre on Strand Road had been evacuated as a precaution. A bomb disposal unit from Catterick Garrison, in North Yorkshire, attended the scene.

http://www.bbc.co.uk/news/uk-england-cumbria-19224152

28th July 2012 News – Alert over **'unexploded shells'** in Sheerness Harbour

Thirty-nine people were evacuated from two vessels in Kent after suspected unexploded shells were found. A 100m exclusion zone was also put around Sheerness Harbour on Saturday afternoon after two separate calls. The first call came from a catamaran which had an 18in by 5in shell on its deck at about 14:00 BST. At 15:30 BSt a 90m cable layer reported having a 12in by 4in shell on board. The shells were later declared safe by Royal Navy experts.

http://www.bbc.co.uk/news/uk-england-kent-19034493

10th July 2012 News – **Unexploded WWII Bomb** safely detonated off Kent coast

An unexploded wartime German bomb found off the coast of Kent has been safely detonated, coastguards have said. The 500lb (226kg) device was discovered by a dredger in Dover harbour on Monday but it could not be made safe as the tidal conditions were not right. Dover Coastguard worked with a four-man Royal Navy bomb disposal team from Portsmouth to move it to a remote area. A spokeswoman said it was detonated at 08:45 BSt three-and-a-half miles (5.6km) east of Deal Pier. The World War II explosive was 3.3ft (1m) in length and was said to have had fins which had rusted off.

http://www.bbc.co.uk/news/uk-england-kent-18765547

8th April 2012 News – Huge explosion as experts detonate **large WWII Mine**

Water and ash were propelled more than 120m (390ft) into the air when Royal Navy experts detonated a German mine in the Thames estuary. The 750kg (1,650lb) unexploded World War II (WWII) weapon was placed on the sea bed after it was caught in the nets of a fishing boat earlier in the week. Divers brought it to the surface and then took it to a spot off Kent during a "delicate" seven-hour operation.

http://www.bbc.co.uk/news/uk-england-kent-17652116

5th March 2012 News – Beach open after **WWII shell found**

A beach in County derry has reopened after an unexploded World War II shell was found on Sunday. The device was discovered lying near the water on Benone beach by a member of the public. The beach was evacuated just before 16:00 GMt and a controlled explosion was carried out by army bomb experts

http://www.bbc.co.uk/news/uk-northern-ireland-foyle-west-17255505

21st February 2012 News – **Two WWII bombs** detonated near Lincolnshire village

Bomb disposal experts have carried out a controlled explosion on two devices found near Manby in Lincolnshire. Anglian Water found the unexploded World War II shells near the former RAF Manby airfield, opposite the Motorplex building, on Monday. The area was cordoned off and police remained at the scene until experts from the Ministry of Defence explosive ordnance disposal team arrived.

http://www.bbc.co.uk/news/uk-england-lincolnshire-17111021

9th January 2012 News – County Durham road reopens after **WWII shell uncovered**

A road in County Durham was closed after an unexploded WWII shell was found. The shell was found on land at Slaidburn Road, Stanley, near the A693 Chester Road. Durham Police advised people to avoid the area, closing Chester Road and evacuating a local bus depot and nearby garage as a precaution. Catterick's bomb squad carried out a controlled explosion and all cordons have now been lifted.

http://www.bbc.co.uk/news/uk-england-tyne-16473968

13th October 2011 News – **WWII grenades** found near Gatwick Airport

Unexploded World War II hand grenades have been discovered close to Gatwick Airport. Network Rail staff found the explosives while working near Gatwick Airport railway station in West Sussex. A bomb disposal team was called in to carry out a controlled explosion at about 10:50 BSt Sussex Police said. The bomb disposal team found three hand grenades, one four-inch mortar and a smoke grenade in a metal container and identified them as World War II explosives, he added. Outgoing flights from the airport and rail services were halted as a precaution for about 15 minutes but have since resumed. The alert affected train services run by Gatwick Express, Southern, First Capital Connect and First Great Western.

http://www.bbc.co.uk/news/uk-england-sussex-15292719

SKY NEWS Website of the Year — FIRST FOR BREAKING NEWS

M62 Motorway Closed For Detonation Of World War Two Bomb

5:04pm UK, Friday January 04, 2008

A busy motorway has been closed to allow for a wartime bomb to be detonated nearby.

The controlled explosion

Army expertsdestroyed the huge Second World War device in a controlled explosion near the M62.

The motorway was shut in both directions between junctions 37 and 38 as a safety precaution.

The "deeply buried" bomb had lain dormant in an East Yorkshire field for almost 64 years.

The device was discovered by a metal detecting enthusiast on New Year's Eve in a field near the B1230 at Balkholme, near Howden, which was also closed.

An Army bomb disposal team travelled up from Essex to join police, ambulance and fire services and utility companies at the scene.

Captain Tim Ives, of 33 Engineer Regiment, earlier said 10 soldiers would be employed to "reduce the effects of the controlled explosion by packing sand around the device".

Page last updated at 14:45 GMT, Friday, 22 May 2009 15:45 UK

E-mail this to a friend Printable version

Building site WWII bomb exploded

Building site WWII bomb exploded

A controlled explosion has been carried out on a World War II bomb found on a building site in East Sussex.

The 110lb (50kg) SC50 bomb, thought to have been dropped from a German aircraft in 1940 or 1941, was found at the Hollenden House site in Bexhill.

Children at St Peter and St Paul Primary School next door in Buckhurst Road were sent home early after the discovery on Thursday.

Police said a 160ft (50m) cordon was put round the site during the blast.

BBC 14:23 GMT, Thursday, 5 June 2008 15:23 UK

E-mail this to a friend Printable version

Unexploded bomb 'started to tick'

An unexploded World War II bomb started to tick and ooze liquid as experts tried to defuse it, police have said.

The large bomb was found in a river at Sugar House Lane, near Bromley-by-Bow Tube station in east London, on Monday.

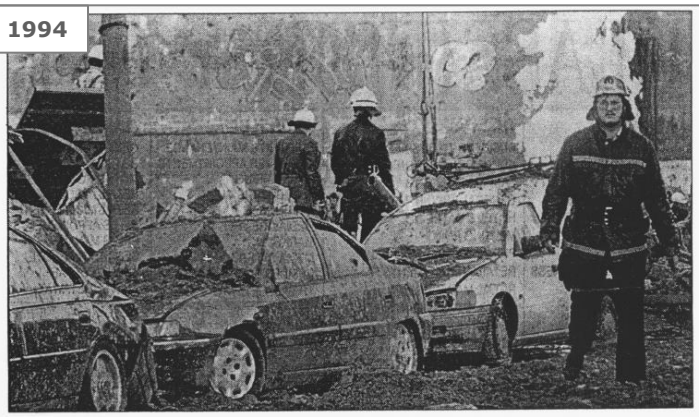
Rush-hour travel was disrupted as overnight work to make the bomb safe continued into Thursday morning.

Police commander Simon O'Brien said: "It started to tick and ooze some pretty horrible substances." It stopped ticking when doused with liquid.

'Hero colleague'

"It measures approximately the size and length of a man, and weighs around 1,000kg (2,200lb).

1994



RESCUE workers search for survivors after a Second World War bomb exploded at a building site in Berlin, killing three people and injuring at least eight others.

A fire brigade spokesman said he feared the final death toll could be higher. One worker was still missing, believed to be trapped under a machine. "We've found human remains 100 metres away but we can't tell if they belong to the dead already found," the spokesman said.

The blast, set off by drilling work on Frankfurter Allee, one of east Berlin's busiest avenues, trapped workers under building machinery and sent huge chunks of concrete tumbling through the air.

A large office block was being built on the site of the explosion which sent shoppers scrambling for shelter and paralysed dense afternoon traffic. One eyewitness said: "There was a bang, then silence, and then it started raining stones and dirt."

Dozens of cars within a 250-metre radius were wrecked and the top two floors of a nearby apartment block caved in.

Radio reports claimed that the total number of injured stood at 14.

Blown up by history

2008

2006

World War II bomb kills three in Germany

Three people have been killed and six injured trying to defuse a World War II bomb in central Germany.

Workers building a sports stadium had earlier unearthed the bomb in the town of Goettingen.

It was not immediately clear why the bomb, reportedly weighing 500kg (1,100lb), had detonated.

Unexploded WWII bombs dropped by Allied planes are frequently found in Germany, though it is unusual for them to explode unexpectedly.

2010

2006

WW2 bomb blast kills digger driver in Germany

The bomb went off as the machine lifted up earth and debris

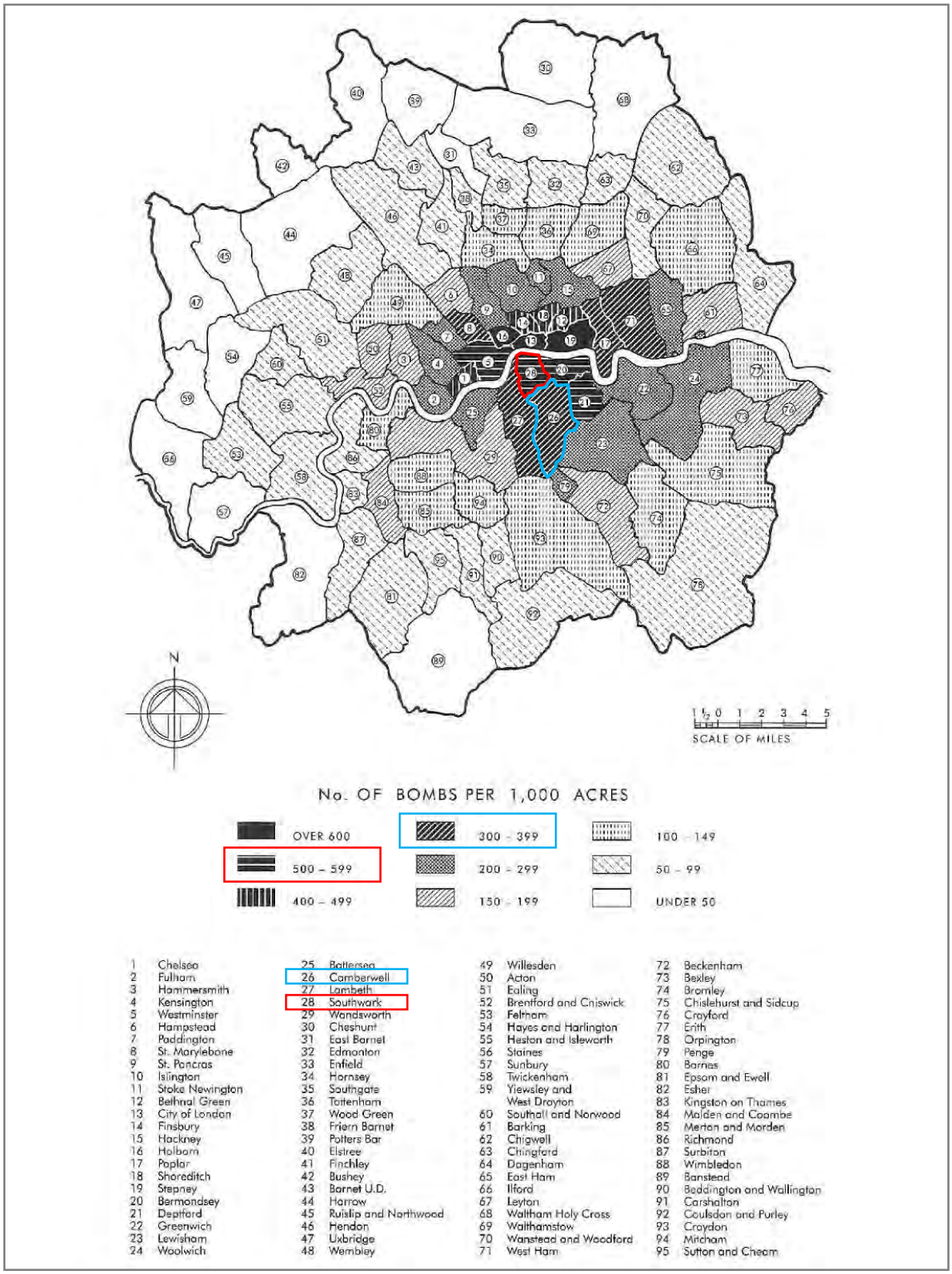
A World War Two bomb has exploded at a construction site near a west German town, killing a man and injuring eight others, police say.

The explosion occurred after a digger accidentally struck the device during excavation work in Euskirchen in the state of North Rhine-Westphalia.

The machine's operator died on the spot. Two of those hurt were critically wounded, the dpa news agency reports.

2014

Top Left: WWII bomb killed 3 and injured 8 in Berlin – 1994.
Middle Left: WWII bomb killed 3 in Goettingen, Germany – 2010.
Bottom Left: Excavator operator killed by WWII bomb in Euskirchen, Germany – 2014.
Top Right: WWII bomb injures 17 at construction site in Hattingen, Germany - 2008.
Middle Right: A highway construction worker in Germany accidentally struck a WWII bomb, killing himself and wrecking several passing cars - 2006.
Bottom Right: Destroyed piling rig and dump truck after detonation of WWII UXB in Austria - 2006.



The density of bombing across the London Region from 1939 to 1945 produced by the Research and Experiments Dept. of the Ministry of Home Security. The site lies at the borough boundary of Southwark and Camberwell, which sustained 500 - 599 and 300 - 399 bombs per 1,000 acres, respectively.

Report Reference:	Client:	
5469TA	WSP UK Limited	BAC TEC
	Project: Aylesbury Estate, Southwark	

Source: London Metropolitan Archives

Consolidated Maps

Night Bombing up to 7th October 1940

Night Bombing 7th October 1940 – 28th July 1941

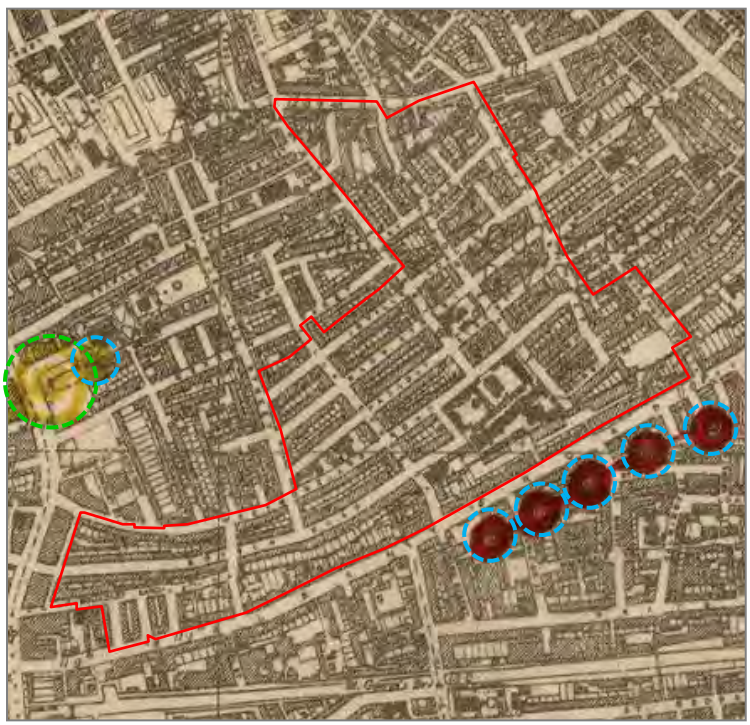
Approximate site boundary

HE Parachute Mine strike

HE Bomb strike

Weekly Maps

Day Bombing - 08th to 31st December 1940



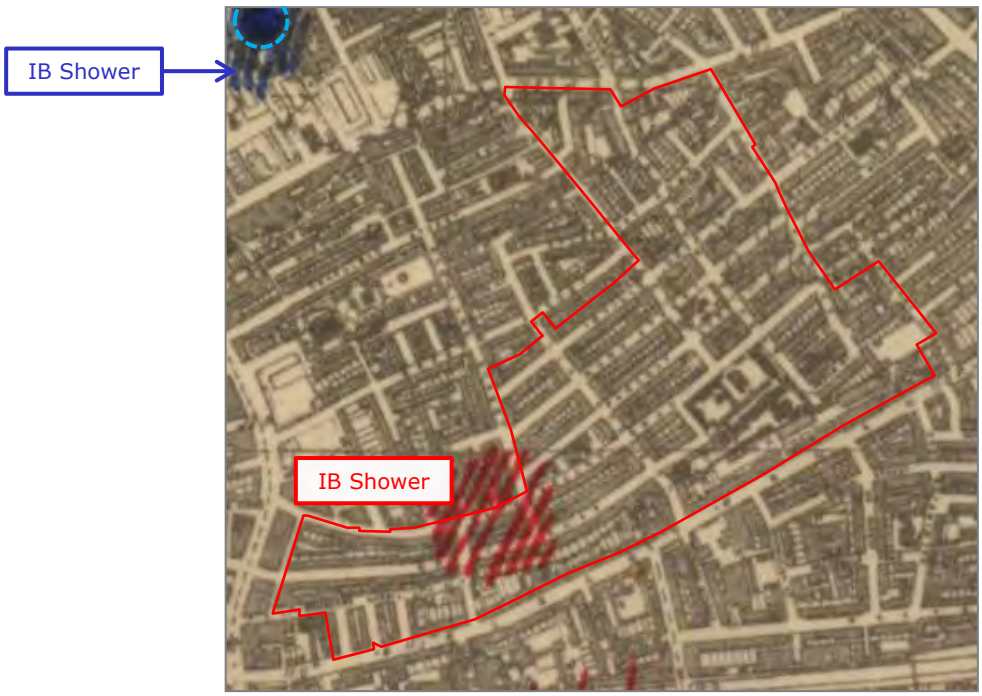
14th to 21st Oct 1940

Approximate site boundary

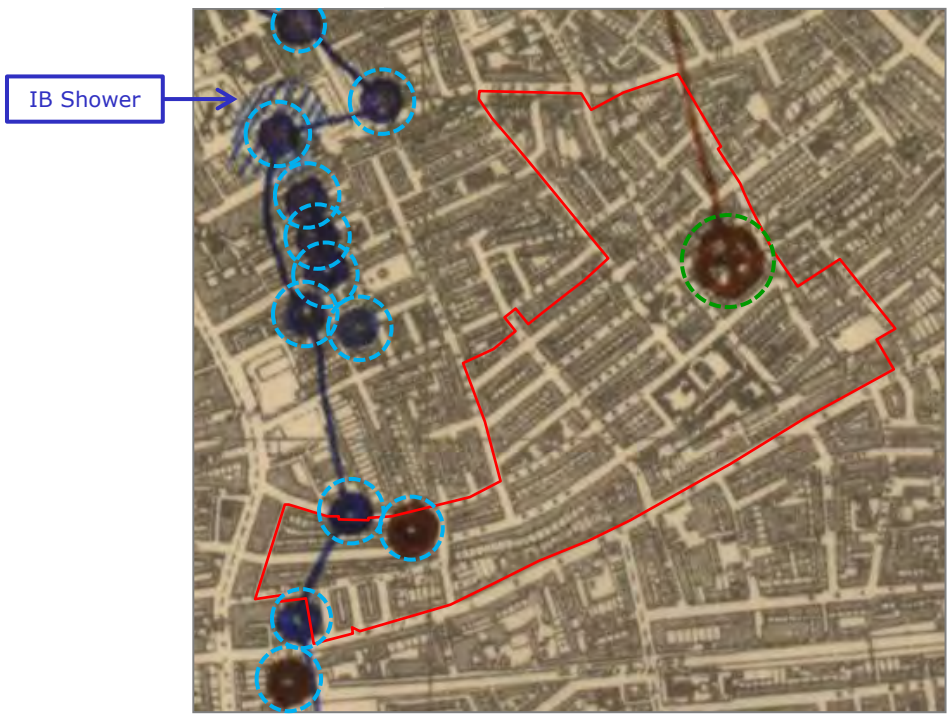
Oil bomb strike

HE bomb strike

Weekly Maps



21st to 28th October 1940



28th October to 4th November 1940

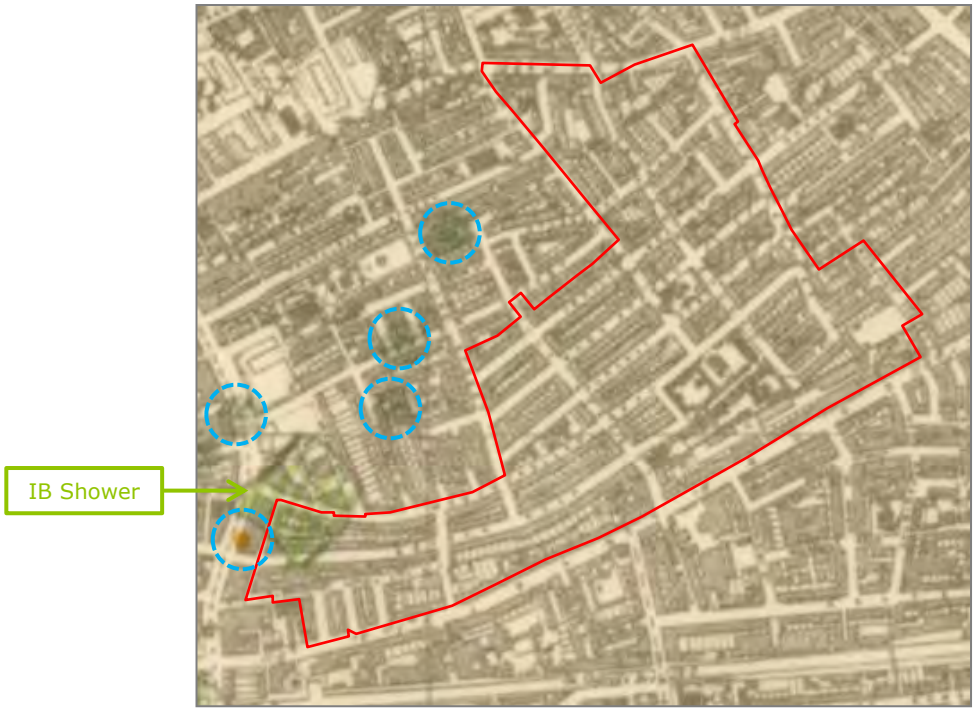
Approximate site boundary Oil UXB strike HE bomb strike

Report Reference:	Client:	
5469TA	WSP UK Limited	BAC TEC
	Project: Aylesbury Estate, Southwark	

Source: National Archives

North

Weekly Maps



11th to 18th November 1940

02nd to 09th December 1940

Approximate site boundary

HE bomb strike

Report Reference:	Client:	
5469TA	WSP UK Limited	BAC TEC
	Project: Aylesbury Estate, Southwark	

Source: National Archives

Weekly Maps

23rd – 30th December 1940

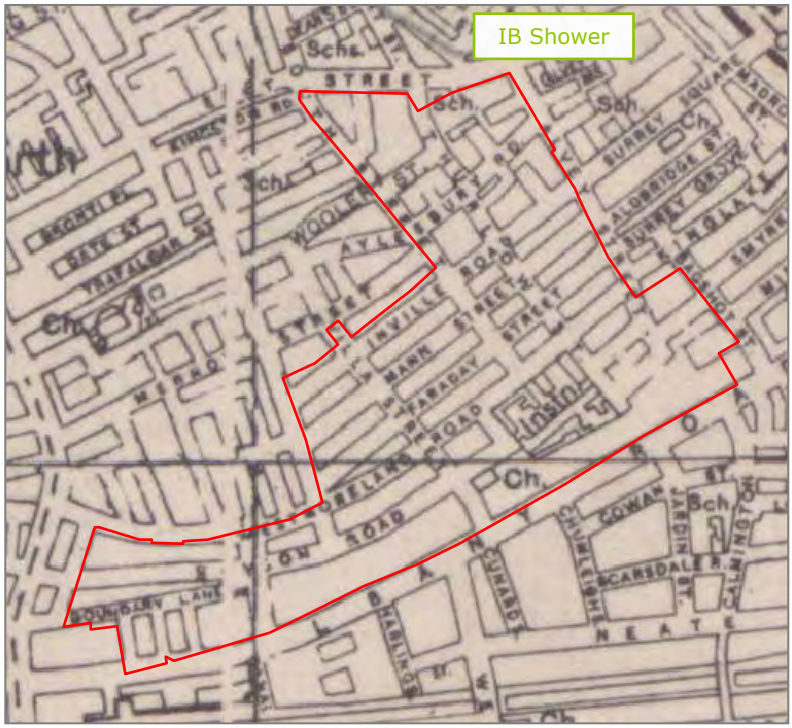
06th to 13th January 1941

Approximate site boundary Oil bomb strike HE bomb strike

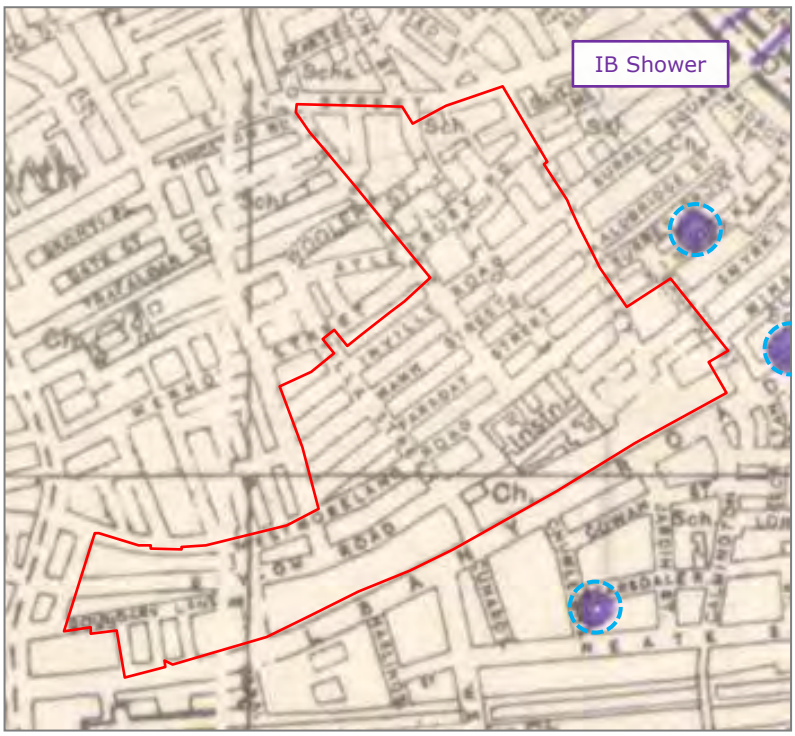
Report Reference:	Client:	
5469TA	WSP UK Limited	BAC TEC
	Project: Aylesbury Estate, Southwark	

Source: National Archives

Weekly Maps



27th January to 3rd February 1941



03rd to 10th March 1941

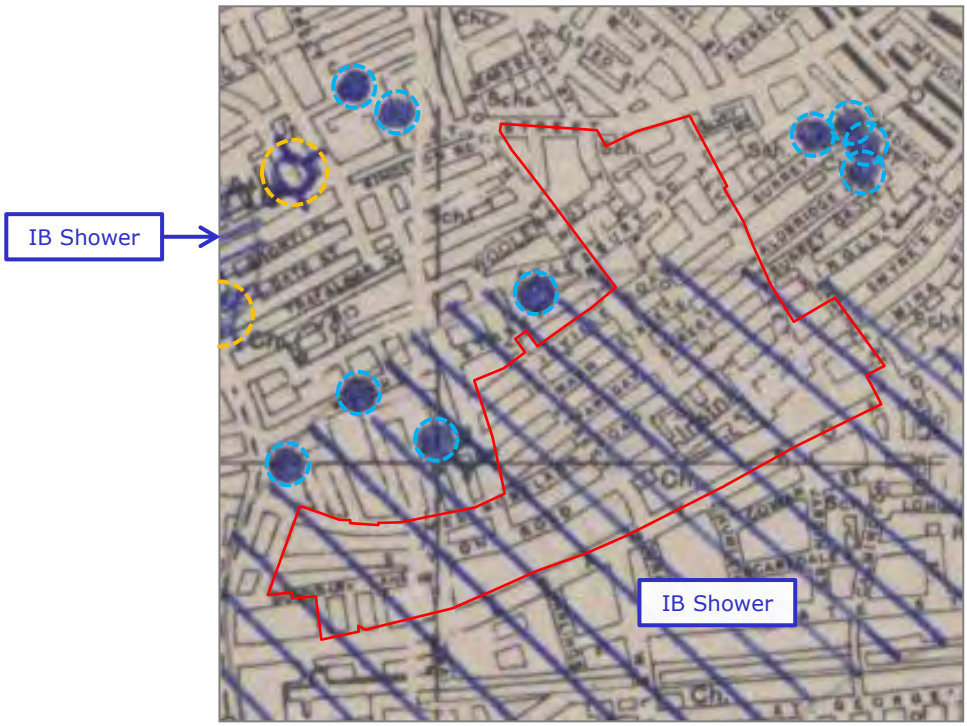
Approximate site boundary

HE bomb strike

Report Reference:	Client:	
5469TA	WSP UK Limited	BAC TEC
	Project: Aylesbury Estate, Southwark	

Source: National Archives

Weekly Maps



14th to 21st April 1941

05th to 12th May 1941

Approximate site boundary

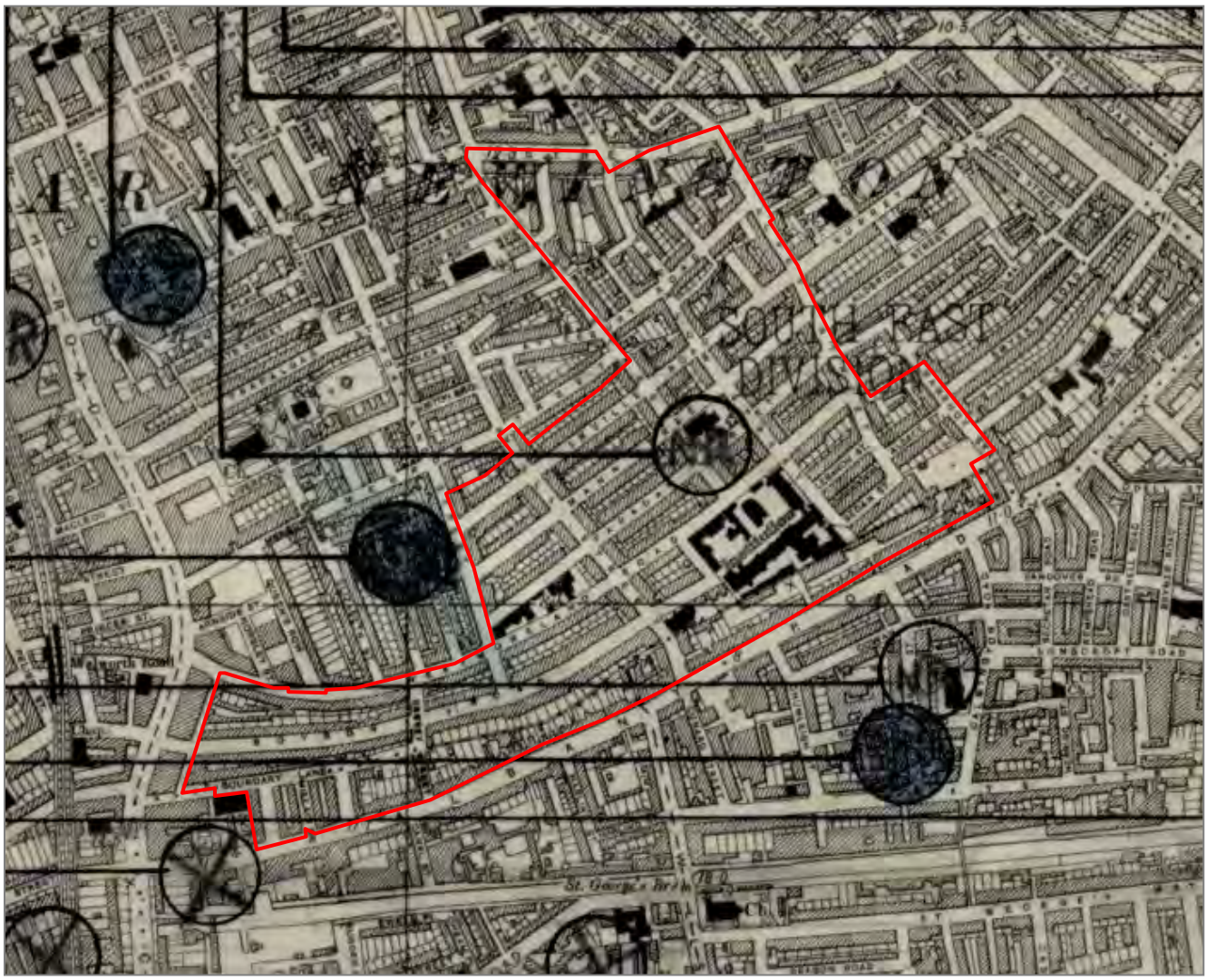
HE bomb strike

HE UXB strike

Report Reference:	Client:	
5469TA	WSP UK Limited	BAC TEC
	Project: Aylesbury Estate, Southwark	

Source: National Archives

North



Approximate site boundary

NR V1 bomb strike

Report Reference:	Client:	
5469TA	WSP UK Limited	BAC TEC
	Project: Aylesbury Estate, Southwark	

Source: National Archives

Report Reference: 5469TA	Client: WSP UK Limited	BACTEC
	Project: Aylsebury Estate, Southwark	
Source: London Metropolitan Archives		

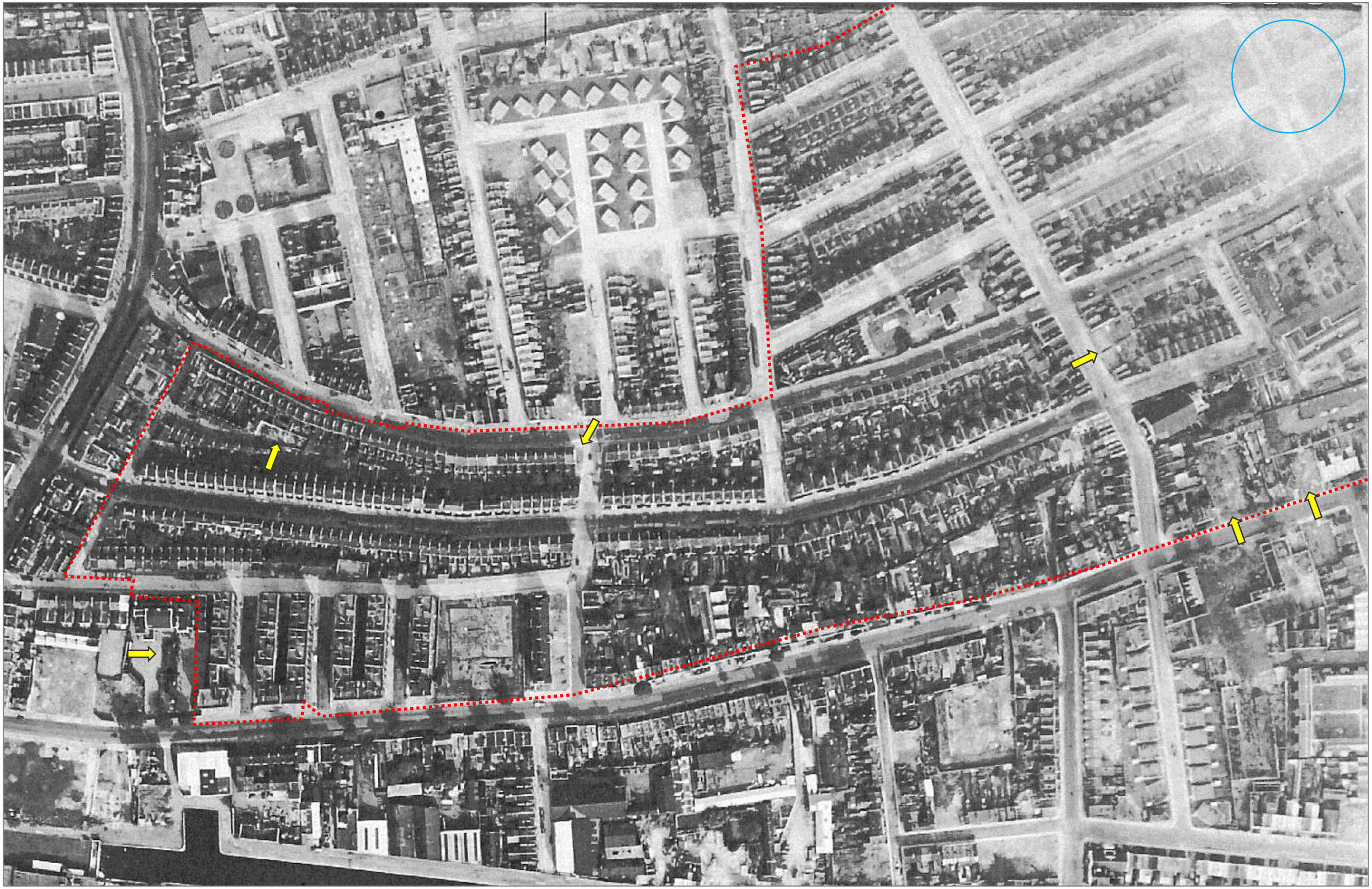
North

Approximate site boundary

Bomb damage/clearance

Report Reference:	Client:	
5469TA	WSP UK Limited	BAC TEC
	Project: Aylesbury Estate, Southwark	

Source: Google Earth ™ Mapping Services



Approximate site boundary

Bomb damage/clearance

V1 Bomb strike

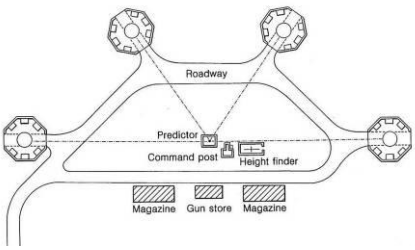
North

Report Reference:	Client:	
5469TA	WSP UK Limited	BACTEC
	Project: Aylsebury Estate, Southwark	
Source: National Monument Records Office		

Report Reference: 5469TA	Client: WSP UK Limited	BAC TEC
	Project: Aylsebury Estate, Southwark	
Source: Various Sources		

3.7 inch Anti-Aircraft Projectile

Weight:	12.7kg (28lb)
Dimensions:	94 x 360mm (3.7 x 14.7in)
Carriage:	Mobile and Static Versions
Rate of Fire:	10-20 rounds per minute
Ceiling:	9-18,000m (29-59,000ft)
Muzzle Velocity:	792m/s (2,598ft/s)
Remarks:	4.5 inch projectiles were also commonly utilised



Layout plan for a typical HAA battery site.

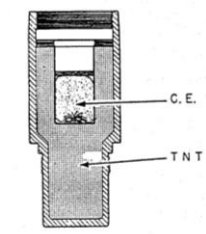
This AA shell was uncovered on a construction site in North London in February 2009.

Hyde Park 1939 3.7 Inch QF gun on mobile mounting

3.7 inch AA Projectile Minus Fuze

Rockets/Unrotated Projectiles

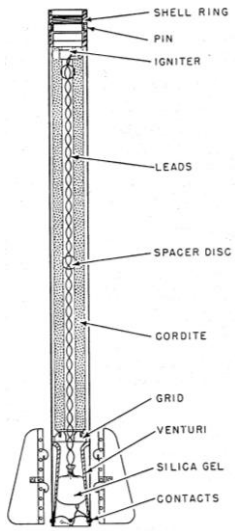
Weight:	Overall: 24.5kg (54lb) Warhead: 1.94kg (4.28lb)
Dimensions:	1930mm x 82.6mm (76 x 3.25in)
Carriage:	Mobile – transported on trailers
Ceiling:	6770m (22,200ft)
Maximum Velocity:	457mps (1,500 fps)



MK II HE Shell (3.5kg)

Rocket Battery in action

Home Guard soldiers load an anti-aircraft rocket at a 'Z' Battery



2" U.P AA Rocket

40mm Bofors Gun Projectile

Weight:	0.86kg (1.96lb)
Dimensions:	40mm x 310mm (1.6in x 12.2in)
Rate of Fire:	120 rounds per minute
Ceiling:	23,000ft (7000m)
Muzzle Velocity:	2,890 ft/s (881m/s)
Remarks:	Mobile batteries – normally few records of where these guns were located

Unexploded 40mm Bofors projectile recovered from a marine environment

40mm Bofors gun and crew at Stanmore in Middlesex, 28 June 1940.

Report Reference:	Client:	
5469TA	WSP UK Limited	
	Project: Aylesbury Estate, Southwark	

Source: BACTEC International Limited and various historical sources

North

Low Risk Zone

WWII built-up areas that remained lightly or completely undamaged throughout WWII.

Medium Risk Zone

WWII built-up areas which sustained confirmed bomb strikes, subsequent significant bomb damage and which have seen significant intrusive redevelopment post-war

Medium-High Risk Zone

WWII built-up areas which sustained confirmed bomb strikes and significant bomb damage during WWII and which have not been redeveloped post-war.

Approximate site boundary

Recommended Risk Mitigation Measures

All Risk Zones:

- Explosive Ordnance Safety and Awareness Briefings to all personnel conducting intrusive works
- The provision of Unexploded Ordnance Site Safety Instructions

Medium and Medium-High Risk Zones Only:

- Explosive Ordnance Disposal (EOD) Engineer presence on site to support shallow intrusive works
- Intrusive Magnetometer Survey (and target investigation) of all borehole and pile locations down to a maximum bomb penetration depth

Report Reference:	Client:	
5469TA	WSP UK Limited	BAC TEC
	Project: Aylsebury Estate, Southwark	
Source: Google Earth		

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E-mail: bactec.int@bactec.com

Branches/Offices in:

- Australia
- Cambodia
- Lao P DR
- Lebanon
- Libya
- Mozambique

Website: www.bactec.com

BACTEC

Appendix F

EXPLORATORY HOLE RECORDS

Borehole Log

Drilled	GP	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	2.18 mOD
Logged	EP	21/10/2015	Dando 1750	0.00	10.00	150	9.50	**Coordinates (m)**	E 533000.32
Checked	HD	**End**	Hand dug inspection pit GL to 1.20m. Cable percussion drilling 1.20m to 10.00m					**National Grid**	N 178241.95
Approved	DB	22/10/2015							

Samples and Tests

Strata Description

Depth	Type & No	Records	Date / Casing	Time / Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
			21/10/15	0900	MACADAM		0.10 (0.10) +2.08		
0.30	ES 1			dry	(MADE GROUND)				
0.30	D 2				Soft to firm brown mottled dark brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse of brick and macadam.		(0.40)		
0.70	ES 3						0.50 +1.68		
0.70	D 4				(MADE GROUND)		(0.30)		
					Brown gravelly clayey SAND. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse of brick and flint.		0.80 +1.38		
1.20	ES 5								
1.20 - 1.65	SPTS	N=42 (4,6/8,10,12,12)		dry	Dense and very dense orangish brown gravelly SAND. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint.				
1.20	D 6				(KEMPTON PARK GRAVEL FORMATION)				
1.20	D 7								
			21/10/15	1800					
			22/10/15	dry 0900					
2.00 - 2.45	SPTC	N=50 (1,4/8,10,15,17)	2.00	dry					
2.00 - 2.50	B 8			damp					
							(3.90)		
3.00 - 3.40	SPTC	50 (2,6/11,15,18,6 for 30mm)	3.00	damp					
3.00 - 3.50	B 9								
4.00 - 4.45	SPTC	N=46 (7,12/18,14,9,5)	4.00	damp					
4.00 - 4.50	B 10								
4.70	B 13				Stiff brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse of flint. (LAMBETH GROUP)		4.70 -2.52		
4.80	D 12								
4.80	ES 11								
5.00 - 5.50	B 14								
							(1.30)		
5.50 - 5.95	U 15	15 blows 100% rec	5.00	Dry					
6.00	D 16				Stiff to very stiff brown mottled grey slightly gravelly CLAY. Gravel is angular to subangular, fine to medium of flint. Rare wood fragments (<3mm x 5mm). (LAMBETH GROUP)		6.00 -3.82		
							(0.50)		
6.50	D 17						6.50 -4.32		
6.50 - 6.95	SPTS	N=31 (2,4/6,8,8,9)	5.30	damp	Stiff to very stiff brown mottled grey sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is angular to subangular, fine to medium of flint. (LAMBETH GROUP)				
							(0.50)		
7.00	D 19						7.00 -4.82		
7.00	ES 18				Grey fine to medium SAND. (LAMBETH GROUP)				
8.00	D 20								
8.00 - 8.45	SPTS	N=22 (2,2/4,4,6,8)	8.00	5.30					
							(2.30)		
							9.30 -7.12		
9.50 - 9.90	U 21	70 blows 90% rec	9.50	6.50	Very stiff dark grey mottled light grey slightly gravelly CLAY. Sand is fine to medium. Gravel is subangular to rounded, fine to coarse of flint. Driller notes shells.				
							(0.80)		
			22/10/15	1800					
			9.50	6.50					

Hole continues on next sheet

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
1	6.50		8.00

Depth Related Remarks

Depths (m)	Remarks
1.20 - 4.90	Water added to assist boring.
1.20 - 10.00	SPT hammer ID SM14 (Er 73%) rod type NWY

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project	**Plot 18 Aylesbury Estate, Southwark**
Project No.	**D5501-15**
Carried out for	**WSP Group PLC**

Borehole

BH101

Borehole Log

Drilled	GP	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	2.18 mOD
Logged	EP	21/10/2015	Dando 1750	0.00	10.00	150	9.50	**Coordinates (m)**	E 533000.32
Checked	HD	**End**	Hand dug inspection pit GL to 1.20m. Cable percussion drilling 1.20m to 10.00m					**National Grid**	N 178241.95
Approved	DB	22/10/2015							

Samples and Tests

Strata Description

Depth	Type & No	Records	Date / Time Casing / Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
9.95	D 22			(LAMBETH GROUP)		10.00 -7.82		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks	
Depths (m)	Remarks

Hard Boring		
Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project Plot 18 Aylesbury Estate, Southwark

Project No. D5501-15

Carried out for WSP Group PLC

Borehole BH101

Borehole Log

Drilled	MJ	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	3.15 mOD
Logged	EP	20/10/2015	Competitor Rig Hand excavated inspection pit from GL to 1.20m. Window Sampling from 1.20m to 3.00m. Hole terminated at 3.00m due to possible very dense granular material.	1.20 2.00	2.00 3.00	100 87		**Coordinates (m)**	E 532951.47
Checked	HD	**End**						**National Grid**	N 178281.20
Approved	DB	20/10/2015							

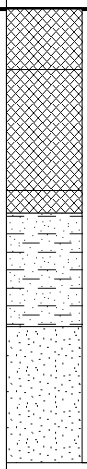
Samples and Tests

Depth	Type & No	Records	Date / Casing	Time / Water
0.10	ES 1			
0.10	D 2			
0.50	ES 3			
0.50	D 4			
1.00	ES 5			
1.10	D 6			
1.20	D 7			
1.20 - 1.65	SPTS	N=7 (2,2/2,2,1,2)		
1.30	D 8			
1.70	ES 9			
1.80	D 10			
2.00	D 11			
2.00 - 2.45	SPTS	N=26 (3,3/5,7,7,7)		
2.20	D 12			
2.40	D 13			
2.60	ES 14			
2.70	D 15			
2.80 - 3.20	SPTS	50 (5,6/10,11,13,16 for 30mm)		
3.00	D 16			

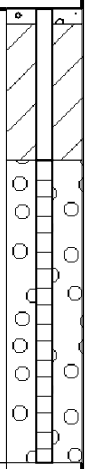
Strata Description

Main	Detail	Depth, Level (Thickness)
(MADE GROUND) Grass over dark brown silty gravelly SAND. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse of brick, flint and ceramic.		(0.40) 0.40 +2.75
(MADE GROUND) Brown silty gravelly SAND with frequent rootlets. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick and ceramic		(0.80) 1.20 +1.95
(MADE GROUND) Dark brown clayey gravelly SAND. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse of brick and flint		(0.15) 1.35 +1.80
Firm orangish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse of flint. (KEMPTON PARK GRAVEL FORMATION)		(0.75) 2.10 +1.05
Very dense orangish brown becoming light orangish brown slightly gravelly SAND. Sand is fine to coarse. Gravel is angular, fine to coarse of flint (KEMPTON PARK GRAVEL FORMATION)	2.50-2.57 Very gravelly	(0.90) 3.00 +0.15

Legend



Backfill



Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks
1.20 - 2.00	0.80m recovery
2.00 - 3.00	0.90m recovery

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project Plot 18 Aylesbury Estate, Southwark

Project No. D5501-15

Carried out for WSP Group PLC

Borehole

WS101

Borehole Log

Drilled	MJ	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	2.11 mOD
Logged	EP	20/10/2015	Competitor Rig Hand excavated inspection pit from GL to 1.20m. Window Sampling from 1.20m to 2.00m.					**Coordinates (m)**	E 532969.72
Checked	HD	**End**	Hole terminated at 2.00m due to possible very dense granular material. Monitoring installation not specified.					**National Grid**	N 178285.78
Approved	DB	20/10/2015							

Samples and Tests

Strata Description

Depth	Type & No	Records	Date / Time Casing / Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20	ES 1 D 2			(MADE GROUND) Grass over dark brown clayey gravelly SAND with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of flint, brick and macadam. Cobbles are angular of brick.		(0.50) 0.50 +1.61		
0.70 0.70	ES 3 D 4			(MADE GROUND) Brown slightly clayey slightly gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of flint and rare brick.		(0.50) 1.00 +1.11		
1.20 1.20 - 1.65 1.30	D 5 SPTS D 6	N=13 (2,2/2,3,3,5)		Firm orangish brown sandy slightly gravelly CLAY. Gravel is subangular to subrounded, fine to coarse of flint. Sand is fine to coarse. (KEMPTON PARK GRAVEL FORMATION)		(0.50) 1.50 +0.61		
1.60	D 7			Light orangish brown clayey gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of flint. (KEMPTON PARK GRAVEL FORMATION)		(0.20) 1.70 +0.41		
1.80	D 8			Very dense light orangish brown gravelly SAND. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse of flint. (KEMPTON PARK GRAVEL FORMATION)		(0.30) 2.00 +0.11		
2.00 2.00 - 2.42	D 9 SPTS	50 (6,8/10,12,13,15 for 40mm)						

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks
1.20 - 2.00	0.86m recovery

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project	**Plot 18 Aylesbury Estate, Southwark**
Project No.	**D5501-15**
Carried out for	**WSP Group PLC**

Borehole

WS102

Borehole Log

Drilled	MJ	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	3.15 mOD
Logged	EP	20/10/2015	Hand dug Hand excavated inspection pit from GL to 0.80m. Hole terminated at 0.80m (cause of obstruction unknown).					**Coordinates (m)**	E 532940.56
Checked	HD	**End**						**National Grid**	N 178263.32
Approved	DB	20/10/2015							

Samples and Tests

Strata Description

Depth	Type & No	Records	Date / Time Casing / Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
				(MADE GROUND) Dark brown silty SAND with frequent roots and rootlets (<5mm). Sand is fine to coarse.		0.05 (0.05) +3.10		
				(MADE GROUND) Dark brown silty gravelly SAND with low cobble content. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse of brick and flint. Cobbles are angular of brick.		(0.75)		
						0.80 +2.35		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project Plot 18 Aylesbury Estate, Southwark

Project No. D5501-15

Carried out for WSP Group PLC

Borehole

WS103

Sheet 1 of 1

Borehole Log

Drilled	MJ	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	3.15 mOD
Logged	EP	20/10/2015	Competitor Rig Hand excavated inspection pit from GL to 1.20m. Window Sampling from 1.20m to 2.50m.	1.20 2.00	2.00 2.50	100 87		**Coordinates (m)**	E 532940.56
Checked	HD	**End**	Hole terminated at 2.50m due to possible very dense granular material. Monitoring installation not specified.					**National Grid**	N 532940.56
Approved	DB	20/10/2015							

Samples and Tests

Depth	Type & No	Records	Date / Time Casing / Water
0.10	ES 1		
0.10	D 2		
0.50	ES 3		
0.50	D 4		
1.00	ES 5		
1.00	D 6		
1.20	D 7		
1.20 - 1.65	SPTS	N=12 (2,2/3,3,3,3)	
1.50	D 8		
1.80	D 9		
2.00	D 10		
2.00 - 2.45	SPTS	N=43 (4,7/7,9,11,16)	
2.30	ES 11		
2.40	D 12		
2.50 - 2.88	SPTS	50 (9,11/14,14,14,8 for 10mm)	

Strata Description

Main	Detail	Depth, Level (Thickness)	Legend	Backfill
(MADE GROUND) Grass over dark brown silty SAND with frequent roots and rootlets (<5mm).		0.05 (0.05) +3.10		
(MADE GROUND) Brown silty gravelly SAND with low cobble content. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse of flint and brick. Cobbles are angular of brick.	0.70-0.80 Rare pieces of ceramic (<5mm x 3mm)	(1.35)		
Soft to firm orangish brown slightly gravelly CLAY. Gravel is angular to subrounded, fine to coarse of flint. Sand is fine to coarse. (KEMPTON PARK GRAVEL FORMATION)		1.40 +1.75 (0.30)		
Dense to very dense orangish brown fine to coarse SAND. (KEMPTON PARK GRAVEL FORMATION)	1.90-1.95 Sandy gravel. Gravel is angular to subangular, fine to coarse of flint.	1.70 +1.45 (0.80)		
		2.50 +0.65		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks
1.20 - 2.00	0.80m recovery
2.00 - 2.50	0.40m recovery

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project Plot 18 Aylesbury Estate, Southwark

Project No. D5501-15

Carried out for WSP Group PLC

Borehole

WS103A

Sheet 1 of 1

Borehole Log

Drilled	MJ	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	2.89 mOD
Logged	EP	20/10/2015	Hand tools					**Coordinates (m)**	E 532987.62
Checked	HD	**End**	Hand excavated inspection pit from GL to 1.20m.					**National Grid**	N 178305.39
Approved	DB	20/10/2015	Hole terminated at 1.20m (cause of obstruction unknown).						

Samples and Tests

Strata Description

Depth	Type & No	Records	Date / Time Casing / Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20	ES 1 D 2			(MADE GROUND) Grass over dark brown slightly silty gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of brick and flint.		(0.40) 0.40 +2.49		
0.70 0.70	ES 3 D 4			(MADE GROUND) Brown slightly gravelly SAND. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint.		(0.80)		
1.20 - 1.21	SPTS					1.20 +1.69		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project Plot 18 Aylesbury Estate, Southwark

Project No. D5501-15

Carried out for WSP Group PLC

Borehole

WS104

Borehole Log

Drilled	SGT	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	3.09 mOD
Logged	EP	21/10/2015	Hand Tools Hand dug pit from GL to 0.70m. Hole terminated at 0.70m due to encountering of a water pipe (diameter unknown).					**Coordinates (m)**	E 532981.33
Checked	HD	**End**						**National Grid**	N 178276.34
Approved	DB	21/10/2015							

Samples and Tests

Strata Description

Depth	Type & No	Records	Date / Time Casing / Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.50 0.50	D 2 ES 1			(MADE GROUND) Grass over dark brown clayey gravelly SAND. Sand is fine to coarse, gravel is subangular to subrounded fine to coarse of brick.		0.10 (0.10) +2.99 (0.60)		
			21/10/15 0900	(MADE GROUND) Soft brown sandy gravelly CLAY. Sand is fine to coarse, gravel is subangular to subrounded fine to coarse of brick and flint. rare angular cobbles of brick.		0.70 +2.39		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project Plot 18 Aylesbury Estate, Southwark

Project No. D5501-15

Carried out for WSP Group PLC

Borehole

WS105

Sheet 1 of 1

Borehole Log

Drilled	SGT	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	2.94 mOD
Logged	EP	20/10/2015	Hand tools Hand dug inspection pit from GL to 1.00m Hole terminated at 1.20m (cause of obstruction unknown).					**Coordinates (m)**	E 532999.48
Checked	HD	**End**						**National Grid**	N 178286.24
Approved	DB	20/10/2015							

Samples and Tests

Strata Description

Depth	Type & No	Records	Date / Time Casing / Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.50 0.50	D 2 ES 1			(MADE GROUND) Grass over dark brown slightly gravelly SAND. Sand is fine to coarse, Gravel is angular to subangular fine to coarse of brick and flint.		(0.30) 0.30 +2.64		
				(MADE GROUND) Brown silty gravelly SAND. Gravel is angular to subrounded fine to coarse of brick and flint.		(0.70) 1.00 +1.94		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project Plot 18 Aylesbury Estate, Southwark

Project No. D5501-15

Carried out for WSP Group PLC

Borehole

WS106

Sheet 1 of 1

Borehole Log

Drilled	ESG	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	2.24 mOD
Logged	EP	21/10/2015	Dart Rig	1.20	2.00	100		**Coordinates (m)**	E 532984.54
Checked	HD	**End**	Hand dug inspection pit from GL to 1.20m. Window sampling from 1.20m to 4.00m.	2.00	3.00	87		**National Grid**	N 178261.38
Approved	DB	21/10/2015	Borehole hole terminated at 4.0m due to hole collapse. Monitoring installation not specified.	3.00	4.00	77			

Samples and Tests

Strata Description

Depth	Type & No	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
			21/10/15	1200	MACADAM (MADE GROUND) Brown slightly clayey gravelly SAND. Gravel is angular to subrounded fine to coarse of brick and flint.		0.10 (0.10) +2.14		
1.20 - 1.65	SPTS	N=4 (2,1/1,1,1,1)		dry			(2.45)		
2.00 - 2.45	SPTS	N=6 (1,1/1,1,2,2)		dry					
					Orangeish brown fine to coarse SAND. (KEMPTON PARK GRAVEL FORMATION)		2.55 -0.31		
3.00 - 3.45	SPTS	N=9 (1,1/1,1,3,4)		dry			(0.55)		
					Orangish brown gravelly SAND. Gravel is angular to subrounded fine to coarse of flint. (KEMPTON PARK GRAVEL FORMATION)		3.10 -0.86		
			21/10/15	1400			(0.90)		
							4.00 -1.76		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks
1.20 - 2.00	0.35m recovery
2.00 - 3.00	1.0m recovery
3.00 - 4.00	0.80m recovery

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project Plot 18 Aylesbury Estate, Southwark

Project No. D5501-15

Carried out for WSP Group PLC

Borehole

WS107

Borehole Log

Drilled	SGT	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	2.20 mOD
Logged	EP	19/10/2015	Competitor rig	1.20	2.00	100		**Coordinates (m)**	E 533008.70
Checked	HD	**End**	Hand excavated inspection pit from GL to 1.20m Window sampling from 1.20m to 3.50m.	2.00	3.00	87		**National Grid**	N 178272.88
Approved	DB	19/10/2015	Hole terminated at 3.50m due to possible very dense granular material. Monitoring installation not specified.	3.00	3.50	77			

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.10	D 2			
0.10	ES 1			
0.40	D 4			
0.40	ES 3			
0.80	D 6			
0.80	ES 5			
1.20	D 7			
1.20 - 1.65	SPTS	N=20 (2,3/4,5,5,6)		
1.50	D 9			
1.50	ES 8			
1.50 - 2.00	B 10			
2.00	D 11			
2.00 - 2.45	SPTS	N=18 (4,5/3,4,5,6)		
2.70	D 12			
3.00	D 13			
3.00 - 3.45	SPTS	N=34 (4,8/7,8,9,10)		
3.20	D 14			
3.20	ES 15			
3.50	D 16			
3.50 - 3.90	SPTS	50 (9,9/11,13,13,13 for 20mm)		

Strata Description

Main	Detail	Depth, Level (Thickness)	Legend	Backfill
MACADAM		0.10 (0.10) +2.10		
(MADE GROUND) Dark brown to black sandy GRAVEL. Sand is medium to coarse, gravel is angular to subrounded fine to coarse of macadam and brick.		0.30 (0.20) +1.90		
(MADE GROUND) Brown sandy GRAVEL with frequent cobbles of brick. Gravel is angular to subangular fine to coarse of brick and flint.		0.70 (0.40) +1.50		
Orangeish brown clayey gravelly SAND. Gravel is angular to subangular of flint. (KEMPTON PARK GRAVEL FORMATION)		1.50 (0.80) +0.70		
Orangeish brown sandy GRAVEL. Gravel is angular to subangular of flint. (KEMPTON PARK GRAVEL FORMATION)		2.65 (1.15) -0.45		
Light orangeish brown fine to coarse SAND. (KEMPTON PARK GRAVEL FORMATION)		3.00 (0.35) -0.80		
Dense light orangeish brown gravelly SAND. Gravel is angular to subrounded fine to coarse of flint. (KEMPTON PARK GRAVEL FORMATION)		3.50 (0.50) -1.30		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks
1.20 - 2.00	No recovery
2.00 - 3.00	0.75m recovery
3.00 - 3.50	0.50m recovery

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project Plot 18 Aylesbury Estate, Southwark

Project No. D5501-15

Carried out for WSP Group PLC

Borehole

WS108

Borehole Log

Drilled	MJ	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	2.20 mOD
Logged	EP	19/10/2015	Hand tools					**Coordinates (m)**	E 532989.46
Checked	HD	**End**	Hand excavated inspection pit from GL to 0.75m.					**National Grid**	N 178234.91
Approved	DB	19/10/2015	Hole terminated at 0.75m (cause of obstruction unknown).						

Samples and Tests

Strata Description

Depth	Type & No	Records	Date / Time Casing / Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10	ES 1 D 2			(MADE GROUND) Strong grey CONCRETE. 60% aggregate of angular flint. 40% matrix. Steel Reinforcements 8mm diameter at 0.05m.	0.10 Plastic sheeting.	0.10 (0.10) +2.10		
				(MADE GROUND) Light brownish grey sandy GRAVEL. Gravel is angular to subangular, fine to coarse of concrete and brick. Sand is fine to coarse.		(0.65) 0.75 +1.45		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks	
Depths (m)	**Remarks**

Hard Boring		
Depths (m)	**Duration (mins)**	**Tools used**

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project	**Plot 18 Aylesbury Estate, Southwark**
Project No.	**D5501-15**
Carried out for	**WSP Group PLC**

Borehole

WS109

Sheet 1 of 1

Borehole Log

Drilled	MJ	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	2.32 mOD
Logged	EP	19/10/2015	Competitor Rig Hand excavated inspection pit from GL to 1.20m. Window sampling from 1.20m to 3.00m. Hole terminated at 3.00m due to possible very dense granular material.					**Coordinates (m)**	E 533023.54
Checked	HD	**End**						**National Grid**	N 178251.07
Approved	DB	19/10/2015							

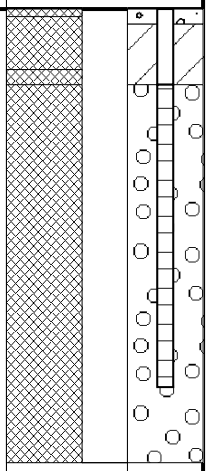
Samples and Tests

Depth	Type & No	Records	Date / Time Casing / Water
0.10	ES 1		
0.10	D 2		
0.50	ES 3		
0.50	D 4		
0.50	D 6		
1.00	ES 5		
1.20	D 7		
1.20 - 1.65	SPTS	N=14 (2,3/3,3,4,4)	
1.50	D 8		
1.50 - 2.00	B 9		
2.00	D 10		
2.00 - 2.45	SPTS	N=28 (2,7/10,8,6,4)	
2.50	D 11		
3.00	D 12		
3.00 - 3.31	SPTS	50 (3,2/12,13,25 for 10mm)	

Strata Description

Main	Detail	Depth, Level (Thickness)
(MADE GROUND) CONCRETE paving slab.		0.05 (0.05) +2.27
(MADE GROUND) Orangish brown and black slightly gravelly SAND. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of macadam.		(0.35) 0.40 +1.92 0.50 (0.10) +1.82
(MADE GROUND) Grey CONCRETE comprising 20% aggregate of angular fine to coarse flint and 80% matrix.		
(MADE GROUND) Dense and very dense brown gravelly SAND with low cobble content. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse of brick and flint. Cobbles are angular of brick.		(2.50) 3.00 -0.68

Legend



Backfill

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

Project Plot 18 Aylesbury Estate, Southwark

Project No. D5501-15

Carried out for WSP Group PLC

Borehole

WS110

Sheet 1 of 1

Appendix G

GROUNDWATER MONITORING

Groundwater Monitoring

Location	Instrument reference	Instrument Type	Base of Instrument	Date Time (hhmm)	Depth to groundwater (mbgl)	Comments
BH101	1	SP	10.00	29/10/2015 11:11	4.02	
BH101	1	SP	10.00	06/11/2015 11:26	4.06	
BH101	1	SP	10.00	13/11/2015 14:16	4.08	
BH101	1	SP	10.00	16/11/2015 14:56	4.05	
WS101	1	SP	3.00	29/10/2015 10:51	Dry	
WS101	1	SP	3.00	06/11/2015 11:56	Dry	
WS101	1	SP	3.00	13/11/2015 13:56	Dry	
WS101	1	SP	3.00	16/11/2015 14:36	Dry	
WS110	1	SP	2.50	29/10/2015 10:36	Dry	
WS110	1	SP	2.50	06/11/2015 11:41	Dry	
WS110	1	SP	2.50	13/11/2015 13:36	Dry	
WS110	1	SP	2.50	16/11/2015 14:16	Dry	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer, HPIE - Hydraulic Piezometer, PPIE - Pneumatic Piezometer, EPIE - Vibrating Wire Piezometer, PWEL - Pumping Well

Appendix H

LABORATORY ANALYSIS

Our Ref: EFS/157295 (Ver. 2)
Your Ref: D5501-15

November 19, 2015

Environmental Chemistry
ESG
Bretby Business Park
Ashby Road
Burton-on-Trent
Staffordshire
DE15 0YZ

Telephone: 01283 554400
Facsimile: 01283 554422

Ms H Dwane
ESG Wokingham
Glossop House
Hogwood Lane
Finchamstead
Wokingham
Berkshire
RG40 4QW

For the attention of Ms H Dwane

Dear Ms Dwane

Sample Analysis - Aylesbury Estate Plot 18

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Where appropriate the samples will be kept until 07/12/15 when they will be discarded. Please call 01283 554467 for an extension of this date.
Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with Environmental Scientifics Group Ltd (Multi-Sector Services) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for ESG

L Thompson
Project Co-ordinator
01283 554467

TEST REPORT

1252

Report No. EFS/157295 (Ver. 2)

ESG Wokingham
Glossop House
Hogwood Lane
Finchamstead
Wokingham
Berkshire
RG40 4QW

Site: Aylesbury Estate Plot 18

The 17 samples described in this report were registered for analysis by ESG on 26-Oct-2015. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 19-Nov-2015

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 4)
Table of PAH (MS-SIM) (80) Results (Pages 5 to 21)
Table of PCB Congener Results (Page 22)
Table of GRO Results (Page 23)
Table of TPH (Si) banding (std) (Pages 24 to 25)
GC-FID Chromatograms (Pages 26 to 55)
Table of VOC (HSA) Results (Pages 56 to 68)
Table of WAC Analysis Results (Pages 69 to 72)
Table of Asbestos Results (Pages 73 to 74)
Analytical and Deviating Sample Overview (Pages 75 to 78)
Table of Additional Report Notes (Page 79)
Table of Method Descriptions (Pages 80 to 81)
Table of Report Notes (Page 82)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
ESG :
Declan Burns

Managing Director
Multi-Sector Services

Date of Issue: 19-Nov-2015

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected. ESG accepts no responsibility for any sampling not carried out by our personnel.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l	mg/kg	%		%	mg/kg
Method Codes :			GROHSA	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPWSS	SFAPI	Sub002	Sub002a	TMSS	TPHFIDUS
Method Reporting Limits :			0.2	0.3	0.1	0.5	0.5	0.5	0.1	0.5	0.5	3	10	0.5			0.2	10
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**GRO (AA) by HSA GC-FID**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**	**Selenium (MS)**	**Zinc (MS)**	**SO4-- (H2O sol) mg/l**	**Cyanide(Free) (AR)**	**^Asbestos ID and Quantification**	**^Asbestos Screen**	**Tot.Moisture @ 105C**	**TPH Band (>C10-C40)**
1567230	WS101 ES 1 0.1	20-Oct-15	Req	20.9	0.22	22.6	121	934	2.84	27.4	0.8	80.4	1230	<0.5	NADIS	CH AM		
1567231	WS101 ES 14 2.6	20-Oct-15	Req	15.6	0.11	18.7	9.2	43.6	0.12	17.5	<0.5	24.1	81	<0.5				
1567232	WS102 ES 1 0.2	20-Oct-15	Req	16.1	0.6	21.7	55	297.8	0.67	19.5	<0.5	108.9	31	<0.5	NADIS	CH		
1567233	WS103A ES 1 0.1	20-Oct-15															9.9	188
1567234	WS103A ES 3 0.5	20-Oct-15	Req	17.9	0.23	19.6	73.5	399.4	0.98	19.3	<0.5	90.3	223	<0.5		NAIIS		
1567235	WS103A ES 11 2.3	20-Oct-15	Req	12.7	<0.1	17	7.6	21.9	<0.1	14.6	<0.5	22.4	47	<0.5				
1567236	WS104 ES 1 0.2	20-Oct-15															10.8	39
1567237	WS104 ES 3 0.7	20-Oct-15	Req	17.6	0.4	25.1	36.4	420.1	0.48	21.5	<0.5	227.3	174	<0.5	< 0.001	CH CR		
1567238	WS105 ES 1 0.5	21-Oct-15	Req	10.6	0.3	23.6	35.5	120.8	0.26	18.8	<0.5	118.7	200	<0.5	0.004	AM		
1567239	WS106 ES 1 0.5	20-Oct-15	Req	16.8	0.39	24	36	243	0.59	19.6	<0.5	148.2	133	<0.5	NADIS	AM		
1567240	WS107 ES 1 0.4	21-Oct-15															16.8	17
1567241	WS107 ES 3 0.8	21-Oct-15	Req	14.4	0.25	26.1	11.9	52.7	<0.1	19.2	<0.5	52.8	102	<0.5		NAIIS		
1567242	WS108 ES 3 0.4	19-Oct-15	Req	16.8	0.27	24.6	30	127.7	0.17	22.6	<0.5	94.2	122	<0.5		NAIIS		
1567243	WS108 ES 5 0.8	19-Oct-15	Req	11.6	0.16	21.9	10.2	20.8	<0.1	20.7	<0.5	32.2	309	<0.5				
1567244	WS108 ES 8 1.5	19-Oct-15															5.4	<10
1567245	WS109 ES 1 0.1		Req	11	0.21	29.8	21.1	167.7	0.37	22.5	<0.5	97.6	86	<0.5	< 0.001	CH		
1567246	WS110 ES 3 0.5	19-Oct-15	Req	17.2	0.19	24.2	28.9	217	0.63	19.7	<0.5	70.6	<10	<0.5		NAIIS		

ESG

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Client Name ESG Wokingham

Contact Ms H Dwane

Aylesbury Estate Plot 18

Sample Analysis

Date Printed	**19-Nov-2015**
Report Number	**EFS/157295**
Table Number	**1**

Units :			mg/kg	mg/kg	µg/kg	% M/M	mg/kg	mg/kg	µg/kg	% M/M	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
Method Codes :			TPHFIDUS	TPHUSSI	VOCHSAS	FOCS	ICPMSS	KONECR	PCBUSECDAR	WSLM59	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	PAHMSUS
Method Reporting Limits :			10	20		0.04	0.6	0.1		0.04	10	10	10	30	20	20	10	
UKAS Accredited :			Yes	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**TPH by GCFID (AR)**	**TPH by GCFID (AR/Si)**	**VOC HSA-GCMS**	**S.O.M. % (Calc)**	**Vanadium (MS)**	**Chromium vi:**	**PCB-7 Congeners Analysis**	**Total Organic Carbon**	**Benzene**	**Toluene**	**Ethyl Benzene**	**Xylenes**	**MTBE**	**m/p Xylenes**	**o Xylene**	**PAH (16) by GCMS**
1567230	WS101 ES 1 0.1	20-Oct-15		Req	Req	10.7	54.9	<0.1		6.2								Req
1567231	WS101 ES 14 2.6	20-Oct-15		Req	Req	0.36	34.2	<0.1		0.21								Req
1567232	WS102 ES 1 0.2	20-Oct-15		Req	Req	2.45	35.8	<0.1		1.42								Req
1567233	WS103A ES 1 0.1	20-Oct-15	190						Req	2.77	<10	<10	<10	<30	<20	<20	<10	
1567234	WS103A ES 3 0.5	20-Oct-15		Req	Req	2.95	34.3	<0.1		1.71								Req
1567235	WS103A ES 11 2.3	20-Oct-15		Req	Req	0.19	30.3	<0.1		0.11								Req
1567236	WS104 ES 1 0.2	20-Oct-15	40						Req	1.20	<10	11	<10	<30	<20	<20	<10	
1567237	WS104 ES 3 0.7	20-Oct-15		Req	Req	2.40	38.1	<0.1		1.39								Req
1567238	WS105 ES 1 0.5	21-Oct-15		Req	Req	2.03	32.3	<0.1		1.18								Req
1567239	WS106 ES 1 0.5	20-Oct-15		Req	Req	3.84	38.6	<0.1		2.23								Req
1567240	WS107 ES 1 0.4	21-Oct-15	18						Req	1.15	<10	<10	<10	<30	<20	<20	<10	
1567241	WS107 ES 3 0.8	21-Oct-15		Req	Req	0.66	40.7	<0.1		0.38								Req
1567242	WS108 ES 3 0.4	19-Oct-15		Req	Req	1.88	42.2	<0.1		1.09								Req
1567243	WS108 ES 5 0.8	19-Oct-15		Req	Req	0.47	34.6	<0.1		0.27								Req
1567244	WS108 ES 8 1.5	19-Oct-15	<10						Req	0.12	<10	<10	<10	<30	<20	<20	<10	
1567245	WS109 ES 1 0.1			Req	Req	1.10	25.4	0.3		0.64								Req
1567246	WS110 ES 3 0.5	19-Oct-15		Req	Req	1.71	35.8	0.1		0.99								Req

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Client Name **ESG Wokingham**

Contact Ms H Dwane

Aylesbury Estate Plot 18

Sample Analysis

Date Printed	**19-Nov-2015**
Report Number	**EFS/157295**
Table Number	**1**

Where individual results are flagged see report notes for status.

		Units :	mg/kg															
		Method Codes :	PAHMSUS															
		Method Reporting Limits :																
		UKAS Accredited :	Yes															
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**PAH (17) by GCMS**															
1567230	WS101 ES 1 0.1	**20-Oct-15**																
1567231	WS101 ES 14 2.6	**20-Oct-15**																
1567232	WS102 ES 1 0.2	**20-Oct-15**																
1567233	WS103A ES 1 0.1	**20-Oct-15**	Req															
1567234	WS103A ES 3 0.5	**20-Oct-15**																
1567235	WS103A ES 11 2.3	**20-Oct-15**																
1567236	WS104 ES 1 0.2	**20-Oct-15**	Req															
1567237	WS104 ES 3 0.7	**20-Oct-15**																
1567238	WS105 ES 1 0.5	**21-Oct-15**																
1567239	WS106 ES 1 0.5	**20-Oct-15**																
1567240	WS107 ES 1 0.4	**21-Oct-15**	Req															
1567241	WS107 ES 3 0.8	**21-Oct-15**																
1567242	WS108 ES 3 0.4	**19-Oct-15**																
1567243	WS108 ES 5 0.8	**19-Oct-15**																
1567244	WS108 ES 8 1.5	**19-Oct-15**	Req															
1567245	WS109 ES 1 0.1																	
1567246	WS110 ES 3 0.5	**19-Oct-15**																

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Client Name	**ESG Wokingham**
Contact	Ms H Dwane

Aylesbury Estate Plot 18

Sample Analysis

Date Printed	**19-Nov-2015**
Report Number	**EFS/157295**
Table Number	**1**

Where individual results are flagged see report notes for status.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS101 ES 1 0.1	**Job Number:**	S15_7295
LIMS ID Number:	CL1567230	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	5.63	0.23	96
Anthracene	120-12-7	-	< 0.08	-
Fluoranthene	206-44-0	6.97	0.24	91
Pyrene	129-00-0	7.26	0.20	92
Benzo[a]anthracene	56-55-3	8.95	0.19	91
Chrysene	218-01-9	9.00	0.19	95
Benzo[b]fluoranthene	205-99-2	10.49	0.25	72
Benzo[k]fluoranthene	207-08-9	10.52	0.08	73
Benzo[a]pyrene	50-32-8	10.91	0.16	95
Indeno[1,2,3-cd]pyrene	193-39-5	12.30	0.13	63
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	12.60	0.12	75
Total (USEPA16) PAHs	-	-	< 2.27	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	120
Acenaphthene-d10	126
Phenanthrene-d10	130
Chrysene-d12	141
Perylene-d12	144

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	83
Terphenyl-d14	70

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS101 ES 14 2.6	**Job Number:**	S15_7295
LIMS ID Number:	CL1567231	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	-	< 0.08	-
Anthracene	120-12-7	-	< 0.08	-
Fluoranthene	206-44-0	-	< 0.08	-
Pyrene	129-00-0	-	< 0.08	-
Benzo[a]anthracene	56-55-3	-	< 0.08	-
Chrysene	218-01-9	-	< 0.08	-
Benzo[b]fluoranthene	205-99-2	-	< 0.08	-
Benzo[k]fluoranthene	207-08-9	-	< 0.08	-
Benzo[a]pyrene	50-32-8	-	< 0.08	-
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.08	-
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	-	< 0.08	-
Total (USEPA16) PAHs	-	-	< 1.28	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	118
Acenaphthene-d10	122
Phenanthrene-d10	125
Chrysene-d12	139
Perylene-d12	145

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	78
Terphenyl-d14	67

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS102 ES 1 0.2	**Job Number:**	S15_7295
LIMS ID Number:	CL1567232	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	-	< 0.08	-
Anthracene	120-12-7	-	< 0.08	-
Fluoranthene	206-44-0	6.97	0.18	91
Pyrene	129-00-0	7.26	0.16	93
Benzo[a]anthracene	56-55-3	8.95	0.14	84
Chrysene	218-01-9	8.99	0.13	61
Benzo[b]fluoranthene	205-99-2	10.48	0.20	74
Benzo[k]fluoranthene	207-08-9	-	< 0.08	-
Benzo[a]pyrene	50-32-8	10.91	0.14	91
Indeno[1,2,3-cd]pyrene	193-39-5	12.30	0.13	79
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	12.60	0.12	92
Total (USEPA16) PAHs	-	-	< 1.84	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	118
Acenaphthene-d10	125
Phenanthrene-d10	129
Chrysene-d12	142
Perylene-d12	151

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	87
Terphenyl-d14	75

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS103A ES 1 0.1	**Job Number:**	S15_7295
LIMS ID Number:	CL1567233	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	4.30	0.08	97
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	5.63	0.94	99
Anthracene	120-12-7	5.68	0.23	91
Fluoranthene	206-44-0	6.97	1.38	92
Pyrene	129-00-0	7.25	1.08	92
Benzo[a]anthracene	56-55-3	8.94	0.69	90
Chrysene	218-01-9	8.99	0.66	94
Benzo[b]fluoranthene	205-99-2	10.49	0.83	98
Benzo[k]fluoranthene	207-08-9	10.50	0.40	98
Benzo[a]pyrene	50-32-8	10.91	0.61	94
Indeno[1,2,3-cd]pyrene	193-39-5	12.30	0.46	92
Dibenzo[a,h]anthracene	53-70-3	12.32	0.09	89
Benzo[g,h,i]perylene	191-24-2	12.60	0.42	94
Coronene	191-07-1 *	14.75	0.13	M
Total (USEPA16) PAHs	-	-	< 8.11	-

* Denotes compound is not UKAS accredited

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	118
Acenaphthene-d10	124
Phenanthrene-d10	129
Chrysene-d12	144
Perylene-d12	150

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	81
Terphenyl-d14	70

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS103A ES 3 0.5	**Job Number:**	S15_7295
LIMS ID Number:	CL1567234	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	4.30	0.11	94
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	5.63	0.32	97
Anthracene	120-12-7	5.68	0.15	96
Fluoranthene	206-44-0	6.97	1.10	92
Pyrene	129-00-0	7.26	0.99	92
Benzo[a]anthracene	56-55-3	8.94	0.86	93
Chrysene	218-01-9	8.99	0.83	94
Benzo[b]fluoranthene	205-99-2	10.48	1.23	94
Benzo[k]fluoranthene	207-08-9	10.52	0.42	95
Benzo[a]pyrene	50-32-8	10.91	0.88	95
Indeno[1,2,3-cd]pyrene	193-39-5	12.30	0.73	96
Dibenzo[a,h]anthracene	53-70-3	12.32	0.15	85
Benzo[g,h,i]perylene	191-24-2	12.60	0.62	92
Total (USEPA16) PAHs	-	-	< 8.63	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	115
Acenaphthene-d10	121
Phenanthrene-d10	123
Chrysene-d12	134
Perylene-d12	142

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	88
Terphenyl-d14	74

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS103A ES 11 2.3	**Job Number:**	S15_7295
LIMS ID Number:	CL1567235	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	-	< 0.08	-
Anthracene	120-12-7	-	< 0.08	-
Fluoranthene	206-44-0	-	< 0.08	-
Pyrene	129-00-0	-	< 0.08	-
Benzo[a]anthracene	56-55-3	-	< 0.08	-
Chrysene	218-01-9	-	< 0.08	-
Benzo[b]fluoranthene	205-99-2	-	< 0.08	-
Benzo[k]fluoranthene	207-08-9	-	< 0.08	-
Benzo[a]pyrene	50-32-8	-	< 0.08	-
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.08	-
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	-	< 0.08	-
Total (USEPA16) PAHs	-	-	< 1.28	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	111
Acenaphthene-d10	116
Phenanthrene-d10	119
Chrysene-d12	136
Perylene-d12	144

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	92
Terphenyl-d14	80

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS104 ES 1 0.2	**Job Number:**	S15_7295
LIMS ID Number:	CL1567236	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	5.63	0.10	97
Anthracene	120-12-7	-	< 0.08	-
Fluoranthene	206-44-0	6.97	0.30	92
Pyrene	129-00-0	7.26	0.24	93
Benzo[a]anthracene	56-55-3	8.94	0.16	92
Chrysene	218-01-9	8.99	0.17	95
Benzo[b]fluoranthene	205-99-2	10.48	0.20	79
Benzo[k]fluoranthene	207-08-9	10.50	0.10	80
Benzo[a]pyrene	50-32-8	10.91	0.14	89
Indeno[1,2,3-cd]pyrene	193-39-5	12.30	0.12	86
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	12.60	0.11	93
Coronene	191-07-1 *	-	< 0.08	-
Total (USEPA16) PAHs	-	-	< 2.12	-

* Denotes compound is not UKAS accredited

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	119
Acenaphthene-d10	123
Phenanthrene-d10	126
Chrysene-d12	133
Perylene-d12	143

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	89
Terphenyl-d14	76

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS104 ES 3 0.7	**Job Number:**	S15_7295
LIMS ID Number:	CL1567237	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	5.63	0.22	97
Anthracene	120-12-7	-	< 0.08	-
Fluoranthene	206-44-0	6.97	0.53	92
Pyrene	129-00-0	7.26	0.44	92
Benzo[a]anthracene	56-55-3	8.94	0.30	92
Chrysene	218-01-9	8.99	0.31	96
Benzo[b]fluoranthene	205-99-2	10.48	0.44	79
Benzo[k]fluoranthene	207-08-9	10.52	0.17	79
Benzo[a]pyrene	50-32-8	10.91	0.32	96
Indeno[1,2,3-cd]pyrene	193-39-5	12.30	0.28	100
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	12.59	0.26	93
Total (USEPA16) PAHs	-	-	< 3.75	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	119
Acenaphthene-d10	125
Phenanthrene-d10	128
Chrysene-d12	144
Perylene-d12	149

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	80
Terphenyl-d14	70

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS105 ES 1 0.5	**Job Number:**	S15_7295
LIMS ID Number:	CL1567238	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	4.30	0.12	96
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	5.63	1.01	98
Anthracene	120-12-7	5.68	0.33	89
Fluoranthene	206-44-0	6.97	2.26	92
Pyrene	129-00-0	7.26	1.87	93
Benzo[a]anthracene	56-55-3	8.94	1.02	93
Chrysene	218-01-9	8.99	0.94	95
Benzo[b]fluoranthene	205-99-2	10.48	1.29	95
Benzo[k]fluoranthene	207-08-9	10.51	0.50	95
Benzo[a]pyrene	50-32-8	10.91	0.95	94
Indeno[1,2,3-cd]pyrene	193-39-5	12.30	0.75	97
Dibenzo[a,h]anthracene	53-70-3	12.32	0.12	88
Benzo[g,h,i]perylene	191-24-2	12.60	0.63	93
Total (USEPA16) PAHs	-	-	< 12.03	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	116
Acenaphthene-d10	123
Phenanthrene-d10	124
Chrysene-d12	137
Perylene-d12	147

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	89
Terphenyl-d14	76

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS106 ES 1 0.5	**Job Number:**	S15_7295
LIMS ID Number:	CL1567239	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	4.30	0.08	96
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	5.63	0.42	97
Anthracene	120-12-7	5.68	0.13	93
Fluoranthene	206-44-0	6.97	1.01	92
Pyrene	129-00-0	7.26	0.87	92
Benzo[a]anthracene	56-55-3	8.94	0.56	91
Chrysene	218-01-9	8.99	0.54	95
Benzo[b]fluoranthene	205-99-2	10.48	0.73	93
Benzo[k]fluoranthene	207-08-9	10.52	0.26	93
Benzo[a]pyrene	50-32-8	10.91	0.52	96
Indeno[1,2,3-cd]pyrene	193-39-5	12.29	0.45	93
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	12.59	0.39	94
Total (USEPA16) PAHs	-	-	< 6.28	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	116
Acenaphthene-d10	119
Phenanthrene-d10	123
Chrysene-d12	139
Perylene-d12	146

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	83
Terphenyl-d14	71

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS107 ES 1 0.4	**Job Number:**	S15_7295
LIMS ID Number:	CL1567240	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	5.63	0.74	98
Anthracene	120-12-7	5.68	0.19	89
Fluoranthene	206-44-0	6.97	1.08	92
Pyrene	129-00-0	7.26	0.70	93
Benzo[a]anthracene	56-55-3	8.94	0.41	95
Chrysene	218-01-9	8.99	0.39	92
Benzo[b]fluoranthene	205-99-2	10.48	0.45	92
Benzo[k]fluoranthene	207-08-9	10.52	0.18	92
Benzo[a]pyrene	50-32-8	10.91	0.27	96
Indeno[1,2,3-cd]pyrene	193-39-5	12.30	0.21	83
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	12.60	0.18	95
Coronene	191-07-1 *	-	< 0.08	-
Total (USEPA16) PAHs	-	-	< 5.20	-

* Denotes compound is not UKAS accredited

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	112
Acenaphthene-d10	121
Phenanthrene-d10	121
Chrysene-d12	135
Perylene-d12	141

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	85
Terphenyl-d14	75

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS107 ES 3 0.8	**Job Number:**	S15_7295
LIMS ID Number:	CL1567241	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	-	< 0.08	-
Anthracene	120-12-7	-	< 0.08	-
Fluoranthene	206-44-0	-	< 0.08	-
Pyrene	129-00-0	-	< 0.08	-
Benzo[a]anthracene	56-55-3	-	< 0.08	-
Chrysene	218-01-9	-	< 0.08	-
Benzo[b]fluoranthene	205-99-2	-	< 0.08	-
Benzo[k]fluoranthene	207-08-9	-	< 0.08	-
Benzo[a]pyrene	50-32-8	-	< 0.08	-
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.08	-
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	-	< 0.08	-
Total (USEPA16) PAHs	-	-	< 1.28	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	112
Acenaphthene-d10	117
Phenanthrene-d10	119
Chrysene-d12	133
Perylene-d12	140

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	91
Terphenyl-d14	79

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS108 ES 3 0.4	**Job Number:**	S15_7295
LIMS ID Number:	CL1567242	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	4.30	0.14	96
Acenaphthene	83-32-9	4.42	0.14	95
Fluorene	86-73-7	4.80	0.15	96
Phenanthrene	85-01-8	5.63	4.51	99
Anthracene	120-12-7	5.68	1.27	91
Fluoranthene	206-44-0	6.97	9.98	92
Pyrene	129-00-0	7.26	6.91	93
Benzo[a]anthracene	56-55-3	8.94	4.19	94
Chrysene	218-01-9	8.99	4.02	98
Benzo[b]fluoranthene	205-99-2	10.48	5.46	99
Benzo[k]fluoranthene	207-08-9	10.52	1.65	99
Benzo[a]pyrene	50-32-8	10.91	3.32	96
Indeno[1,2,3-cd]pyrene	193-39-5	12.30	2.67	95
Dibenzo[a,h]anthracene	53-70-3	12.32	0.52	93
Benzo[g,h,i]perylene	191-24-2	12.59	2.14	93
Total (USEPA16) PAHs	-	-	< 47.15	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	116
Acenaphthene-d10	122
Phenanthrene-d10	126
Chrysene-d12	147
Perylene-d12	157

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	86
Terphenyl-d14	75

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS108 ES 5 0.8	**Job Number:**	S15_7295
LIMS ID Number:	CL1567243	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	-	< 0.08	-
Anthracene	120-12-7	-	< 0.08	-
Fluoranthene	206-44-0	-	< 0.08	-
Pyrene	129-00-0	-	< 0.08	-
Benzo[a]anthracene	56-55-3	-	< 0.08	-
Chrysene	218-01-9	-	< 0.08	-
Benzo[b]fluoranthene	205-99-2	-	< 0.08	-
Benzo[k]fluoranthene	207-08-9	-	< 0.08	-
Benzo[a]pyrene	50-32-8	-	< 0.08	-
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.08	-
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	-	< 0.08	-
Total (USEPA16) PAHs	-	-	< 1.28	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	119
Acenaphthene-d10	126
Phenanthrene-d10	128
Chrysene-d12	142
Perylene-d12	147

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	86
Terphenyl-d14	75

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS108 ES 8 1.5	**Job Number:**	S15_7295
LIMS ID Number:	CL1567244	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	-	< 0.08	-
Anthracene	120-12-7	-	< 0.08	-
Fluoranthene	206-44-0	-	< 0.08	-
Pyrene	129-00-0	-	< 0.08	-
Benzo[a]anthracene	56-55-3	-	< 0.08	-
Chrysene	218-01-9	-	< 0.08	-
Benzo[b]fluoranthene	205-99-2	-	< 0.08	-
Benzo[k]fluoranthene	207-08-9	-	< 0.08	-
Benzo[a]pyrene	50-32-8	-	< 0.08	-
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.08	-
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	-	< 0.08	-
Coronene	191-07-1 *	-	< 0.08	-
Total (USEPA16) PAHs	-	-	< 1.28	-

* Denotes compound is not UKAS accredited

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	116
Acenaphthene-d10	120
Phenanthrene-d10	118
Chrysene-d12	128
Perylene-d12	132

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	78
Terphenyl-d14	69

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS109 ES 1 0.1	**Job Number:**	S15_7295
LIMS ID Number:	CL1567245	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	-	< 0.08	-
Anthracene	120-12-7	-	< 0.08	-
Fluoranthene	206-44-0	-	< 0.08	-
Pyrene	129-00-0	-	< 0.08	-
Benzo[a]anthracene	56-55-3	-	< 0.08	-
Chrysene	218-01-9	-	< 0.08	-
Benzo[b]fluoranthene	205-99-2	-	< 0.08	-
Benzo[k]fluoranthene	207-08-9	-	< 0.08	-
Benzo[a]pyrene	50-32-8	-	< 0.08	-
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.08	-
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	-	< 0.08	-
Total (USEPA16) PAHs	-	-	< 1.28	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	117
Acenaphthene-d10	121
Phenanthrene-d10	120
Chrysene-d12	131
Perylene-d12	137

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	81
Terphenyl-d14	71

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	WS110 ES 3 0.5	**Job Number:**	S15_7295
LIMS ID Number:	CL1567246	**Date Booked in:**	26-Oct-15
QC Batch Number:	151104	**Date Extracted:**	29-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	-	< 0.08	-
Anthracene	120-12-7	-	< 0.08	-
Fluoranthene	206-44-0	6.97	0.22	92
Pyrene	129-00-0	7.26	0.19	94
Benzo[a]anthracene	56-55-3	8.94	0.16	94
Chrysene	218-01-9	8.99	0.16	95
Benzo[b]fluoranthene	205-99-2	10.48	0.24	74
Benzo[k]fluoranthene	207-08-9	10.51	0.09	74
Benzo[a]pyrene	50-32-8	10.91	0.16	94
Indeno[1,2,3-cd]pyrene	193-39-5	12.30	0.14	72
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	12.59	0.13	82
Total (USEPA16) PAHs	-	-	< 2.05	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	111
Acenaphthene-d10	118
Phenanthrene-d10	116
Chrysene-d12	124
Perylene-d12	128

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	74
Terphenyl-d14	65

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polychlorinated Biphenyls (congeners)

Customer and Site Details: ESG Wokingham: Aylesbury Estate Plot 18
Job Number: S15_7295
QC Batch Number: 151104
Directory: 1030PCB.GC8
Method: Ultrasonic

Matrix: SOIL
Date Booked in: 26-Oct-15
Date Extracted: 29-Oct-15
Date Analysed: 02-Nov-15

*** This sample data is not UKAS accredited.**

			Concentration, (µg/kg)						
	Sample ID	**Customer ID**	**PCB28**	**PCB52**	**PCB101**	**PCB118**	**PCB153**	**PCB138**	**PCB180**
*	CL1567233	WS103A ES 1 0.1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
*	CL1567236	WS104 ES 1 0.2	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
*	CL1567240	WS107 ES 1 0.4	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
*	CL1567244	WS108 ES 8 1.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

Where individual results are flagged see report notes for status.

Gasoline Range Organics
(BTEX and Aliphatic Carbon Ranges)

Customer and Site Details: ESG Wokingham : Aylesbury Estate Plot 18
Job Number: S15_7295
Directory: C:\CHEM32\1\DATA\1029HSA_GC12\102915 2015-10-29 11-01-59\020F2001.D
Method: Headspace GCFID

Matrix: Soil
Date Booked in: 26-Oct-15
Date extracted: 29-Oct-15
Date Analysed: 29-Oct-15, 17:22

*** Sample data with an asterisk are not UKAS accredited.**

		Concentration, (mg/kg) - as wet weight					Aliphatics				
Sample ID	**Client ID**	**Benzene**	**Toluene**	**Ethyl benzene**	**m/p-Xylene**	**o-Xylene**	**C5 - C6**	**>C6 - C7**	**>C7 - C8**	**>C8 - C10**	**Total GRO**
CL1567230	WS101 ES 1 0.1	<0.010	0.255	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	0.3
CL1567231	WS101 ES 14 2.6	<0.010	<0.010	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2
CL1567232	WS102 ES 1 0.2	<0.010	0.018	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2
CL1567234	WS103A ES 3 0.5	<0.010	0.028	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2
CL1567235	WS103A ES 11 2.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2
CL1567237	WS104 ES 3 0.7	<0.010	<0.010	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2
CL1567238	WS105 ES 1 0.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2
CL1567239	WS106 ES 1 0.5	<0.010	0.012	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2
CL1567241	WS107 ES 3 0.8	<0.010	<0.010	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2
CL1567242	WS108 ES 3 0.4	<0.010	0.028	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2
CL1567243	WS108 ES 5 0.8	<0.010	<0.010	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2
CL1567245	WS109 ES 1 0.1	<0.010	0.013	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2
CL1567246	WS110 ES 3 0.5	<0.010	0.020	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2

Where individual results are flagged see report notes for status.

ALIPHATIC / AROMATIC FRACTION BY GC/FID

Customer and Site Details: ESG Wokingham : Aylesbury Estate Plot 18
Job Number: S15_7295
QC Batch Number: 151127
Directory: D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\090BAC01.D
Method: Ultra Sonic

Separation: Silica gel
Eluents: Hexane, DCM

Matrix: Soil
Date Booked in 26-Oct-15
Date Extracted 03-Nov-15
Date Analysed: 05-Nov-15, 18:28:02

*** This sample data is not UKAS accredited.**

		Concentration, (mg/kg) - as wet weight											
		>C8 - C10		>C10 - C12		>C12 - C16		>C16 - C21		>C21 - C35		>C8 - C40	
Sample ID	**Client ID**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**
CL1567230	WS101 ES 1 0.1	<4	<4	<4	<4	8.66	<4	6.26	4.16	23.2	14.3	45.7	26.7
CL1567231	WS101 ES 14 2.6	<4	<4	<4	<4	<4	4.32	<4	<4	<8.76	<8.76	<20	<20
CL1567232	WS102 ES 1 0.2	<4	<4	<4	<4	<4	<4	<4	<4	<8.76	15.3	<20	29.2
CL1567234	WS103A ES 3 0.5	<4	<4	<4	<4	<4	4.35	<4	5.58	<8.76	37.3	<20	57.6
CL1567235	WS103A ES 11 2.3	<4	<4	<4	<4	<4	<4	<4	<4	<8.76	<8.76	<20	<20
CL1567237	WS104 ES 3 0.7	<4	<4	<4	<4	<4	<4	4.38	9.2	17	40.6	23.8	60.4
CL1567238	WS105 ES 1 0.5	<4	<4	<4	<4	<4	<4	<4	6.77	12.5	32.9	<20	55
CL1567239	WS106 ES 1 0.5	<4	<4	<4	<4	<4	4.21	5.23	9.6	21.2	43.7	30.1	68.9
CL1567241	WS107 ES 3 0.8	<4	<4	<4	<4	<4	<4	<4	<4	<8.76	<8.76	<20	<20
CL1567242	WS108 ES 3 0.4	<4	<4	<4	<4	<4	<4	7.51	36.6	15.7	102	26.3	154
CL1567243	WS108 ES 5 0.8	<4	<4	<4	<4	<4	<4	<4	<4	<8.76	<8.76	<20	<20
CL1567245	WS109 ES 1 0.1	<4	<4	<4	<4	<4	<4	4.47	<4	12.3	14.1	21	24.2
CL1567246	WS110 ES 3 0.5	<4	<4	<4	<4	<4	<4	<4	<4	<8.76	15.5	<20	27.4

Where individual results are flagged see report notes for status.

ALIPHATIC / AROMATIC FRACTION BY GC/FID

Customer and Site Details: ESG Wokingham : Aylesbury Estate Plot 18
Job Number: S15_7295
QC Batch Number: 151127
Directory:
Method: Ultra Sonic

Separation: Silica gel
Eluents: Hexane, DCM

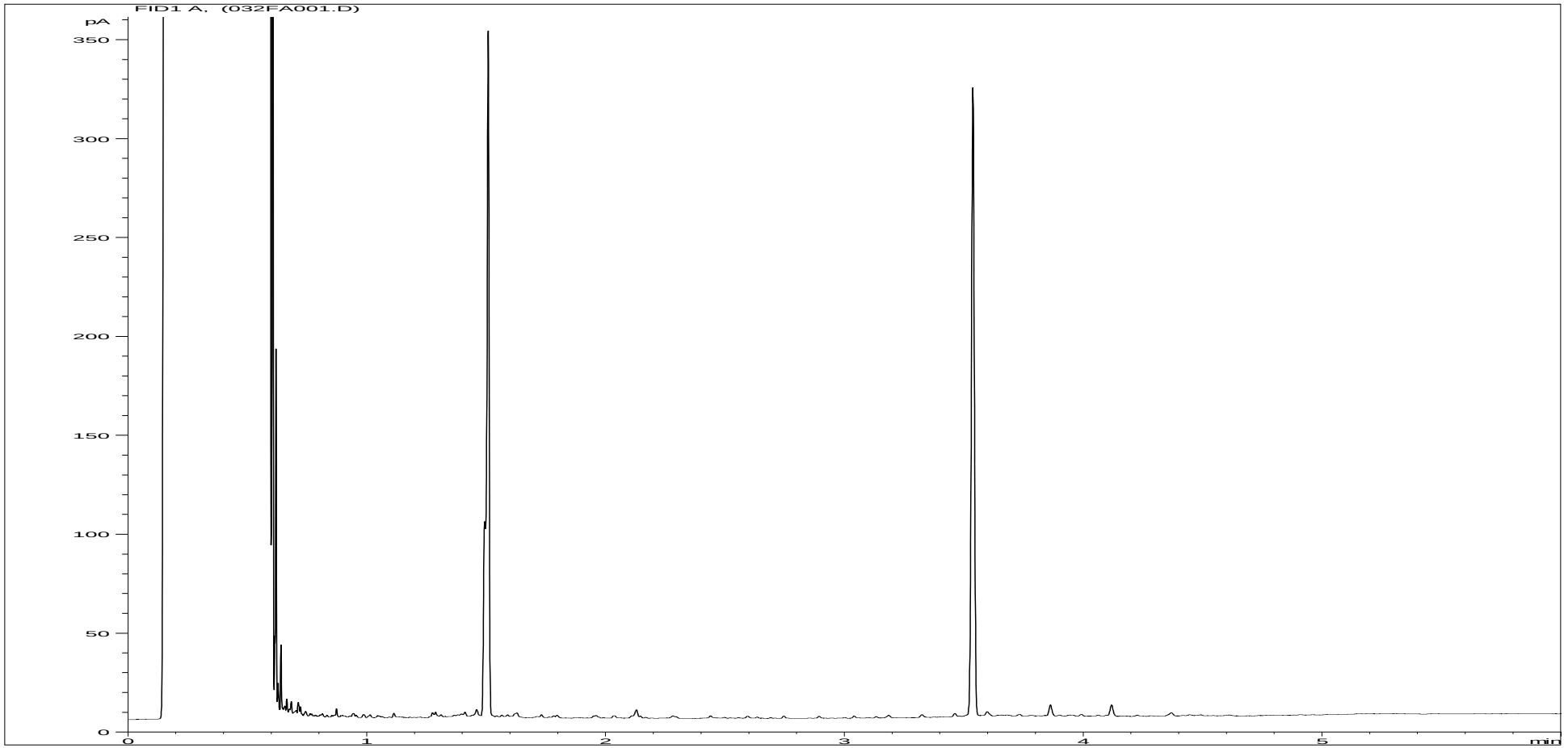
Matrix: Soil
Date Booked in 26-Oct-15
Date Extracted 03-Nov-15
Date Analysed:

*** This sample data is not UKAS accredited.**

		Concentration, (mg/kg) - as wet weight											
		>C8 - C10		>C10 - C12		>C12 - C16		>C16 - C21		>C21 - C35		>C8 - C40	
Sample ID	**Client ID**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**

Where individual results are flagged see report notes for status.

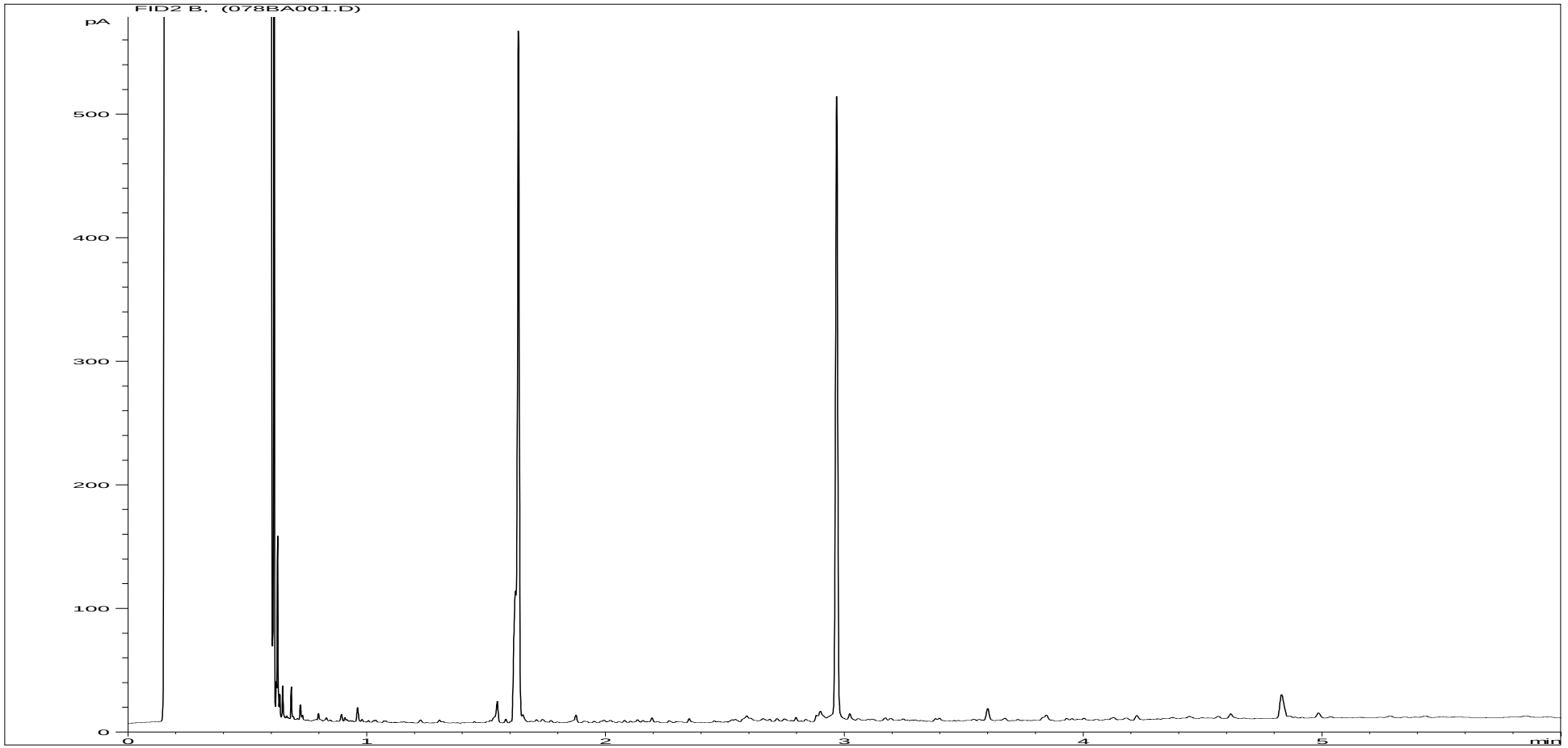
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567230ALI	**Job Number:**	S15_7295
Multiplier:	16	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS101 ES 1 0.1
Acquisition Date/Time:	05-Nov-15, 15:47:42		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\032FA001.D		

Where individual results are flagged see report notes for status.

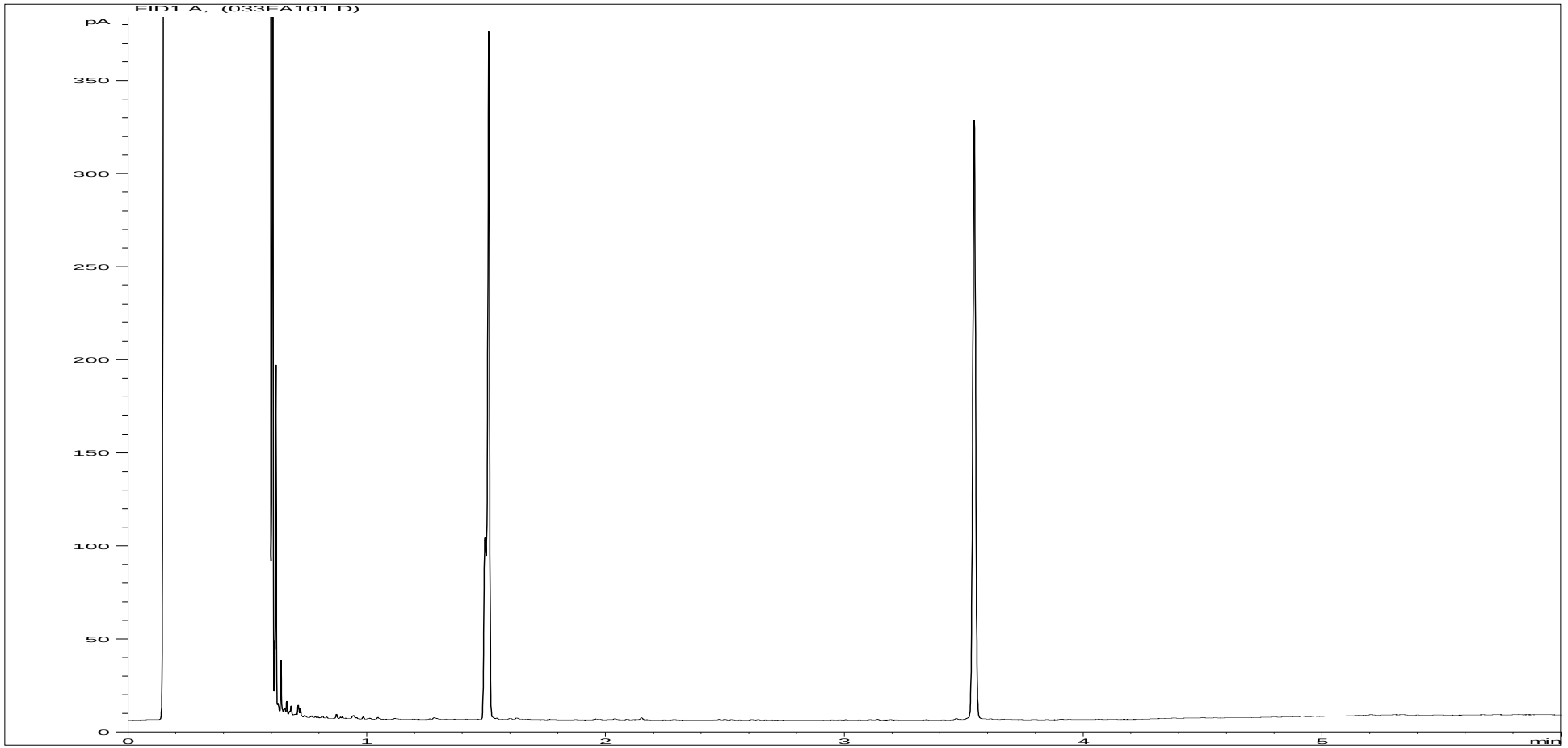
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567230ARO	**Job Number:**	S15_7295
Multiplier:	9.92	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS101 ES 1 0.1
Acquisition Date/Time:	05-Nov-15, 15:47:42		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\078BA001.D		

Where individual results are flagged see report notes for status.

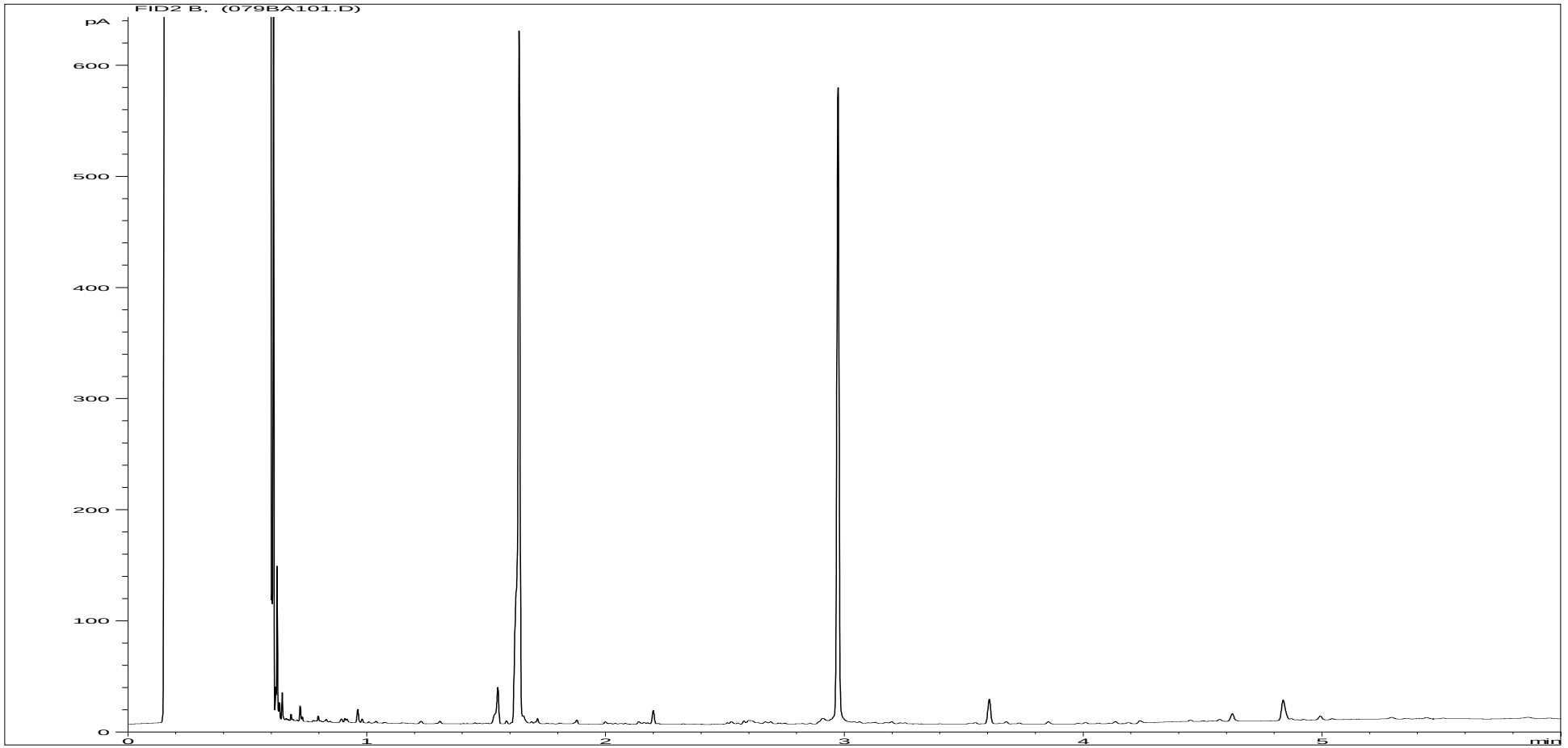
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567231ALI	**Job Number:**	S15_7295
Multiplier:	16	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS101 ES 14 2.6
Acquisition Date/Time:	05-Nov-15, 16:01:01		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\033FA101.D		

Where individual results are flagged see report notes for status.

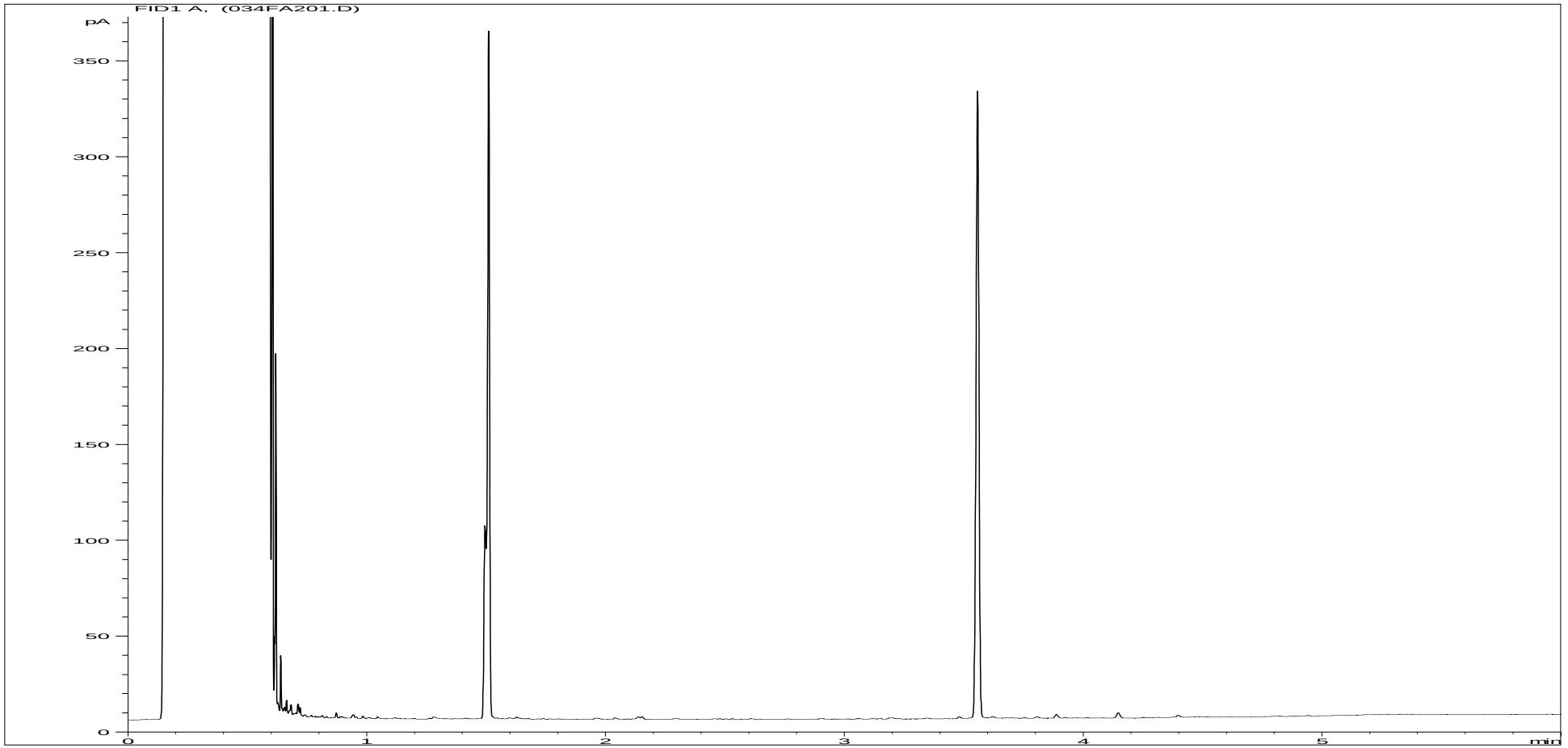
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567231ARO	**Job Number:**	S15_7295
Multiplier:	10.88	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS101 ES 14 2.6
Acquisition Date/Time:	05-Nov-15, 16:01:01		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\079BA101.D		

Where individual results are flagged see report notes for status.

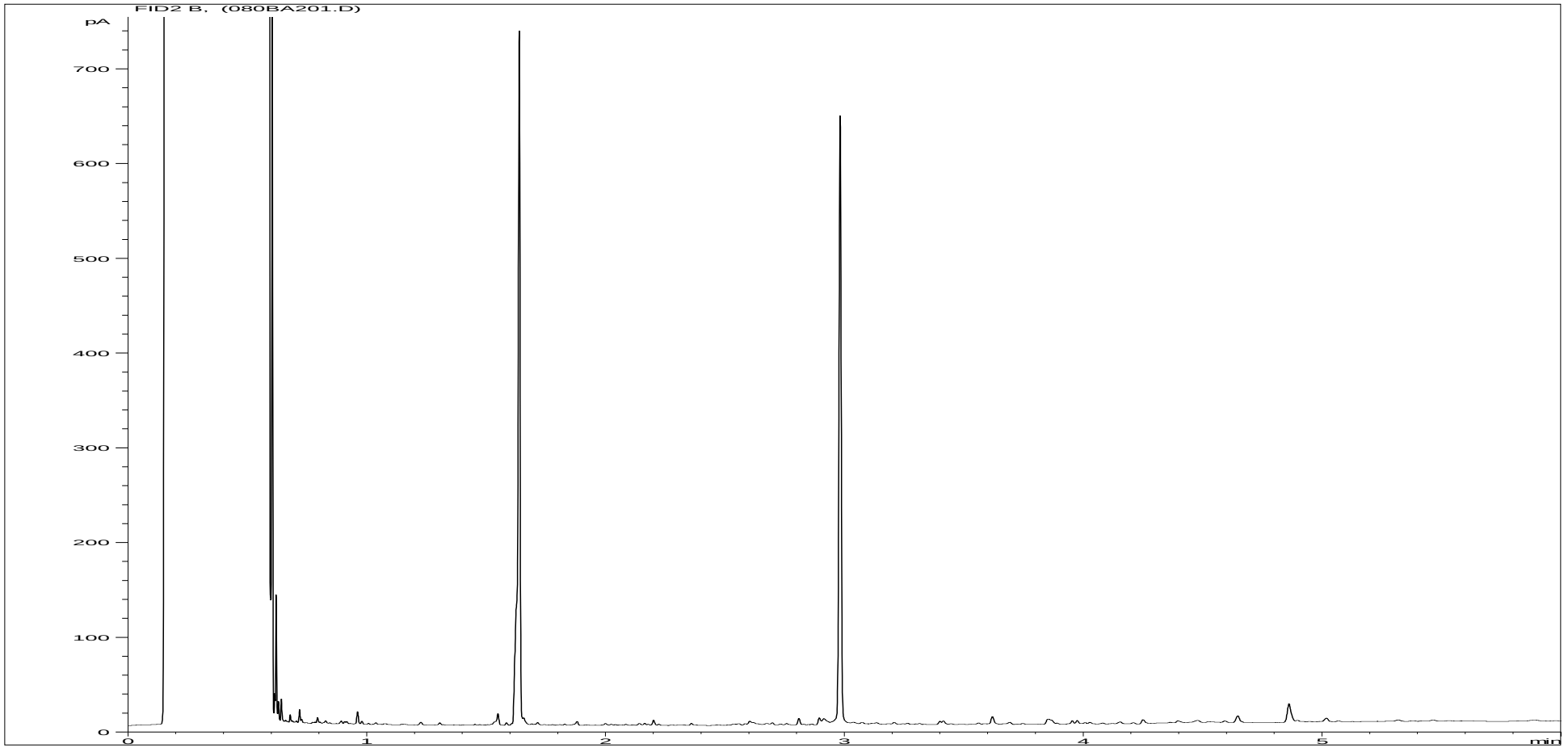
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567232ALI	**Job Number:**	S15_7295
Multiplier:	16	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS102 ES 1 0.2
Acquisition Date/Time:	05-Nov-15, 16:14:25		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\034FA201.D		

Where individual results are flagged see report notes for status.

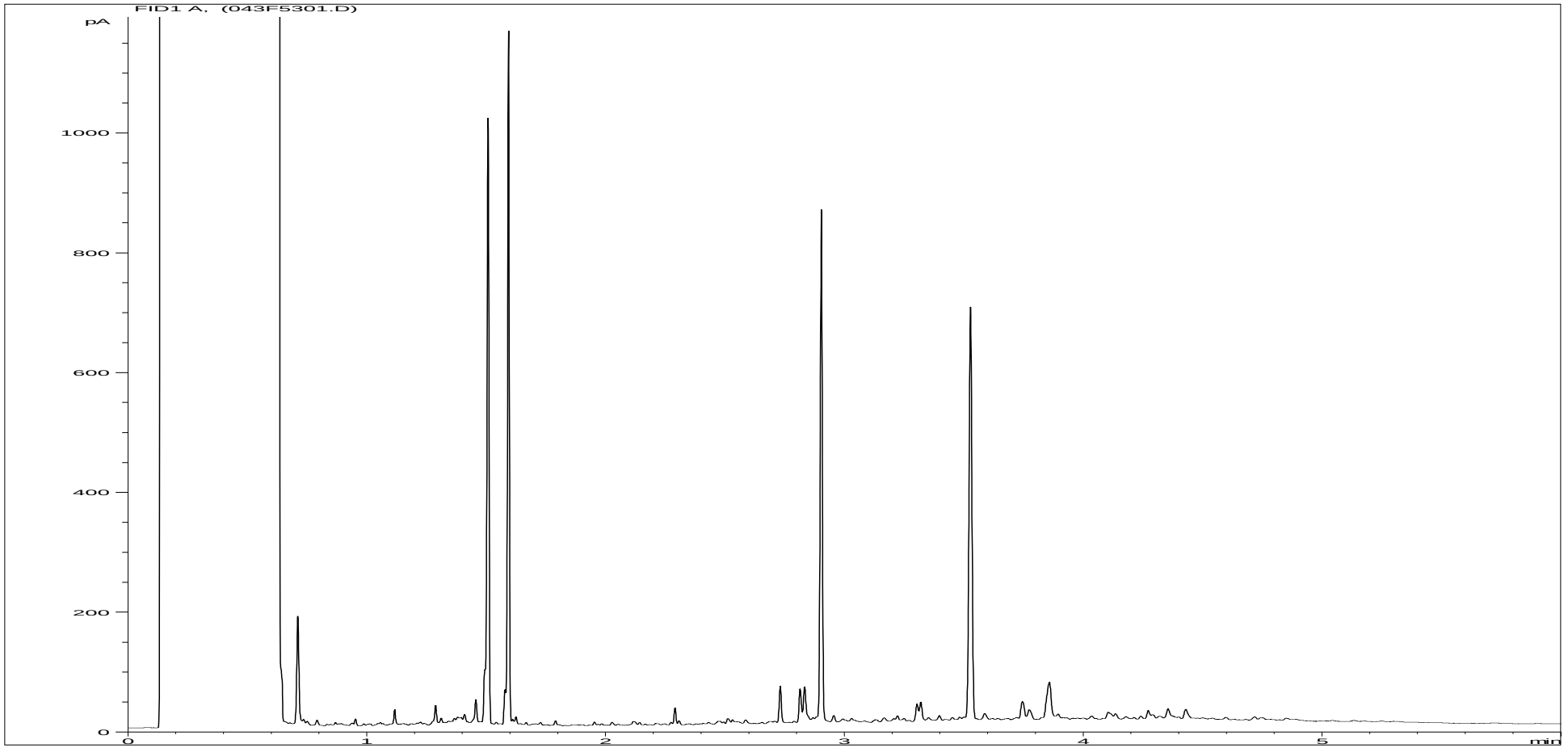
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567232ARO	**Job Number:**	S15_7295
Multiplier:	9.92	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS102 ES 1 0.2
Acquisition Date/Time:	05-Nov-15, 16:14:25		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\080BA201.D		

Where individual results are flagged see report notes for status.

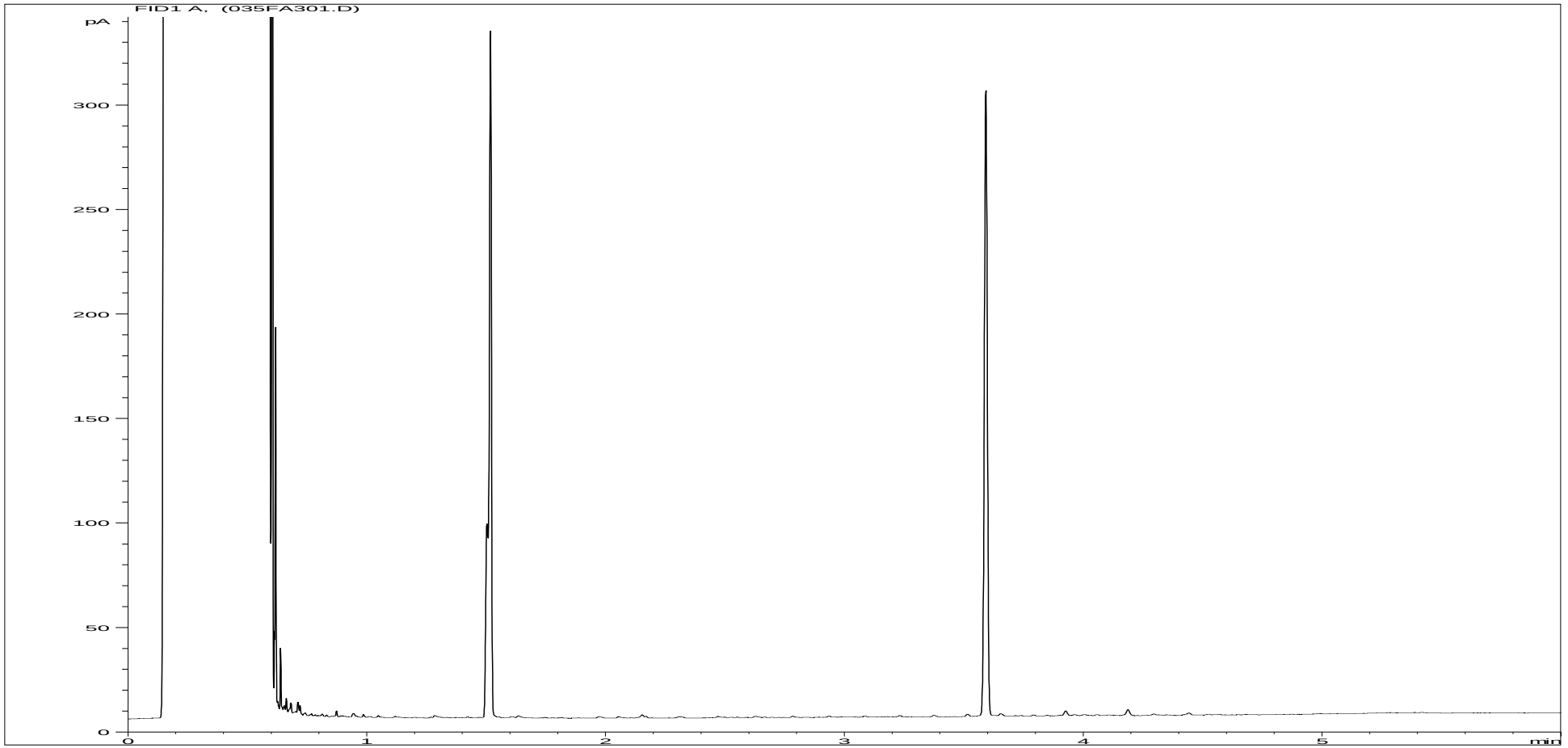
Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	CL1567233	**Job Number:**	S15_7295
Multiplier:	8	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS103A ES 1 0.1
Acquisition Date/Time:	02-Nov-15, 05:42:07		
Datafile:	D:\TES\DATA\Y2015\110115TPH_GC4\110115 2015-11-01 18-21-09\043F5301.D		

Where individual results are flagged see report notes for status.

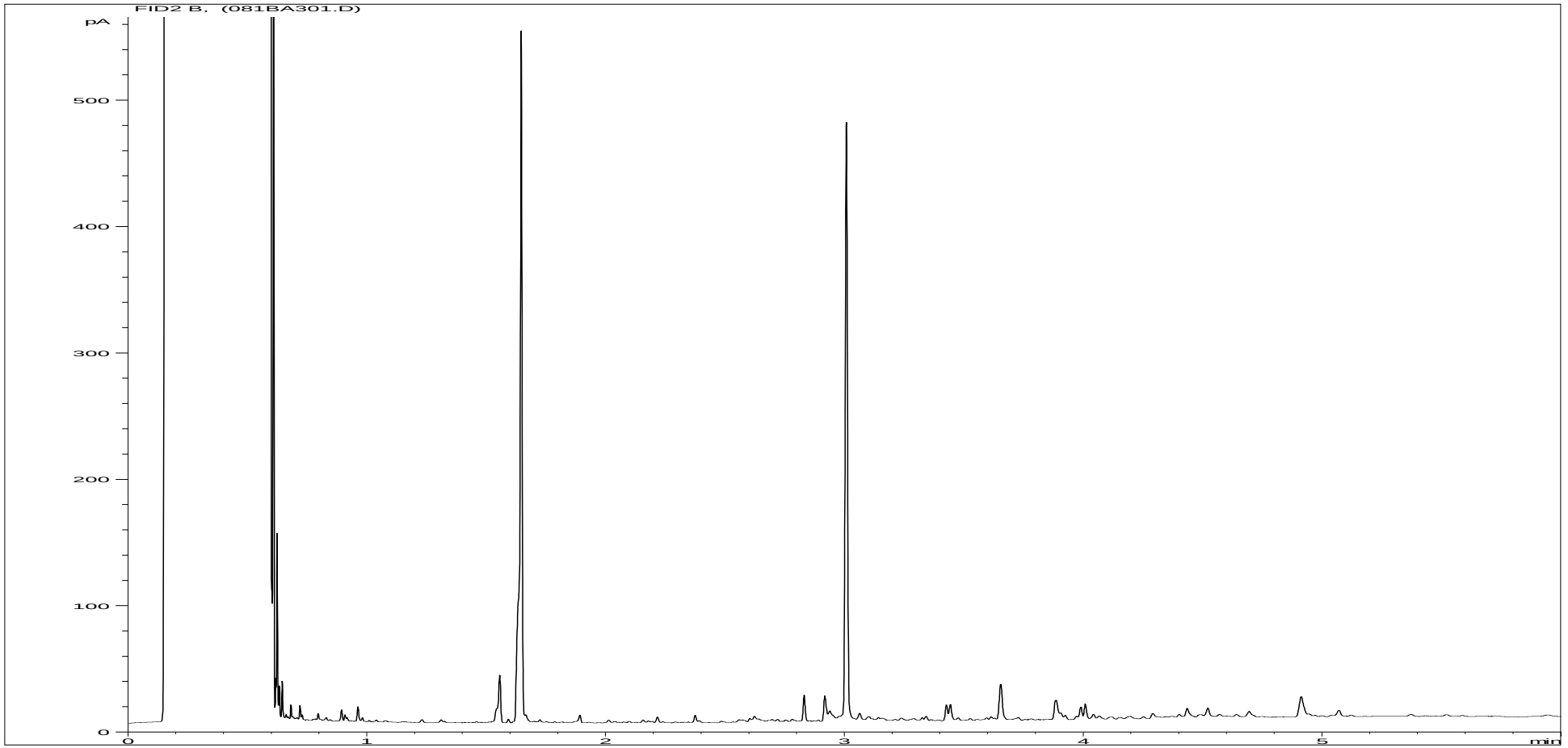
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567234ALI	**Job Number:**	S15_7295
Multiplier:	16	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS103A ES 3 0.5
Acquisition Date/Time:	05-Nov-15, 16:27:59		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\035FA301.D		

Where individual results are flagged see report notes for status.

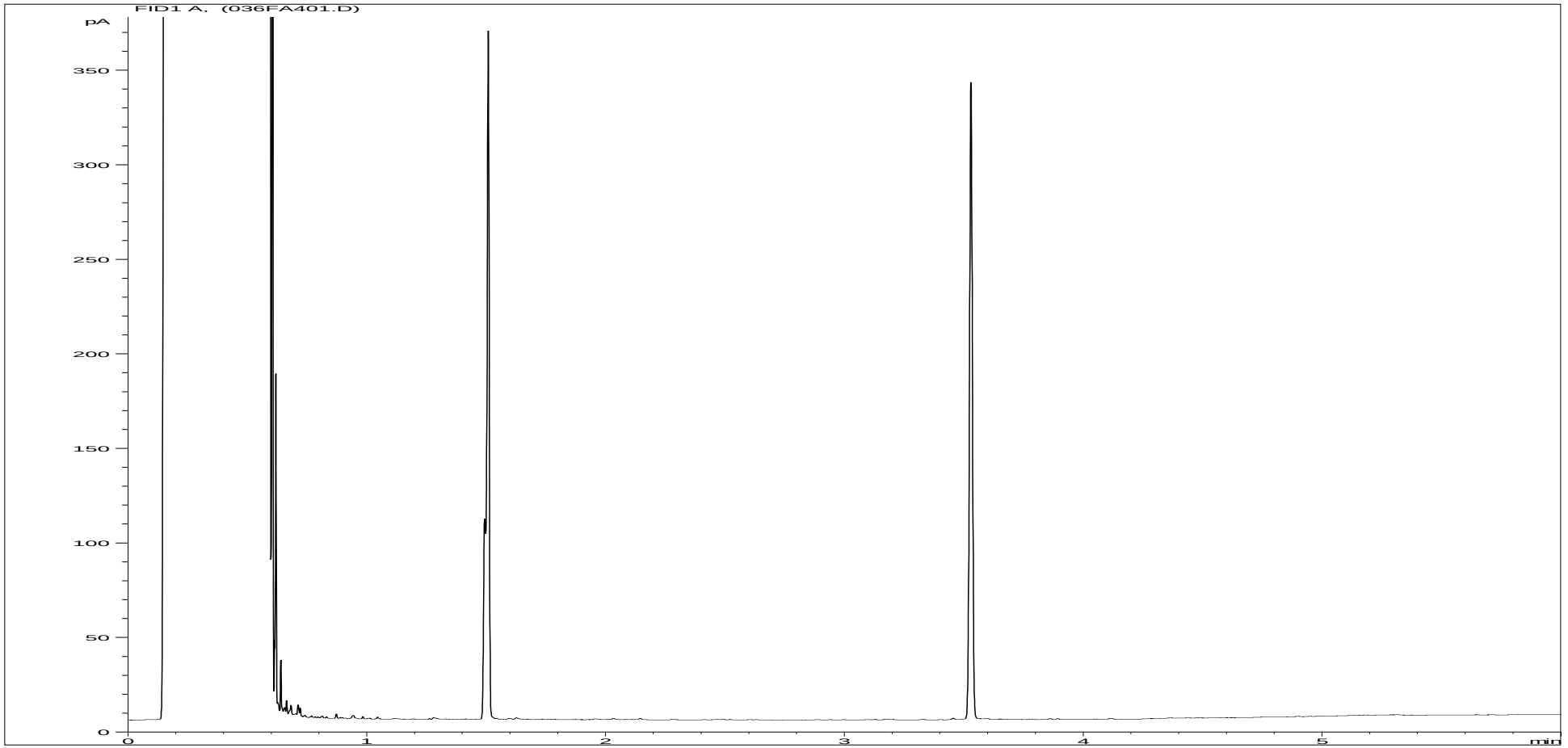
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567234ARO	**Job Number:**	S15_7295
Multiplier:	10.4	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS103A ES 3 0.5
Acquisition Date/Time:	05-Nov-15, 16:27:59		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\081BA301.D		

Where individual results are flagged see report notes for status.

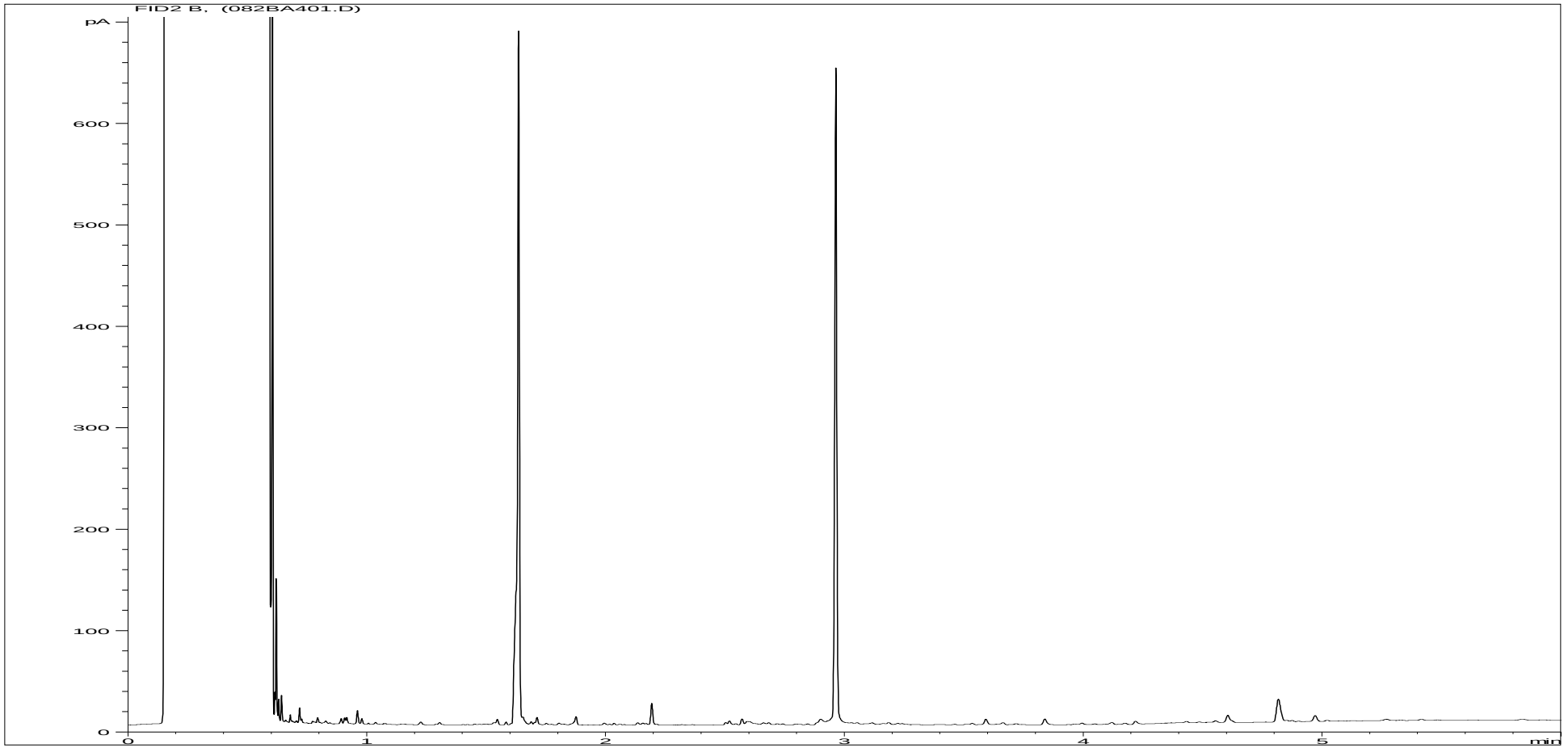
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567235ALI	**Job Number:**	S15_7295
Multiplier:	16	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS103A ES 11 2.3
Acquisition Date/Time:	05-Nov-15, 16:41:17		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\036FA401.D		

Where individual results are flagged see report notes for status.

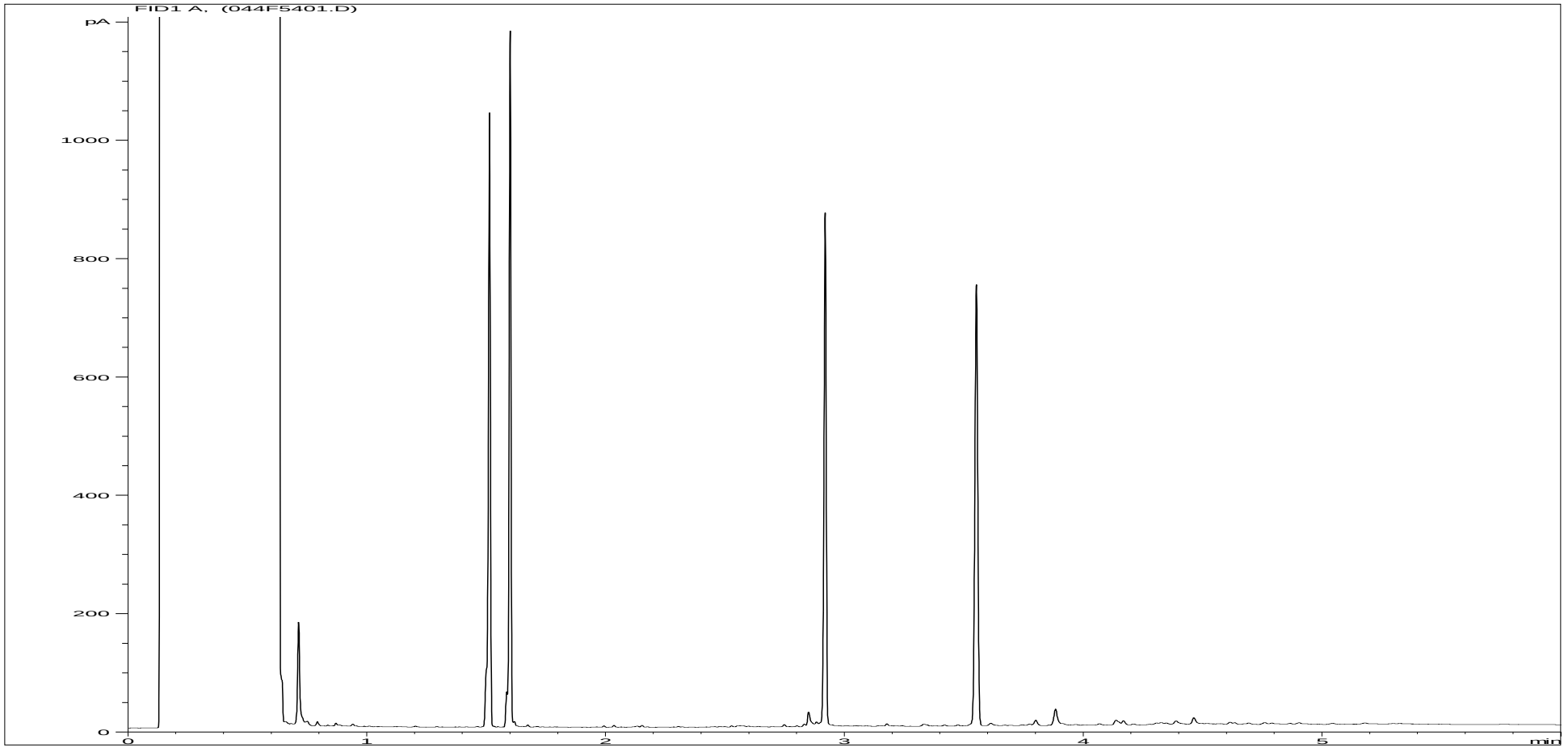
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567235ARO	**Job Number:**	S15_7295
Multiplier:	9.92	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS103A ES 11 2.3
Acquisition Date/Time:	05-Nov-15, 16:41:17		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\082BA401.D		

Where individual results are flagged see report notes for status.

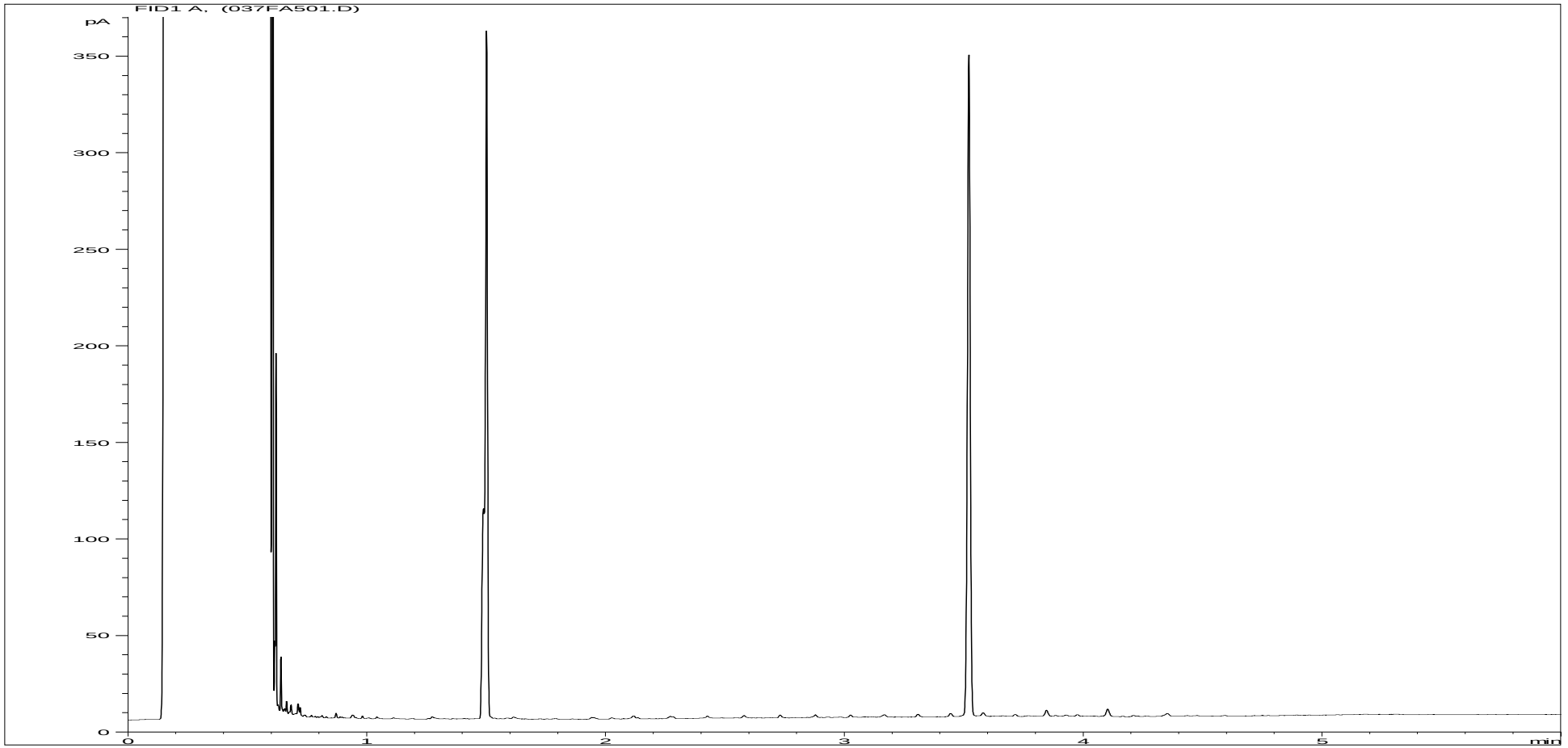
Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	CL1567236	**Job Number:**	S15_7295
Multiplier:	8	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS104 ES 1 0.2
Acquisition Date/Time:	02-Nov-15, 05:54:41		
Datafile:	D:\TES\DATA\Y2015\110115TPH_GC4\110115 2015-11-01 18-21-09\044F5401.D		

Where individual results are flagged see report notes for status.

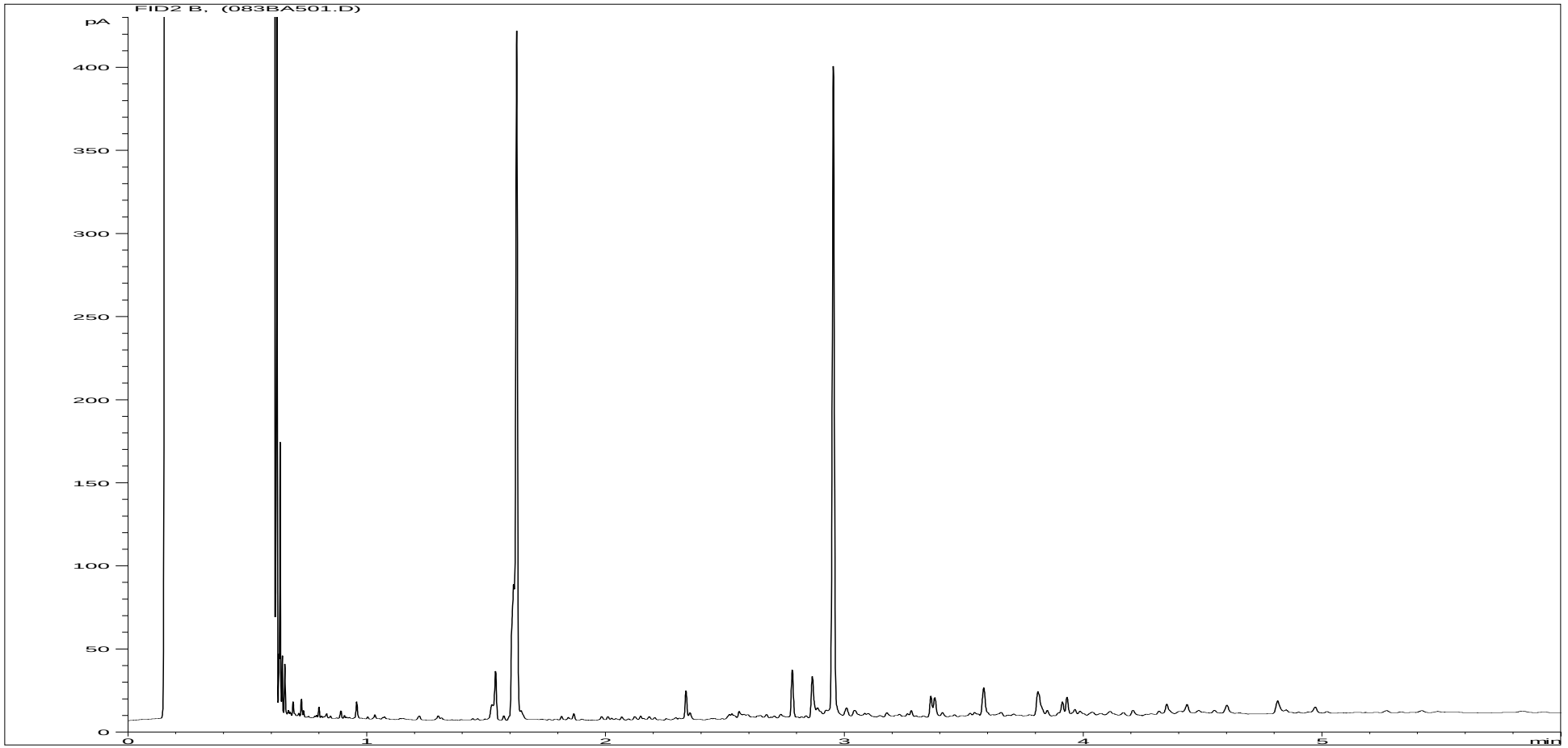
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567237ALI	**Job Number:**	S15_7295
Multiplier:	16	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS104 ES 3 0.7
Acquisition Date/Time:	05-Nov-15, 16:54:36		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\037FA501.D		

Where individual results are flagged see report notes for status.

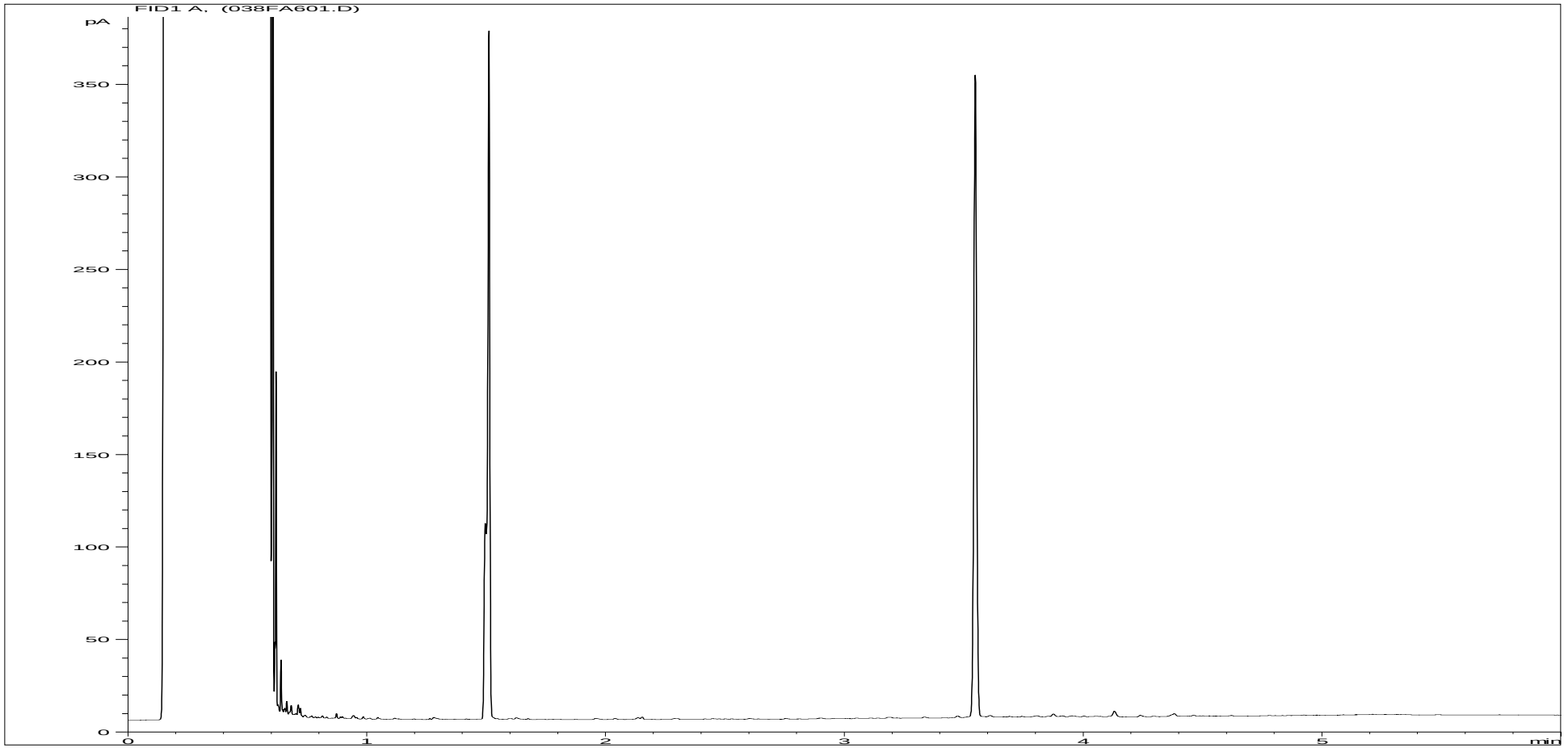
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567237ARO	**Job Number:**	S15_7295
Multiplier:	10.56	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS104 ES 3 0.7
Acquisition Date/Time:	05-Nov-15, 16:54:36		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\083BA501.D		

Where individual results are flagged see report notes for status.

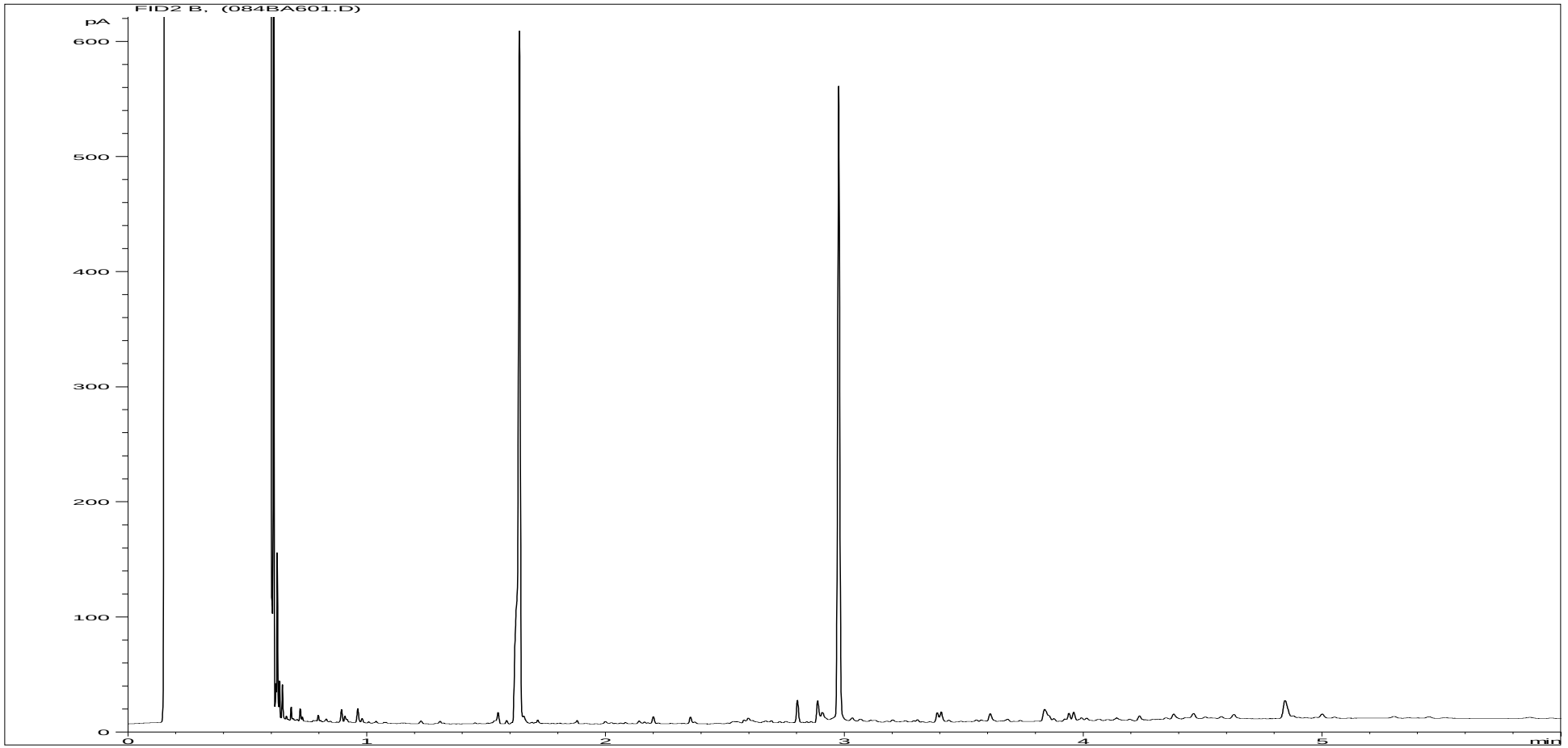
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567238ALI	**Job Number:**	S15_7295
Multiplier:	16	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS105 ES 1 0.5
Acquisition Date/Time:	05-Nov-15, 17:07:56		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\038FA601.D		

Where individual results are flagged see report notes for status.

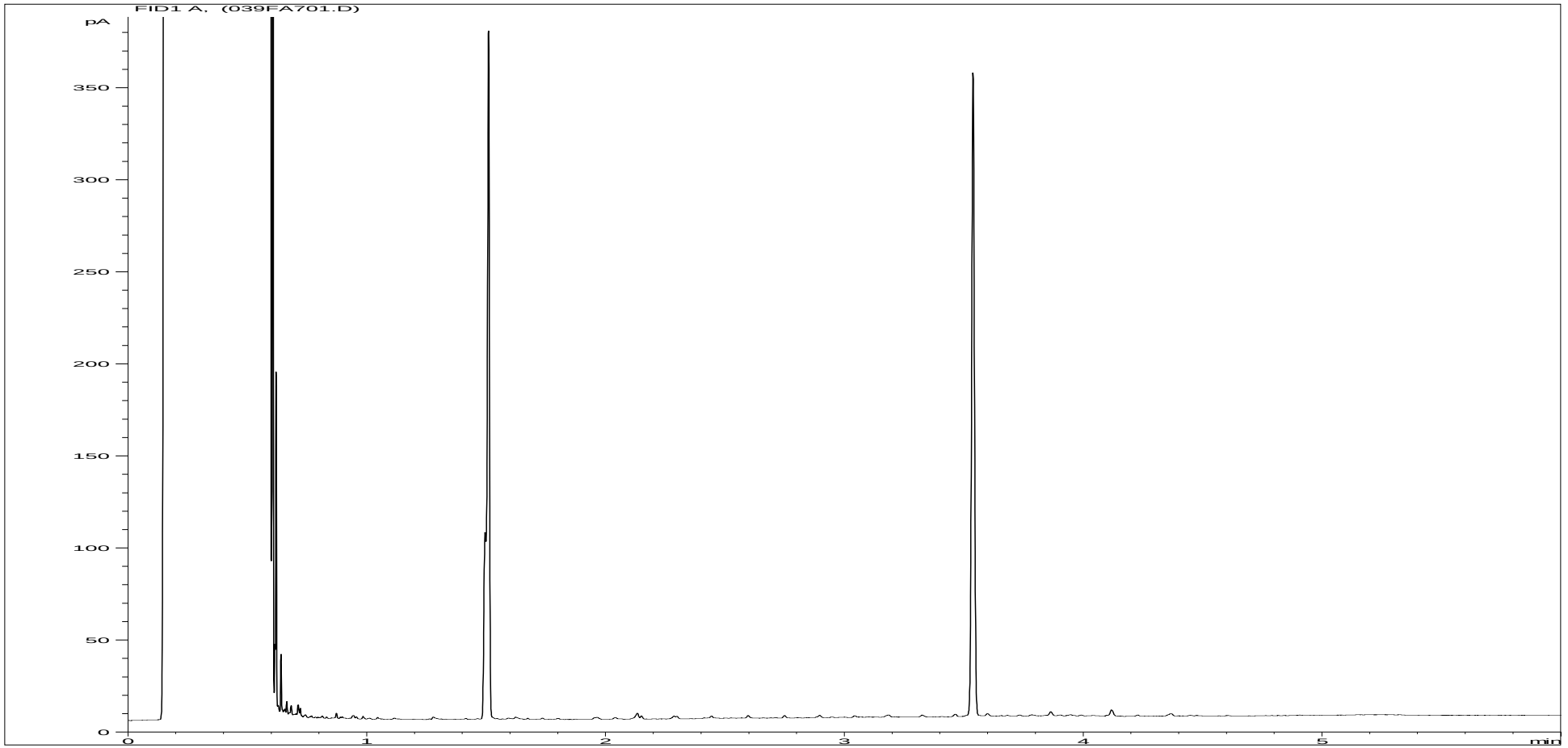
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567238ARO	**Job Number:**	S15_7295
Multiplier:	10.72	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS105 ES 1 0.5
Acquisition Date/Time:	05-Nov-15, 17:07:56		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\084BA601.D		

Where individual results are flagged see report notes for status.

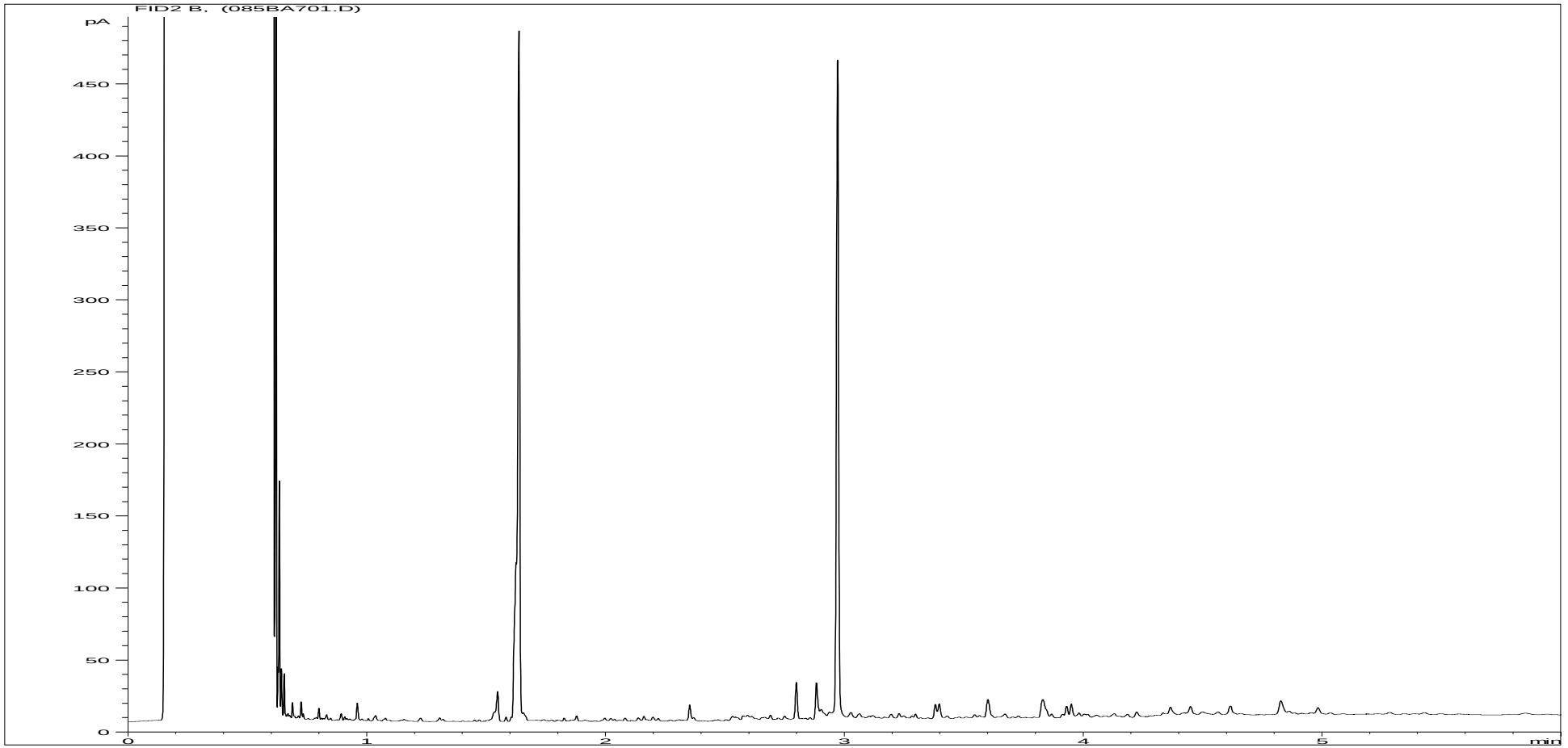
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567239ALI	**Job Number:**	S15_7295
Multiplier:	16	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS106 ES 1 0.5
Acquisition Date/Time:	05-Nov-15, 17:21:18		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\039FA701.D		

Where individual results are flagged see report notes for status.

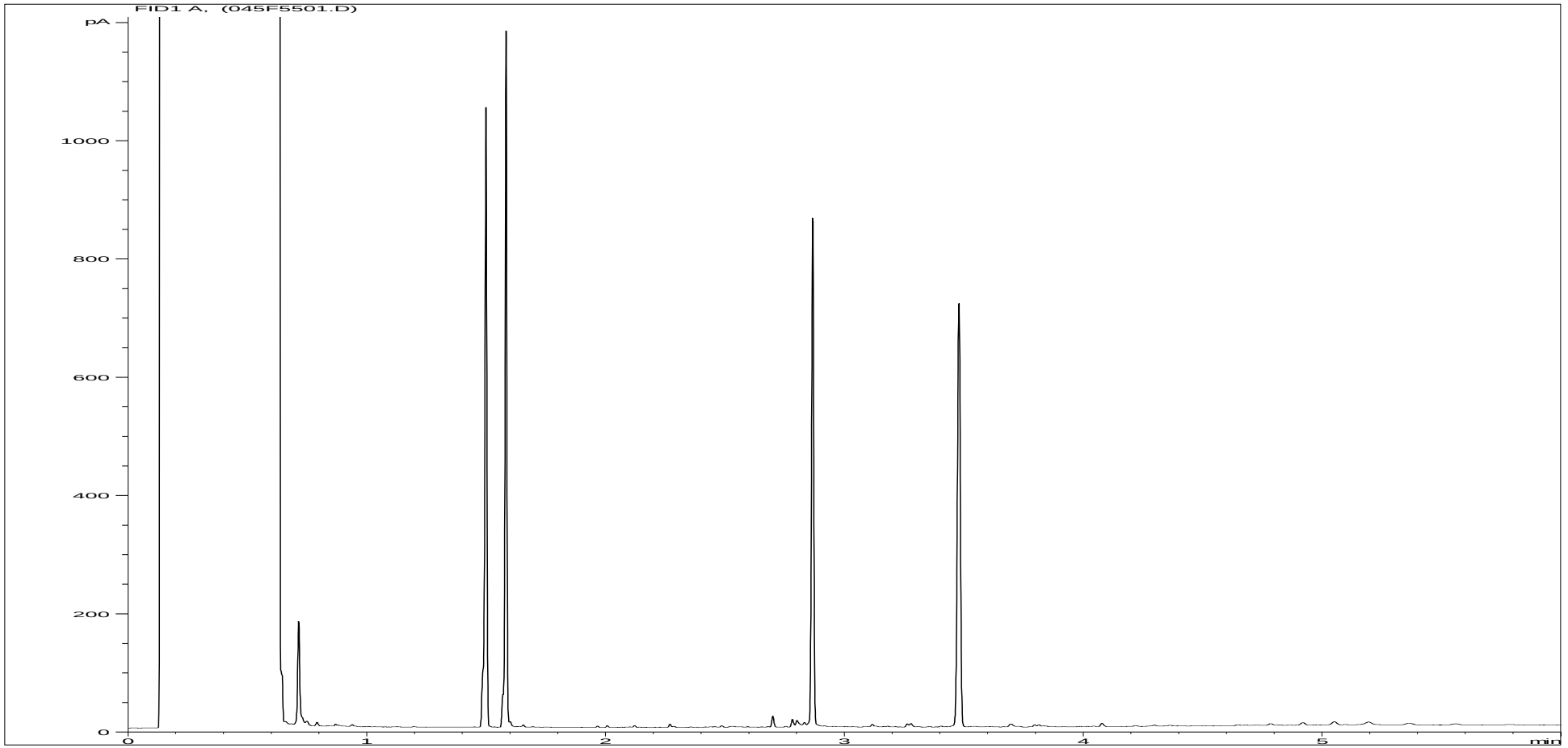
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567239ARO	**Job Number:**	S15_7295
Multiplier:	10.56	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS106 ES 1 0.5
Acquisition Date/Time:	05-Nov-15, 17:21:18		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\085BA701.D		

Where individual results are flagged see report notes for status.

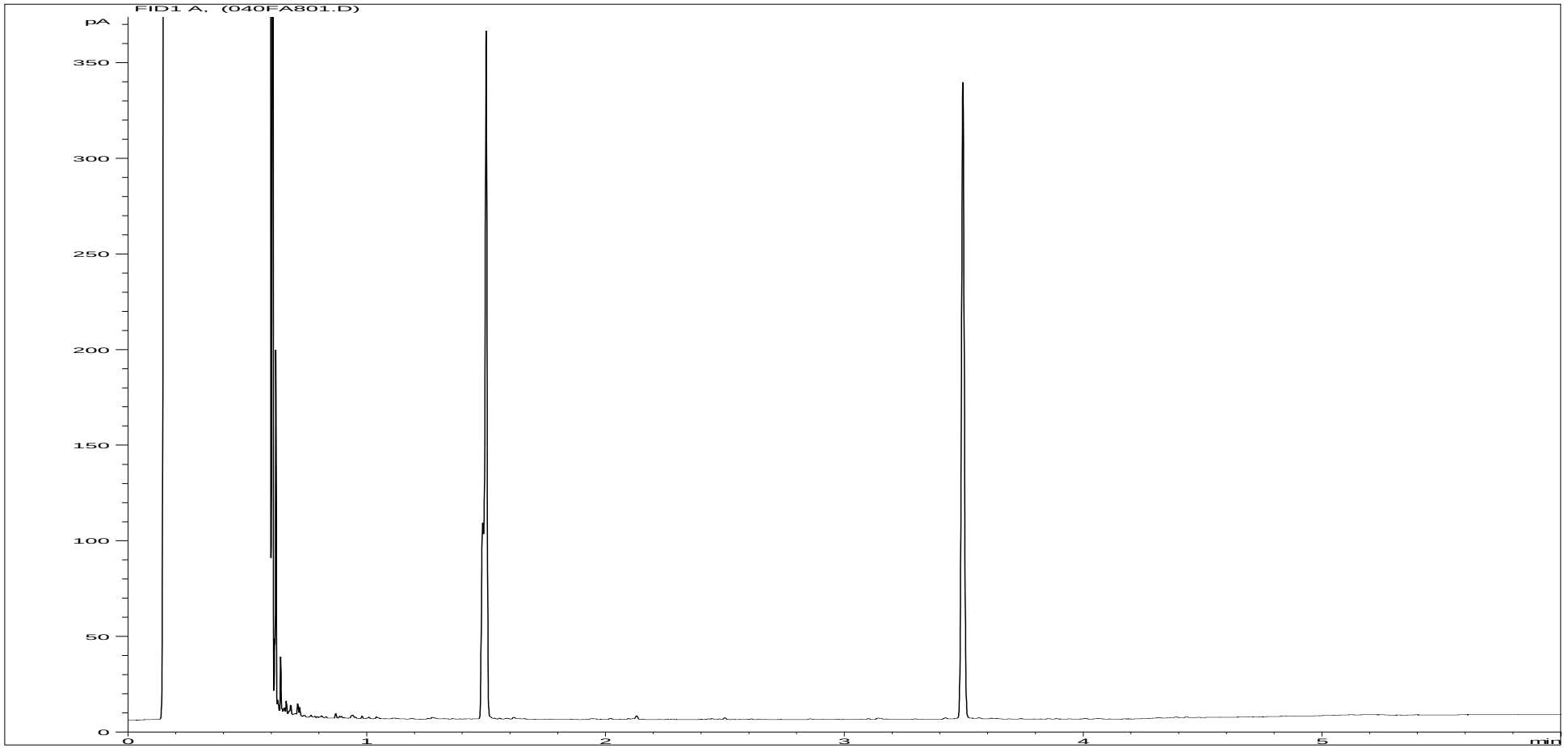
Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	CL1567240	**Job Number:**	S15_7295
Multiplier:	8	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS107 ES 1 0.4
Acquisition Date/Time:	02-Nov-15, 06:07:18		
Datafile:	D:\TES\DATA\Y2015\110115TPH_GC4\110115 2015-11-01 18-21-09\045F5501.D		

Where individual results are flagged see report notes for status.

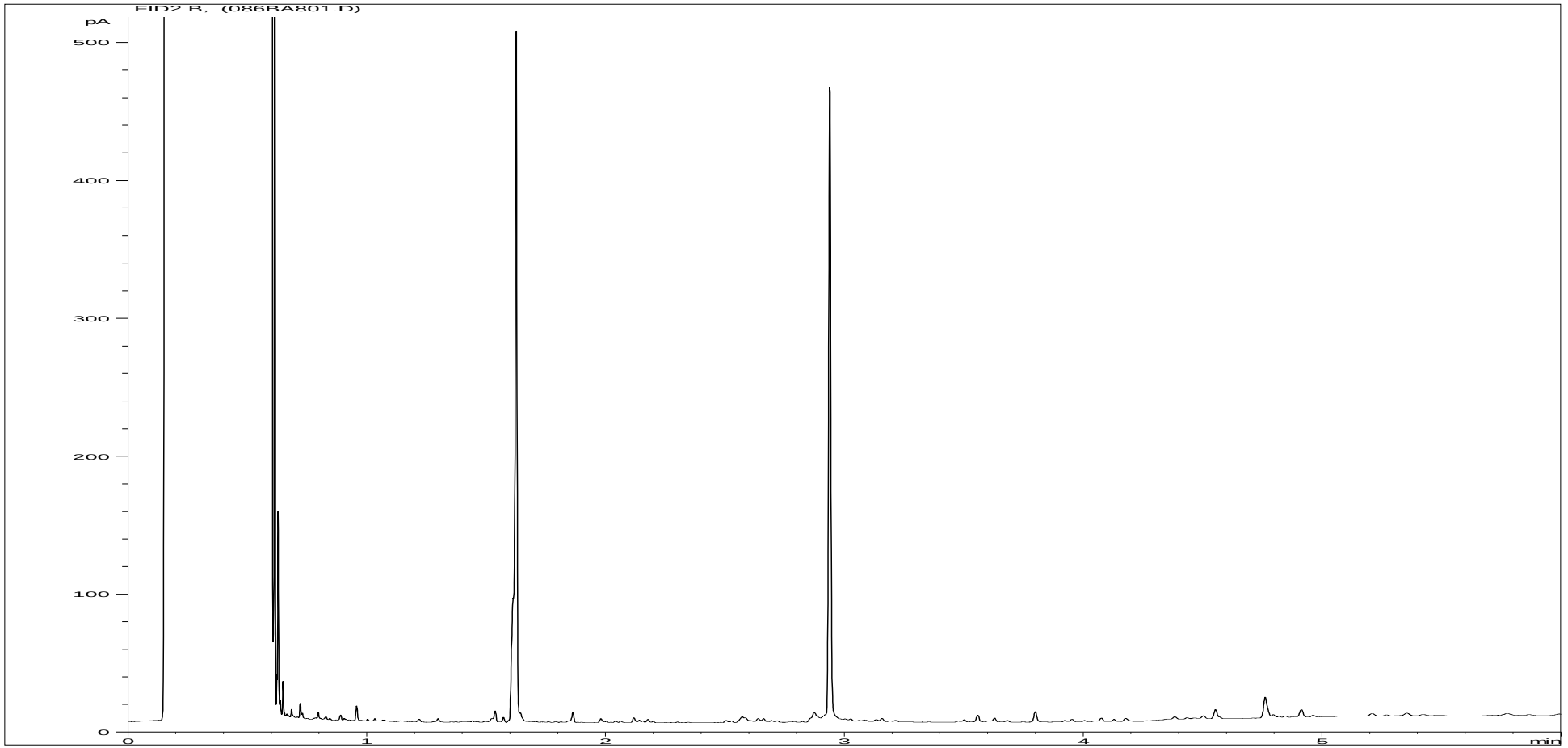
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567241ALI	**Job Number:**	S15_7295
Multiplier:	16	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS107 ES 3 0.8
Acquisition Date/Time:	05-Nov-15, 17:34:53		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\040FA801.D		

Where individual results are flagged see report notes for status.

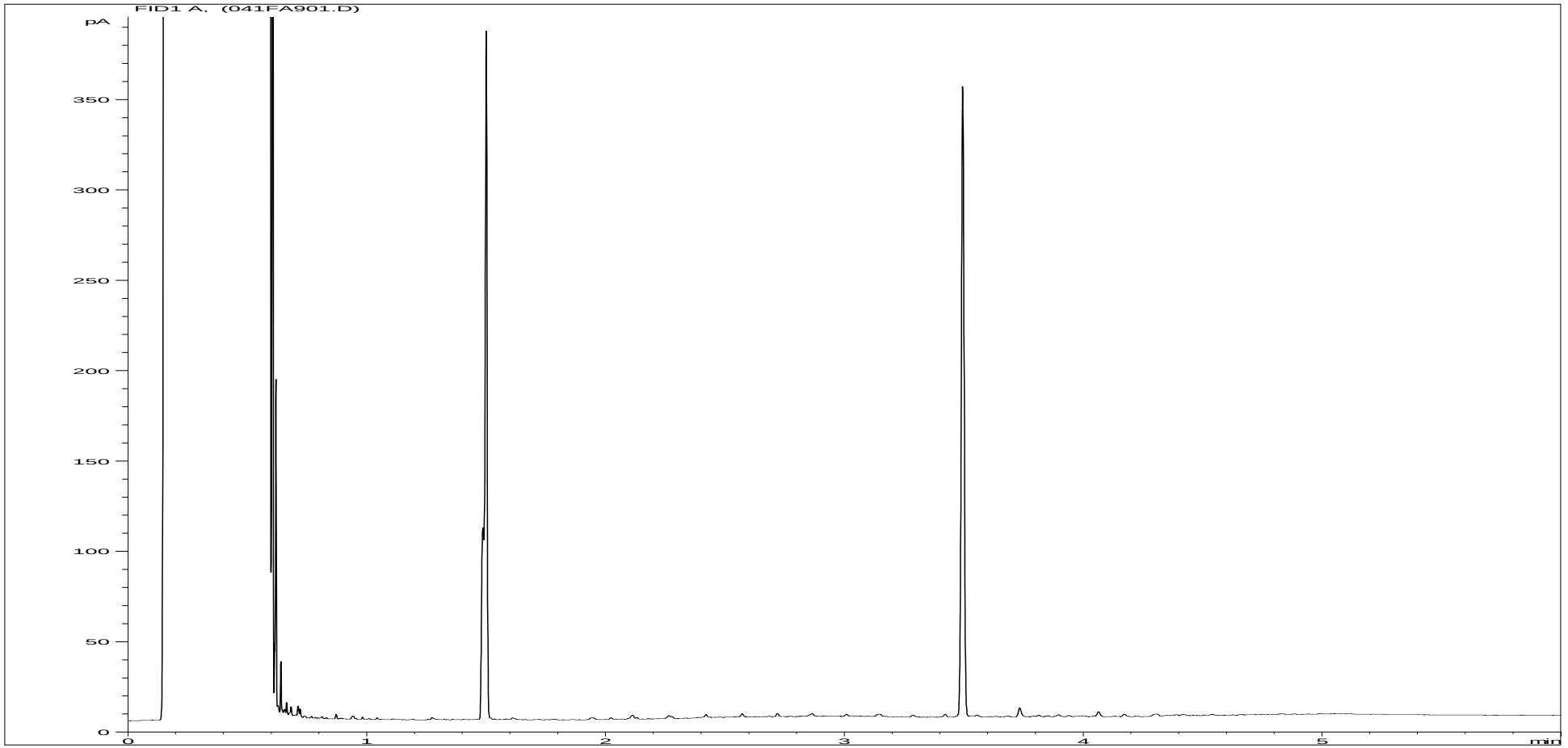
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567241ARO	**Job Number:**	S15_7295
Multiplier:	9.76	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS107 ES 3 0.8
Acquisition Date/Time:	05-Nov-15, 17:34:53		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\086BA801.D		

Where individual results are flagged see report notes for status.

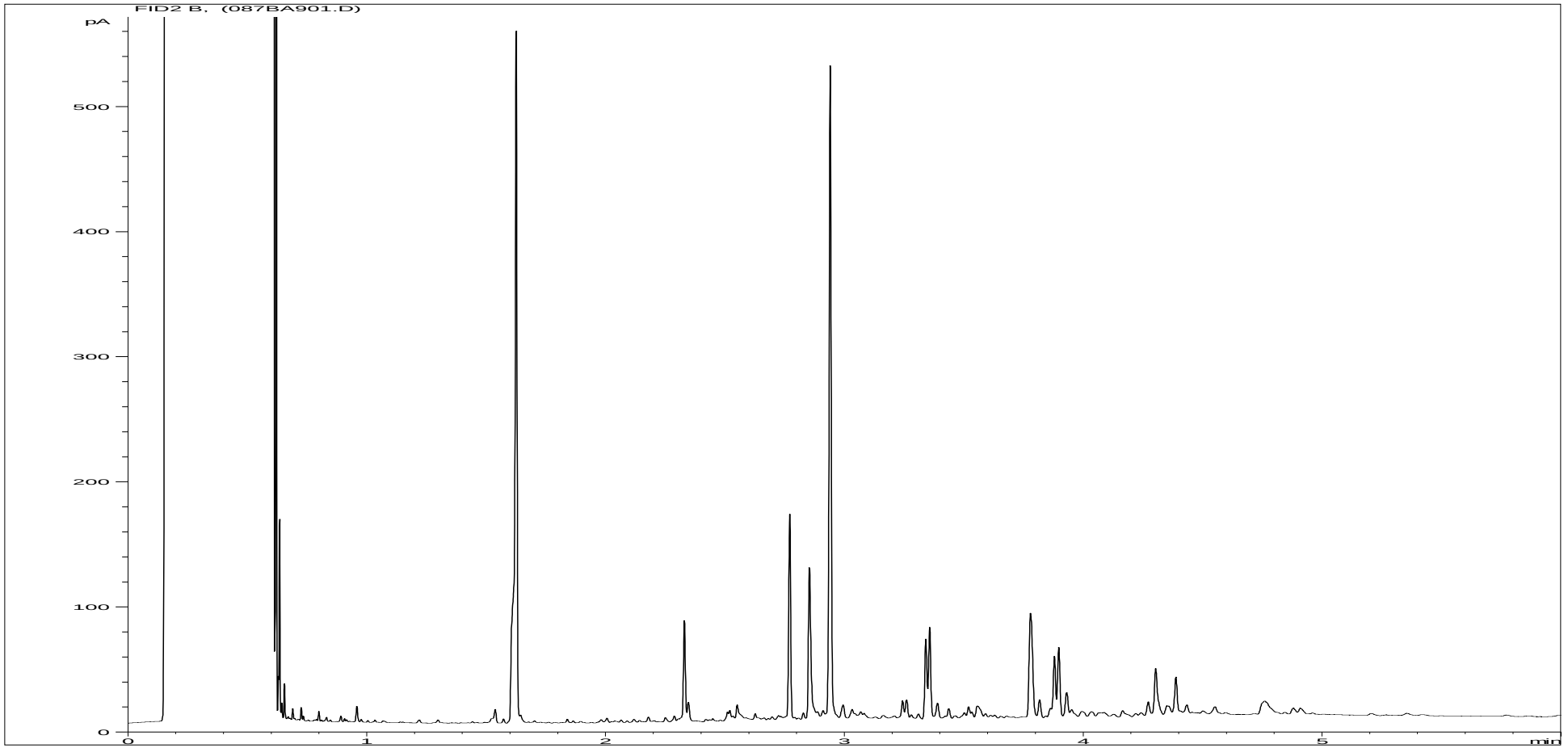
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567242ALI	**Job Number:**	S15_7295
Multiplier:	16	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS108 ES 3 0.4
Acquisition Date/Time:	05-Nov-15, 17:48:07		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\041FA901.D		

Where individual results are flagged see report notes for status.

Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567242ARO	**Job Number:**	S15_7295
Multiplier:	10.24	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS108 ES 3 0.4
Acquisition Date/Time:	05-Nov-15, 17:48:07		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\087BA901.D		

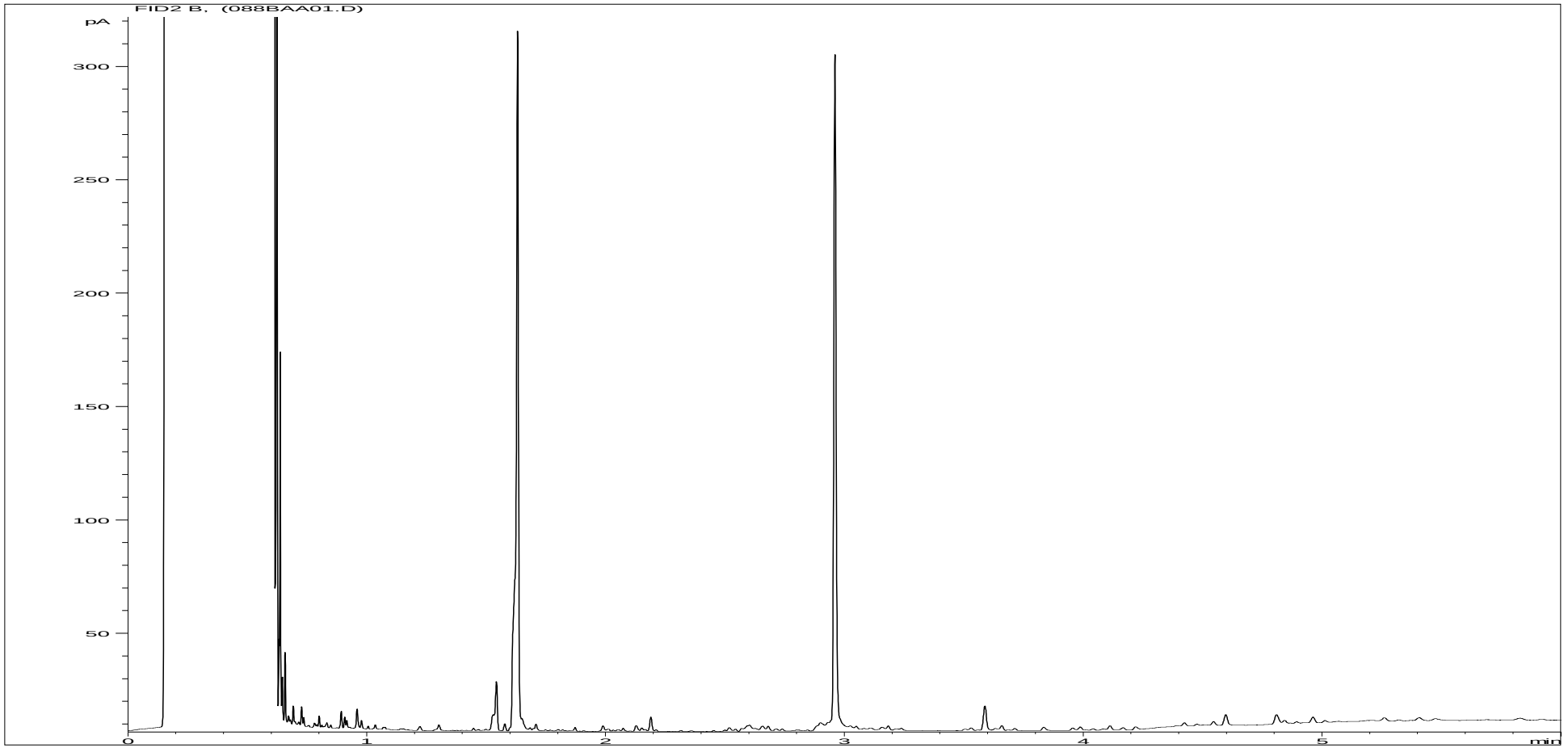
Where individual results are flagged see report notes for status.

Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.

Sample ID:	CL1567243ALI	**Job Number:**	S15_7295
Multiplier:	16	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS108 ES 5 0.8
Acquisition Date/Time:	05-Nov-15, 18:01:22		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\042FAA01.D		

Where individual results are flagged see report notes for status.

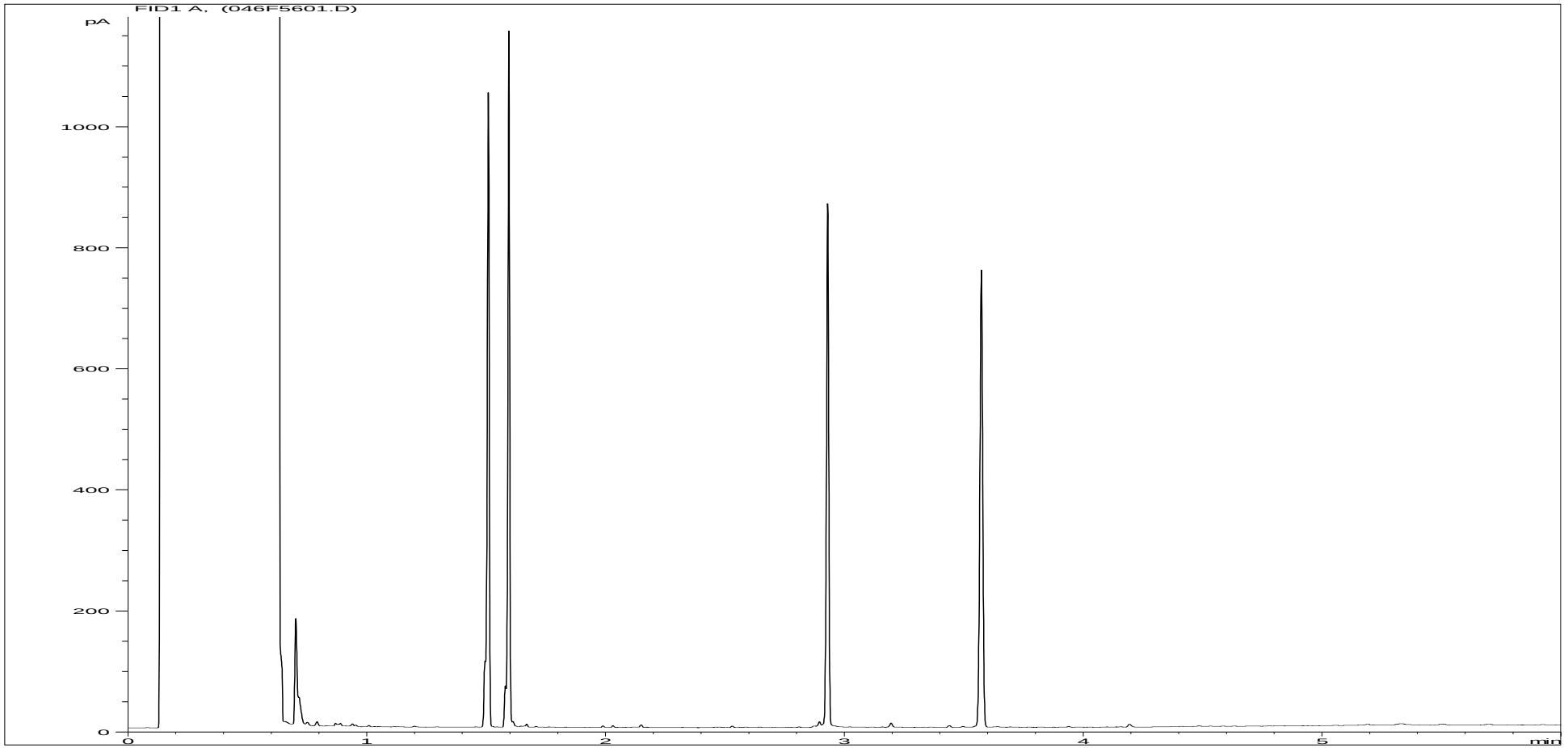
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567243ARO	**Job Number:**	S15_7295
Multiplier:	10.24	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS108 ES 5 0.8
Acquisition Date/Time:	05-Nov-15, 18:01:22		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\088BAA01.D		

Where individual results are flagged see report notes for status.

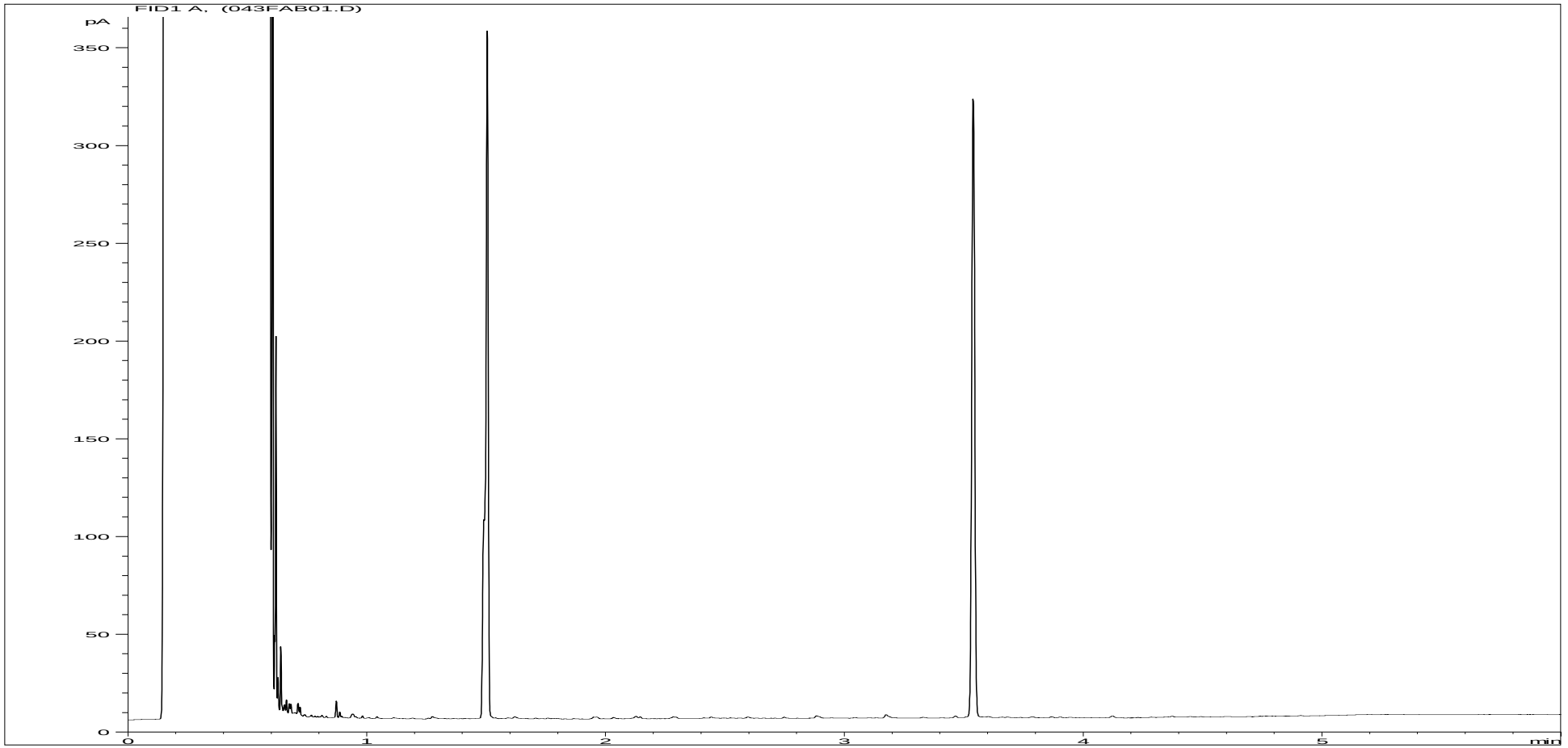
Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	CL1567244	**Job Number:**	S15_7295
Multiplier:	8	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS108 ES 8 1.5
Acquisition Date/Time:	02-Nov-15, 06:19:53		
Datafile:	D:\TES\DATA\Y2015\110115TPH_GC4\110115 2015-11-01 18-21-09\046F5601.D		

Where individual results are flagged see report notes for status.

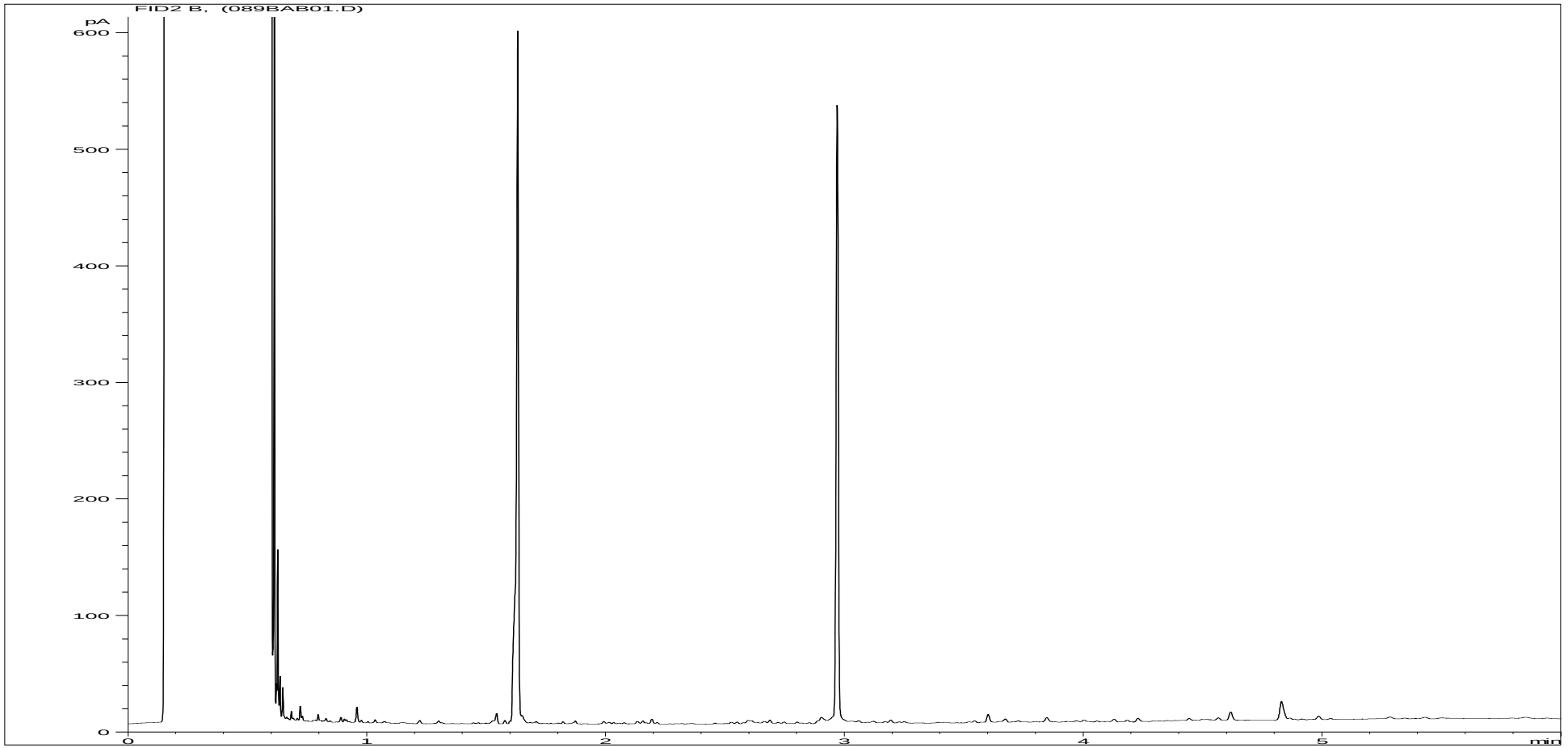
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567245ALI	**Job Number:**	S15_7295
Multiplier:	16	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS109 ES 1 0.1
Acquisition Date/Time:	05-Nov-15, 18:14:43		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\043FAB01.D		

Where individual results are flagged see report notes for status.

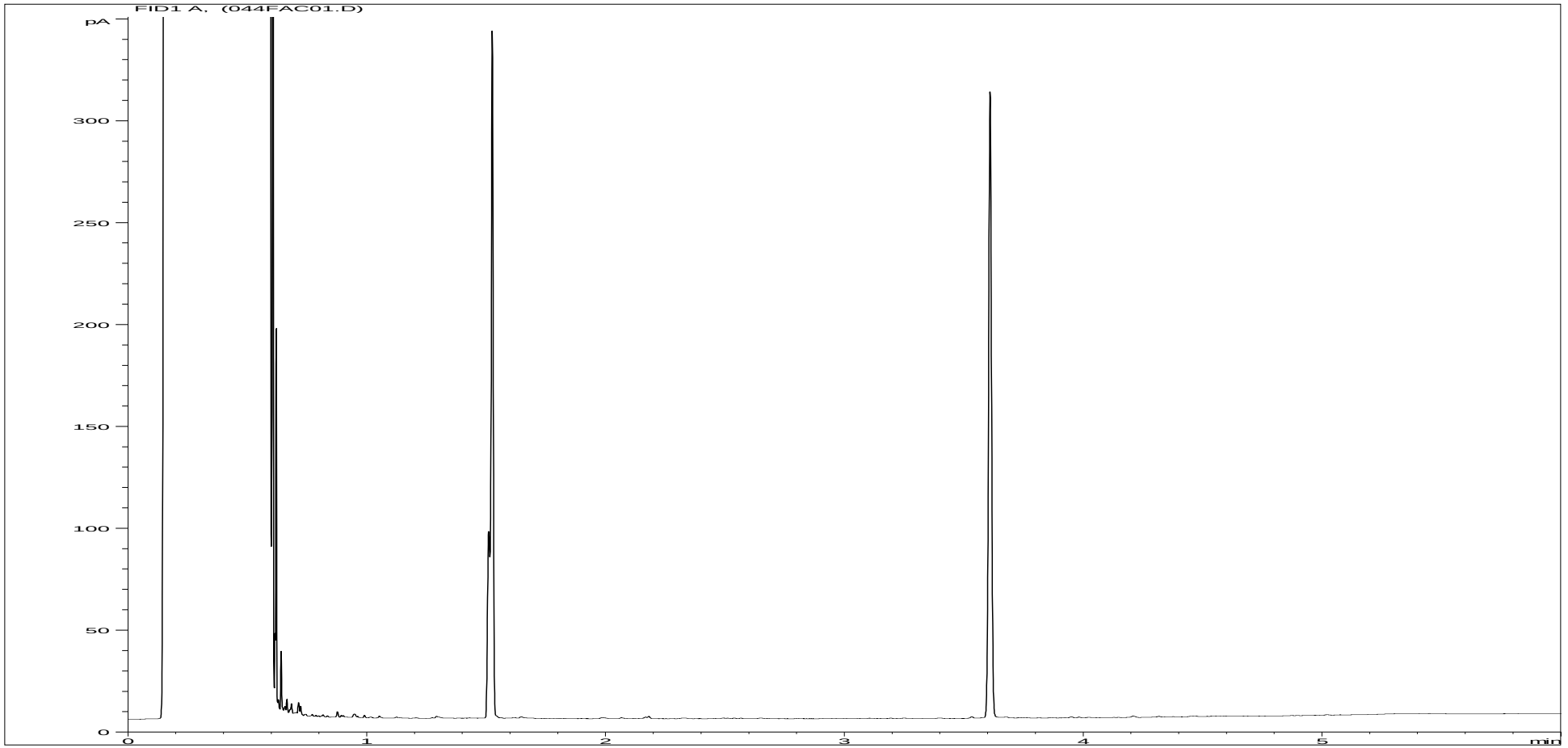
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567245ARO	**Job Number:**	S15_7295
Multiplier:	10.24	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS109 ES 1 0.1
Acquisition Date/Time:	05-Nov-15, 18:14:43		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\089BAB01.D		

Where individual results are flagged see report notes for status.

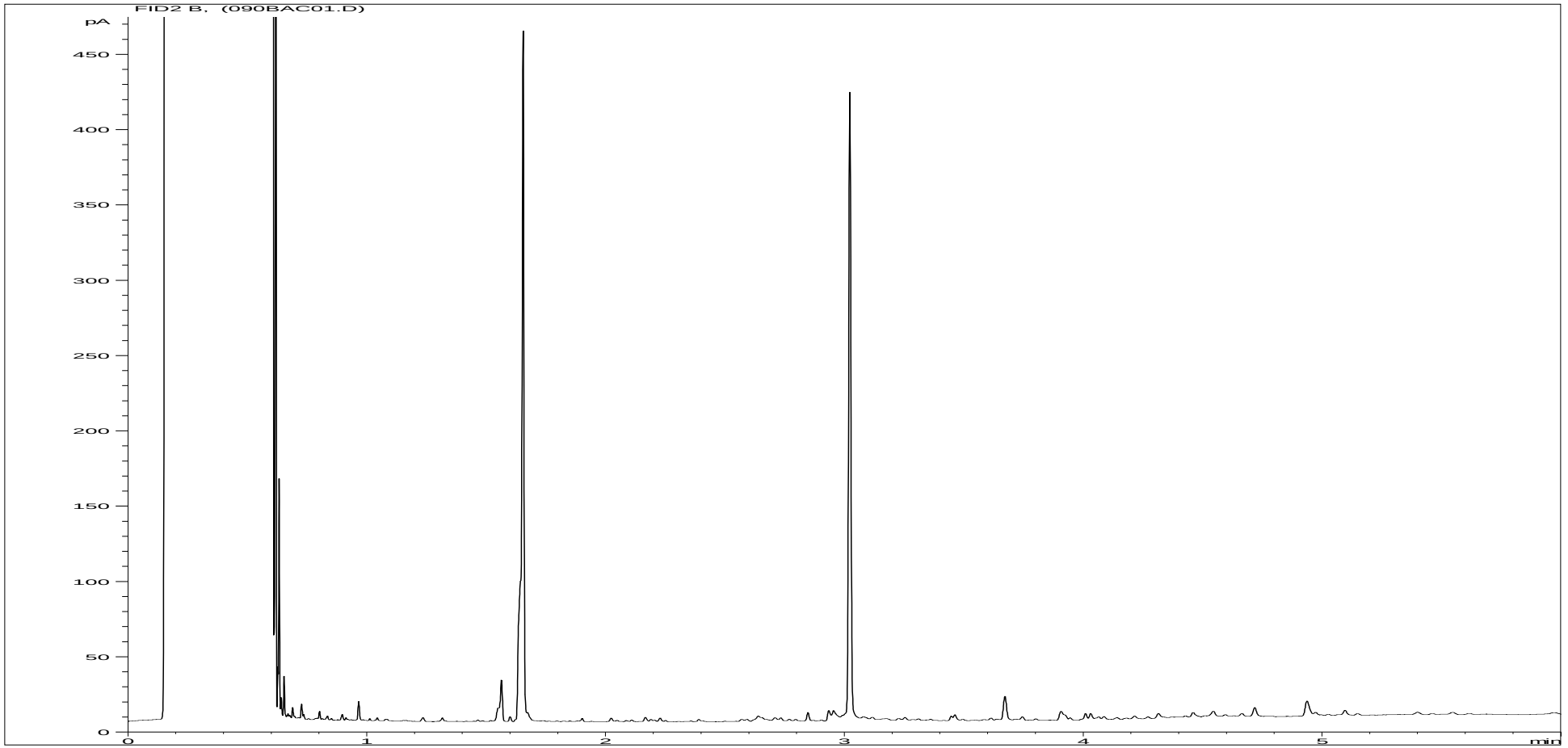
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567246ALI	**Job Number:**	S15_7295
Multiplier:	16	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS110 ES 3 0.5
Acquisition Date/Time:	05-Nov-15, 18:28:02		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\044FAC01.D		

Where individual results are flagged see report notes for status.

Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567246ARO	**Job Number:**	S15_7295
Multiplier:	10.72	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	WS110 ES 3 0.5
Acquisition Date/Time:	05-Nov-15, 18:28:02		
Datafile:	D:\TES\DATA\Y2015\110415TPH_GC4\110415 2015-11-04 09-25-08\090BAC01.D		

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18	**Directory/Quant file:**	028VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS101 ES 1 0.1	**Date Booked in:**	26-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567230	**Date Analysed:**	28-Oct-15	**Multiplier:**	0.93
Job Number:	S15_7295	**Operator:**	PR	**Position:**	2

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	4.47	2	M
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	4.95	521	97
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	5.16	8	M
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited

Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.01	98	Dibromofluoromethane	107
1,4-Difluorobenzene	4.35	96	Toluene-d8	94
Chlorobenzene-d5	5.46	72		
Bromofluorobenzene	5.86	54		
1,4-Dichlorobenzene-d4	6.26	39		
Naphthalene-d8	7.09	9		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18	**Directory/Quant file:**	028VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS101 ES 14 2.6	**Date Booked in:**	26-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567231	**Date Analysed:**	28-Oct-15	**Multiplier:**	1.03
Job Number:	S15_7295	**Operator:**	PR	**Position:**	3

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	-	< 5	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited

Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.01	105	Dibromofluoromethane	106
1,4-Difluorobenzene	4.35	108	Toluene-d8	98
Chlorobenzene-d5	5.46	106		
Bromofluorobenzene	5.86	106		
1,4-Dichlorobenzene-d4	6.26	99		
Naphthalene-d8	7.09	100		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18	**Directory/Quant file:**	028VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS102 ES 1 0.2	**Date Booked in:**	26-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567232	**Date Analysed:**	28-Oct-15	**Multiplier:**	0.92
Job Number:	S15_7295	**Operator:**	PR	**Position:**	4

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	4.95	44	92
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	5.16	5	M
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited

Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %
Pentafluorobenzene	4.01	100
1,4-Difluorobenzene	4.35	102
Chlorobenzene-d5	5.46	92
Bromofluorobenzene	5.86	79
1,4-Dichlorobenzene-d4	6.26	60
Naphthalene-d8	7.09	23

Surrogates	% Rec
Dibromofluoromethane	107
Toluene-d8	99

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18	**Directory/Quant file:**	028VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS103A ES 3 0.5	**Date Booked in:**	26-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567234	**Date Analysed:**	28-Oct-15	**Multiplier:**	0.93
Job Number:	S15_7295	**Operator:**	PR	**Position:**	5

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	4.95	54	96
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	5.16	6	M
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited

Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.01	99	Dibromofluoromethane	107
1,4-Difluorobenzene	4.35	104	Toluene-d8	93
Chlorobenzene-d5	5.46	82		
Bromofluorobenzene	5.86	70		
1,4-Dichlorobenzene-d4	6.26	55		
Naphthalene-d8	7.09	16		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18	**Directory/Quant file:**	028VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS103A ES 11 2.3	**Date Booked in:**	26-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567235	**Date Analysed:**	28-Oct-15	**Multiplier:**	1.1
Job Number:	S15_7295	**Operator:**	PR	**Position:**	6

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 6	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	-	< 6	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 6	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited

Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.01	101	Dibromofluoromethane	114
1,4-Difluorobenzene	4.35	104	Toluene-d8	93
Chlorobenzene-d5	5.46	96		
Bromofluorobenzene	5.86	93		
1,4-Dichlorobenzene-d4	6.26	81		
Naphthalene-d8	7.09	62		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18	**Directory/Quant file:**	029VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS104 ES 3 0.7	**Date Booked in:**	26-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567237	**Date Analysed:**	30-Oct-15	**Multiplier:**	1
Job Number:	S15_7295	**Operator:**	PR	**Position:**	31

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4 **	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4 **	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	4.95	17	89
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	5.16	4	M
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited

Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.01	80	Dibromofluoromethane	109
1,4-Difluorobenzene	4.35	80	Toluene-d8	98
Chlorobenzene-d5	5.46	69		
Bromofluorobenzene	5.86	55		
1,4-Dichlorobenzene-d4	6.26	46		
Naphthalene-d8	7.09	19		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18	**Directory/Quant file:**	029VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS105 ES 1 0.5	**Date Booked in:**	26-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567238	**Date Analysed:**	30-Oct-15	**Multiplier:**	1
Job Number:	S15_7295	**Operator:**	PR	**Position:**	32

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4 **	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4 **	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	3.93	2	M
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	4.95	9	92
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited

Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %
Pentafluorobenzene	4.01	77
1,4-Difluorobenzene	4.35	79
Chlorobenzene-d5	5.46	69
Bromofluorobenzene	5.86	58
1,4-Dichlorobenzene-d4	6.26	49
Naphthalene-d8	7.09	23

Surrogates	% Rec
Dibromofluoromethane	107
Toluene-d8	95

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18	**Directory/Quant file:**	029VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS106 ES 1 0.5	**Date Booked in:**	26-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567239	**Date Analysed:**	30-Oct-15	**Multiplier:**	0.98
Job Number:	S15_7295	**Operator:**	PR	**Position:**	1

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4 **	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4 **	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	4.95	16	92
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	5.16	3	M
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

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"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.01	77	Dibromofluoromethane	106
1,4-Difluorobenzene	4.35	76	Toluene-d8	92
Chlorobenzene-d5	5.46	58		
Bromofluorobenzene	5.86	42		
1,4-Dichlorobenzene-d4	6.26	30		
Naphthalene-d8	7.09	10		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18	**Directory/Quant file:**	029VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS107 ES 3 0.8	**Date Booked in:**	26-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567241	**Date Analysed:**	30-Oct-15	**Multiplier:**	0.95
Job Number:	S15_7295	**Operator:**	PR	**Position:**	2

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4 **	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4 **	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	-	< 5	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

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Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.01	85	Dibromofluoromethane	111
1,4-Difluorobenzene	4.35	87	Toluene-d8	99
Chlorobenzene-d5	5.46	84		
Bromofluorobenzene	5.86	78		
1,4-Dichlorobenzene-d4	6.26	74		
Naphthalene-d8	7.09	64		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18	**Directory/Quant file:**	029VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS108 ES 3 0.4	**Date Booked in:**	26-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567242	**Date Analysed:**	30-Oct-15	**Multiplier:**	1.03
Job Number:	S15_7295	**Operator:**	PR	**Position:**	3

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4 **	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4 **	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	4.95	57	96
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	5.16	4	M
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited

Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.01	81	Dibromofluoromethane	106
1,4-Difluorobenzene	4.35	80	Toluene-d8	97
Chlorobenzene-d5	5.46	70		
Bromofluorobenzene	5.86	60		
1,4-Dichlorobenzene-d4	6.26	50		
Naphthalene-d8	7.09	24		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18	**Directory/Quant file:**	029VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS108 ES 5 0.8	**Date Booked in:**	26-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567243	**Date Analysed:**	30-Oct-15	**Multiplier:**	1
Job Number:	S15_7295	**Operator:**	PR	**Position:**	4

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4 **	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4 **	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	-	< 5	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

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"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.01	82	Dibromofluoromethane	108
1,4-Difluorobenzene	4.35	85	Toluene-d8	97
Chlorobenzene-d5	5.46	80		
Bromofluorobenzene	5.86	75		
1,4-Dichlorobenzene-d4	6.26	73		
Naphthalene-d8	7.09	63		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18	**Directory/Quant file:**	029VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS109 ES 1 0.1	**Date Booked in:**	26-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567245	**Date Analysed:**	30-Oct-15	**Multiplier:**	0.98
Job Number:	S15_7295	**Operator:**	PR	**Position:**	5

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4 **	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4 **	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	4.95	14	89
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited

Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.01	82	Dibromofluoromethane	1
1,4-Difluorobenzene	4.35	84	Toluene-d8	99
Chlorobenzene-d5	5.46	80		
Bromofluorobenzene	5.86	74		
1,4-Dichlorobenzene-d4	6.26	69		
Naphthalene-d8	7.09	56		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18	**Directory/Quant file:**	029VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS110 ES 3 0.5	**Date Booked in:**	26-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567246	**Date Analysed:**	30-Oct-15	**Multiplier:**	0.99
Job Number:	S15_7295	**Operator:**	PR	**Position:**	6

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4 **	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4 **	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	4.95	34	94
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	7.11	8	71
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited

Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.01	82	Dibromofluoromethane	2
1,4-Difluorobenzene	4.35	83	Toluene-d8	98
Chlorobenzene-d5	5.46	76		
Bromofluorobenzene	5.86	66		
1,4-Dichlorobenzene-d4	6.26	58		
Naphthalene-d8	7.09	37		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/3

					Leaching Data	
Client	ESG Wokingham				Weight of sample (kg)	0.259
Contact	Ms H Dwane				Moisture content @ 105°C (% of Wet Weight)	9.9
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	Aylesbury Estate Plot 18				Volume of water required to carry out 2:1 stage (litres)	0.416
					Fraction of sample above 4 mm %	29.200
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
WS103A ES 1 0.1		s15_7295	CL/1567233	06-Nov-15	Volume to undertake analysis (2:1 Stage) (litres)	0.300
					Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	2.67	3	5	6
	LOI450	Loss on Ignition (%)				10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.06	6		
N	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.035	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	209	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<9.15	100		
	PHSOIL	pH (pH units)			>6	
	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except ºº		mg/kg (dry weight)				
U	WSLM3	pH (pH units) ºº	7.8	7.5	Calculated data not UKAS Accredited				
U	WSLM2	Conductivity (µs/cm) ºº	386	164					
U	ICPMSW	Arsenic	0.033	0.038	0.066	0.37	0.5	2	25
U	ICPWATVAR	Barium	0.07	0.09	0.14	0.9	20	100	300
U	ICPMSW	Cadmium	<0.0001	0.0005	<0.0002	<0.004	0.04	1	5
U	ICPMSW	Chromium	<0.001	0.004	<0.002	<0.04	0.5	10	70
U	ICPMSW	Copper	0.052	0.069	0.104	0.67	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.004	<0.001	0.008	<0.01	0.5	10	30
U	ICPMSW	Nickel	0.005	0.006	0.01	0.06	0.4	10	40
U	ICPMSW	Lead	0.011	0.44	0.022	3.83	0.5	10	50
U	ICPMSW	Antimony	0.022	0.013	0.044	0.14	0.06	0.7	5
U	ICPMSW	Selenium	0.002	<0.001	0.004	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.031	0.184	0.062	1.64	4	50	200
U	KONENS	Chloride	6	8	12	77	800	15000	25000
U	ISEF	Fluoride	0.2	0.2	0.4	2	10	150	500
U	ICPWATVAR	Sulphate as SO4	22	4	44	64	1000	20000	50000
N	WSLM27	Total Dissolved Solids	301	128	602	1511	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	21	21	42	210	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

Where individual results are flagged see report notes for status.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/3

					Leaching Data	
Client	ESG Wokingham				Weight of sample (kg)	0.256
Contact	Ms H Dwane				Moisture content @ 105°C (% of Wet Weight)	10.8
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	Aylesbury Estate Plot 18				Volume of water required to carry out 2:1 stage (litres)	0.419
					Fraction of sample above 4 mm %	34.900
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
WS104 ES 1 0.2		s15_7295	CL/1567236	06-Nov-15	Volume to undertake analysis (2:1 Stage) (litres)	0.300
					Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	1.23	3	5	6
	LOI450	Loss on Ignition (%)				10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.062	6		
N	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.035	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	44	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<2.5	100		
	PHSOIL	pH (pH units)			>6	
	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except oo		mg/kg (dry weight)				
U	WSLM3	pH (pH units) oo	7.8	7.5	Calculated data not UKAS Accredited				
U	WSLM2	Conductivity (µs/cm) oo	278	150					
U	ICPMSW	Arsenic	0.01	0.011	0.02	0.11	0.5	2	25
U	ICPWATVAR	Barium	0.04	0.05	0.08	0.5	20	100	300
U	ICPMSW	Cadmium	<0.0001	0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	<0.001	0.002	<0.002	<0.02	0.5	10	70
U	ICPMSW	Copper	0.023	0.027	0.046	0.26	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.006	0.001	0.012	0.02	0.5	10	30
U	ICPMSW	Nickel	0.002	0.003	0.004	0.03	0.4	10	40
U	ICPMSW	Lead	0.005	0.168	0.01	1.46	0.5	10	50
U	ICPMSW	Antimony	0.008	0.005	0.016	0.05	0.06	0.7	5
U	ICPMSW	Selenium	0.001	<0.001	0.002	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.007	0.049	0.014	0.43	4	50	200
U	KONENS	Chloride	3	5	6	47	800	15000	25000
U	ISEF	Fluoride	0.4	0.3	0.8	3	10	150	500
U	ICPWATVAR	Sulphate as SO4	17	3	34	49	1000	20000	50000
N	WSLM27	Total Dissolved Solids	216	117	432	1302	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	15	11	30	115	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

Where individual results are flagged see report notes for status.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/3

					Leaching Data	
Client	ESG Wokingham				Weight of sample (kg)	0.262
Contact	Ms H Dwane				Moisture content @ 105°C (% of Wet Weight)	16.8
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	Aylesbury Estate Plot 18				Volume of water required to carry out 2:1 stage (litres)	0.413
					Fraction of sample above 4 mm %	29.400
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
WS107 ES 1 0.4		s15_7295	CL/1567240	06-Nov-15	Volume to undertake analysis (2:1 Stage) (litres)	0.300
					Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	1.2	3	5	6
	LOI450	Loss on Ignition (%)				10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.07	6		
N	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.035	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	20	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<6.35	100		
	PHSOIL	pH (pH units)			>6	
	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except ºº		mg/kg (dry weight)				
U	WSLM3	pH (pH units) ºº	7.4	7.2	Calculated data not UKAS Accredited				
U	WSLM2	Conductivity (µs/cm) ºº	269	134					
U	ICPMSW	Arsenic	0.006	0.007	0.012	0.07	0.5	2	25
U	ICPWATVAR	Barium	0.07	0.06	0.14	0.6	20	100	300
U	ICPMSW	Cadmium	<0.0001	0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	0.001	0.002	0.002	0.02	0.5	10	70
U	ICPMSW	Copper	0.007	0.011	0.014	0.1	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.032	0.011	0.064	0.14	0.5	10	30
U	ICPMSW	Nickel	<0.001	0.002	<0.002	<0.02	0.4	10	40
U	ICPMSW	Lead	0.003	0.085	0.006	0.74	0.5	10	50
U	ICPMSW	Antimony	0.01	0.007	0.02	0.07	0.06	0.7	5
U	ICPMSW	Selenium	0.004	0.001	0.008	0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.003	0.039	0.006	0.34	4	50	200
U	KONENS	Chloride	8	4	16	45	800	15000	25000
U	ISEF	Fluoride	0.9	0.6	1.8	6	10	150	500
U	ICPWATVAR	Sulphate as SO4	46	9	92	139	1000	20000	50000
N	WSLM27	Total Dissolved Solids	210	104	420	1181	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	9.5	6.8	19	72	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

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Where individual results are flagged see report notes for status.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/3

					Leaching Data	
Client	ESG Wokingham				Weight of sample (kg)	0.234
Contact	Ms H Dwane				Moisture content @ 105°C (% of Wet Weight)	5.4
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	Aylesbury Estate Plot 18				Volume of water required to carry out 2:1 stage (litres)	0.441
					Fraction of sample above 4 mm %	36.000
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
WS108 ES 8 1.5		s15_7295	CL/1567244	06-Nov-15	Volume to undertake analysis (2:1 Stage) (litres)	0.300
					Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	0.12	3	5	6
	LOI450	Loss on Ignition (%)				10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.06	6		
N	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.035	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	<11	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<1.44	100		
	PHSOIL	pH (pH units)			>6	
	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except oo		mg/kg (dry weight)				
U	WSLM3	pH (pH units) oo	7.7	7.3	Calculated data not UKAS Accredited				
U	WSLM2	Conductivity (µs/cm) oo	218	108					
U	ICPMSW	Arsenic	0.001	<0.001	0.002	<0.01	0.5	2	25
U	ICPWATVAR	Barium	0.03	0.02	0.06	0.2	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.001	<0.002	<0.01	0.5	10	70
U	ICPMSW	Copper	0.002	0.002	0.004	0.02	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.001	<0.001	0.002	<0.01	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.001	<0.002	<0.01	0.4	10	40
U	ICPMSW	Lead	0.02	0.003	0.04	0.05	0.5	10	50
U	ICPMSW	Antimony	0.002	0.001	0.004	0.01	0.06	0.7	5
U	ICPMSW	Selenium	0.002	<0.001	0.004	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.012	0.004	0.024	0.05	4	50	200
U	KONENS	Chloride	3	3	6	30	800	15000	25000
U	ISEF	Fluoride	0.7	0.4	1.4	4	10	150	500
U	ICPWATVAR	Sulphate as SO4	39	6	78	104	1000	20000	50000
N	WSLM27	Total Dissolved Solids	170	84	340	955	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	5	3	10	33	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

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Where individual results are flagged see report notes for status.

ASBESTOS ANALYSIS RESULTS - SOIL ANALYSIS

ESG Asbestos Limited Certificate of Analysis for Asbestos in Soils

1089

Detection limit of Method SCI-ASB-020 is 0.001%

Sampling has been carried out by a third party

Client:	ESG Environmental Chemistry	**Page 1 of 1**	
Address:	Etwall House, Bretby Business Park, Ashby Road, Burton upon Trent	**Report No:**	**ANO-0488-11289**
For the attention of:	ESG Wokingham	**Report Date:**	**27/10/2015**
Site Address:	Aylesbury Estate Plot 18	**Project Number:**	**S157295**

Sample Number	Sample Date	Sample Location	Test Date	Total Sample Dry Weight (g)	Weight of <2mm Fraction (g)	Asbestos(g) in >8mm+>2mm	Asbestos(g) in <2mm	% Asbestos by weight of Total Dried Sample	Asbestos Fibre Types Identified
CL/1567230	20/10/15	WS101 0.1	27/10/2015					Screen & ID	Amosite,Chrysotile(Lagging,Free Fibres)
CL/1567232	20/10/15	WS102 0.2	27/10/2015					Screen & ID	Chrysotile(Bitumen)
CL/1567234	20/10/15	WS103A 0.5	27/10/2015					Screen Only	NAIIS
CL/1567237	20/10/15	WS104 0.7	27/10/2015					Screen & ID	Crocidolite,Chrysotile(Lagging,Free Fibres)
CL/1567238	21/10/15	WS105 0.5	27/10/2015					Screen & ID	Amosite(Free Fibres)
CL/1567239	20/10/15	WS106 0.5	27/10/2015					Screen & ID	Amosite(Free Fibres)
CL/1567241	21/10/15	WS107 0.8	27/10/2015					Screen Only	NAIIS
CL/1567242	19/10/15	WS108 0.4	27/10/2015					Screen Only	NAIIS
CL/1567245		WS109 0.1	27/10/2015					Screen & ID	Chrysotile(Lagging)
CL/1567246	19/10/15	WS110 0.5	27/10/2015					Screen Only	NAIIS

Keys

NAACR = Not Analysed at Clients Request

NAIIS = No Asbestos Identified in Sample (Screens Only)

*** visible to naked eye**

NADIS = No Asbestos Detected in Sample (ID & Quant Only)

Name:	Stacey Innes	Authorised Signatory:
Position:	Lab Analyst	

The sample analysis for the above results was carried out using the procedures detailed in ESG Asbestos Limited in house method (SCI-ASB-020) based on HSE document MDHS 90 - Asbestos Contaminated Land - Draft 5 - November 1997 (withdrawn). Fibre identification was carried out using ESG Asbestos Limited in house method of transmitted/polarised light microscopy and centre stop dispersion staining (SCI-ASB-007), based on HSE's HSG 248. The analysis of fine fraction for asbestos content only includes fibres and does not discriminate non-asbestos fibres. All fibres are assumed, unless specified, to be amphiboles. All tests were carried out at ESG Asbestos Laboratory, Ashbourne House, Bretby Business Park, Ashby Road, Burton-upon-Trent, Staffordshire. DE15 0XD, UKAS Laboratory Number 1089.

ASBESTOS ANALYSIS RESULTS - SOIL ANALYSIS

ESG Asbestos Limited Certificate of Analysis for Asbestos in Soils

1089

Detection limit of Method SCI-ASB-020 is 0.001%

Sampling has been carried out by a third party

Client:	ESG Environmental Chemistry	**Page 1 of 1**	
Address:	Etwall House, Bretby Business Park, Ashby Road, Burton upon Trent	**Report No:**	**ANO-0503-11424**
For the attention of:	ESG Wokingham	**Report Date:**	**18/11/2015**
Site Address:	Aylesbury Estate Plot 18	**Project Number:**	**S157295**

Sample Number	Sample Date	Sample Location	Test Date	Total Sample Dry Weight (g)	Weight of <2mm Fraction (g)	Asbestos(g) in >8mm+>2mm	Asbestos(g) in <2mm	% Asbestos by weight of Total Dried Sample	Asbestos Fibre Types Identified
CL/1567230	20/10/15	WS101 0.1	18/11/2015	955	734	0.0000	0.0000		NADIS
CL/1567232	20/10/15	WS102 0.2	18/11/2015	1097	923	0.0000	0.0000		NADIS
CL/1567237	20/10/15	WS104 0.7	18/11/2015	1234	900	0.0009	0.0000	<0.001	Chrysotile(Cement) NADIS to Fines (<2mm)
CL/1567238	21/10/15	WS105 0.5	18/11/2015	905	603	0.0001	0.0349	0.004	Amosite(Free Fibres) Amphiboles in Fines
CL/1567239	20/10/15	WS106 0.5	18/11/2015	1357	917	0.0000	0.0000		NADIS
CL/1567245		WS109 0.1	18/11/2015	1338	978	0.0057	0.0000	<0.001	Chrysotile(Cement,Free Fibres) NADIS to Fines (<2mm)

Keys

NAACR = Not Analysed at Clients Request

*** visible to naked eye**

NAIIS = No Asbestos Identified in Sample (Screens Only)

NADIS = No Asbestos Detected in Sample (ID & Quant Only)

Name:	Rachel Howell	Authorised Signatory:
Position:	Lab Technician	

The sample analysis for the above results was carried out using the procedures detailed in ESG Asbestos Limited in house method (SCI-ASB-020) based on HSE document MDHS 90 - Asbestos Contaminated Land - Draft 5 - November 1997 (withdrawn). Fibre identification was carried out using ESG Asbestos Limited in house method of transmitted/polarised light microscopy and centre stop dispersion staining (SCI-ASB-007), based on HSE's HSG 248. The analysis of fine fraction for asbestos content only includes fibres and does not discriminate non-asbestos fibres. All fibres are assumed, unless specified, to be amphiboles. All tests were carried out at ESG Asbestos Laboratory, Ashbourne House, Bretby Business Park, Ashby Road, Burton-upon-Trent, Staffordshire. DE15 0XD, UKAS Laboratory Number 1089.

ESG Environmental Chemistry
Analytical and Deviating Sample Overview

Customer ESG Wokingham
Site Aylesbury Estate Plot 18
Report No S157295

Consignment No S51386
Date Logged 26-Oct-2015

Report Due 18-Nov-2015

ID Number	Description	Sampled	MethodID	BTEXHSA		CEN Leachate		CustServ	FOCS	GROHSA	ICPMSS									ICPWSS	KONECR	PAHMSUS		PCBUSECOAR	SFAPI	Sub002	Sub002a
				BTEX-HSA + MTBE analysis	MTBE (µg/kg)	CEN Leac(P)1	CEN Leac(P)2	REPORT A	S.O.M. % (Calc)	GRO (AA) by HSA GC-FID	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Vanadium (MS)	Zinc (MS)	SO4-- (H2O sol) mg/l	Chromium vi:	PAH (16) by GCMS	PAH (17) by GCMS	PCB-7 Congeners Analysis	Cyanide(Free) (AR)	^Asbestos ID and Quantification	^Asbestos Screen
				✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓
CL/1567230	WS101 0.1	20/10/15																									
CL/1567231	WS101 2.6	20/10/15																									
CL/1567232	WS102 0.2	20/10/15																									
CL/1567233	WS103A 0.1	20/10/15																									
CL/1567234	WS103A 0.5	20/10/15																									
CL/1567235	WS103A 2.3	20/10/15																									
CL/1567236	WS104 0.2	20/10/15																									
CL/1567237	WS104 0.7	20/10/15																									
CL/1567238	WS105 0.5	21/10/15																									
CL/1567239	WS106 0.5	20/10/15																									
CL/1567240	WS107 0.4	21/10/15																									
CL/1567241	WS107 0.8	21/10/15																									
CL/1567242	WS108 0.4	19/10/15																									
CL/1567243	WS108 0.8	19/10/15																									
CL/1567244	WS108 1.5	19/10/15																									

Note: For analysis where the scheduled turnaround is greater than the holding time we will do our utmost to prioritise these samples. However, it is possible that samples could become deviant whilst being processed in the laboratory.

In this instance please contact the laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

Deviating Sample Key

A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key

	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer ESG Wokingham
Site Aylesbury Estate Plot 18
Report No S157295

Consignment No S51386
Date Logged 26-Oct-2015

Report Due 18-Nov-2015

ID Number	Description	Sampled	MethodID	TMSS	TPHFIDUS		TPHUSSI	VOCHSAS	WSLM59
				Tot.Moisture @ 105C	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH by GCFID (AR/Si)	VOC HSA-GCMS	Total Organic Carbon
				✓	✓	✓	✓	✓	
CL/1567230	WS101 0.1	20/10/15							
CL/1567231	WS101 2.6	20/10/15							
CL/1567232	WS102 0.2	20/10/15							
CL/1567233	WS103A 0.1	20/10/15		E					
CL/1567234	WS103A 0.5	20/10/15							
CL/1567235	WS103A 2.3	20/10/15							
CL/1567236	WS104 0.2	20/10/15		E					
CL/1567237	WS104 0.7	20/10/15							
CL/1567238	WS105 0.5	21/10/15							
CL/1567239	WS106 0.5	20/10/15							
CL/1567240	WS107 0.4	21/10/15							
CL/1567241	WS107 0.8	21/10/15							
CL/1567242	WS108 0.4	19/10/15							
CL/1567243	WS108 0.8	19/10/15							
CL/1567244	WS108 1.5	19/10/15		E					

Note: For analysis where the scheduled turnaround is greater than the holding time we will do our utmost to prioritise these samples. However, it is possible that samples could become deviant whilst being processed in the laboratory.

In this instance please contact the laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

Deviating Sample Key

A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key

	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

ESG Environmental Chemistry
Analytical and Deviating Sample Overview

Customer ESG Wokingham
Site Aylesbury Estate Plot 18
Report No S157295

Consignment No S51386
Date Logged 26-Oct-2015

Report Due 18-Nov-2015

ID Number	Description	MethodID	BTEXHSA		CEN Leachate		CustServ	FOCS	GROHSA	ICPMSS									ICPWSS	KONECR	PAHMSUS		PCBUSECOAR	SFAPI	Sub002	Sub002a
		Sampled	BTEX-HSA + MTBE analysis	MTBE (µg/kg)	CEN Leac(P)1	CEN Leac(P)2	REPORT A	S.O.M. % (Calc)	GRO (AA) by HSA GC-FID	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Vanadium (MS)	Zinc (MS)	SO4-- (H2O sol) mg/l	Chromium vi:	PAH (16) by GCMS	PAH (17) by GCMS	PCB-7 Congeners Analysis	Cyanide(Free) (AR)	^Asbestos ID and Quantification	^Asbestos Screen
			✓						✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓		✓	✓	✓
CL/1567245	WS109 0.1																										
CL/1567246	WS110 0.5	19/10/15																									

Note: For analysis where the scheduled turnaround is greater than the holding time we will do our utmost to prioritise these samples. However, it is possible that samples could become deviant whilst being processed in the laboratory.

In this instance please contact the laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

Deviating Sample Key

A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key

	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer ESG Wokingham
Site Aylesbury Estate Plot 18
Report No S157295

Consignment No S51386
Date Logged 26-Oct-2015

Report Due 18-Nov-2015

ID Number	Description	MethodID	TMSS	TPHFIDUS		TPHUSSI	VOCHSAS	WSLM59
		Sampled	Tot.Moisture @ 105C	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH by GCFID (AR/Si)	VOC HSA-GCMS	Total Organic Carbon
			✓	✓	✓	✓	✓	
CL/1567245	WS109 0.1							
CL/1567246	WS110 0.5	19/10/15						

Note: For analysis where the scheduled turnaround is greater than the holding time we will do our utmost to prioritise these samples. However, it is possible that samples could become deviant whilst being processed in the laboratory.

In this instance please contact the laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

Deviating Sample Key

A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key

	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

Report Number : EFS/157295

Additional Report Notes

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
TMSS	CL/1567233	When reviewed at the reporting stage the total moisture at 105°C was lower than the loss on oven drying moisture at 35°C. The laboratory repeated the analysis and confirmed the original data. Having examined the sample it is our opinion that the homogeneity of the sample is inconsistent due to high stone content which has led this discrepancy. As all quality control parameters pass the data we consider that the data obtained from both tests is analytically valid has therefore been included in the final report. However as the total moisture data has been used to correct all other analysis for the WAC report to a dry basis this should be taken into consideration when interpreting the data.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	BTEXHSA	As Received	Determination of Benzene, Toluene, Ethyl benzene and Xylenes (BTEX) by Headspace GCFID
Soil	FOCS	Oven Dried @ < 35°C	Calculation of Soil Organic Matter content from Organic Carbon content of soil samples
Soil	GROHSA	As Received	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) by Headspace GCFID
Soil	ICPMSS	Oven Dried @ < 35°C	Determination of Metals in soil samples by aqua regia digestion followed by ICPMS
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	KONECR	Oven Dried @ < 35°C	Determination of Chromium vi in soil samples by water extraction followed by colorimetric detection
Soil	PAHMSUS	As Received	Determination of Polycyclic Aromatic Hydrocarbons (PAH) by hexane/acetone extraction followed by GCMS detection
Soil	PCBUSECDAR	As Received	Determination of Polychlorinated Biphenyl (PCB) congeners/aroclors by hexane/acetone extraction followed by GCECD detection
Soil	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Soil	SubCon*	*	Contact Laboratory for details of the methodology used by the sub-contractor.
Soil	TMSS	As Received	Determination of the Total Moisture content at 105ºC by loss on oven drying gravimetric analysis (% based upon wet weight)
Soil	TPHFIDUS	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection.
Soil	TPHUSSI	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection including quantitation of Aromatic and Aliphatic fractions.
Soil	VOCHSAS	As Received	Determination of Volatile Organic Compounds (VOC) by Headspace GCMS
Soil	WSLM59	Oven Dried @ < 35°C	Determination of Organic Carbon in soil using sulphurous Acid digestion followed by high temperature combustion and IR detection
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	ISEF	As Received	Determination of Fluoride in water samples by Ion Selective Electrode (ISE)
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis
Water	SFAPI	As Received	Segmented flow analysis with colorimetric detection

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	WSLM13	As Received	Instrumental analysis using acid/persulphate digestion and non-dispersive IR detection
Water	WSLM2	As Received	Determination of the Electrical Conductivity (µS/cm) by electrical conductivity probe.
Water	WSLM27	As Received	Gravimetric Determination
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : ESG Wokingham

Site : Aylesbury Estate Plot 18

Report Number : S15_7295

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1567230	WS101 ES 1 0.1	MADE GROUND
CL/1567231	WS101 ES 14 2.6	SAND
CL/1567232	WS102 ES 1 0.2	MADE GROUND
CL/1567233	WS103A ES 1 0.1	MADE GROUND
CL/1567234	WS103A ES 3 0.5	MADE GROUND
CL/1567235	WS103A ES 11 2.3	SAND
CL/1567236	WS104 ES 1 0.2	MADE GROUND
CL/1567237	WS104 ES 3 0.7	MADE GROUND
CL/1567238	WS105 ES 1 0.5	MADE GROUND
CL/1567239	WS106 ES 1 0.5	MADE GROUND
CL/1567240	WS107 ES 1 0.4	MADE GROUND
CL/1567241	WS107 ES 3 0.8	MADE GROUND
CL/1567242	WS108 ES 3 0.4	MADE GROUND
CL/1567243	WS108 ES 5 0.8	SILT
CL/1567244	WS108 ES 8 1.5	SILT
CL/1567245	WS109 ES 1 0.1	MADE GROUND
CL/1567246	WS110 ES 3 0.5	MADE GROUND

Our Ref: EFS/157359 (Ver. 1)
Your Ref: D5501-15

November 3, 2015

Environmental Chemistry
ESG
Bretby Business Park
Ashby Road
Burton-on-Trent
Staffordshire
DE15 0YZ

Telephone: 01283 554400
Facsimile: 01283 554422

Ms H Dwane
ESG Geotechnical Division
Glossop House
Hogwood Lane
Finchamstead
Wokingham
RG40 4QW

For the attention of Ms H Dwane

Dear Ms Dwane

Sample Analysis - Aylesbury Estate Plot 18

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Where appropriate the samples will be kept until 09/12/15 when they will be discarded. Please call 01283 554467 for an extension of this date.
Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with Environmental Scientifics Group Ltd (Multi-Sector Services) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for ESG

L Thompson
Project Co-ordinator
01283 554467

TEST REPORT

1252

Report No. EFS/157359 (Ver. 1)

ESG Geotechnical Division
Glossop House
Hogwood Lane
Finchamstead
Wokingham
RG40 4QW

Site: Aylesbury Estate Plot 18

The 2 samples described in this report were registered for analysis by ESG on 28-Oct-2015. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 03-Nov-2015

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 4)
Table of PAH (MS-SIM) (80) Results (Pages 5 to 6)
Table of PCB Congener Results (Page 7)
Table of GRO Results (Page 8)
Table of TPH (Si) banding (std) (Page 9)
GC-FID Chromatograms (Pages 10 to 14)
Table of VOC (HSA) Results (Pages 15 to 16)
Table of WAC Analysis Results (Page 17)
Table of Asbestos Screening Results (Page 18)
Analytical and Deviating Sample Overview (Pages 19 to 20)
Table of Method Descriptions (Pages 21 to 22)
Table of Report Notes (Page 23)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of ESG :
Declan Burns

Managing Director
Multi-Sector Services

Date of Issue: 03-Nov-2015

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected. ESG accepts no responsibility for any sampling not carried out by our personnel.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l	pH Units	mg/kg		%	mg/kg
Method Codes :			GROHSA	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPWSS	PHSOIL	SFAPI	Sub002a	TMSS	TPHFIDUS
Method Reporting Limits :			0.2	0.3	0.1	0.5	0.5	0.5	0.1	0.5	0.5	3	10		0.5		0.2	10
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**GRO (AA) by HSA GC-FID**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**	**Selenium (MS)**	**Zinc (MS)**	**SO4-- (H2O sol) mg/l**	**pH units (AR)**	**Cyanide(Free) (AR)**	**^Asbestos Screen**	**Tot.Moisture @ 105C**	**TPH Band (>C10-C40)**
1567522	BH101 1.2		Req	13.3	<0.1	26.9	6.7	8.1	<0.1	22.6	<0.5	32.8	44	7.8	<0.5	NAIIS	11.9	15
1567523	BH101 0.7		Req	12.4	<0.1	23.1	9.7	12	<0.1	19.6	<0.5	30.1	104	8.0	<0.5	NAIIS		

ESG

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Client Name ESG Geotechnical Division

Contact Ms H Dwane

Aylesbury Estate Plot 18

Sample Analysis

Date Printed	**03-Nov-2015**
Report Number	**EFS/157359**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	µg/kg	% M/M	mg/kg	mg/kg	µg/kg	% M/M	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
Method Codes :			TPHFIDUS	TPHUSSI	VOCHSAS	FOCS	ICPMSS	KONECR	PCBUSECDAR	WSLM59	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	PAHMSUS
Method Reporting Limits :			10	20		0.04	0.6	0.1		0.04	10	10	10	30	20	20	10	
UKAS Accredited :			Yes	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**TPH by GCFID (AR)**	**TPH by GCFID (AR/Si)**	**VOC HSA-GCMS**	**S.O.M. % (Calc)**	**Vanadium (MS)**	**Chromium vi:**	**PCB-7 Congeners Analysis**	**Total Organic Carbon**	**Benzene**	**Toluene**	**Ethyl Benzene**	**Xylenes**	**MTBE**	**m/p Xylenes**	**o Xylene**	**PAH (16) by GCMS**
1567522	BH101 1.2		16	Req	Req	0.16	30.8	<0.1	Req	0.09	<10	<10	<10	<30	<20	<20	<10	
1567523	BH101 0.7			Req	Req	0.43	32.8	<0.1		0.25								Req

ESG

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Client Name	**ESG Geotechnical Division**
Contact	Ms H Dwane

Aylesbury Estate Plot 18

Sample Analysis

Date Printed	**03-Nov-2015**
Report Number	**EFS/157359**
Table Number	**1**

		Units :	mg/kg															
		Method Codes :	PAHMSUS															
		Method Reporting Limits :																
		UKAS Accredited :	Yes															
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**PAH (17) by GCMS**															
1567522	BH101 1.2		Req															
1567523	BH101 0.7																	

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Fax +44 (0) 1283 554422

Client Name	**ESG Geotechnical Division**
Contact	Ms H Dwane

Aylesbury Estate Plot 18

Sample Analysis

Date Printed	**03-Nov-2015**
Report Number	**EFS/157359**
Table Number	**1**

Where individual results are flagged see report notes for status.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Geotechnical Division: Aylesbury Estate Plot 18		
Sample Details:	BH101 1.2	**Job Number:**	S15_7359
LIMS ID Number:	CL1567522	**Date Booked in:**	28-Oct-15
QC Batch Number:	151112	**Date Extracted:**	30-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAHMS20\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	5.75	0.17	98
Anthracene	120-12-7	-	< 0.08	-
Fluoranthene	206-44-0	7.10	0.32	97
Pyrene	129-00-0	7.39	0.23	87
Benzo[a]anthracene	56-55-3	9.08	0.14	96
Chrysene	218-01-9	9.13	0.15	97
Benzo[b]fluoranthene	205-99-2	10.61	0.18	81
Benzo[k]fluoranthene	207-08-9	-	< 0.08	-
Benzo[a]pyrene	50-32-8	11.04	0.11	99
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.08	-
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	-	< 0.08	-
Coronene	191-07-1 *	-	< 0.08	-
Total (USEPA16) PAHs	-	-	< 2.02	-

* Denotes compound is not UKAS accredited

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	104
Acenaphthene-d10	104
Phenanthrene-d10	99
Chrysene-d12	88
Perylene-d12	78

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	103
Terphenyl-d14	76

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Geotechnical Division: Aylesbury Estate Plot 18		
Sample Details:	BH101 0.7	**Job Number:**	S15_7359
LIMS ID Number:	CL1567523	**Date Booked in:**	28-Oct-15
QC Batch Number:	151112	**Date Extracted:**	30-Oct-15
Quantitation File:	Initial Calibration	**Date Analysed:**	30-Oct-15
Directory:	2915PAHMS20\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit
Naphthalene	91-20-3	-	< 0.08	-
Acenaphthylene	208-96-8	-	< 0.08	-
Acenaphthene	83-32-9	-	< 0.08	-
Fluorene	86-73-7	-	< 0.08	-
Phenanthrene	85-01-8	-	< 0.08	-
Anthracene	120-12-7	-	< 0.08	-
Fluoranthene	206-44-0	7.10	0.14	92
Pyrene	129-00-0	7.39	0.10	95
Benzo[a]anthracene	56-55-3	-	< 0.08	-
Chrysene	218-01-9	-	< 0.08	-
Benzo[b]fluoranthene	205-99-2	10.61	0.08	86
Benzo[k]fluoranthene	207-08-9	-	< 0.08	-
Benzo[a]pyrene	50-32-8	-	< 0.08	-
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.08	-
Dibenzo[a,h]anthracene	53-70-3	-	< 0.08	-
Benzo[g,h,i]perylene	191-24-2	-	< 0.08	-
Coronene	191-07-1 *	-	< 0.08	-
Total (USEPA16) PAHs	-	-	< 1.36	-

* Denotes compound is not UKAS accredited

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	113
Acenaphthene-d10	114
Phenanthrene-d10	114
Chrysene-d12	104
Perylene-d12	92

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	103
Terphenyl-d14	77

Concentrations are reported on a wet weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Polychlorinated Biphenyls (congeners)

Customer and Site Details:	ESG Geotechnical Division: Aylesbury Estate Plot 18	**Matrix:**	SOIL
Job Number:	S15_7359	**Date Booked in:**	28-Oct-15
QC Batch Number:	151112	**Date Extracted:**	30-Oct-15
Directory:	1030PCB.GC8	**Date Analysed:**	02-Nov-15
Method:	Ultrasonic		

*** This sample data is not UKAS accredited.**

			Concentration, (µg/kg)						
	Sample ID	**Customer ID**	**PCB28**	**PCB52**	**PCB101**	**PCB118**	**PCB153**	**PCB138**	**PCB180**
*	CL1567522	BH101 1.2	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

Where individual results are flagged see report notes for status.

Gasoline Range Organics
(BTEX and Aliphatic Carbon Ranges)

Customer and Site Details: ESG Geotechnical Division : Aylesbury Estate Plot 18
Job Number: S15_7359
Directory: C:\CHEM32\1\DATA\1030HSA_GC12\103015 2015-10-30 11-18-46\055F5501.D
Method: Headspace GCFID

Matrix: Soil
Date Booked in: 28-Oct-15
Date extracted: 30-Oct-15
Date Analysed: 31-Oct-15, 04:4

*** Sample data with an asterisk are not UKAS accredited.**

		Concentration, (mg/kg) - as wet weight					Aliphatics				
Sample ID	**Client ID**	**Benzene**	**Toluene**	**Ethyl benzene**	**m/p-Xylene**	**o-Xylene**	**C5 - C6**	**>C6 - C7**	**>C7 - C8**	**>C8 - C10**	**Total GRO**
CL1567522	BH101 1.2	<0.010	<0.010	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2
CL1567523	BH101 0.7	<0.010	<0.010	<0.010	<0.010	<0.010	<0.2	<0.2	<0.2	<0.2	<0.2

Where individual results are flagged see report notes for status.

ALIPHATIC / AROMATIC FRACTION BY GC/FID

Customer and Site Details: ESG Geotechnical Division : Aylesbury Estate Plot 18
Job Number: S15_7359
QC Batch Number: 151112
Directory: D:\TES\DATA\Y2015\103015TPH_GC17\103015 2015-10-30 10-04-56\068B5901.D
Method: Ultra Sonic

Separation: Silica gel
Eluents: Hexane, DCM

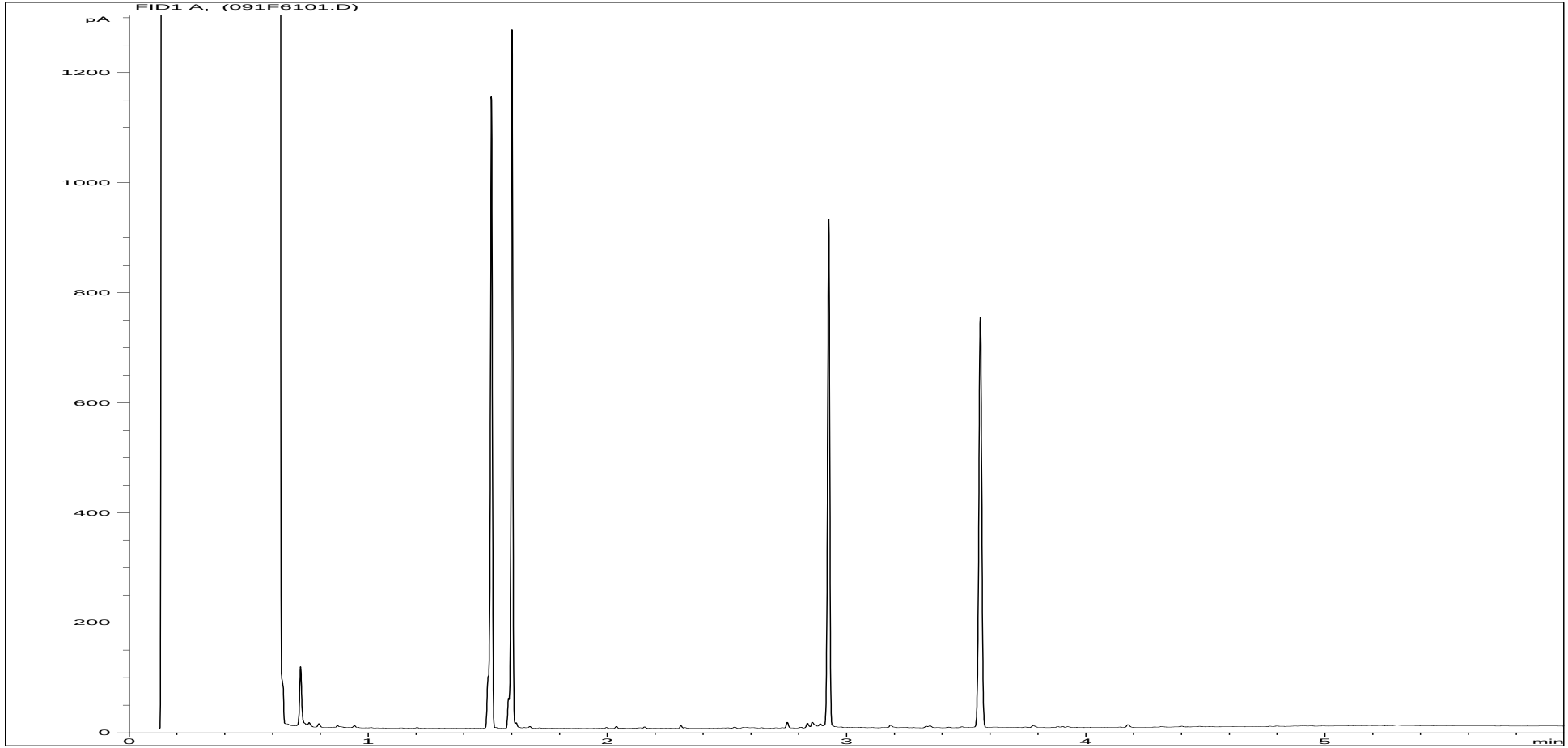
Matrix: Soil
Date Booked ir 28-Oct-15
Date Extracted 30-Oct-15
Date Analysed 31-Oct-15, 04:18:07

*** This sample data is not UKAS accredited.**

		Concentration, (mg/kg) - as wet weight											
		>C8 - C10		>C10 - C12		>C12 - C16		>C16 - C21		>C21 - C35		>C8 - C40	
Sample ID	**Client ID**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**
CL1567522	BH101 1.2	<4	<4	<4	<4	<4	<4	<4	<4	<8.76	<8.76	<20	<20
CL1567523	BH101 0.7	<4	<4	<4	<4	<4	<4	<4	<4	13.7	<8.76	<20	<20

Where individual results are flagged see report notes for status.

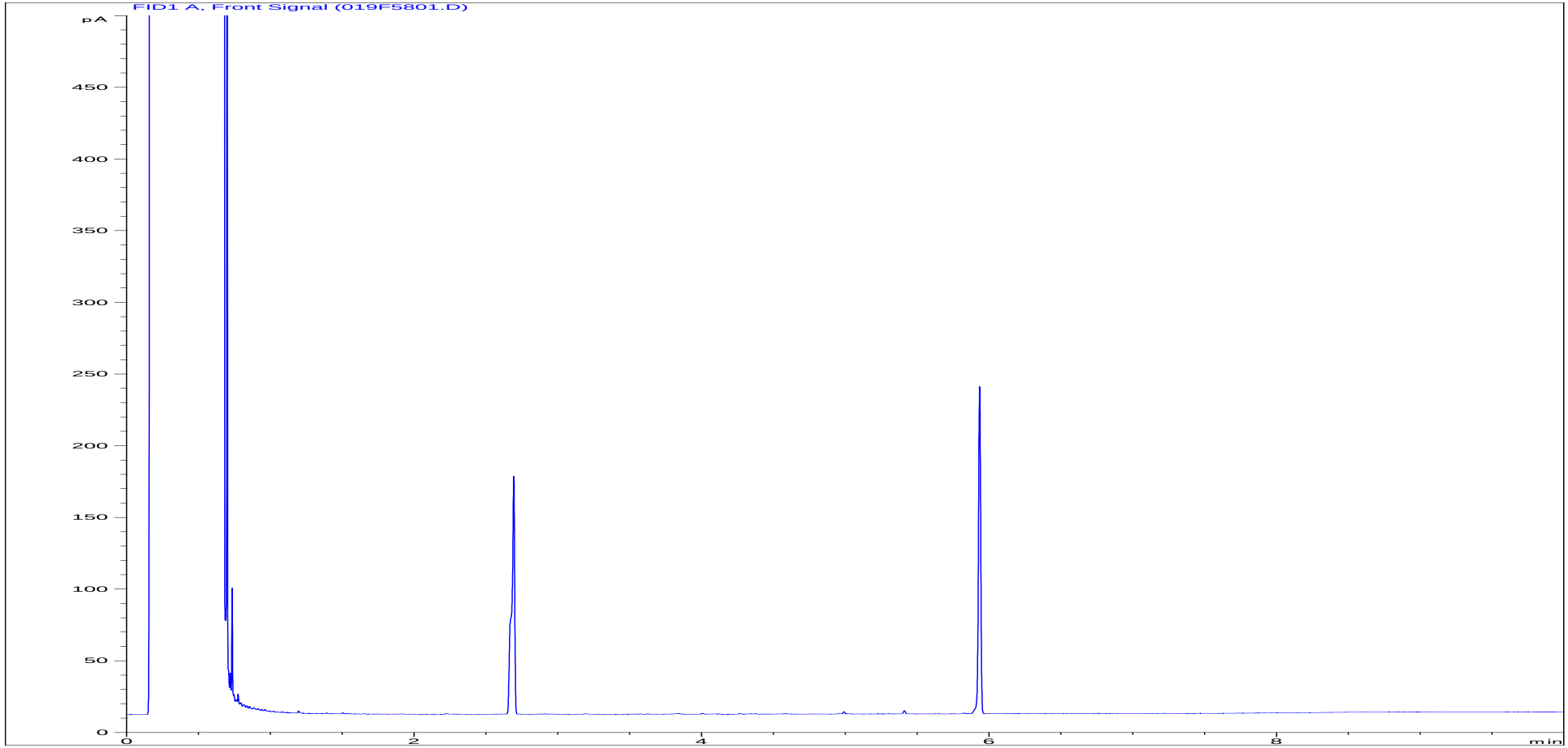
Petroleum Hydrocarbons (C8 to C40) by GC/FID



Sample ID:	CL1567522	**Job Number:**	S15_7359
Multiplier:	8	**Client:**	ESG Geotechnical Division
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	5UL_RUNF.M	**Client Sample Ref:**	BH101 1.2
Acquisition Date/Time:	02-Nov-15, 07:23:04		
Datafile:	D:\TES\DATA\Y2015\110115TPH_GC4\110115 2015-11-01 18-21-09\091F6101.D		

Where individual results are flagged see report notes for status.

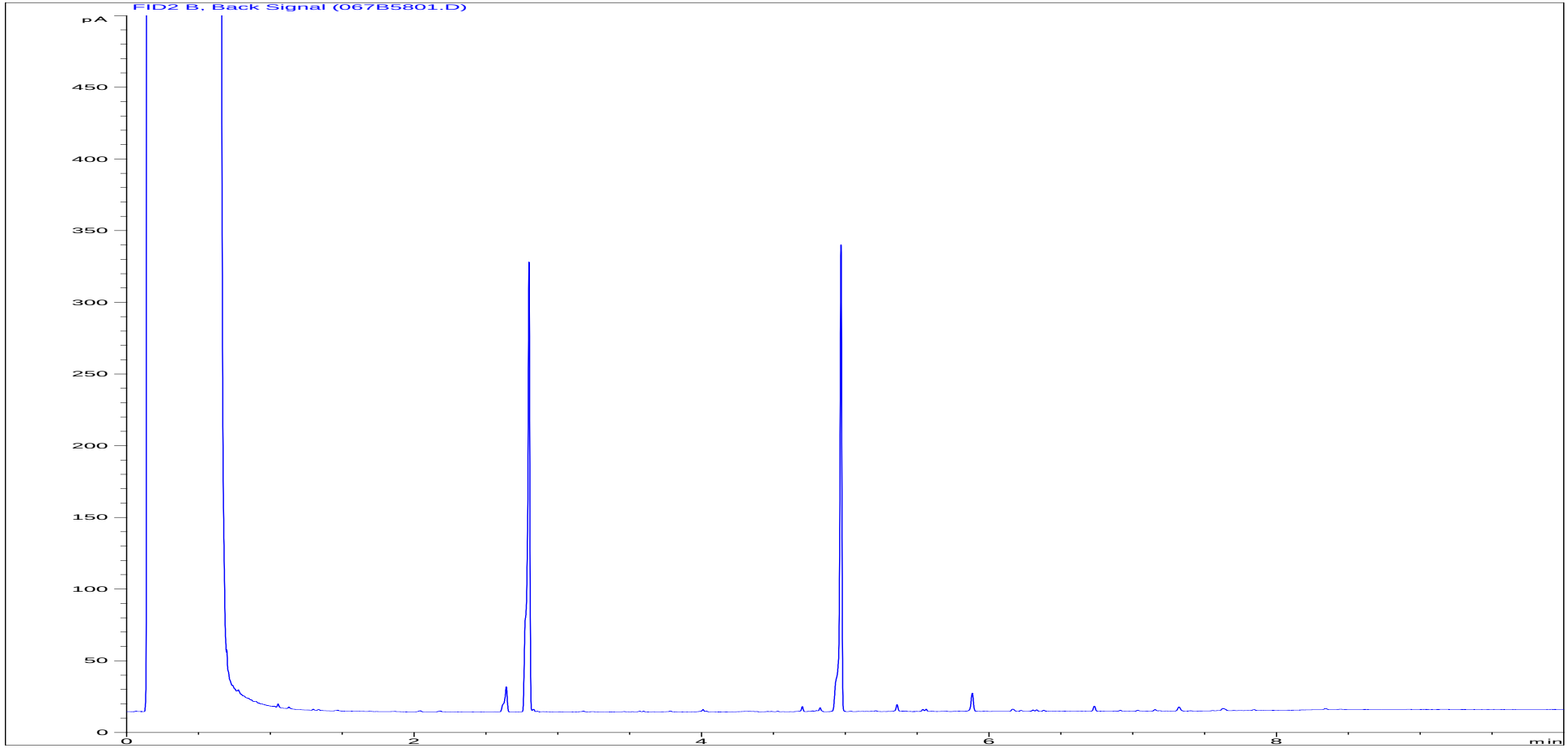
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567522ALI	**Job Number:**	S15_7359
Multiplier:	15.36	**Client:**	ESG Geotechnical Division
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	TPH_RUNF.M	**Client Sample Ref:**	BH101 1.2
Acquisition Date/Time:	31-Oct-15, 03:59:27		
Datafile:	D:\TES\DATA\Y2015\103015TPH_GC17\103015 2015-10-30 10-04-56\019F5801.D		

Where individual results are flagged see report notes for status.

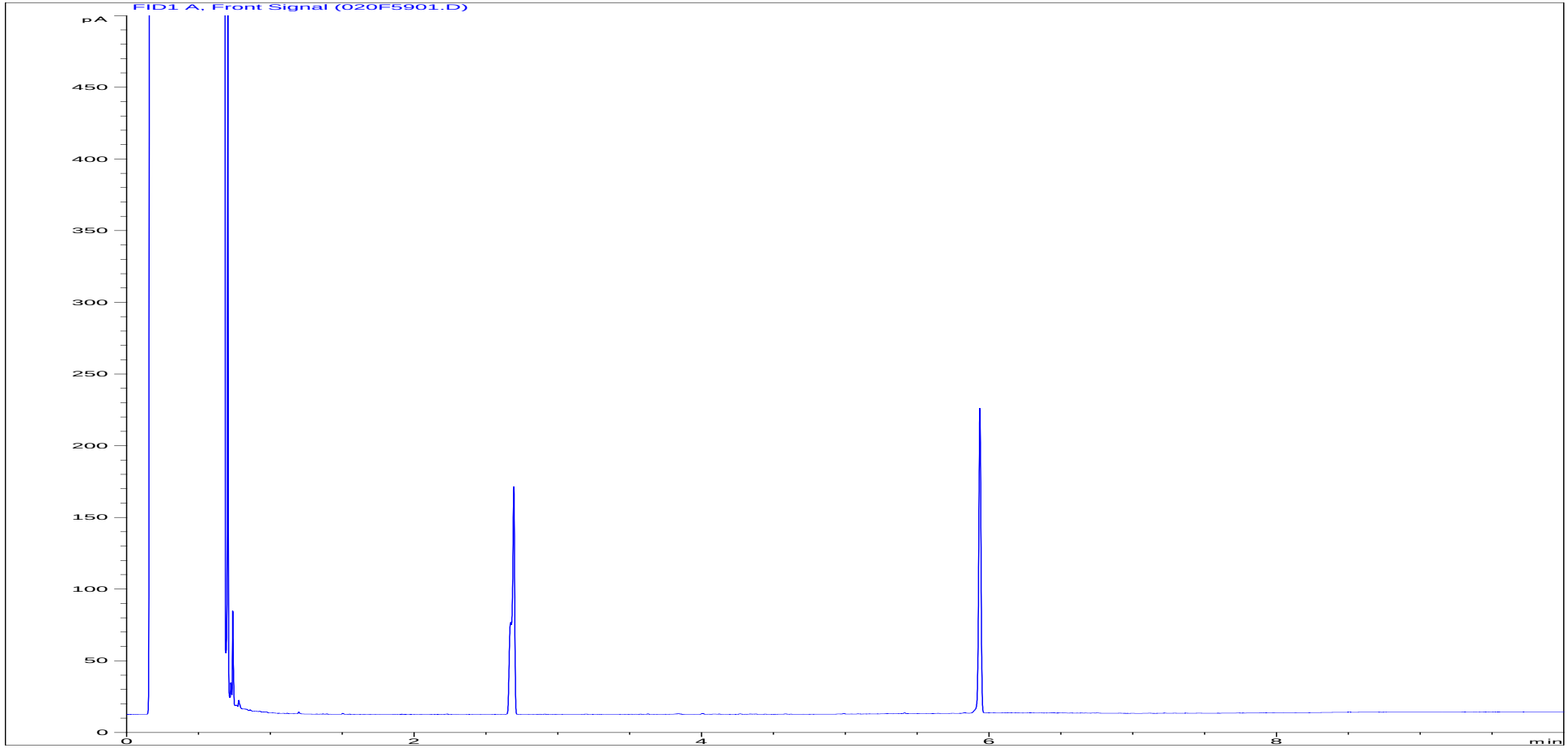
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567522ARO	**Job Number:**	S15_7359
Multiplier:	11.52	**Client:**	ESG Geotechnical Division
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	TPH_RUNF.M	**Client Sample Ref:**	BH101 1.2
Acquisition Date/Time:	31-Oct-15, 03:59:27		
Datafile:	D:\TES\DATA\Y2015\103015TPH_GC17\103015 2015-10-30 10-04-56\067B5801.D		

Where individual results are flagged see report notes for status.

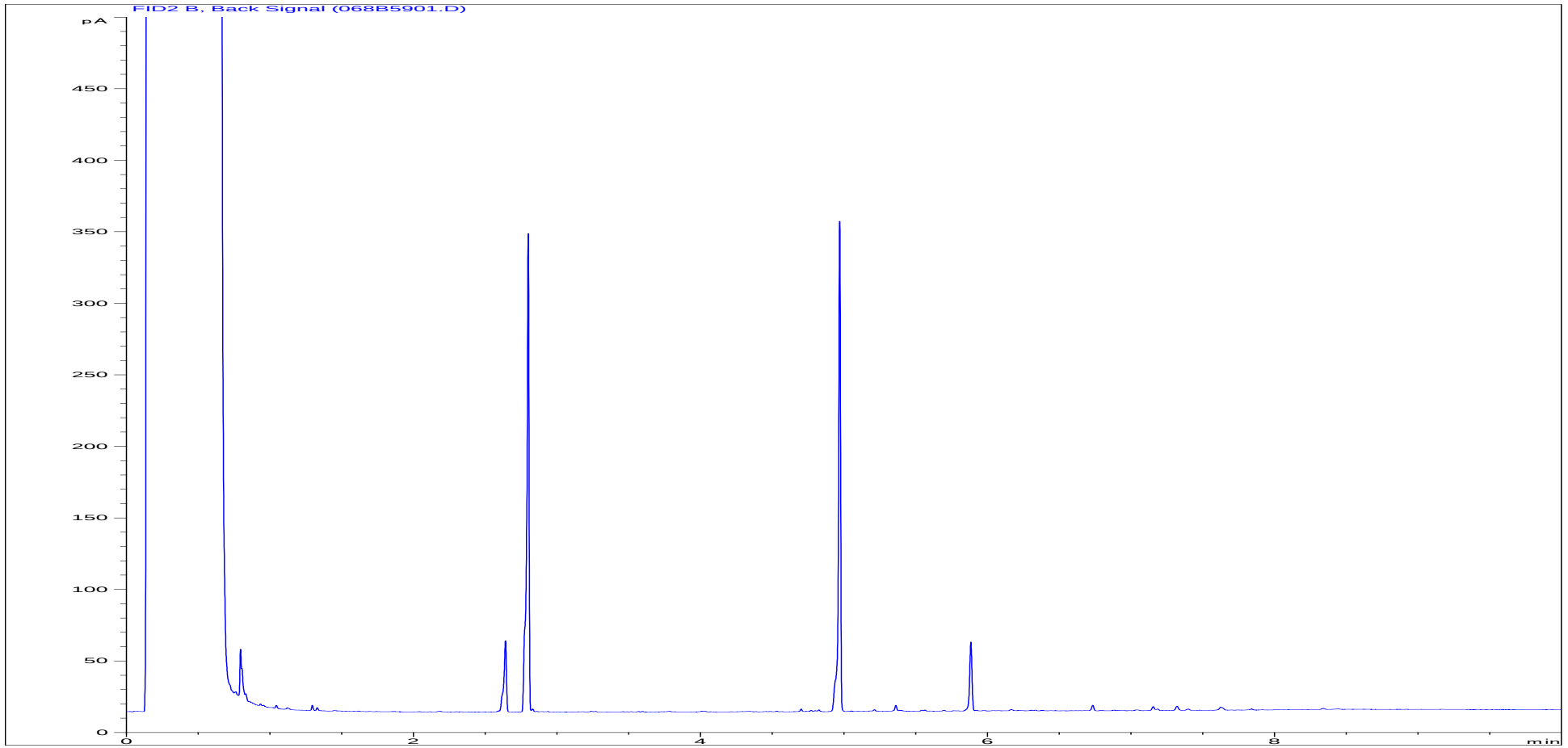
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	CL1567523ALI	**Job Number:**	S15_7359
Multiplier:	15.36	**Client:**	ESG Geotechnical Division
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	TPH_RUNF.M	**Client Sample Ref:**	BH101 0.7
Acquisition Date/Time:	31-Oct-15, 04:18:07		
Datafile:	D:\TES\DATA\Y2015\103015TPH_GC17\103015 2015-10-30 10-04-56\020F5901.D		

Where individual results are flagged see report notes for status.

Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	CL1567523ARO	**Job Number:**	S15_7359
Multiplier:	11.68	**Client:**	ESG Geotechnical Division
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	TPH_RUNF.M	**Client Sample Ref:**	BH101 0.7
Acquisition Date/Time:	31-Oct-15, 04:18:07		
Datafile:	D:\TES\DATA\Y2015\103015TPH_GC17\103015 2015-10-30 10-04-56\068B5901.D		

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Geotechnical Division: Aylesbury Estate Plot 18	**Directory/Quant file:**	030VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	BH101 1.2	**Date Booked in:**	28-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567522	**Date Analysed:**	30-Oct-15	**Multiplier:**	1.05
Job Number:	S15_7359	**Operator:**	PR	**Position:**	11

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	-	< 5	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %
Pentafluorobenzene	4.01	84
1,4-Difluorobenzene	4.35	84
Chlorobenzene-d5	5.46	84
Bromofluorobenzene	5.86	86
1,4-Dichlorobenzene-d4	6.26	85
Naphthalene-d8	7.09	90

Surrogates	% Rec
Dibromofluoromethane	107
Toluene-d8	100

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for details

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	ESG Geotechnical Division: Aylesbury Estate Plot 18	**Directory/Quant file:**	030VOC.MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	BH101 0.7	**Date Booked in:**	28-Oct-15	**Method:**	Headspace
LIMS ID Number:	CL1567523	**Date Analysed:**	30-Oct-15	**Multiplier:**	0.96
Job Number:	S15_7359	**Operator:**	PR	**Position:**	12

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-48 *	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 **	-	< 1	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	-	< 5	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %
Pentafluorobenzene	4.01	99
1,4-Difluorobenzene	4.35	102
Chlorobenzene-d5	5.46	99
Bromofluorobenzene	5.86	95
1,4-Dichlorobenzene-d4	6.26	92
Naphthalene-d8	7.09	91

Surrogates	% Rec
Dibromofluoromethane	107
Toluene-d8	98

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for details

WASTE ACCEPTANCE CRITERIA TESTING

Client	ESG Geotechnical Division				**Leaching Data**	
					Weight of sample (kg)	0.250
Contact	Ms H Dwane				Moisture content @ 105°C (% of Wet Weight)	11.9
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	Aylesbury Estate Plot 18				Volume of water required to carry out 2:1 stage (litres)	0.425
					Fraction of sample above 4 mm %	43.800
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
BH101 1.2		s15_7359	CL/1567522	03-Nov-15	Volume to undertake analysis (2:1 Stage) (litres)	0.300
					Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	0.09	3	5	6
	LOI450	Loss on Ignition (%)				10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.06	6		
N	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.035	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	17	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<2.4	100		
U	PHSOIL	pH (pH units)	7.8		>6	
	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except °°		mg/kg (dry weight)				
U	WSLM3	pH (pH units) °°	7.9	8.2	Calculated data not UKAS Accredited				
U	WSLM2	Conductivity (µs/cm) °°	362	129					
U	ICPMSW	Arsenic	0.001	0.002	0.002	0.02	0.5	2	25
U	ICPWATVAR	Barium	0.04	0.04	0.08	0.4	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.001	<0.002	<0.01	0.5	10	70
U	ICPMSW	Copper	0.002	0.003	0.004	0.03	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.016	0.003	0.032	0.05	0.5	10	30
U	ICPMSW	Nickel	0.001	<0.001	0.002	<0.01	0.4	10	40
U	ICPMSW	Lead	0.009	0.021	0.018	0.19	0.5	10	50
U	ICPMSW	Antimony	0.002	0.001	0.004	0.01	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	<0.001	<0.002	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.003	0.003	0.006	0.03	4	50	200
U	KONENS	Chloride	13	3	26	43	800	15000	25000
U	ISEF	Fluoride	1.9	0.6	3.8	8	10	150	500
U	ICPWATVAR	Sulphate as SO4	126	14	252	289	1000	20000	50000
N	WSLM27	Total Dissolved Solids	282	100	564	1243	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	7.6	3.2	15.2	38	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

Where individual results are flagged see report notes for status.

ASBESTOS ANALYSIS RESULTS - SOIL ANALYSIS

ESG Asbestos Limited Certificate of Analysis for Asbestos in Soils

UKAS TESTING 1089

Detection limit of Method SCI-ASB-020 is 0.001%

Sampling has been carried out by a third party

Client:	ESG Environmental Chemistry	**Page 1 of 1**	
Address:	Etwall House, Bretby Business Park, Ashby Road, Burton upon Trent	**Report No:**	**ANO-0488-11322**
For the attention of:	ESG Geotechnical Division	**Report Date:**	**29/10/2015**
Site Address:	Aylesbury Estate Plot 18	**Project Number:**	**S157359**

Sample Number	Sample Date	Sample Location	Test Date	Total Sample Dry Weight (g)	Weight of <2mm Fraction (g)	Asbestos(g) in >8mm+>2mm	Asbestos(g) in <2mm	% Asbestos by weight of Total Dried Sample	Asbestos Fibre Types Identified
CL/1567522		BH101 1.2	29/10/2015					Screen Only	NAIIS
CL/1567523		BH101 0.7	29/10/2015					Screen Only	NAIIS

Keys

NAACR = Not Analysed at Clients Request

*** visible to naked eye**

NAIIS = No Asbestos Identified in Sample (Screens Only)

NADIS = No Asbestos Detected in Sample (ID & Quant Only)

Name:	Stacey Innes	Authorised Signatory:
Position:	Lab Analyst	

The sample analysis for the above results was carried out using the procedures detailed in ESG Asbestos Limited in house method (SCI-ASB-020) based on HSE document MDHS 90 - Asbestos Contaminated Land - Draft 5 - November 1997 (withdrawn). Fibre identification was carried out using ESG Asbestos Limited in house method of transmitted/polarised light microscopy and centre stop dispersion staining (SCI-ASB-007), based on HSE's HSG 248. The analysis of fine fraction for asbestos content only includes fibres and does not discriminate non-asbestos fibres. All fibres are assumed, unless specified, to be amphiboles. All tests were carried out at ESG Asbestos Laboratory, Ashbourne House, Bretby Business Park, Ashby Road, Burton-upon-Trent, Staffordshire. DE15 0XD, UKAS Laboratory Number 1089.

Analytical and Deviating Sample Overview

Customer **ESG Geotechnical Division**
Site **Aylesbury Estate Plot 18**
Report No **S157359**

Consignment No S51478
Date Logged 28-Oct-2015

Report Due 04-Nov-2015

ID Number	Description	MethodID	BTEXHSA		CEN Leachate		CustServ	FOCS	GROHSA	ICPMSS										ICPWSS	KONECR	PAHMSUS		PCBUSECDAR	PHSOIL	SFAPI	Sub002a
		Sampled	BTEX-HSA + MTBE analysis	MTBE (µg/kg)	CEN Leac(P)1	CEN Leac(P)2	REPORT A	S.O.M. % (Calc)	GRO (AA) by HSA GC-FID	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Vanadium (MS)	Zinc (MS)	SO4-- (H2O sol) mg/l	Chromium vi:	PAH (16) by GCMS	PAH (17) by GCMS	PCB-7 Congeners Analysis	pH units (AR)	Cyanide(Free) (AR)	^Asbestos Screen
			✓						✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓		✓	✓	✓
CL/1567522	BH101 1.2	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D		D	D	D	D	D
CL/1567523	BH101 0.7	D					D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D			D	D	D

Note: For analysis where the scheduled turnaround is greater than the holding time we will do our utmost to prioritise these samples. However, it is possible that samples could become deviant whilst being processed in the laboratory.

In this instance please contact the laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

Deviating Sample Key

A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key

	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status

Analytical and Deviating Sample Overview

Customer **ESG Geotechnical Division**
Site **Aylesbury Estate Plot 18**
Report No **S157359**

Consignment No S51478
Date Logged 28-Oct-2015

Report Due 04-Nov-2015

ID Number	Description	Sampled	MethodID	TMSS	TPHFIDUS		TPHUSSI	VOCHSAS	WSLM59
				Tot.Moisture @ 105C	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH by GCFID (AR/Si)	VOC HSA-GCMS	Total Organic Carbon
				✓	✓	✓	✓	✓	
CL/1567522	BH101 1.2	D		D	D	D	D	D	D
CL/1567523	BH101 0.7	D					D	D	D

Note: For analysis where the scheduled turnaround is greater than the holding time we will do our utmost to prioritise these samples. However, it is possible that samples could become deviant whilst being processed in the laboratory.

In this instance please contact the laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	BTEXHSA	As Received	Determination of Benzene, Toluene, Ethyl benzene and Xylenes (BTEX) by Headspace GCFID
Soil	FOCS	Oven Dried @ < 35°C	Calculation of Soil Organic Matter content from Organic Carbon content of soil samples
Soil	GROHSA	As Received	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) by Headspace GCFID
Soil	ICPMSS	Oven Dried @ < 35°C	Determination of Metals in soil samples by aqua regia digestion followed by ICPMS
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	KONECR	Oven Dried @ < 35°C	Determination of Chromium vi in soil samples by water extraction followed by colorimetric detection
Soil	PAHMSUS	As Received	Determination of Polycyclic Aromatic Hydrocarbons (PAH) by hexane/acetone extraction followed by GCMS detection
Soil	PCBUSECDAR	As Received	Determination of Polychlorinated Biphenyl (PCB) congeners/aroclors by hexane/acetone extraction followed by GCECD detection
Soil	PHSOIL	As Received	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.
Soil	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Soil	SubCon*	*	Contact Laboratory for details of the methodology used by the sub-contractor.
Soil	TMSS	As Received	Determination of the Total Moisture content at 105ºC by loss on oven drying gravimetric analysis (% based upon wet weight)
Soil	TPHFIDUS	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection.
Soil	TPHUSSI	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection including quantitation of Aromatic and Aliphatic fractions.
Soil	VOCHSAS	As Received	Determination of Volatile Organic Compounds (VOC) by Headspace GCMS
Soil	WSLM59	Oven Dried @ < 35°C	Determination of Organic Carbon in soil using sulphurous Acid digestion followed by high temperature combustion and IR detection
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	ISEF	As Received	Determination of Fluoride in water samples by Ion Selective Electrode (ISE)

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis
Water	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Water	WSLM13	As Received	Instrumental analysis using acid/persulphate digestion and non-dispersive IR detection
Water	WSLM2	As Received	Determination of the Electrical Conductivity (µS/cm) by electrical conductivity probe.
Water	WSLM27	As Received	Gravimetric Determination
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : ESG Geotechnical Division

Site : Aylesbury Estate Plot 18

Report Number : S15_7359

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1567522	BH101 1.2	Brown Stone SAND
CL/1567523	BH101 0.7	SILT

Our Ref: EXR/208612 (Ver. 1)
Your Ref: D5501-15

November 9, 2015

Environmental Chemistry
ESG
Bretby Business Park
Ashby Road
Burton-on-Trent
Staffordshire
DE15 0YZ

Telephone: 01283 554400
Facsimile: 01283 554422

Ms H Dwane
ESG Wokingham
Glossop House
Hogwood Lane
Wokingham
Berkshire
RG40 4QW

For the attention of Ms H Dwane

Dear Ms Dwane

Sample Analysis - Aylesbury Estate Plot 18

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with Environmental Scientifics Group Ltd (Multi-Sector Services) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for ESG

L Thompson
Project Co-ordinator
01283 554467

TEST REPORT

1252

Report No. EXR/208612 (Ver. 1)

ESG Wokingham
Glossop House
Hogwood Lane
Wokingham
Berkshire
RG40 4QW

Site: Aylesbury Estate Plot 18

The 1 sample described in this report were registered for analysis by ESG on 02-Nov-2015. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 09-Nov-2015

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 3)
Table of PAH (MS-SIM) (10) Results (Page 4)
Table of SVOC Results (Page 5)
Table of GRO Results (Page 6)
Table of TPH (Si) banding (0.01) (Page 7)
GC-FID Chromatograms (Pages 8 to 9)
Analytical and Deviating Sample Overview (Pages 10 to 11)
Table of Method Descriptions (Page 12)
Table of Report Notes (Page 13)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
ESG :
Declan Burns

Managing Director
Multi-Sector Services

Date of Issue: 09-Nov-2015

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected. ESG accepts no responsibility for any sampling not carried out by our personnel.

Units :			pH units	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Method Codes :			WSLM3	ICPWATVAR	ICPWATVAR	ICPMSW	ICPMSW	ICPMSW	PAHMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPWATVAR	ICPMSW	ICPMSW	ICPMSW	SFAPI
Method Reporting Limits :				3	0.01	0.001	0.001	0.0001		0.001	0.001	0.002	0.001	0.01	0.0001	0.001	0.001	0.02
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**pH units w**	**Total Sulphur as SO4 (Dissolved) a**	**Barium as Ba (Dissolved) a**	**Nickel as Ni (Dissolved)**	**Chromium as Cr (Dissolved)**	**Cadmium as Cd (Dissolved)**	**PAH GC-MS (16) o**	**Copper as Cu (Dissolved)**	**Lead as Pb (Dissolved)**	**Zinc as Zn (Dissolved)**	**Arsenic as As (Dissolved)**	**Boron as B (Dissolved) a**	**Mercury as Hg (Dissolved)**	**Selenium as Se (Dissolved)**	**Vanadium as V (Dissolved)**	**Cyanide (Total) as CN**
1635851	BH101 EW 291015	**29-Oct-15**	7.6	28	0.02	0.014	<0.001	<0.0001	Req	<0.001	<0.001	0.007	0.003	<0.01	<0.0001	0.005	0.002	<0.02

Bretby Business Park, Ashby Road

Burton-on-Trent, Staffordshire, DE15 0YZ

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Client Name ESG Wokingham

Contact Ms H Dwane

Aylesbury Estate Plot 18

Sample Analysis

Date Printed	**09-Nov-2015**
Report Number	**EXR/208612**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/l	mg/l	mg/l	mg/l												
Method Codes :			TPHFID-Si	ICPWATVAR	GROHSA	SVOCSW												
Method Reporting Limits :			0.01	0.01	0.1	0.002												
UKAS Accredited :			Yes	No	No	No												
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**TPH by GC(Si) o**	**Beryllium as Be (Dissolved) a**	**GRO-HSA (AA)**	**Semi Volatile Organic Compounds**												
1635851	BH101 EW 291015	**29-Oct-15**	Req	<0.01	Req	Req												

ESG

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Client Name	**ESG Wokingham**
Contact	Ms H Dwane

Aylesbury Estate Plot 18

Sample Analysis

Date Printed	**09-Nov-2015**
Report Number	**EXR/208612**
Table Number	**1**

Where individual results are flagged see report notes for status.

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18		
Sample Details:	BH101 EW 291015	**Job Number:**	W20_8612
LIMS ID Number:	EX1635851	**Date Booked in:**	02-Nov-15
QC Batch Number:	150739	**Date Extracted:**	05-Nov-15
Quantitation File:	Initial Calibration	**Date Analysed:**	06-Nov-15
Directory:	15AMS17.PAH\	**Matrix:**	Water
Dilution:	1.0	**Ext Method:**	Bottle

UKAS accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration ug/l	% Fit
Naphthalene	91-20-3	3.14	0.029	86
Acenaphthylene	208-96-8	-	< 0.010	-
Acenaphthene	83-32-9	4.30	0.014	52
Fluorene	86-73-7	-	< 0.010	-
Phenanthrene	85-01-8	-	< 0.010	-
Anthracene	120-12-7	-	< 0.010	-
Fluoranthene	206-44-0	-	< 0.010	-
Pyrene	129-00-0	-	< 0.010	-
Benzo[a]anthracene	56-55-3	-	< 0.010	-
Chrysene	218-01-9	-	< 0.010	-
Benzo[b]fluoranthene	205-99-2	-	< 0.010	-
Benzo[k]fluoranthene	207-08-9	-	< 0.010	-
Benzo[a]pyrene	50-32-8	-	< 0.010	-
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.010	-
Dibenzo[a,h]anthracene	53-70-3	-	< 0.010	-
Benzo[g,h,i]perylene	191-24-2	-	< 0.010	-
Total (USEPA16) PAHs	-	-	< 0.183	-

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	101
Acenaphthene-d10	100
Phenanthrene-d10	98
Chrysene-d12	85
Perylene-d12	81

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	70
Terphenyl-d14	58

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Semi-Volatile Organic Compounds

UKAS accredited?: No

Customer and Site Details:	ESG Wokingham: Aylesbury Estate Plot 18			**Matrix:**	Water	**QC Batch Number:**	238
Sample Details:	BH101 EW 291015	**Date Booked in:**	02-Nov-15	**Ext Method:**	Sep. Funnel	**Multiplier:**	0.005
LIMS ID Number:	EX1635851	**Date Extracted:**	05-Nov-15	**Operator:**	JO	**Dilution Factor:**	1
Job Number:	W20_8612	**Date Analysed:**	05-Nov-15	**Directory/Quant File:**	15SVOC.MS16\	**GPC (Y/N)**	N

Target Compounds	CAS #	R.T. (min)	Concentration mg/l	% Fit
Phenol	108-95-2	-	< 0.020	-
bis(2-Chloroethyl)ether	111-44-4	-	< 0.005	-
2-Chlorophenol	95-57-8	-	< 0.020	-
1,3-Dichlorobenzene	541-73-1	-	< 0.005	-
1,4-Dichlorobenzene	106-46-7	-	< 0.005	-
Benzyl alcohol	100-51-6	-	< 0.005	-
1,2-Dichlorobenzene	95-50-1	-	< 0.005	-
2-Methylphenol	95-48-7	-	< 0.005	-
bis(2-Chloroisopropyl)ether	108-60-1	-	< 0.005	-
Hexachloroethane	67-72-1	-	< 0.005	-
N-Nitroso-di-n-propylamine	621-64-7	-	< 0.005	-
3- & 4-Methylphenol	108-39-4/106-44-5	-	< 0.020	-
Nitrobenzene	98-95-3	-	< 0.005	-
Isophorone	78-59-1	-	< 0.005	-
2-Nitrophenol	88-75-5	-	< 0.020	-
2,4-Dimethylphenol	105-67-9	-	< 0.020	-
Benzoic Acid	65-85-0	-	< 0.100	-
bis(2-Chloroethoxy)methane	111-91-1	-	< 0.005	-
2,4-Dichlorophenol	120-83-2	-	< 0.020	-
1,2,4-Trichlorobenzene	120-82-1	-	< 0.005	-
Naphthalene	91-20-3	-	< 0.002	-
4-Chlorophenol	106-48-9	-	< 0.020	-
4-Chloroaniline	106-47-8	-	< 0.005	-
Hexachlorobutadiene	87-68-3	-	< 0.005	-
4-Chloro-3-methylphenol	59-50-7	-	< 0.005	-
2-Methylnaphthalene	91-57-6	-	< 0.002	-
1-Methylnaphthalene	90-12-0	-	< 0.002	-
Hexachlorocyclopentadiene	77-47-4	-	< 0.005	-
2,4,6-Trichlorophenol	88-06-2	-	< 0.020	-
2,4,5-Trichlorophenol	95-95-4	-	< 0.020	-
2-Chloronaphthalene	91-58-7	-	< 0.002	-
Biphenyl	92-52-4	-	< 0.002	-
Diphenyl ether	101-84-8	-	< 0.002	-
2-Nitroaniline	88-74-4	-	< 0.005	-
Acenaphthylene	208-96-8	-	< 0.002	-
Dimethylphthalate	131-11-3	-	< 0.005	-
2,6-Dinitrotoluene	606-20-2	-	< 0.005	-
Acenaphthene	83-32-9	-	< 0.002	-
3-Nitroaniline	99-09-2	-	< 0.005	-

Target Compounds	CAS #	R.T.	Concentration mg/l	% Fit
2,4-Dinitrophenol	51-28-5	-	< 0.010	-
Dibenzofuran	132-64-9	-	< 0.005	-
4-Nitrophenol	100-02-7	-	< 0.050	-
2,4-Dinitrotoluene	121-14-2	-	< 0.005	-
Fluorene	86-73-7	-	< 0.002	-
Diethylphthalate	84-66-2	-	< 0.005	-
4-Chlorophenyl-phenylether	7005-72-3	-	< 0.005	-
4,6-Dinitro-2-methylphenol	534-52-1	-	< 0.050	-
4-Nitroaniline	100-01-6	-	< 0.005	-
N-Nitrosodiphenylamine	86-30-6	-	< 0.005	-
4-Bromophenyl-phenylether	101-55-3	-	< 0.005	-
Hexachlorobenzene	118-74-1	-	< 0.005	-
Pentachlorophenol	87-86-5	-	< 0.050	-
Phenanthrene	85-01-8	-	< 0.002	-
Anthracene	120-12-7	-	< 0.002	-
Di-n-butylphthalate	84-74-2	-	< 0.005	-
Fluoranthene	206-44-0	-	< 0.002	-
Pyrene	129-00-0	-	< 0.002	-
Butylbenzylphthalate	85-68-7	-	< 0.005	-
Benzo[a]anthracene	56-55-3	-	< 0.002	-
Chrysene	218-01-9	-	< 0.002	-
3,3'-Dichlorobenzidine	91-94-1	-	< 0.020	-
bis(2-Ethylhexyl)phthalate	117-81-7	-	< 0.005	-
Di-n-octylphthalate	117-84-0	-	< 0.002	-
Benzo[b]fluoranthene	205-99-2	-	< 0.002	-
Benzo[k]fluoranthene	207-08-9	-	< 0.002	-
Benzo[a]pyrene	50-32-8	-	< 0.002	-
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.002	-
Dibenzo[a,h]anthracene	53-70-3	-	< 0.002	-
Benzo[g,h,i]perylene	191-24-2	-	< 0.002	-
Coronene	191-07-1	-	< 0.050	-

Internal Standards	% Area
1,4-Dichlorobenzene-d4	81
Naphthalene-d8	83
Acenaphthene-d10	82
Phenanthrene-d10	84
Chrysene-d12	105
Perylene-d12	102

Surrogates	% Rec
2-Fluorophenol	45
Phenol-d5	30
Nitrobenzene-d5	89
2-Fluorobiphenyl	95
2,4,6-Tribromophenol	81
Terphenyl-d14	84

Concentrations are reported on a wet weight basis.
"M" denotes that % fit has been manually interpreted

Where individual results are flagged see report notes for status.

Gasoline Range Organics
(BTEX and Aliphatic Carbon Ranges)

Customer and Site Details: ESG Wokingham : Aylesbury Estate Plot 18
Job Number: W20_8612
Directory: C:\CHEM32\1\DATA\1104HSA_GC12\110415 2015-11-04 13-32-04\034F3401.D
Method: Headspace GCFID

Matrix: Water
Date Booked in: 02-Nov-15
Date extracted: 04-Nov-15
Date Analysed: 05-Nov-15, 00:1

*** Sample data with an asterisk are not UKAS accredited.**

		Concentration, (mg/l)					Aliphatics				
Sample ID	Client ID	Benzene	Toluene	Ethyl benzene	m/p-Xylene	o-Xylene	C5 - C6	>C6 - C7	>C7 - C8	>C8 - C10	Total GRO
* EX1635851	BH101 EW 291015	<0.005	<0.005	<0.005	<0.005	<0.005	<0.1	<0.1	<0.1	<0.1	<0.1

Where individual results are flagged see report notes for status.

ALIPHATIC / AROMATIC FRACTION BY GC/FID

Customer and Site Details: ESG Wokingham : Aylesbury Estate Plot 18
Job Number: w20_8612
QC Batch Number: 150738
Directory: D:\TES\DATA\Y2015\110615TPH_GC15\110615 2015-11-06 09-36-51\070B2201.D
Method: Bottle

Separation: Silica gel
Eluents: Hexane, DCM

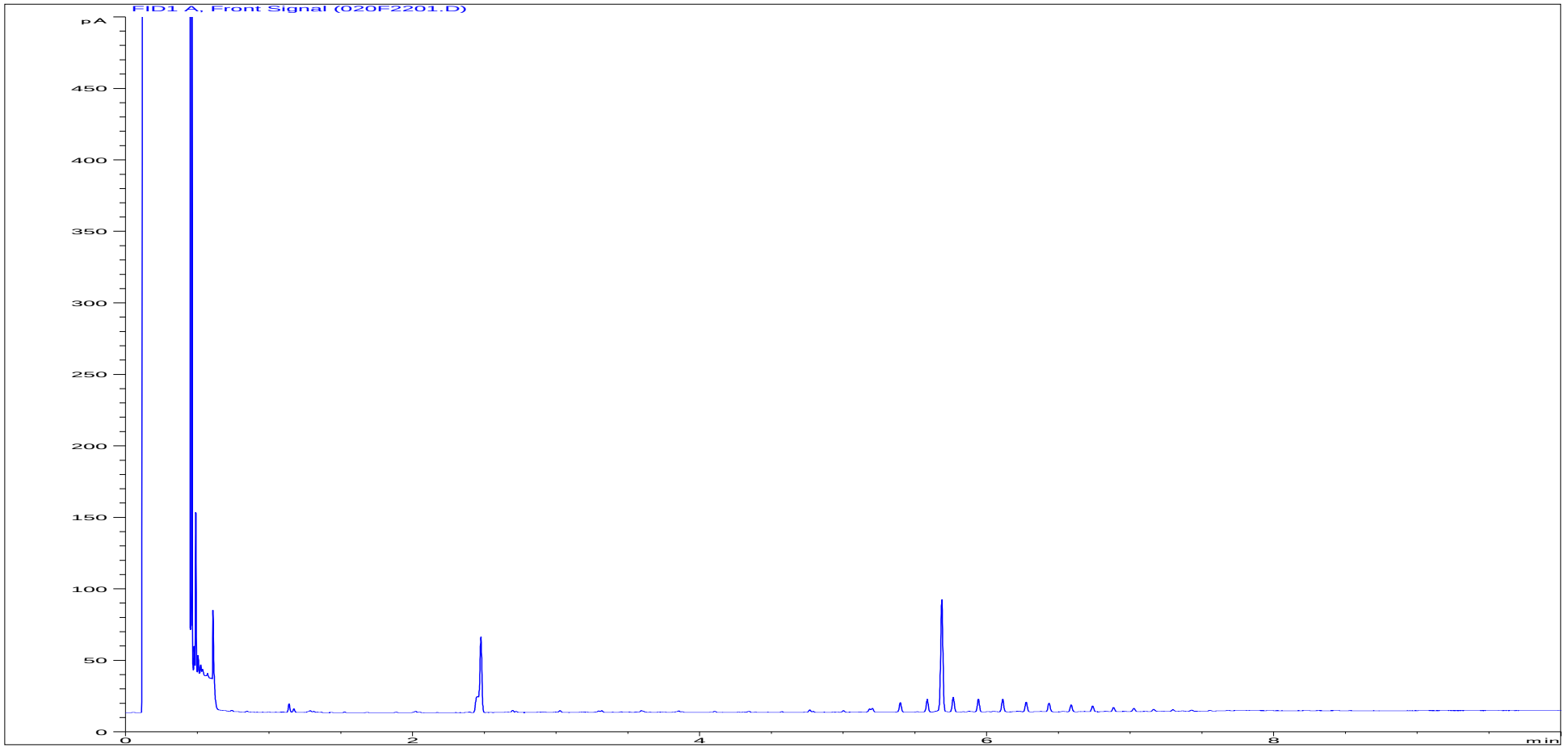
Matrix: Water
Date Booked in 02-Nov-15
Date Extracted 05-Nov-15
Date Analysed 06-Nov-15, 15:42:55

*** This sample data is not UKAS accredited.**

		Concentration, (mg/l)											
		>C8 - C10		>C10 - C12		>C12 - C16		>C16 - C21		>C21 - C35		>C8 - C40	
Sample ID	**Client ID**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**	**Aliphatics**	**Aromatics**
EX1635851	BH101 EW 291015	<0.01	0.024	<0.01	0.019	<0.01	<0.01	<0.01	<0.01	0.032	0.014	0.046	0.07

Where individual results are flagged see report notes for status.

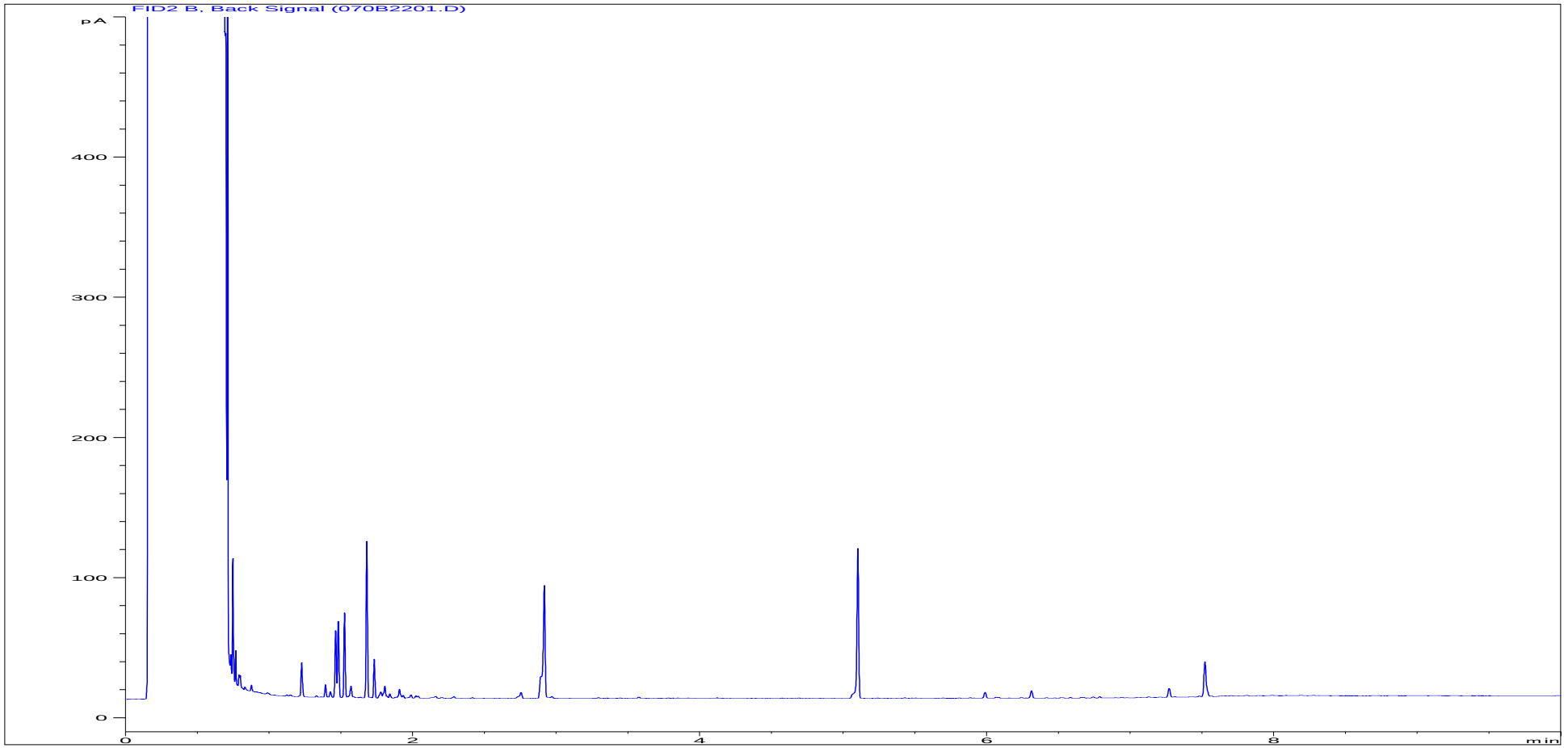
Petroleum Hydrocarbons (C8 to C40) by GC/FID Aliphatics Fraction.



Sample ID:	EX1635851ALI	**Job Number:**	w20_8612
Multiplier:	0.0194	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	TPH_RUNF.M	**Client Sample Ref:**	BH101 EW 291015
Acquisition Date/Time:	06-Nov-15, 15:42:55		
Datafile:	D:\TES\DATA\Y2015\110615TPH_GC15\110615 2015-11-06 09-36-51\020F2201.D		

Where individual results are flagged see report notes for status.

Petroleum Hydrocarbons (C8 to C40) by GC/FID Aromatics Fraction.



Sample ID:	EX1635851ARO	**Job Number:**	w20_8612
Multiplier:	0.0148	**Client:**	ESG Wokingham
Dilution:	1	**Site:**	Aylesbury Estate Plot 18
Acquisition Method:	TPH_RUNF.M	**Client Sample Ref:**	BH101 EW 291015
Acquisition Date/Time:	06-Nov-15, 15:42:55		
Datafile:	D:\TES\DATA\Y2015\110615TPH_GC15\110615 2015-11-06 09-36-51\070B2201.D		

Where individual results are flagged see report notes for status.

ESG Environmental Chemistry
Analytical and Deviating Sample Overview

Customer ESG Wokingham
Site Aylesbury Estate Plot 18
Report No W208612

Consignment No W95329
Date Logged 02-Nov-2015

Report Due 09-Nov-2015

ID Number	Description	Matrix Type	Sampled	MethodID	CUSTSERV	GROHSA	ICPMSW										ICPWATVAR				PAHMSW	SFAPI
					Report A	GRO-HSA GCFID (AA)	Nickel as Ni MS (Dissolved)	Chromium as Cr MS (Dissolved)	Cadmium as Cd MS (Dissolved)	Copper as Cu MS (Dissolved)	Lead as Pb MS (Dissolved)	Zinc as Zn MS (Dissolved)	Arsenic as As MS (Dissolved)	Mercury as Hg MS (Dissolved)	Selenium as Se MS (Dissolved)	Vanadium as V MS (Dissolved)	Total Sulphur as SO4 (Diss) VAR	Barium as Ba (Dissolved) VAR	Boron as B (Dissolved) VAR	Beryllium as Be (Dissolved) VAR	PAH GC-MS (16)	Cyanide (Total) as CN SFA
							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
EX/1635851	BH101	Groundwater	29/10/15																			

Note: For analysis where the scheduled turnaround is greater than the holding time we will do our utmost to prioritise these samples. However, it is possible that samples could become deviant whilst being processed in the laboratory.

In this instance please contact the laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

Customer ESG Wokingham
Site Aylesbury Estate Plot 18
Report No W208612

Consignment No W95329
Date Logged 02-Nov-2015

Report Due 09-Nov-2015

ID Number	Description	Matrix Type	Sampled	SVOC	TPH by GC(Si)	pH units
MethodID				SVOCSW	TPHFID-Si	WSLM3
					✓	✓
EX/1635851	BH101	Groundwater	29/10/15			

Note: For analysis where the scheduled turnaround is greater than the holding time we will do our utmost to prioritise these samples. However, it is possible that samples could become deviant whilst being processed in the laboratory.

In this instance please contact the laboratory immediately should you wish to discuss how you would like us to proceed. If you do not respond within 24 hours, we will proceed as originally requested.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	GROHSA	As Received	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) by Headspace FID
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	PAHMSW	As Received	Determination of PolyAromatic Hydrocarbons in water by pentane extraction GCMS quantitation
Water	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Water	SVOCSW	As Received	Determination of Semi Volatile Organic Compounds (SVOC) by DCM extraction followed by GCMS detection
Water	TPHFID-Si	As Received	Determination of speciated pentane extractable hydrocarbons in water by GCFID
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : ESG Wokingham
Site : Aylesbury Estate Plot 18
Report Number : W20_8612

Lab ID Number	Client ID	Description
EX/1635851	BH101 EW 291015	Groundwater

Appendix I

GROUND GAS MONITORING

Environmental Services Group Limited

Gas Monitoring Record

Project No	D5501-15	Project	Plot 18 Aylesbury Estate, Southwark
Date	29/10/2015	State of Ground	Dry
		Wind	Light
Operator	AG	Wind Direction	N/A
		Cloud Cover	Cloudy
Equipment Used	LMSx (1463)	Precipitation	None

Sheet No: 1

Borehole ID	Inst ID	Barometric Pressure (mbars)	Air temp (°C)	Depth of Installation (m BGL)	Time of Reading hh:mm:ss	Depth to Groundwater (m BGL)	Reading Depth (mBGL)	Differential Pressure (Pa)	FlowRate (l/hr)	CH4 (% vol)	CH4 (% LEL)	O2 (% vol)	CO2 (% vol)	CO (ppm)	H2S (ppm)	Nitrogen (%vol)	Remarks
Detection Limits										<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1	
BH101	1	1017	16	10.00	11:05:00		0.00	-0.2	-0.10	<0.1	<0.1	20.8	<0.1	<1	<1		
BH101	1	1017	16	10.00	11:05:30		0.00	-0.2	-0.10	<0.1	<0.1	20.8	<0.1	<1	<1		
BH101	1	1017	16	10.00	11:06:00		0.00	-0.2	-0.10	<0.1	<0.1	20.8	<0.1	<1	<1		
BH101	1	1017	16	10.00	11:06:30		0.00	-0.2	-0.10	<0.1	<0.1	20.8	<0.1	<1	<1		
BH101	1	1017	16	10.00	11:07:00		0.00	-0.2	-0.10	<0.1	<0.1	20.8	<0.1	<1	<1		
BH101	1	1017	16	10.00	11:07:30		0.00	-0.2	-0.10	<0.1	<0.1	20.8	<0.1	<1	<1		
BH101	1	1017	16	10.00	11:08:00		0.00	-0.2	-0.10	<0.1	<0.1	20.8	<0.1	<1	<1		
BH101	1	1017	16	10.00	11:09:00		0.00	-0.2	-0.10	<0.1	<0.1	20.8	<0.1	<1	<1		
BH101	1	1017	16	10.00	11:10:00		0.00	-0.2	-0.10	<0.1	<0.1	20.8	<0.1	<1	<1		

Environmental Services Group Limited

Gas Monitoring Record

Project No	D5501-15	Project	Plot 18 Aylesbury Estate, Southwark
Date	29/10/2015	State of Ground	Dry
		Wind	Light
Operator	AG	Wind Direction	N/A
		Cloud Cover	Cloudy
Equipment Used	LMSx (1463)	Precipitation	None

Sheet No: 1

Borehole ID	Inst ID	Barometric Pressure (mbars)	Air temp (°C)	Depth of Installation (m BGL)	Time of Reading hh:mm:ss	Depth to Groundwater (m BGL)	Reading Depth (mBGL)	Differential Pressure (Pa)	FlowRate (l/hr)	CH4 (% vol)	CH4 (% LEL)	O2 (% vol)	CO2 (% vol)	CO (ppm)	H2S (ppm)	Nitrogen (%vol)	Remarks
Detection Limits										<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1	
WS110	1	1017	16	3.00	10:30:00		0.00	0.3	0.10	<0.1	<0.1	20.8	<0.1	<1	<1		
WS110	1	1017	16	3.00	10:30:30		0.00	0.2	0.10	<0.1	<0.1	19.9	0.9	<1	<1		
WS110	1	1017	16	3.00	10:31:00		0.00	0.1	0.00	<0.1	<0.1	19.8	1.0	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	10:31:30		0.00	0.1	0.00	<0.1	<0.1	19.8	1.0	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	10:32:00		0.00	0.1	0.00	<0.1	<0.1	19.8	1.0	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	10:32:30		0.00	0.1	0.00	<0.1	<0.1	19.8	1.0	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	10:33:00		0.00	0.1	0.00	<0.1	<0.1	19.8	1.0	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	10:34:00		0.00	0.1	0.00	<0.1	<0.1	19.8	1.0	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	10:35:00		0.00	0.1	0.00	<0.1	<0.1	19.8	1.0	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	10:45:00		0.00	-0.1	0.00	<0.1	<0.1	20.8	<0.1	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	10:45:30		0.00	-0.1	0.00	<0.1	<0.1	20.5	0.4	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	10:46:00		0.00	-0.1	0.00	<0.1	<0.1	20.5	0.4	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	10:46:30		0.00	-0.1	0.00	<0.1	<0.1	20.4	0.6	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	10:47:00		0.00	-0.1	0.00	<0.1	<0.1	20.4	0.6	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	10:47:30		0.00	-0.1	0.00	<0.1	<0.1	20.4	0.6	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	10:48:00		0.00	-0.1	0.00	<0.1	<0.1	20.4	0.6	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	10:49:00		0.00	-0.1	0.00	<0.1	<0.1	20.4	0.6	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	10:50:00		0.00	-0.1	0.00	<0.1	<0.1	20.4	0.6	<1	<1		Flow rate = <0.1

Environmental Services Group Limited

Gas Monitoring Record

Project No	D5501-15	Project	Plot 18 Aylesbury Estate, Southwark
Date	06/11/2015	State of Ground	Damp
		Wind	Calm
Operator	AG	Wind Direction	N/A
		Cloud Cover	Cloudy
Equipment Used	LMSx (1463)	Precipitation	None

Sheet No: 1

Borehole ID	Inst ID	Barometric Pressure (mbars)	Air temp (°C)	Depth of Installation (m BGL)	Time of Reading hh:mm:ss	Depth to Groundwater (m BGL)	Reading Depth (mBGL)	Differential Pressure (Pa)	FlowRate (l/hr)	CH4 (% vol)	CH4 (% LEL)	O2 (% vol)	CO2 (% vol)	CO (ppm)	H2S (ppm)	Nitrogen (%vol)	Remarks
Detection Limits										<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1	
BH101	1	1017	16	10.00	11:20:00		0.00	0.0	0.00	<0.1	<0.1	20.9	<0.1	<1	<1		Flow rate = <0.1
BH101	1	1017	16	10.00	11:20:30		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
BH101	1	1017	16	10.00	11:21:00		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
BH101	1	1017	16	10.00	11:21:30		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
BH101	1	1017	16	10.00	11:22:00		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
BH101	1	1017	16	10.00	11:22:30		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
BH101	1	1017	16	10.00	11:23:00		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
BH101	1	1017	16	10.00	11:24:00		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
BH101	1	1017	16	10.00	11:25:00		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1

Environmental Services Group Limited

Gas Monitoring Record

Project No	D5501-15	Project	Plot 18 Aylesbury Estate, Southwark
Date	06/11/2015	State of Ground	Damp
		Wind	Calm
Operator	RD	Wind Direction	N/A
		Cloud Cover	Cloudy
Equipment Used	LMSx (1463)	Precipitation	None

Sheet No: 1

										Detection Limits	<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1	
Borehole ID	Inst ID	Barometric Pressure (mbars)	Air temp (^{o}C)	Depth of Installation (m BGL)	Time of Reading hh:mm:ss	Depth to Groundwater (m BGL)	Reading Depth (mBGL)	Differential Pressure (Pa)	FlowRate (l/hr)	CH4 (% vol)	CH4 (% LEL)	O2 (% vol)	CO2 (% vol)	CO (ppm)	H2S (ppm)	Nitrogen (%vol)	Remarks
WS110	1	1017	16	3.00	11:35:00		0.00	0.0	0.00	<0.1	<0.1	20.9	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	11:35:30		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	11:36:00		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	11:36:30		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	11:37:00		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	11:37:30		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	11:38:00		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	11:39:00		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1017	16	3.00	11:40:00		0.00	0.0	0.00	<0.1	<0.1	21.0	<0.1	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	11:50:00		0.00	0.0	0.00	<0.1	<0.1	20.8	0.3	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	11:50:30		0.00	0.0	0.00	<0.1	<0.1	20.8	0.3	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	11:51:00		0.00	0.0	0.00	<0.1	<0.1	20.8	0.3	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	11:51:30		0.00	0.0	0.00	<0.1	<0.1	20.8	0.3	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	11:52:00		0.00	0.0	0.00	<0.1	<0.1	20.8	0.3	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	11:52:30		0.00	0.0	0.00	<0.1	<0.1	20.8	0.3	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	11:53:00		0.00	0.0	0.00	<0.1	<0.1	20.8	0.3	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	11:54:00		0.00	0.0	0.00	<0.1	<0.1	20.8	0.3	<1	<1		Flow rate = <0.1
WS101	1	1017	16	3.00	11:55:00		0.00	0.0	0.00	<0.1	<0.1	20.8	0.3	<1	<1		Flow rate = <0.1

Environmental Services Group Limited

Gas Monitoring Record

Project No	D5501-15	Project	Plot 18 Aylesbury Estate, Southwark
Date	13/11/2015	State of Ground	Damp
		Wind	Moderate
Operator	AG	Wind Direction	N/A
		Cloud Cover	Cloudy
Equipment Used	LMSx (1463)	Precipitation	Heavy

Sheet No: 1

Detection Limits									<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1	
Borehole ID	Inst ID	Barometric Pressure (mbars)	Air temp (^{o}C)	Depth of Installation (m BGL)	Time of Reading hh:mm:ss	Depth to Groundwater (m BGL)	Reading Depth (mBGL)	Differential Pressure (Pa)	FlowRate (l/hr)	CH4 (% vol)	CH4 (% LEL)	O2 (% vol)	CO2 (% vol)	CO (ppm)	H2S (ppm)	Nitrogen (%vol)	Remarks
BH101	1	1026	13	10.00	14:10:00		0.00	-1.2	-0.50	<0.1	<0.1	20.8	<0.1	<1	<1		
BH101	1	1026	13	10.00	14:10:30		0.00	-1.1	-0.40	<0.1	<0.1	20.8	<0.1	<1	<1		
BH101	1	1026	13	10.00	14:11:00		0.00	-1.0	-0.30	<0.1	<0.1	20.5	0.3	<1	<1		
BH101	1	1026	13	10.00	14:11:30		0.00	-1.0	-0.30	<0.1	<0.1	20.6	0.2	<1	<1		
BH101	1	1026	13	10.00	14:12:00		0.00	-1.0	-0.30	<0.1	<0.1	20.7	0.1	<1	<1		
BH101	1	1026	13	10.00	14:12:30		0.00	-1.0	-0.30	<0.1	<0.1	20.8	<0.1	<1	<1		
BH101	1	1026	13	10.00	14:13:00		0.00	-1.0	-0.30	<0.1	<0.1	20.8	<0.1	<1	<1		
BH101	1	1026	13	10.00	14:14:00		0.00	-1.0	-0.30	<0.1	<0.1	20.8	<0.1	<1	<1		
BH101	1	1026	13	10.00	14:15:00		0.00	-1.0	-0.30	<0.1	<0.1	20.8	<0.1	<1	<1		

Environmental Services Group Limited

Gas Monitoring Record

Project No	D5501-15	Project	Plot 18 Aylesbury Estate, Southwark
Date	13/11/2015	State of Ground	Damp
		Wind	Moderate
Operator	AG	Wind Direction	N/A
		Cloud Cover	Cloudy
Equipment Used	LMSx (1463)	Precipitation	Heavy

Sheet No: 1

Borehole ID	Inst ID	Barometric Pressure (mbars)	Air temp (°C)	Depth of Installation (m BGL)	Time of Reading hh:mm:ss	Depth to Groundwater (m BGL)	Reading Depth (mBGL)	Differential Pressure (Pa)	FlowRate (l/hr)	CH4 (% vol)	CH4 (% LEL)	O2 (% vol)	CO2 (% vol)	CO (ppm)	H2S (ppm)	Nitrogen (%vol)	Remarks
Detection Limits										<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1	
WS110	1	1026	13	3.00	13:30:00		0.00	-1.1	-0.50	<0.1	<0.1	20.9	<0.1	<1	<1		
WS110	1	1026	13	3.00	13:30:30		0.00	-0.8	-0.40	<0.1	<0.1	20.9	<0.1	<1	<1		
WS110	1	1026	13	3.00	13:31:00		0.00	-0.5	-0.20	<0.1	<0.1	20.9	<0.1	<1	<1		
WS110	1	1026	13	3.00	13:31:30		0.00	-0.5	-0.20	<0.1	<0.1	20.9	<0.1	<1	<1		
WS110	1	1026	13	3.00	13:32:00		0.00	-0.5	-0.20	<0.1	<0.1	20.9	<0.1	<1	<1		
WS110	1	1026	13	3.00	13:32:30		0.00	-0.5	-0.20	<0.1	<0.1	20.9	<0.1	<1	<1		
WS110	1	1026	13	3.00	13:33:00		0.00	-0.5	-0.20	<0.1	<0.1	20.9	<0.1	<1	<1		
WS110	1	1026	13	3.00	13:34:00		0.00	-0.5	-0.20	<0.1	<0.1	20.9	<0.1	<1	<1		
WS110	1	1026	13	3.00	13:35:00		0.00	-0.5	-0.20	<0.1	<0.1	20.9	<0.1	<1	<1		
WS101	1	1026	13	3.00	13:50:00		0.00	-0.3	-0.10	<0.1	<0.1	20.9	<0.1	<1	<1		
WS101	1	1026	13	3.00	13:50:30		0.00	-0.2	-0.10	<0.1	<0.1	20.6	0.3	<1	<1		
WS101	1	1026	13	3.00	13:51:00		0.00	-0.2	-0.10	<0.1	<0.1	20.5	0.4	<1	<1		
WS101	1	1026	13	3.00	13:51:30		0.00	-0.2	-0.10	<0.1	<0.1	20.5	0.5	<1	<1		
WS101	1	1026	13	3.00	13:52:00		0.00	-0.2	-0.10	<0.1	<0.1	20.5	0.6	<1	<1		
WS101	1	1026	13	3.00	13:52:30		0.00	-0.2	-0.10	<0.1	<0.1	20.5	0.7	<1	<1		
WS101	1	1026	13	3.00	13:53:00		0.00	-0.2	-0.10	<0.1	<0.1	20.3	0.8	<1	<1		
WS101	1	1026	13	3.00	13:54:00		0.00	-0.2	-0.10	<0.1	<0.1	20.3	0.9	<1	<1		
WS101	1	1026	13	3.00	13:55:00		0.00	-0.2	-0.10	<0.1	<0.1	20.2	1.0	<1	<1		

Environmental Services Group Limited

Gas Monitoring Record

Project No	D5501-15	Project	Plot 18 Aylesbury Estate, Southwark
Date	16/11/2015	State of Ground	Dry
		Wind	Light
Operator	AG	Wind Direction	N/A
		Cloud Cover	Slight
Equipment Used	LMSx (1463)	Precipitation	None

Sheet No: 1

Borehole ID	Inst ID	Barometric Pressure (mbars)	Air temp (°C)	Depth of Installation (m BGL)	Time of Reading hh:mm:ss	Depth to Groundwater (m BGL)	Reading Depth (mBGL)	Differential Pressure (Pa)	FlowRate (l/hr)	CH4 (% vol)	CH4 (% LEL)	O2 (% vol)	CO2 (% vol)	CO (ppm)	H2S (ppm)	Nitrogen (%vol)	Remarks
Detection Limits										<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1	
BH101	1	1016	15	10.00	14:50:00		0.00	-0.8	-0.40	<0.1	<0.1	20.9	<0.1	<1	<1		
BH101	1	1016	15	10.00	14:50:30		0.00	-0.6	-0.20	<0.1	<0.1	19.9	0.7	<1	<1		
BH101	1	1016	15	10.00	14:51:00		0.00	-0.5	-0.20	<0.1	<0.1	19.8	0.7	<1	<1		
BH101	1	1016	15	10.00	14:51:30		0.00	-0.5	-0.20	<0.1	<0.1	19.9	0.6	<1	<1		
BH101	1	1016	15	10.00	14:52:00		0.00	-0.5	-0.20	<0.1	<0.1	20.0	0.5	<1	<1		
BH101	1	1016	15	10.00	14:52:30		0.00	-0.5	-0.20	<0.1	<0.1	20.1	0.4	<1	<1		
BH101	1	1016	15	10.00	14:53:00		0.00	-0.5	-0.20	<0.1	<0.1	20.2	0.3	<1	<1		
BH101	1	1016	15	10.00	14:54:00		0.00	-0.5	-0.20	<0.1	<0.1	20.4	0.2	<1	<1		
BH101	1	1016	15	10.00	14:55:00		0.00	-0.5	-0.20	<0.1	<0.1	20.7	<0.1	<1	<1		

Environmental Services Group Limited

Gas Monitoring Record

Project No	D5501-15	Project	Plot 18 Aylesbury Estate, Southwark
Date	16/11/2015	State of Ground	Dry
		Wind	Light
Operator	AG	Wind Direction	N/A
		Cloud Cover	Slight
Equipment Used	LMSx (1463)	Precipitation	None

Sheet No: 1

Borehole ID	Inst ID	Barometric Pressure (mbars)	Air temp (°C)	Depth of Installation (m BGL)	Time of Reading hh:mm:ss	Depth to Groundwater (m BGL)	Reading Depth (mBGL)	Differential Pressure (Pa)	FlowRate (l/hr)	CH4 (% vol)	CH4 (% LEL)	O2 (% vol)	CO2 (% vol)	CO (ppm)	H2S (ppm)	Nitrogen (%vol)	Remarks
Detection Limits										<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1	
WS110	1	1015	15	3.00	14:10:00		0.00	0.3	0.10	<0.1	<0.1	20.9	<0.1	<1	<1		
WS110	1	1015	15	3.00	14:10:30		0.00	0.2	0.10	<0.1	<0.1	20.9	<0.1	<1	<1		
WS110	1	1015	15	3.00	14:11:00		0.00	0.1	0.00	<0.1	<0.1	20.9	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1015	15	3.00	14:11:30		0.00	0.1	0.00	<0.1	<0.1	20.9	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1015	15	3.00	14:12:00		0.00	0.1	0.00	<0.1	<0.1	20.9	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1015	15	3.00	14:12:30		0.00	0.1	0.00	<0.1	<0.1	20.9	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1015	15	3.00	14:13:00		0.00	0.1	0.00	<0.1	<0.1	20.9	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1015	15	3.00	14:14:00		0.00	0.1	0.00	<0.1	<0.1	20.9	<0.1	<1	<1		Flow rate = <0.1
WS110	1	1015	15	3.00	14:15:00		0.00	0.1	0.00	<0.1	<0.1	20.9	<0.1	<1	<1		Flow rate = <0.1
WS101	1	1015	15	3.00	14:30:00		0.00	0.4	0.10	<0.1	<0.1	20.9	<0.1	<1	<1		Flow rate = <0.1
WS101	1	1015	15	3.00	14:30:30		0.00	0.2	0.10	<0.1	<0.1	20.7	0.2	<1	<1		Flow rate = <0.1
WS101	1	1015	15	3.00	14:31:00		0.00	0.2	0.10	<0.1	<0.1	20.6	0.3	<1	<1		Flow rate = <0.1
WS101	1	1015	15	3.00	14:31:30		0.00	0.2	0.10	<0.1	<0.1	20.5	0.4	<1	<1		Flow rate = <0.1
WS101	1	1015	15	3.00	14:32:00		0.00	0.2	0.10	<0.1	<0.1	20.5	0.4	<1	<1		Flow rate = <0.1
WS101	1	1015	15	3.00	14:32:30		0.00	0.2	0.10	<0.1	<0.1	20.5	0.4	<1	<1		Flow rate = <0.1
WS101	1	1015	15	3.00	14:33:00		0.00	0.2	0.10	<0.1	<0.1	20.5	0.4	<1	<1		Flow rate = <0.1
WS101	1	1015	15	3.00	14:34:00		0.00	0.2	0.10	<0.1	<0.1	20.5	0.4	<1	<1		Flow rate = <0.1
WS101	1	1015	15	3.00	14:35:00		0.00	0.2	0.10	<0.1	<0.1	20.5	0.4	<1	<1		Flow rate = <0.1