Intended for
St George West London Limited

Date
December 2019

Project Number
1620008283

MORRISONS PETROL FILLING STATION, CAMDEN

PHASE II ENVIRONMENTAL SITE INVESTIGATION

RAMBOLL

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Project No.	**16200008283**
Issue No.	**02**
Date	**20/12/2019**
Made by	**Siobhán McGeever**
Checked by	**Jennifer Gill**
Approved by	**Matthew Pannett**

Made by:	
Checked/Approved by:	

Version Control Log

Revision	Date	Made by	Checked by	Approved by	Description
01	17/12/2019	SM	JG	MP	First Draft
02	20/12/2019	SM	JG	MP	Final Issue to Client

Ramboll
240 Blackfriars Road
London
SE1 8NW
United Kingdom
T +44 20 7808 1420
www.ramboll.co.uk

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EXECUTIVE SUMMARY

Ramboll UK Limited ("Ramboll") was instructed by St George West London Limited (the "client"), to undertake a Phase II Environmental Site Investigation at Morrisons Petrol Filling Station, 93 Juniper Crescent, Camden Town, London NW1 8HQ (the "site"). The report is required in connection with the proposed redevelopment of the site by the client and planning condition 62 of permission ref: 2017/3847/P. Only parts A and C of planning condition 62 are relevant to this site and this report.

The Phase II investigation follows a Phase I report and also a Scheme of Assessment prepared by Ramboll. These reports were subject to separate planning conditions for the proposed development and form the basis of the Phase II investigation design.

The main purpose of the Phase II investigation was to investigate soil and groundwater contamination associated with the site's recent and past use as a petrol filling station, and inform possible remedial actions on redevelopment. This is a requirement of part C of planning condition 62.

The investigation comprised excavation of nine window sample boreholes, soil sampling and groundwater analysis. Ground gas testing was also undertaken.

The ground conditions encountered by the investigation comprised made ground typically around 1m in thickness underlain by London Clay. A small layer of gravel was noted around 2.6m to 2.7m in WS06. Perched groundwater was found, although a continuous groundwater body was not encountered. The London Clay and absence of groundwater will restrict contaminant migration (if any) and reduce the risk of harm and pollution.

No significant field evidence of contamination was encountered during the ground investigation, such as hydrocarbon odours or staining, or sheens on groundwater.

Soil chemical analysis reflect the field observations and no significant hydrocarbon contamination was identified (i.e. no evidence of significant leaks or spills of fuel). All soil analytical results were below the relevant assessment criteria and therefore no further action is considered necessary. Some trace concentrations of contaminants were detected in soil, typical of a brownfield site, and these will need to be managed during development to be protective of construction workers and building materials. However, the concentrations detected in the soil are not considered significant.

Asbestos fibres have also been identified in a limited number of soil samples. Asbestos is not considered a significant risk if left undisturbed. Development contractors will, however, need to assess this risk if soil is to be exposed during any works. This risk is routinely managed on brownfield sites.

Modest concentrations of TPH, PAHs and metals were detected in the groundwater samples. The concentrations are above the conservative Generic Assessment Criteria which is based on drinking water standards. However, Ramboll does not consider the contaminants in groundwater to be significant for the following reasons: the concentrations are low and not indicative of significant pollution; groundwater and surface water are not a plausible water resource; the London Clay will restrict contaminant migration preventing significant harm or pollution to the wider area; and the levels of contaminants are considered typical and background for an urban brownfield site. Therefore, remedial action is not considered necessary for groundwater.

The presence of localised contamination around the underground fuel tanks and associated infrastructure cannot be completely ruled out and is commonly found on petrol station sites. Based on this investigation, contamination, if any, is likely to be localised. Contractors involved in the redevelopment of the site should plan for the possibility of some unexpected contamination being encountered.

In conclusion, Ramboll has not identified significant contamination at the site and does not consider remedial action is required for current use or the proposed development. The following

recommendations are made in terms of good practice and planning condition 62. This forms the **Remediation Scheme (Part A of condition 62).** The **Remediation Report (Part C)** is also described below.

- Planning Condition 62, Part A, "Remediation Scheme"
- The underground tanks and associated infrastructure should be removed prior to development. Localised soil and perched groundwater contamination may be present around these underground features and if encountered should be assessed and removed if considered a risk. A watching brief is recommended during these works or other phases of substantial groundworks that may expose unexpected contamination.
- All free phase product (neat fuels or oils) encountered in the soil or groundwater should be excavated and removed from site under the direction of an environmental consultant. Free phase product may, for example, be found in chambers or soil surrounding the tanks or fuel pipelines.
- Verification samples of the walls and base of excavations should be obtained and analysed for TPH and BTEX compounds. The results of the verification samples should be considered in light of the proposed development (e.g. potential for vapours to migrate from the contamination into buildings). Further excavation or remediation would be required if the verification samples identify a risk, as defined by the environmental consultant.
- Soil samples will be obtained from each side and base of the excavation (five in total) and analysed for TPH CWG and VOCs. Should the excavation extend beyond 10m in length in any direction, soil samples will be taken at a rate of one sample per 10m face, and one sample per 10m by 10m base.
- The chemical analyses will be compared with Ramboll GACs which are protective of human health, including vapour pathways. No further action will be required if the chemical analyses are below the GACs.
- If chemical analyses are above the GACs, the following will be undertaken:
  - Additional risk assessment which may include a "detailed quantitative risk assessment". This will provide a more comprehensive assessment of risks and usually results in a less conservative remedial target; and/or
  - Further remediation, which would most likely be the over excavation of contaminated soil. The size of the site, scale of possible remediation and programme would not likely allow other forms of remediation.
- The findings of the preliminary ground-gas risk assessment indicated that there is no requirement for gas protection measures in new buildings. This may need to be re-assessed depending on the final design and construction of the development, and any remedial or bulk earthworks undertaken.
- This report should be provided to development contractors so that they can manage and plan their risks and work appropriately. The development contractor will be expected to:
  - report on any environmental controls required during excavation works e.g. dust monitoring and noise monitoring;
  - any health and safety or environmental incidents – specific details to be given where an incident could relate to ground contamination;
  - plans showing the location and depth of excavations and description of unexpected contamination (if encountered);
  - 'as-dug' plans of where re-use materials have been placed, including the thicknesses and types of backfill and the final site levels;
  - details of consents, exemptions and permits for the works (including any permissions and requirements for removing the underground tanks and fuel infrastructure);

  - waste duty of care information (including the types and amounts of waste disposed of, waste classification and WAC analysis, waste transfer and consignment notes and applicable site and carriers licenses;
  - documentation obtained from the producer of any imported recycled aggregate and topsoil. All imported material should be compliant with environmental criteria as outlined in this report (i.e. GACs);
  - material tracking information to demonstrate compliance with the MMP (if required).
- Planning Condition 62, Part C, "Remediation Report"
- On completion of the above, a "Remediation Report" should be produced to confirm the final status of the site in terms of ground contamination. The report should be issued to the Local Authority. The report should document all of the activities outlined in Part A above, and include:
  - the details and roles of Contractor / sub-Contractors involved in the remediation work;
  - a description of the remedial activities or confirmation that no remediation was undertaken;
  - a photographic record of the remediation works, together with plans indicating the dates and locations of remediation activities;
  - reference to the Health and Safety file;
  - a clear statement that the remedial scheme objectives have been completed;
  - A discussion on vapour and ground gas and potential risks and mitigation undertaken; and
  - supporting documents, to include where appropriate analytical results, monitoring data, health and safety documentation and quality management documentation.

1. INTRODUCTION

1.1 Background

This report presents the objectives, scope, findings and conclusions of a Phase II Environmental Site Investigation undertaken at Morrisons Petrol Station, Camden (the "site"). The Phase II was undertaken in connection with the proposed redevelopment of the site and planning condition 61.

The Phase II investigation is based on the relevant parts of Ramboll's "Camden Good Yard, Scheme of Assessment, Planning Condition 61, Ramboll, 1700003928_02, June 2019".

A preliminary risk assessment (Phase I report) has also been produced for the PFS and the Main Morrisons site by Ramboll in November 2016 (Preliminary Risk Assessment for Camden Goods Yard (ref: UK11-23069), Ramboll, November 2016). The Phase I report provides the background information necessary to prepare the Scheme of Assessment and design the Phase II investigation.

This report was prepared by Ramboll UK Limited ("Ramboll") on behalf of St George West London Limited (the "client").

1.2 Proposed Development

The Proposed development comprises the redevelopment of the petrol filling station site to include the erection of a new building of up to six storeys and up to 11,243 sq m GEA floorspace to accommodate a petrol filling station (Sui Generis use), flexible retail/food & drink floorspace (Class A1, A3 uses), Class B1 floorspace and a winter garden. Cycle parking and public space will also be created.

1.3 Planning Condition 62, Parts A and C

Planning condition 62 is presented below. Only parts A and C are reproduced as they relate to the petrol filling station. Parts B and D relate to the Main Site which is not relevant to this investigation.

Part A. Prior to commencement of development in each zone of the PFS land parcel as identified in the scheme of assessment (as approved under condition 61) or that parcel of land, ***a Site investigation*** *shall be undertaken in accordance with the approved scheme of assessment. The written results and a proposed* ***remediation scheme*** *shall be submitted to and approved in writing by the local planning authority. The investigation results shall include laboratory results, provided as numeric values in a formatted electronic spread sheet. The development of the PFS parcel of land shall not be implemented other than in accordance with the remediation scheme for that parcel as approved.*

C. No part of the development on the PFS land parcel shall be occupied until the approved ***remediation report*** *for the relevant zone in that parcel of land has been submitted to and approved in writing by the local planning authority.*

With reference to the above:

- This report is the **Site Investigation** referred to in part A.
- Whilst there is no remediation required *per se,* this report provides a **Remediation Scheme** which is a list of good practice recommendations in the Executive Summary and Conclusions (part A of condition 62).
- Ramboll will prepare a **Remediation Report** (part C) when the Remediation Scheme has been implemented. This can only happen once the site has been demolished. The Remediation Report will be compliant with the Remediation Scheme.

1.4 Objectives

The objectives of the Phase II Environmental Site Investigation were to:

- document and interpret the environmental ground conditions encountered;
- assess the potential for risks to both human health and environmental receptors (including controlled waters) based on the data collected;
- carry out a contaminated land risk assessment based on a contaminant-pathway-receptor methodology;
- present a refined Conceptual site Model (CSM) based on the findings of the ground investigation;
- provide a commentary on contaminated land risks in terms of the proposed end use; and
- assess the requirement for further investigation, assessment and/or remedial measures.

1.5 Scope of Works

The scope of work undertaken during this investigation was as follows:

- exploratory locations were marked out and cleared by a specialist underground service clearance contractor before the start of intrusive works, in accordance with Ramboll's Health and Safety procedures;
- drilling of nine 'window sample' boreholes (WS01 to WS09) to depths of up to 4.0m bgl, to facilitate the collection of shallow soil and groundwater samples and allow the assessment of ground conditions for environmental purposes. Five of the window sample boreholes were installed with monitoring wells for ground gas and, where present groundwater;
- supervision of drilling works by a Ramboll field engineer, who logged the soil arisings and collected soil samples for in-situ testing for volatile organic compounds and for laboratory analysis;
- monitoring of resting groundwater levels, where present within the monitoring wells, followed by collection of groundwater samples;
- submission of selected soil and groundwater samples to a Ramboll approved MCERTs[1] and UKAS[2] accredited laboratory (ALS) for analysis for a range of determinands;
- monitoring of each of the installed monitoring wells on one occasion for ground gases; and
- the production of an interpretative report, to include comparison of the analytical results with Generic Assessment Criteria (GAC) derived in accordance with UK guidance on risk assessment, a qualitative contaminant-pathway-receptor risk assessment (based on commercial use of the site) and production of a conceptual site model.

In the preparation of this report Ramboll has made reference to UK regulatory guidance and methodologies, including, but not limited to: Land Contamination: Risk Management (LCRM); BS5930:2015 Code of Practice for site Investigation; and BS10175:2011 + A1:2013 Code of Practice for the Investigation of Potentially Contaminated sites.

1.5.1 Scope of Works Notable Exceptions and Restrictions

A maximum of ten window samples were proposed. Once a site reconnaissance was undertaken by the Client and Ramboll, nine locations were agreed and considered feasible.

[1] Environment Agency's Monitoring Certification Scheme
[2] United Kingdom Accreditation Service for organisations that provide certification, testing, inspection and calibration services.

1.6 General Limitations and Reliance

This report has been prepared by Ramboll exclusively for the intended use by the client in accordance with the agreement (proposal reference number 1700003928), dated 18th October 2019 between Ramboll and the client defining, among others, the purpose, the scope and the terms and conditions for the services. No other warranty, expressed or implied, is made as to the professional advice included in this report or in respect of any matters outside the agreed scope of the services or the purpose for which the report and the associated agreed scope were intended or any other services provided by Ramboll.

In preparation of the report and performance of any other services, Ramboll has relied upon publicly available information, information provided by the client and information provided by third parties. Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll was accurate, complete and available to Ramboll within the reporting schedule.

Ramboll's services are not intended as legal advice, nor an exhaustive review of site conditions and/or compliance. This report and accompanying documents are initial and intended solely for the use and benefit of the client for this purpose only and may not be used by or disclosed to, in whole or in part, any other person without the express written consent of Ramboll. Ramboll neither owes nor accepts any duty to any third party, unless formally agreed by Ramboll through that party entering into, at Ramboll's sole discretion, a written reliance agreement.

The site investigation works were undertaken during a discrete period of time. The findings and conclusions presented in this report are accordingly factually limited by these circumstances and, unless stated otherwise in the report, are preliminary. The field investigations were restricted to a level of detail necessary to meet the stated objectives of the services. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant period of time has elapsed since the sampling took place. The interpretation of the geological and environmental quality conditions is based on extrapolation from point-source data in a heterogeneous environment. Accordingly, more detailed investigation may be appropriate dependent upon the client objectives.

1.7 Report Layout

The report is structured as follows:

Section 1: Describes the background to the report and sets out the objectives of the investigation.

Section 2: Provides a description of the current site layout and summarises information from the Phase I Environmental Assessment.

Section 3: Introduces a preliminary conceptual site model for the site, which has been used in designing the investigation strategy and sets out the sampling and analysis rationale.

Section 4: Details the ground and groundwater conditions and field observations of potential contamination encountered during the investigation.

Section 5: Summarises the laboratory chemical analysis results for soils and screens the data against risk based generic assessment criteria (GAC) for human health derived by Ramboll.

Section 6: Summarises the laboratory chemical analysis results for groundwater and screens the data against available water quality standards.

Section 7: Presents the results of ground gas monitoring and discusses potential risks to the built environment.

Section 8: Presents a revised conceptual site model based on information obtained during the investigation and sets out a qualitative contaminant-pathway-receptor risk assessment.

Section 9: Provides a summary and the conclusions and recommendations of the investigation.

2. SITE DESCRIPTION

2.1 Introduction

The site is occupied by a petrol filling station (PFS) and associated Morrison's store kiosk. The main access is to the east of the site with the exit in the west. The store sits in the east of the site, with the refuelling points and canopy in the centre, the UST tanks and fill points to the west of the canopy and a substation located in the far north west corner of the site. The location and site layout are shown on Figures 1 and 2 in Appendix 1.

The site is an approximately rectangular shaped plot of land of approximately 0.39 hectares (ha) in area, situated in Camden along Chalk Farm Road at National Grid Reference 528402, 184289. The site forms part of the wider Morrisons Chalk Farm site. The natural topography of the site and surrounding area slopes downwards towards the south east. Adjacent sites are at different levels; the nearby Morrisons superstore is at a significantly higher level than that of the PFS. The adjacent Camden Market is at a lower level.

2.2 Summary of Previous Reports

Ramboll has previously undertaken a Preliminary Risk Assessment of the site (Ref. Preliminary Risk Assessment for Camden Goods Yard (ref: UK11-23069); Ramboll UK Ltd.; November 2016)

The PRA encompassed a review of the Morrisons supermarket and the Morrison Petrol Filling Station sites. Salient points are summarised below:

- The Morrison Petrol Filling Station parcel comprises a petrol filling station and associated kiosk. The station is served by six underground fuel storage tanks and eight associated fuel pumps. It was reported that the underground storage tanks and associated pipework was replaced in 2010. There has been no reported incidences of any faults or leaks associated with the tanks or associated pipelines. The site is served by an oil/water interceptor.
- Potentially contaminative historic uses of the application site have included Camden Goods Yard and associated infrastructure throughout the majority of the available mapping history. By the early-1940s, stores, warehouses and a petrol tank were annotated on the Morrison Petrol Filling Station site. By 1970, the west of the Morrison Petrol Filling Station parcel was labelled as forming part of a trailer park.
- A limited Phase II site investigations were undertaken of the Morrisons supermarket site but did not encompass the petrol filling station.
- The site is considered to be located in a setting of low sensitivity with regard to groundwater. The negligible permeability of the London Clay deposits restricts the potential for contaminant migration (if any).
- The site is considered to be located in a low sensitivity setting in relation to surface water resources. The nearest surface water feature is the Grand Union Canal located approximately 59 m south of the Morrison Supermarket parcel. There are no sensitive surface water abstractions within a 1km radius of the application site.
- The application site is located in Flood Zone 1 (low probability).

The Phase I report concluded that there is a potential for contamination to be present at the application site associated with former uses (as with any brownfield site or petrol filling station). Hence the reason for this Phase II investigation.

3. SITE INVESTIGATION STRATEGY

3.1 Preliminary Conceptual Site Model

The preliminary conceptual site model is a simplified representation of the environmental conditions at the site, and in the vicinity of the site, and is used to initially identify potentially sensitive receptors and potential pollutant linkages. Information obtained during the environmental site investigation, described in the following sections of this report, is then used to refine and update this preliminary conceptual model.

Table 3.1: Preliminary Conceptual Site Model

Potential Sources of Contamination Petrol Filling Station with underground fuel tanks. Electricity sub-station present adjacent to southeast corner of site. Made ground is anticipated to be present on site. Past site uses as a good yard which included a petrol tank. Potential contaminants may include VOCs, TPH, PAHs and PCBs, metals and asbestos.			
Geology The geology of the site is expected to comprise Made Ground over a substantial thickness of London Clay.			
Hydrogeology The London Clay is classified as an unproductive stratum. The site is not situated in an Environment Agency (EA) designated source protection zone (SPZ). Groundwater is not considered a significant resource.			
Hydrology The nearest surface water feature is the Grand Union Canal approximately 59 m south-west of the supermarket site. The canal is not likely to be in hydraulic continuity with shallow groundwater beneath the site due to the construction of the canal and low permeability geology. Anecdotal information suggests the possible presence of a tributary of the River Fleet, and underground river located approximately 250m east of the PFS/supermarket site. As with the canal and due to the distance, surface water is not considered a sensitive receptor. According to the EA, the site is located in Flood Zone 1 (low probability). This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding (<0.1% in any year).			
Potential Receptors to Contamination (if Present)			**Receptor Present?**
Human Health	On-site	The site will remain as a Petrol Filling Station for a period of time. Users of the proposed new development. Redevelopment construction workers	**Yes**
	Off-site	Mixed commercial shops, with residential properties above, and high-rise residential properties.	**Yes**
Water Environment	On-site	Groundwater is not expected to be present in the underlying London Clay but perched water may be present.	**No**
	Off-site	Groundwater: The site is located on an unproductive stratum.	**No**
		Surface Water: A hydraulic connection to surface water is not expected.	**No**

Table 3.1: Preliminary Conceptual Site Model			
Ecological Receptors	On-site	There are no statutory designated ecologically sensitive sites present on-site.	**No**
Built Environment	On-site	The site is to be redeveloped and there is a potential for contaminant impact on new buildings, including vapour/gas ingress.	**Yes**

The site investigation strategy was designed to assess the key potential contamination sources and potential pollutant linkages identified in the preliminary conceptual site model. The following sections describe the site investigation strategy, the results of laboratory chemical analysis and a qualitative contaminant-pathway-receptor risk assessment; the revised conceptual model is then presented in section 8.

The investigation is based on the Scheme of Assessment agreed with the Local Authority.

3.2 Site Investigation Works

The intrusive site investigation was undertaken between Monday 25th November and Wednesday 27th November 2019 and was supervised by Siobhán McGeever of Ramboll.

3.2.1 Summary of Intrusive Works

A summary of the investigation undertaken is presented in Table 3.2. Exploratory locations are shown on Figure 2, Appendix 1. Borehole logs (including monitoring well details) are provided in Appendix 2.

Table 3.2: Summary of Intrusive Works		
Item	**No.**	**Comments**
Utilities Clearance Survey	Item	Prior to intrusive works a specialist service location contractor, Subsight, was contracted to locate below ground services and mark out drilling locations.
Window Sample Boreholes	9 No.	A window sample terrier rig was used to advance nine window sample boreholes (WS01 to WS09A) to a maximum depth of 4.0 m bgl. Of the above locations, five monitoring wells were installed for ground gas monitoring and groundwater monitoring purposes. Wells were of appropriate construction for the ground conditions encountered. The well designs are detailed within the borehole logs presented in
Soil Sampling and Analysis	19 No.	During the site investigation, soil samples were recovered from each exploratory hole location and screened on-site using a hand held photo-ionisation detector (PID) for the presence of volatile organic compounds. Up to three soil samples from each sampling location were submitted for selected laboratory analysis. Selected soil samples were analysed for a predetermined suite of contaminants (See section 3.4), designed to be reflective of the site's historic uses.
Groundwater Sampling and Analysis	3 No.	Three of the five window sample boreholes contained sufficient groundwater for sampling. An oil/water interface probe was used to check for free-phase hydrocarbons and resting groundwater levels were monitored. The three groundwater samples were analysed for a suite of contaminants designed to be reflective of the site's historic uses.

Table 3.2: Summary of Intrusive Works		
Item	**No.**	**Comments**
Gas Monitoring	1 No.	One ground gas monitoring round was undertaken on the 6th December 2019 using a portable gas analyser.
Waste Characterisation and Disposal	Item	All soil and groundwater arisings along with general waste generated during the works were stored in dedicated drums during the investigation. Once characterised, the wastes (soil, water and general waste) were collected by Acorn Waste, who (under appropriate consignment notes) arranged for disposal to a suitably licenced facility.

3.2.2 Sample Location Rationale

The rationale for positioning the sampling locations is described in Table 3.3 below.

Table 3.3: Exploratory Hole Rationale			
Exploratory Hole	**Rationale**	**Depth achieved (m bgl)**	**Installed as Monitoring Well?**
WS01	To determine the shallow soil conditions in the west of the site and adjacent to the electrical sub-station.	4.0m	Yes
WS02	To determine the shallow soil conditions in the south west of the site.	0.8m	No
WS03	To determine shallow soil conditions in north-west of the site and to the north of the fill point.	4.0m	No
WS04	To determine shallow soil conditions in the centre of the site near the USTs and to the south of the fill point.	4.0m	Yes
WS05	To determine shallow soil conditions in the north of site and on the forecourt and fuel infrastructure.	1.1m	No
WS06	To determine shallow soil conditions in the centre of the site and fuel infrastructure.	0.45m	No
WS07	To determine shallow soil conditions in the northeast of site and on the forecourt and fuel infrastructure.	0.9m	Yes
WS08	To determine the shallow soil conditions in the south east of the site and downgradient and fuel infrastructure.	4.0m	Yes
WS09	To determine the shallow soil conditions in the south east of the site and downgradient.	4.0m	Yes
WS09A	To determine the shallow soil conditions in the south east of the site and downgradient.	0.18m	No

3.2.3 Limitations to the Investigation

The site investigation was limited by the following factors:

- A second concrete slab was located at approximately 1 m bgl beneath the central forecourt area, prevented the advancement of window samples to the full depth in this area. However, samples were obtained to assess potential shallow impacts.

Overall, Ramboll was able to investigate the majority of identified potential contaminant sources and it is considered that the exploratory holes provide appropriate coverage across the accessible areas of the site. It should be noted that ground conditions at variance with those recorded in the exploratory holes drilled and excavated at the site could exist in areas of the site (e.g. beneath the building or USTs) that could not be accessed.

3.3 Sampling and Monitoring

3.3.1 Soil Samples

Soil samples were recovered from each of the exploratory locations based at regular intervals and/or changes of strata. Samples were collected in accordance with BS 10175:2011+A1:2013 and were stored within appropriate sample containers and forwarded to an independent Ramboll approved MCERTS accredited analytical laboratory (ALS). Selected samples were placed in containers supplied by the laboratory appropriate to the type of analysis being undertaken and stored in cool boxes with ice packs. All samples were dispatched accompanied by chain of custody documentation.

Selected soil samples were tested on-site for the presence of volatile organic compounds (VOCs) using a photo-ionisation detector (PID), calibrated in accordance with Ramboll's Quality Management procedures. Each soil sample tested was placed into a sealed plastic bag and agitated. The PID was then inserted into the headspace and the total VOC reading recorded. The PID screens for a wide range of VOCs but does not indicate a specific compound; therefore, the results of the PID screening provide a semi-quantitative indication of the concentration of VOCs present in soil pore spaces. The results of the PID screening are discussed in section 4.4.

3.3.2 Groundwater Samples

Groundwater development was undertaken on Friday 6th December and groundwater sampling was undertaken on Monday 9th December 2019, following the completion of the site investigation. Prior to sampling, the depth to the resting groundwater level (where present) and base of the monitoring wells were measured using an electronic interface probe. The wells were then purged of more than three times the well volume prior to groundwater sampling. Purging and sampling was undertaken using a dedicated inert disposable bailer to prevent cross contamination.

The recovered samples were placed in containers supplied by the laboratory appropriate to the type of analysis being undertaken and stored in cool boxes with ice packs. All samples were dispatched accompanied by chain of custody documentation to Ramboll's subcontracted and suitably accredited laboratory (ALS) for analysis.

3.3.3 Ground Gas Monitoring

One round of ground gas monitoring was undertaken by Ramboll on Friday 6th December. Ground gas monitoring was completed using a calibrated gas monitor with reference to CIRIA C665 and BS 8576:2013 Guidance on Investigations for Ground Gas. The monitoring was undertaken during periods of high, moderate and falling pressure. The following parameters were monitored:

- Methane (% vol);
- Carbon dioxide (% vol);
- Oxygen (% vol);
- Carbon Monoxide (ppm);
- Hydrogen Sulphide (ppm); and
- Flow rate (l/hrr).

Gas flow rates were measured at all monitoring boreholes and Ramboll recorded the range in flow rates until a steady state was reached. The results of the ground gas monitoring are discussed in section 7.

3.4 Laboratory Analysis

3.4.1 Data Quality Assurance

The laboratory selected to perform the analysis is accredited by UKAS to ISO 17025 and MCerts standards. Internal quality assurance checks are carried out by the laboratory data prior to the laboratory certificates being issued.

3.4.2 Analytical Sampling

The analytical samples are presented in Appendix 5 and Appendix 6.

4. FIELD OBSERVATIONS

4.1 Ground Conditions

Ground conditions are summarised in Table 4.1 below. The information provided below is a summary of both the window sample exploratory locations and also the deeper borehole exploratory locations. A full lithological description is recorded on the logs, which are provided as Appendix 2.

Table 4.1: Summary of Ground Conditions

Strata	Description	Depth to Base (m bgl)	Average Thickness (m)
Concrete / Brick Paving / Paving Slabs	Concrete hardstanding is present across the western half of the forecourt. Brick paving is present in the east of the forecourt in front of the kiosk. Paving slabs are present on public walkways adjacent to the shop and roads.	0.05 – 0.08 m	0.08 m
Topsoil	Grass over topsoil is present across soft landscaped areas on the periphery of the site and comprises a brown sandy slightly silty clay with frequent rootlets. Present in WS01, WS02, WS03, WS04, WS08 and WS09	0.12 m	0.1 m
Made Ground	Typically, brown slightly gravelly sandy CLAY. Gravel is fine and medium very angular to well-rounded of brick, ceramic and various lithologies.	1.2 m, base not proven in WS02, WS05, WS06, WS07, WS09A	1.0 m
London Clay	London Clay was encountered across the site in the form of brown clay. Noted to be weathered in top horizon and have some gravel content. A gravel band was noted in WS01 at 2.6-2.7m.	1.6 m Not proven	>4.0 m Not proven

The ground conditions encountered across the site are generally comparable to the geology described in the British Geological Survey (BGS) map of the area.

4.2 Groundwater

No groundwater was encountered during the ground investigation. The depth to resting groundwater level was recorded during Ramboll's ground gas and groundwater monitoring round on Friday 6th December. Groundwater was noted to range from 0.74m (WS09) to 3.67m bgl (WS01). Groundwater was obtained for analytical testing from three wells (WS04, WS08 and WS09); there was insufficient groundwater present in WS01 for sampling. Shallow groundwater was noted in WS07 at 0.75m bgl (base of well 0.8m bgl) however the cover was flooded prior to opening and the water present in the well is considered to be surface water inflow rather than representative of groundwater.

Given the range of groundwater levels across the site the groundwater is considered to be representative of perched water, likely present in the made ground rather than an aquifer present on the site. Groundwater flow direction, if groundwater is connected within the made ground, could not be determined, although if present is likely to follow topography and flow to the southeast of the site.

4.3 Field Evidence of Contamination

No visual or olfactory evidence of contamination was noted during the ground investigation.

4.3.1 Soils

No filed evidence of contamination was detected within the Made Ground or natural deposits during the investigation.

Soil headspace screening for volatile organic compounds was recorded using a photo-ionisation detector (PID) for selected soil samples. PID concentrations were predominantly 0.0 ppm and at a maximum of 0.2 ppm. No significant VOCs were therefore identified by this method.

4.3.2 Groundwater

During Ramboll's groundwater sampling, no visual or olfactory evidence of contamination was noted.

4.4 Ground Gas Monitoring

A summary of the ground gas concentrations recorded during the monitoring round undertaken on Friday 6th December are provided in Table 4.3 below. The maximum flow rate was 0.6l/hrr. Full ground gas monitoring results are provided in Appendix 3.

Table 4.2: Summary of Ground Gas Monitoring Results

Ground Gas	Max.	Min.	Location of Max.
Methane (% vol)	0.0	0.0	N/A
Carbon Dioxide (% vol)	3.5	0.0	WS01
Carbon Monoxide (ppm)	0.0	0.0	N/A
Hydrogen Sulphide (ppm)	0.0	0.0	N/A
Oxygen (% vol)	20.2	16.8	WS09
VOC (ppmv)	0.1	<0.1	WS01

Monitoring was only undertaken on one occasion and therefore not undertaken under a range of atmospheric pressure conditions, the atmospheric pressure was recorded as steady in the 24 hours prior to the monitoring.

5. HUMAN HEALTH ASSESSMENT

5.1 Assessment Approach

The main environmental legislation relating to contaminated land in the UK is Part 2A of the Environmental Protection Act 1990. The philosophy behind Part 2A is the contaminant-pathway-receptor linkage; for land to be contaminated all three aspects of this linkage must be present (i.e. a contaminant must be present and able to move along a pathway and impact a receptor).

Ramboll has derived generic assessment criteria (GAC) for the interpretation of soil and groundwater chemical analyses. The GAC are threshold, based screening criteria below which a significant risk is not considered to be present. Contaminants at concentrations above the GAC do not infer an unacceptable risk; rather that further assessment is required to more fully understand potential contamination risks (as discussed below).

Full details of Ramboll's assessment methodology are presented in Appendix 4.

5.2 Analytical Results

5.2.1 Soils

The soil analytical results obtained during this investigation have been screened against the Ramboll GAC for commercial end use appropriate for the current and proposed use of the site. The results of the screening are summarised in Table 5.1 below.

The analytical certificates for soils are presented in full in Appendix 5. Exceedance of a Ramboll GAC does not infer that an unacceptable risk is present; the outcome of the screening is assessed further in the context of a qualitative contaminant-pathway-receptor risk assessment presented in Section 8.

Table 5.1: Summary of Soil Analytical Results

Determinand		Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg) and location (m bgl)	Ramboll GAC for Commercial End Use (mg/kg)	No. of GAC Exceedances	Location of Exceedance
Metals & Inorganics						
Boron		<MRL	20.9 (WS08, 2.5)	240000	0	N/A
Arsenic		5.36	21.9 (WS01, 2.6)	640	0	N/A
Cadmium		<MRL	0.615 (WS02, 0.3)	410	0	N/A
Chromium Trivalent		8.55	42.8 (WS09, 1.2)	8600	0	N/A
Chromium Hexavalent		<MRL	<MRL	49	0	N/A
Copper		15.2	100 (WS05, 0.4m)	68000	0	N/A
Cyanide		<MRL	<MRL	49	0	N/A
Lead		12.5	650 (WS04, 0.15)	2300	0	N/A
Mercury		<MRL	1.53 (WS04, 0.15)	1100	0	N/A
Nickel		16	43.5 (WS01, 2.6)			
Selenium		<MRL	1.33 (WS01, 2.6)	12000	0	N/A
Zinc		7.3	359 (WS03, 0.05)	730000	0	N/A
Beryllium		0.418	1.62 (WS05, 0.4m)	12	0	N/A
Vanadium		16.5	84.7 (WS09, 1.2)	9000	0	N/A
Water Soluble Sulphate as SO4		0.0298 g/l	2.7 g/l (WS09, 3.9)	N/A	N/A	N/A
pH		7.17	10 (WS05, 0.4m)	N/A	N/A	N/A
Total Petroleum Hydrocarbons						
Aliphatics	C5-C6	<MRL	0.013 (WS03, 0.5)	2400	0	N/A

Table 5.1: Summary of Soil Analytical Results

Determinand		Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg) and location (m bgl)	Ramboll GAC for Commercial End Use (mg/kg)	No. of GAC Exceedances	Location of Exceedance
	C6-C8	<MRL	0.0389 (WS03, 0.5)	5300	0	N/A
	C8-C10	<MRL	0.046 (WS03, 0.5)	1300	0	N/A
	C10-C12	<MRL	<MRL	6100	0	N/A
	C12-C16	<MRL	12.7 (WS06, 0.3)	43000	0	N/A
	C16-C21	<MRL	65.4 (WS06, 0.3)	1000000	0	N/A
	C21-C35	<MRL	78.5 (WS06, 0.3)			
Aromatics	C5-C7 (benzene)	<MRL	<MRL	15	0	N/A
	C7-C8 (toluene)	<MRL	<MRL	33000	0	N/A
	C8-C10	<MRL	0.0307 (WS03, 0.5)	2200	0	N/A
	C10-C12	<MRL	<MRL	11000	0	N/A
	C12-C16	<MRL	2.12 (WS05, 0.4)	35000	0	N/A
	C16-C21	<MRL	282 (WS03, 0.5)	29000	0	N/A
	C21-C35	1.3	402 (WS03, 0.5)	29000	0	N/A
Benzene		<MRL	<MRL	15	0	N/A
Ethylbenzene		<MRL	<MRL	3200	0	N/A
Toluene		<MRL	<MRL	33000	0	N/A
Xylene		<MRL	<MRL	3300	0	N/A
MTBE		<MRL	<MRL	3800	0	N/A
Polyaromatic Hydrocarbons						

Table 5.1: Summary of Soil Analytical Results

Determinand	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg) and location (m bgl)	Ramboll GAC for Commercial End Use (mg/kg)	No. of GAC Exceedances	Location of Exceedance
Acenaphthylene	<MRL	0.118 (WS02, 0.3)	76000	0	N/A
Acenaphthene	<MRL	0.116 (WS02, 0.3)	75000	0	N/A
Fluorene	<MRL	0.141 (WS02, 0.3)	60000	0	N/A
Phenanthrene	<MRL	1.83 (WS02, 0.3)	22000	0	N/A
Naphthalene	<MRL	0.0565 (WS08, 0.25)	110	0	N/A
Anthracene	<MRL	0.512 (WS02, 0.3)	520000	0	N/A
Fluoranthene	<MRL	3.52 (WS02, 0.3)	23000	0	N/A
Pyrene	<MRL	2.97 (WS02, 0.3)	54000	0	N/A
Benzo[a]pyrene	<MRL	1.59 (WS02, 0.3)	76	0	N/A
Additional Organics					
Monohydric phenols	<MRL	<MRL	380	0	N/A
Cresols	<MRL	<MRL	N/A	N/A	N/A
Xylenols	<MRL	<MRL	N/A	N/A	N/A
PCBs	<MRL	<MRL	N/A	N/A	N/A
Asbestos					
Asbestos Screen	No detection*	Detection	Detection	**3**	**WS02, WS04$ and WS07****
Volatile Organic Compounds and Semi-volatile Organic Compounds (identified above MDL)					
Carbon Disulphide	<MRL	0.0108 (WS08, 1.5)	6.7	0	N/A
Dichloromethane	<MRL	0.109 (WS1, 0.5)	130	0	N/A

Table 5.1: Summary of Soil Analytical Results

Determinand	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg) and location (m bgl)	Ramboll GAC for Commercial End Use (mg/kg)	No. of GAC Exceedances	Location of Exceedance
* The fibrous material from WS04, 0.9m was tested for asbestos, it was proved not be asbestos					
** Amosite identified in WS07 at 0.7m, quantification undertaken <0.001%					
$ Chrysotile identified in WS02 at 0.3m, quantification undertaken <0.001%					

5.2.2 Groundwater (Human Health)

The groundwater analytical results obtained during this investigation have been screened against the Ramboll GAC for commercial end use for a volatilisation pathway. The results of the screening are summarised in Table 5.2 below.

Exceedance of a Ramboll GAC does not infer that an unacceptable risk is present; the outcome of the screening is assessed further in the context of a qualitative contaminant-pathway-receptor risk assessment presented in Section 8.

Table 5.2: Summary of Groundwater Analytical Results (Human Health)

Determinand	Minimum concentration (µg/l)	Maximum concentration (µg/l) and Location of Max. Conc.	Ramboll Water GAC for Human Health (Commercial) (µg/l)	No. and Location of Exceedances
Inorganics				
Boron	200	297 (WS04)	NV	NA
Arsenic	0.916	2.6 (WS08)	NV	NA
Cadmium	0.101	0.141 (WS08)	NV	NA
Chromium Total	1.1	13.7 (WS09)	NV	NA
Chromium Hexavalent	<MRL	<MRL	NV	NA
Copper	7.81	13.3 (WS08)	NV	NA
Cyanide	<MRL	<MRL	NV	NA
Lead	0.689	1.39 (WS08)	NV	NA
Mercury	<MRL	0.014 (WS08)	95	0
Nickel	6.68	35 (WS09)	NV	NA
Selenium	1.37	35.8 (WS09)	NV	NA
Zinc	30.3	84 (WS04)	NV	NA
Beryllium	<MRL	<MRL	NV	NA
Vanadium	<MRL	1.26	NV	NA
pH	7.37	7.4	NV	NA
Ammoniacal Nitrogen as N	<MRL	2.53	NV	NA
Sulphate	556mg/l	2600mg/l (WS04)	NV	NA
Hydrocarbons				

Table 5.2: Summary of Groundwater Analytical Results (Human Health)

Determinand		Minimum concentration (µg/l)	Maximum concentration (µg/l) and Location of Max. Conc.	Ramboll Water GAC for Human Health (Commercial) (µg/l)	No. and Location of Exceedances
Aliphatics	C5-C6	<MRL	<MRL	190000	0
	C6-C8	<MRL	<MRL	150000	0
	C8-C10	<MRL	<MRL	5700	0
	C10-C12	<MRL	<MRL	3600	0
	C12-C16	<MRL	<MRL	NV	NA
	C16-C21	<MRL	10 (WS08)	NV	NA
	C21-C35	<MRL	47 (WS08)	NV	NA
Aromatics	C5-C7 (benzene)	<MRL	<MRL	20000	0
	C7-C8 (toluene)	<MRL	<MRL	21000000	0
	C8-C10	<MRL	<MRL	190000	0
	C10-C12	<MRL	<MRL	660000	0
	C12-C16	<MRL	<MRL	3700000	0
	C16-C21	<MRL	<MRL	NV	NA
	C21-C35	<MRL	29 (WS08)	NV	NA
Benzene		<MRL	<MRL	20000	0
Ethylbenzene		<MRL	<MRL	960000	0
Toluene		<MRL	1.05 (WS04)	21000000	0
Xylene		<MRL	<MRL	940000	0
MTBE		<MRL	2.22 (WS09)	7800000	0

Table 5.2: Summary of Groundwater Analytical Results (Human Health)

Determinand	Minimum concentration (µg/l)	Maximum concentration (µg/l) and Location of Max. Conc.	Ramboll Water GAC for Human Health (Commercial) (µg/l)	No. and Location of Exceedances
Polycyclic Aromatic Hydrocarbons				
Acenaphthylene	<MRL	0.124 (WS08)	20000000	0
Acenaphthene	<MRL	0.0171 (WS08)	15000000	0
Fluorene	<MRL	0.0151 (WS08)	18000000	0
Phenanthrene	<MRL	0.171 (WS08)	NV	NA
Anthracene	<MRL	0.0874 (WS08)	NV	NA
Fluoranthene	0.0144	1.09 (WS08)	NV	NA
Pyrene	0.0184	1.28 (WS08)	NV	NA
Chrysene	0.00743	0.692 (WS08)	NV	NA
Benzo[b]fluoranthene	0.0241	1.62 (WS08)	NV	NA
Benzo[k]fluoranthene	0.00902	0.73 (WS08)	NV	NA
Benzo[a]pyrene	0.0112	1.25 (WS08)	NV	NA
Indeno[1,2,3-cd]pyrene	0.00901	0.969 (WS08)	NV	NA
Benzo[g,h,i]perylene	0.016	1.19 (WS08)	NV	NA
Naphthalene	0.0116	0.0215 (WS04)	23000	0
Other				
PCBS	<MRL	<MRL	NA	NA
Monohydric phenols	<MRL	<MRL	NV	NA
Cresols	<MRL	<MRL	NA	NA

Table 5.2: Summary of Groundwater Analytical Results (Human Health)

Determinand	Minimum concentration (µg/l)	Maximum concentration (µg/l) and Location of Max. Conc.	Ramboll Water GAC for Human Health (Commercial) (µg/l)	No. and Location of Exceedances
Xylenols	<MRL	<MRL	NA	NA
VOCs (unless otherwise stated above)	<MRL	<MRL	NA	NA

Notes:
NV – Not considered volatile
NA – Not applicable

5.3 Discussion of Results

5.3.1 Soils

Asbestos

Ten samples of Made Ground and / or surface soil were analysed for the presence of asbestos fibres and asbestos was detected in two samples WS02, 0.3m and WS07, 0.1m. Testing on WS07 showed amosite asbestos and on WS02 chrysotile, quantification on both samples was <0.001%. This was detected as loose fibres of chrysotile asbestos in the soil matrix. Asbestos fibres were not recorded as being present in the Made Ground at other locations at the site. Note, quantification of asbestos in one sample is awaited and this report will be updated when it is received.

Asbestos is a risk if exposed or disturbed. The likelihood of this happening during the current site use and also when the site is redeveloped is considered low. The main risk is likely to arise when construction works start and the soil is disturbed. However, the asbestos identified is at low levels and typical of similar brownfield sites. Ramboll envisages that the asbestos identified should be manageable by competent contractors.

Inorganics

Inorganic substances were not detected above the GAC in any of the Made Ground or Natural Ground obtained during this site investigation. A risk was therefore not identified.

Organics

Polycyclic aromatic hydrocarbons (PAHs) were detected in the majority of the soil samples, however none of the concentrations were noted to exceed Ramboll GACs

Concentrations of TPH, BTEX, MTBE, VOC or sVOCs were not detected above the relevant Ramboll GACs.

No evidence of significant contamination from the use of the site as a petrol station was therefore identified.

5.3.2 Groundwater (Human Health)

Inorganics

Inorganic substances were not detected above the GAC in the groundwater. A risk was therefore not identified.

Organics

Concentrations of TPH, BTEX, MTBE, PCBs, VOC or sVOCs were not detected above the relevant Ramboll GACs.

5.3.3 No evidence of significant contamination from the use of the site as a petrol station was therefore identified. Construction Workers

This report and the generic assessment criteria (GAC) consider long term and chronic risk to humans based on defined exposure scenarios set out in the Contaminated Land Exposure Assessment (CLEA) model. In some cases contaminants may also pose acute hazards to workers at a site, or a worker's exposure scenario may differ from the scenarios considered when deriving the GAC.

As exposure times for construction workers are generally short term, risks from site contamination are generally addressed through the use of appropriate working procedures and

the use of personal protective equipment (PPE) in line with the Management of Health and Safety at Work Regulations (1999), Construction (Design and Management) Regulations (2015) for some sites and the Control of Substances Hazardous to Health Regulations (2002). This potential contaminant-pathway-receptor linkage is considered further in Section 8.

6. WATER ENVIRONMENT ASSESSMENT

6.1 Assessment Approach

In the absence of relevant published water assessment criteria, the potential risk to the aquatic environment from entry of pollutants (either directly or via a groundwater pathway) has been assessed using commonly accepted UK guidelines including the Water Supply (Water Quality) (England) Regulations 2000 (DWS) and the Environmental Quality Standards (EQS) defined in European legislation such as the Water Framework Directive (WFD) (2000/60/EC).

For those determinands included in the analytical suite which do not have a corresponding UK screening criteria derived from the above sources, reference is made to a hierarchy of international guidance in accordance with Environment Agency guidance. Full details of Ramboll Environ's assessment methodology are presented in Appendix 4.

6.2 Analytical Results

The results of the screening are summarised in Table 6.1 below. Groundwater analytical certificates are presented in Appendix 6. Exceedance of screening criteria does not infer that an unacceptable risk is present; the outcome of the screening is assessed further in the context of a qualitative contaminant-pathway-receptor risk assessment presented in Section 8.

Table 6.1: Summary of Groundwater Analytical Results (Controlled Waters)

Determinand	Minimum concentration (µg/l)	Maximum concentration (µg/l) and Location of Max. Conc.	Ramboll Controlled Waters GAC (µg/l)	No. and Location of Exceedances
Inorganics				
Boron	200	297 (WS04)	1000[1]	0
Arsenic	0.916	2.6 (WS08)	10[1]	0
Cadmium	0.101	0.141 (WS08)	5[1]	0
Chromium Total	1.1	13.7 (WS09)	50[1]	0
Chromium Hexavalent	<MRL	<MRL	NA	NA
Copper	7.81	13.3 (WS08)	2000[1]	0
Cyanide	<MRL	<MRL	NA	NA
Lead	0.689	1.39 (WS08)	10[1]	0
Mercury	<MRL	0.014 (WS08)	1[1]	0
Nickel	6.68	35 (WS09)	20[1]	1 WS09
Selenium	1.37	35.8 (WS09)	10[1]	1 WS09
Zinc	30.3	84 (WS04)	5000[2]	0
Beryllium	<MRL	<MRL	NA	NA
Vanadium	<MRL	1.26	60[7]	0
pH	7.37	7.4 (WS08)	NA	NA
Ammoniacal Nitrogen as N	<MRL	2.53 (WS08)	0.6[8]	1 WS08
Sulphate	556mg/l	2600mg/l (WS04)	250mg/l[3]	3
Hydrocarbons				

Table 6.1: Summary of Groundwater Analytical Results (Controlled Waters)

Determinand		Minimum concentration (µg/l)	Maximum concentration (µg/l) and Location of Max. Conc.	Ramboll Controlled Waters GAC (µg/l)	No. and Location of Exceedances
Aliphatics	C5-C6	<MRL	<MRL	NA	
	C6-C8	<MRL	<MRL	NA	NA
	C8-C10	<MRL	<MRL	NA	NA
	C10-C12	<MRL	<MRL	NA	NA
	C12-C16	<MRL	<MRL	NA	NA
	C16-C21	<MRL	10 (WS08)	10^4	0
	C21-C35	<MRL	47 (WS08)	10^4	1 WS08
Aromatics	C5-C7 (benzene)	<MRL	<MRL	NA	NA
	C7-C8 (toluene)	<MRL	<MRL	NA	NA
	C8-C10	<MRL	<MRL	NA	NA
	C10-C12	<MRL	<MRL	NA	NA
	C12-C16	<MRL	<MRL	NA	NA
	C16-C21	<MRL	<MRL	NA	NA
	C21-C35	<MRL	29 (WS08)	10^4/90^5	1/0 WS08
Benzene		<MRL	<MRL	NA	NA
Ethylbenzene		<MRL	<MRL	NA	NA
Toluene		<MRL	1.05 (WS04)	700^5	0
Xylene		<MRL	<MRL	NA	NA
MTBE		<MRL	2.22 (WS09)	15^5	0

Table 6.1: Summary of Groundwater Analytical Results (Controlled Waters)

Determinand	Minimum concentration (µg/l)	Maximum concentration (µg/l) and Location of Max. Conc.	Ramboll Controlled Waters GAC (µg/l)	No. and Location of Exceedances
Polycyclic Aromatic Hydrocarbons				
Acenaphthylene	<MRL	0.124 (WS08)	NV	NA
Acenaphthene	<MRL	0.0171 (WS08)	NV	NA
Fluorene	<MRL	0.0151 (WS08)	NV	NA
Phenanthrene	<MRL	0.171 (WS08)	NV	NA
Anthracene	<MRL	0.0874 (WS08)	0.1[9]	0
Fluoranthene	0.0144	1.09 (WS08)	0.0063[9]	3 (WS04/8/9)
Pyrene	0.0184	1.28 (WS08)	NV	NA
Chrysene	0.00743	0.692 (WS08)	NV	NA
Benzo[b]fluoranthene	0.0241	1.62 (WS08)	0.1[6]	1 WS08
Benzo[k]fluoranthene	0.00902	0.73 (WS08)	0.1[6]	1 WS08
Benzo[a]pyrene	0.0112	1.25 (WS08)	0.01[1]	3 (WS04/8/9)
Indeno[1,2,3-cd]pyrene	0.00901	0.969 (WS08)	0.1[6]	2 (WS04/8)
Benzo[g,h,i]perylene	0.016	1.19 (WS08)	0.1[6]	1 WS08
Naphthalene	0.0116	0.0215 (WS04)	2[7]	0
Other				
PCBS	<MRL	<MRL	NA	NA
Monohydric phenols	<MRL	<MRL	NA	NA

Table 6.1: Summary of Groundwater Analytical Results (Controlled Waters)

Determinand	Minimum concentration (µg/l)	Maximum concentration (µg/l) and Location of Max. Conc.	Ramboll Controlled Waters GAC (µg/l)	No. and Location of Exceedances
Cresols	<MRL	<MRL	NA	NA
Xylenols	<MRL	<MRL	NA	NA
VOCs (unless otherwise stated above)	<MRL	<MRL	NA	NA

Notes:
NV – No standard identified for comparison
NA – Not applicable
1- EU Drinking Water Directive
2- Standard taken for Scotland Private Water Supplies, in absence of other standards
3- Indicator Parameter EU DWD
4- Withdrawn former Oils and Hydrocarbons Private Water Supply standard
5- World Health Organisation Drinking Water Standard
6- EU DWD, sum of compounds
7- Environmental Quality Standard – Freshwater
8- Water Framework Directive 'Good' Standard Inland Surface Water taken for >200mg/l CaCO3
9- Water Framework Directive 'Good' Standard Inland Surface Water

6.3 **Discussion of Results**

Modest concentrations of contaminants were detected in groundwater, including TPH and PAHs at maximum concentrations of respectively 0.086mg/l in WS08 and 0.0019mg/l. Slightly elevated concentration were detected of metals, primarily in WS09 and ammoniacal nitrogen as N in WS08.

In comparison with drinking water standards the following exceedances were found. Where no drinking water standard was identified the surface water standard has been used for comparison:

- Metals, Nickel at 35µg/l (standard 20µg/l) and Selenium at 35.8µg/l (standard 10µg/l) in WS09.
- Ammoniacal Nitrogen as N at 2.53µg/l in WS08 in comparison to 0.6µg/l standard for 'good' surface water conditions.
- Hydrocarbons, Aliphatic C21-35 at 47µg/l and Aromatic C21-35 at 29µg/l in comparison to the withdrawn oils and hydrocarbon private water supply standard of 10µg/l.
- PAHs, Fluoranthene in all three boreholes (WS04, WS08, WS09) with a maximum of 1.09µg/l in WS08 in comparison to a standard of 0.0063 for groundwater protective of surface waters.
- Benzo(b)fluoranthene (1.62µg/l), Benzo(k)fluoranthene (0.73µg/l), Indeno(1,2,3-cd)pyrene (0.969 in WS08 and 0.0147µg/l in WS04) and benzo(g,h,i)perylene (1.19µg/l in WS08) in comparison to the drinking water standard of 0.1µg/l as a sum of the 4 compounds.
- Benzo(a)pyrene in all three boreholes (WS04 at 0.0154µg/l, WS08 at 1.19µg/l, WS09 at 0.0112µg/l) in comparison of the drinking water standard of 0.01µg/l.

Although above GAC, the contaminant concentrations detected are not considered significant for the following reasons:

- The GACs are based on conservative drinking water standards and not for groundwater (although this is a standard approach to screening contaminant concentrations in groundwater);
- It is not considered plausible that the perched groundwater beneath the site would ever be a viable water resource;
- The TPH and PAHs detected are not indicative of fuel releases. i.e. concentrations are a reasonable heavy range of hydrocarbons and not characteristic of fuel (petrol or diesel).
- The London Clay will restrict contaminant migration and therefore potential for off-site pollution; and
- The concentrations detected are typical of a brownfield site and 'background' for urban areas.

7. BUILT ENVIRONMENT ASSESSMENT & ECOLOGY

7.1 Ground Gases

7.1.1 Assessment Approach

Ground gases can be produced as a result of the decomposition of organic materials and may also originate from natural sources, such as coal seams and organic-rich soils. The principal components of ground gas are methane and carbon dioxide, although other gases may be present in trace concentrations. Ground gas can present a hazard to site occupants and property as result of flammable/explosive hazards, physiological effects, odour and effects on vegetation.

Ramboll has applied a semi-quantitative method in line with current good practice guidance on risk assessment to assess ground gas risks. Full details of Ramboll's assessment methodology are presented in Appendix 4.

7.1.2 Discussion of Results

Atmospheric Pressure

One monitoring round was undertaken at 1001 mb. Results were taken from the installed boreholes on site WS01, WS04, WS07, WS08 and WS09).

Flow Rates

The steady state gas flow rates recorded during the monitoring rounds ranged from below detection level (<0.1 L/hr) to 0.6 L/hr although reducing to <0.1 L/hr during sampling. It is therefore considered that no significant flow rates are present at the site.

Methane and Carbon Dioxide

Carbon dioxide concentrations ranged from <0.1 % to 3.5 % by volume. The highest concentrations were noted in WS01. Similarly, there were additional three monitoring locations where the levels of carbon dioxide exceeded 1.5 % by volume in WS04, WS08 and WS09.

No elevated methane concentrations were detected.

Oxygen

Oxygen concentrations varied from 16.8% to 20.2% v/v across the boreholes, this is considered a typical range of oxygen within soil gas.

Carbon Monoxide

Carbon monoxide was not detected at concentrations above the instrument method detection limit (i.e. carbon monoxide was recorded to be 0 ppm at all locations).

Hydrogen Sulphide

Hydrogen sulphide was not detected at concentrations above the instrument method detection limit (i.e. carbon monoxide was recorded to be 0 ppm at all locations).

Volatile Organic Compounds

The ground gas monitoring has not identified elevated VOC concentrations (measured with a PID in the monitoring wells). The maximum reading identified during the monitoring was 0.1ppm reducing to <0.1 during sampling.

7.1.3 Site Gas Screening Value (SGSV)

Ramboll has used the Modified Wilson and Card method to define a characteristic situation for the site, by calculating a site Gas Screening Value (SGSV). The SGSV is calculated using a worst case scenario (i.e. the maximum gas concentration and flow rates detected) across the entire site during the monitoring period. The SGSV is calculated for both methane and carbon dioxide, and the 'Characteristic Situation' is derived by comparison with a table relevant to each method. It is important to note that SGSVs are not absolute thresholds but guideline values.

The carbon dioxide SGSV for the site has been calculated as 0.035 L/hr by multiplying the maximum carbon dioxide concentration (3.5% by volume in WS01) by the highest steady state flow rate (0.1 L/hr). This corresponds to CIRIA C665 Characteristic Situation 1 (very low risk).

The findings of this gas risk assessment and requirements for further gas testing and any gas protection measures should be agreed with the local authority building control department once the development layout and construction design is finalised.

7.2 Water Supply Pipes

Buried water supply pipes can be at risk from permeation and accelerated deterioration from certain contaminants. A detailed assessment of existing and future pipe materials is outside of the scope of this investigation; however, architects and designers should liaise with the local water supply company and are directed to the following document for guidance:

- Guidance for the Selection of Water Supply Pipes to be used in Brownfield sites; UK Water Industry Research (UK WIR), 2010 (Ref. 10/WM/03/21)

7.3 Building Materials

There are a number of contaminants that may attack some building materials under certain conditions if present. The focus of this investigation is to assess risks to human health and environmental receptors and no assessment has been made of impact to building materials.

7.4 Ecology

There is no proposed landscaping for the site, except around the picnic area (near WS1) where existing trees are present. The contaminants detected in this area are not considered a risk to ecology as no significantly elevated levels of contaminants were detected. Furthermore, no distressed vegetation has been observed on the site.

It is recommended that a suitable depth of topsoil/growing material is imported onto site in areas where new landscaping or trees are installed to aid their growth.

8. CONTAMINANT-PATHWAY-RECEPTOR RISK ASSESSMENT

8.1 Revised Conceptual Site Model

Using information obtained during this site investigation, the preliminary conceptual site model presented in section 3.1 has been refined and is described in Table 8.1 below.

Table 8.1: Revised Conceptual Site Model

Sources of Contamination On the basis of this site investigation, the following contaminants have been identified at elevated concentrations on site within soils and groundwater: • Asbestos fibres detected in shallow reworked natural ground. • Trace concentrations of TPH and PAHs in Soil			
Geology The ground conditions comprise Made Ground over London Clay.			
Hydrogeology Perched groundwater is present within the made ground. A consistent groundwater body was not identified. Overall the site is considered to be of low environmental sensitivity in terms of groundwater.			
Hydrology A plausible pollutant pathway to surface water was not identified.			
Potential Contaminant Linkages The following potential pollutant linkages have been identified at the site and are considered further in the qualitative risk assessment:			**Potential Contaminant Linkage**
Human Health **(Commercial and construction workers)**	On-site	Dermal contact & ingestion	PCL1

8.2 Qualitative Risk Assessment

The principal sources of contamination, receptors and potential pollutant linkages have been assessed using a qualitative contaminant-pathway-receptor approach and are summarised in Table 8.2 below.

Table 8.2: Qualitative Risk Assessment – Commercial

Potential Contaminant Linkage	Contaminant	Pathways	Receptors	Discussion	Risk Rating
PCL1	Localised TPH and PAHs in Made Ground. Low level of asbestos in soil.	Dermal Contact, Ingestion	Construction workers	On the basis of the chemical analysis, the risk to construction workers from soil is considered low. However, precautionary control measures, such as basic personal protective equipment and good hygiene practices should be maintained. Asbestos in soils needs to be considered in terms of future works. The results of this report should be made available to relevant contractors to manage their risks.	Low, assuming appropriate re-use of Made Ground materials and health and safety precautions.

9. CONCLUSIONS AND REMEDIAL RECOMMENDATIONS

9.1 Conclusions

The Phase II investigation was undertaken to support discharge of planning conditions for the redevelopment of the site for a commercial use. The investigation was based on a Scheme of Assessment agreed by the Local Authority and follows a Phase I assessment that provides relevant background information on the history of the site and its environmental setting.

The investigation has not identified any evidence of significant ground contamination. Testing of soil and groundwater was undertaken for a range of contaminants associated with past uses and the petrol station. All contaminants in soil were below the relevant GAC for a commercial use and therefore not considered a risk. Asbestos fibres have been identified in the soil, which is common to many brownfield sites. This should be manageable by a competent contractor during development and is not considered a risk to current or proposed future users of the site.

Contaminants detected in groundwater were low, albeit above the conservative GAC for Controlled Waters which is based on a drinking water standard. The groundwater contaminants are not considered a significant risk given the low levels of contaminants detected and the low sensitivity of environmental receptors.

Furthermore, the site geology comprises low permeability London Clay and consequently this substantially reduces risk of impact to groundwater and surface water and the possibility of off-site contaminant migration.

The presence of localised contamination around the underground fuel tanks and associated infrastructure cannot be completely ruled out and is commonly found on petrol station sites. Based on this investigation, contamination, if any, is likely to be localised. Contractors involved in the redevelopment of the site should plan for the possibility of some unexpected contamination being encountered.

In conclusion, Ramboll has not identified significant contamination at the site and does not consider remedial action is required for current use or the proposed development. The following recommendations in Section 9.2 are made in terms of good practice and planning condition 62. This forms the **Remediation Scheme (Part A of condition 62).** The **Remediation Report (Part C)** is also described below.

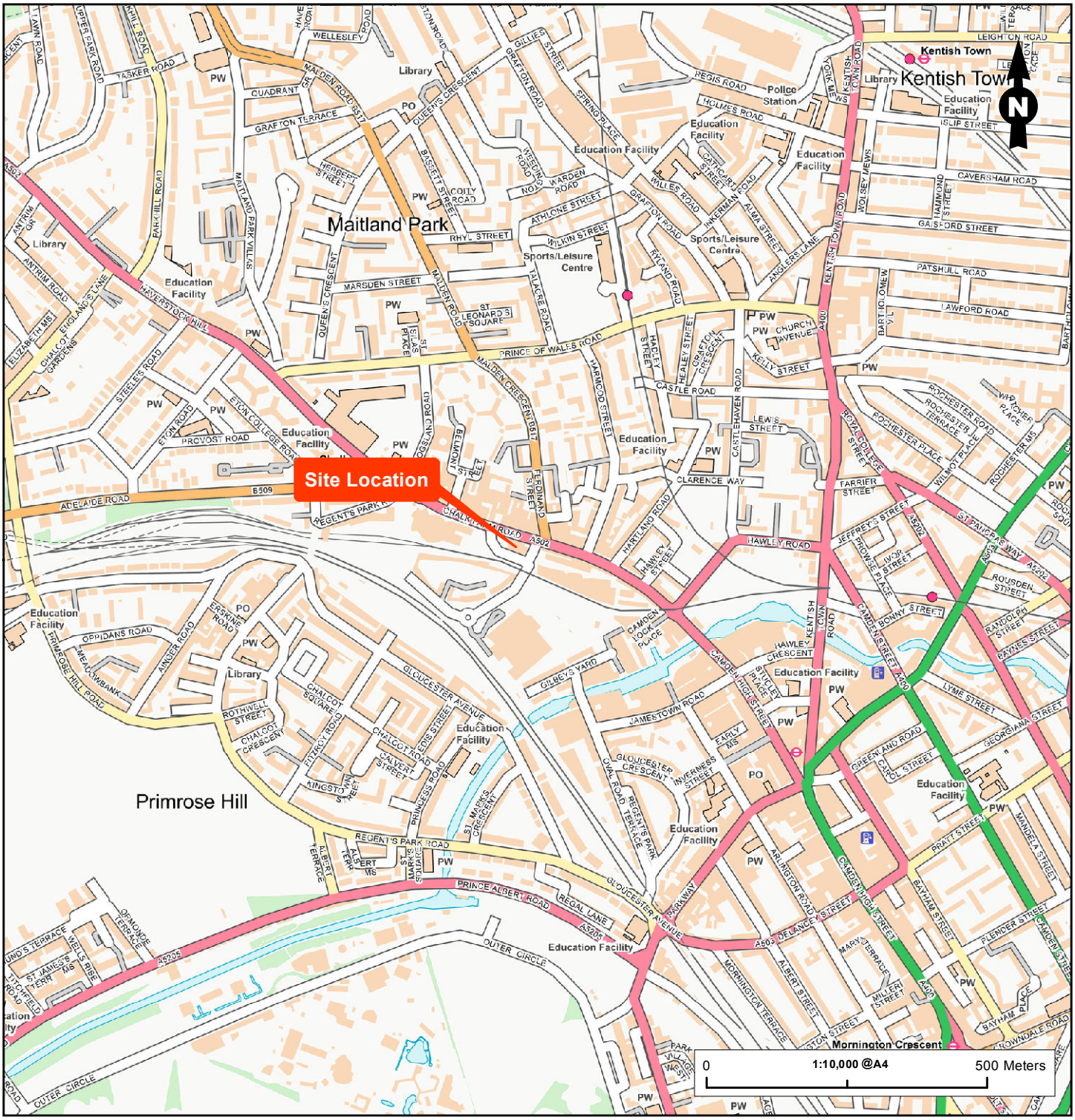
9.2 Remediation Scheme and Remediation Report

- Planning Condition 62, Part A, "Remediation Scheme"
- The underground tanks and associated infrastructure should be removed prior to development. Localised soil and perched groundwater contamination may be present around these underground features and if encountered should be assessed and removed if considered a risk. A watching brief is recommended during these works or other phases of substantial groundworks that may expose unexpected contamination.
- All free phase product (neat fuels or oils) encountered in the soil or groundwater should be excavated and removed from site under the direction of an environmental consultant. Free phase product may, for example, be found in chambers or soil surrounding the tanks or fuel pipelines.
- Verification samples of the walls and base of excavations should be obtained and analysed for TPH and BTEX compounds. The results of the verification samples should be considered in light of the proposed development (e.g. potential for vapours to migrate from the contamination into buildings). Further excavation or remediation would be required if the verification samples identify a risk, as defined by the environmental consultant.

- Soil samples will be obtained from each side and base of the excavation (five in total) and analysed for TPH CWG and VOCs. Should the excavation extend beyond 10m in length in any direction, soil samples will be taken at a rate of one sample per 10m face, and one sample per 10m by 10m base.
- The chemical analyses will be compared with Ramboll GACs which are protective of human health, including vapour pathways. No further action will be required if the chemical analyses are below the GACs.
- If chemical analyses are above the GACs, the following will be undertaken:
  - Additional risk assessment which may include a "detailed quantitative risk assessment". This will provide a more comprehensive assessment of risks and usually results in a less conservative remedial target; and/or
  - Further remediation, which would most likely be the over excavation of contaminated soil. The size of the site, scale of possible remediation and programme would not likely allow other forms of remediation.
- The findings of the preliminary ground-gas risk assessment indicated that there is no requirement for gas protection measures in new buildings. This may need to be re-assessed depending on the final design and construction of the development, and any remedial or bulk earthworks undertaken.
- This report should be provided to development contractors so that they can manage and plan their risks and work appropriately. The development contractor will be expected to:
  - report on any environmental controls required during excavation works e.g. dust monitoring and noise monitoring;
  - any health and safety or environmental incidents – specific details to be given where an incident could relate to ground contamination;
  - plans showing the location and depth of excavations and description of unexpected contamination (if encountered);
  - 'as-dug' plans of where re-use materials have been placed, including the thicknesses and types of backfill and the final site levels;
  - details of consents, exemptions and permits for the works (including any permissions and requirements for removing the underground tanks and fuel infrastructure);
  - waste duty of care information (including the types and amounts of waste disposed of, waste classification and WAC analysis, waste transfer and consignment notes and applicable site and carriers licenses;
  - documentation obtained from the producer of any imported recycled aggregate and topsoil. All imported material should be compliant with environmental criteria as outlined in this report (i.e. GACs);
  - material tracking information to demonstrate compliance with the MMP (if required).
- Planning Condition 62, Part C, "Remediation Report"
- On completion of the above, a "Remediation Report" should be produced to confirm the final status of the site in terms of ground contamination. The report should be issued to the Local Authority. The report should document all of the activities outlined in Part A above, and include:
  - the details and roles of Contractor / sub-Contractors involved in the remediation work;
  - a description of the remedial activities or confirmation that no remediation was undertaken;
  - a photographic record of the remediation works, together with plans indicating the dates and locations of remediation activities;

- reference to the Health and Safety file;
- a clear statement that the remedial scheme objectives have been completed;
- A discussion on vapour and ground gas and potential risks and mitigation undertaken; and
- supporting documents, to include where appropriate analytical results, monitoring data, health and safety documentation and quality management documentation.

APPENDIX 1
FIGURES



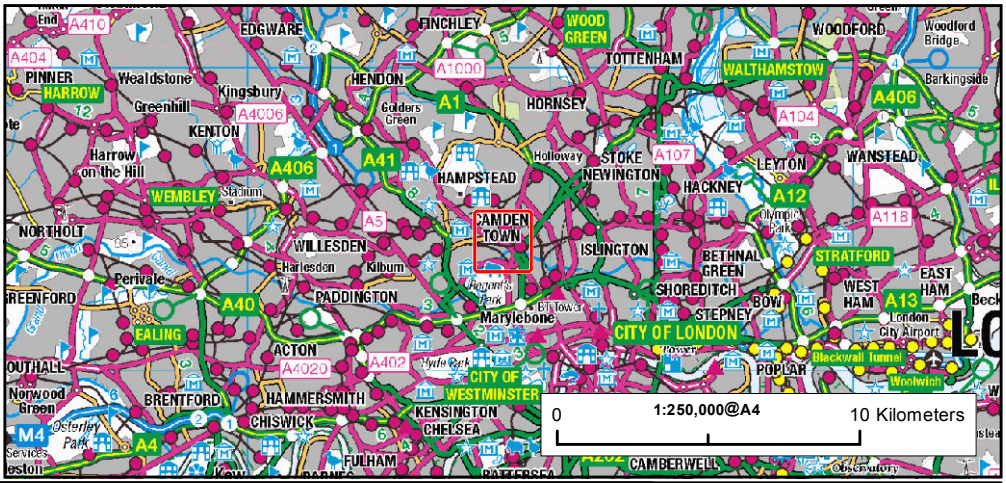
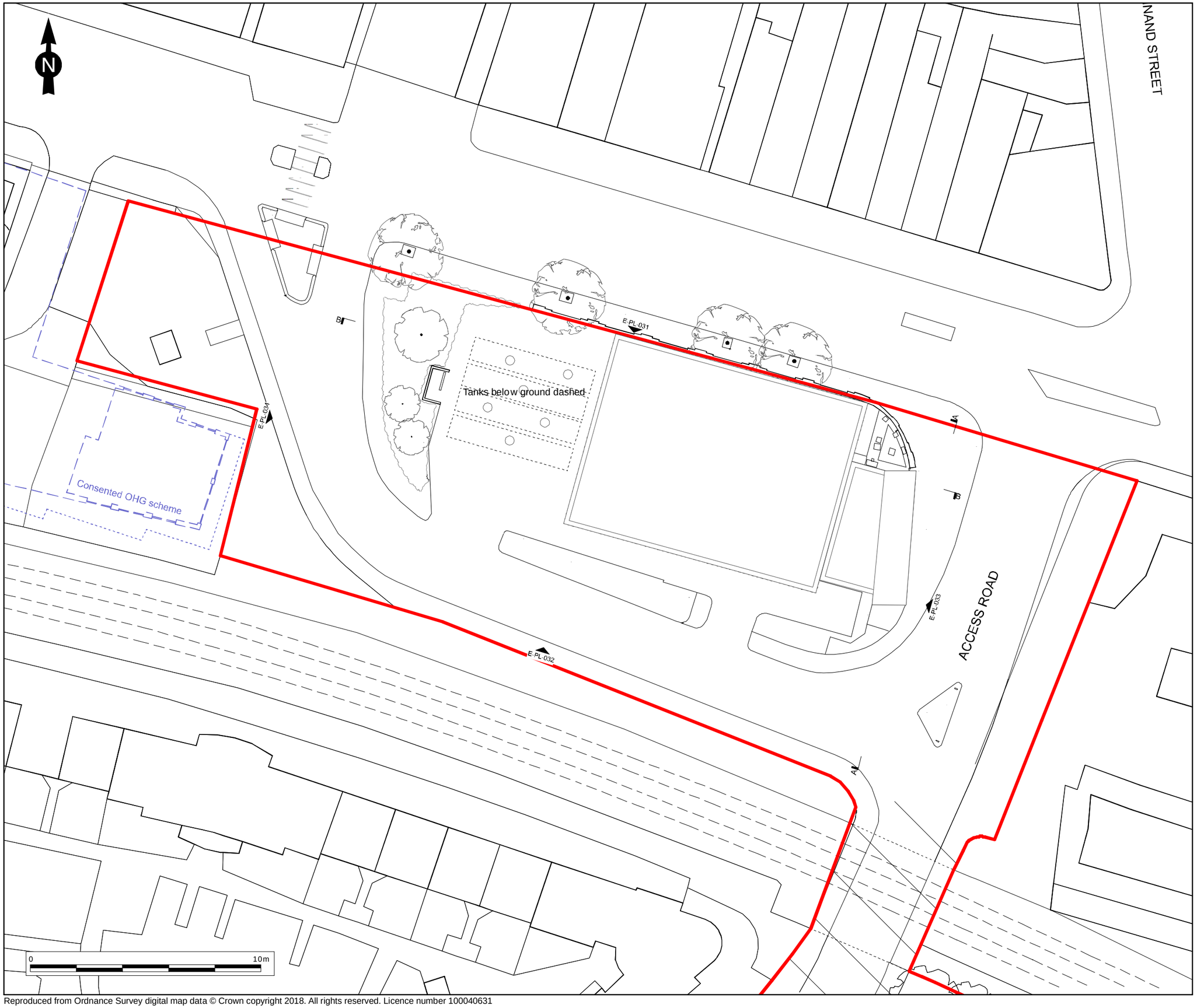


Figure Title: Figure 1: Site Location	Project Name: Morrisons Petrol Filling Station, 93 Juniper Crescent, Camden Town, London NW1 8HQ	Date: November 2019	
		Scale: As shown	
Project Number: 1620008283	Client: St George West London Limited	Issue: 1	Prepared By: BVK

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

Site Boundary

Figure Title

Figure 2: Site Layout Plan

Project Name

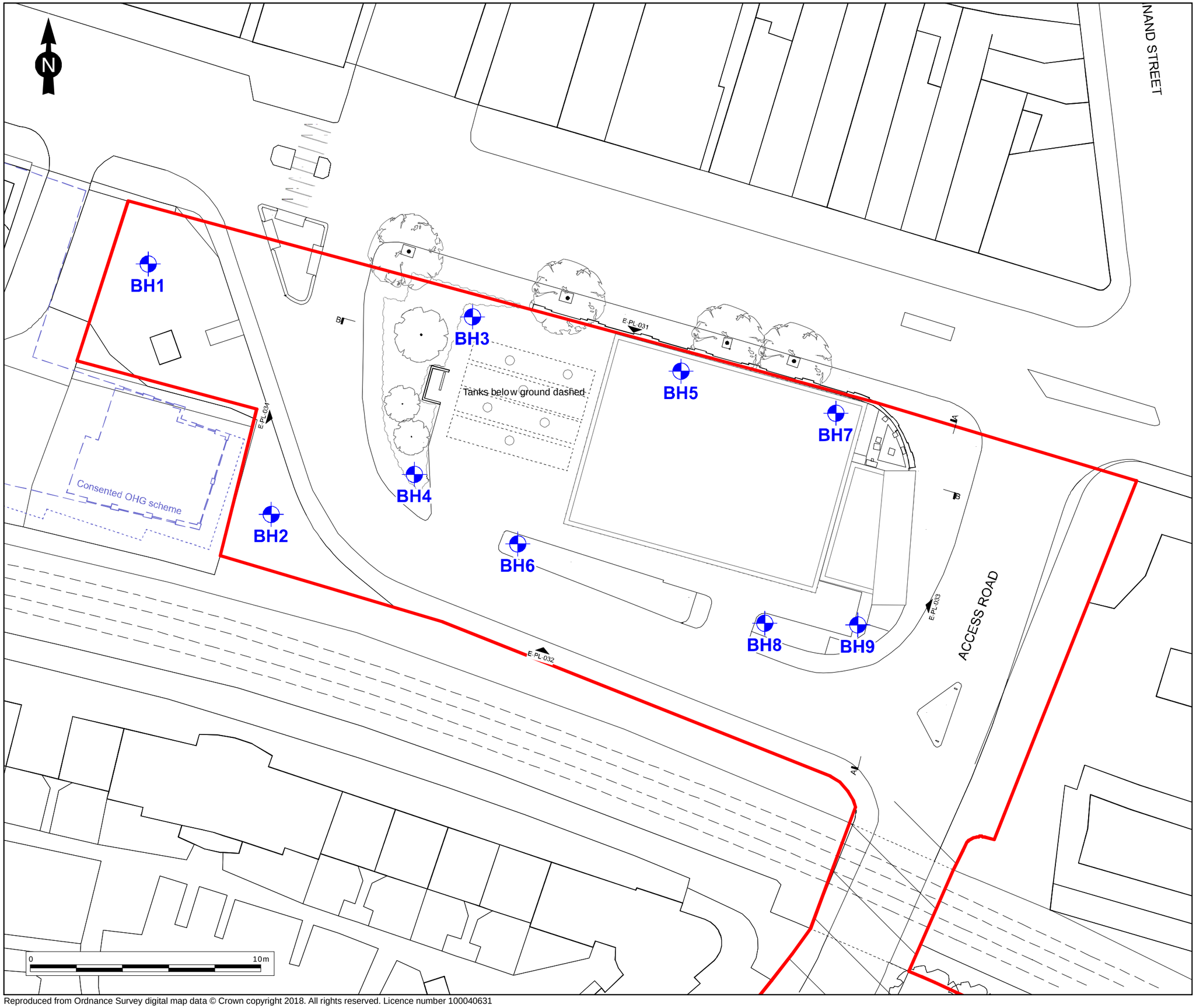
Morrisons Petrol Filling Station, 93 Juniper Crescent, Camden Town, London NW1 8HQ

Project Number	Figure No.
1620008283	2
Date	**Prepared By**
November 2019	BVK
Scale	**Issue**
Refer to scale bar	1

Client

St George West London Limited

RAMBOLL



Legend

- Site Boundary
- Borehole Location

Figure Title	Figure 3: Borehole Location Plan
Project Name	Morrisons Petrol Filling Station, 93 Juniper Crescent, Camden Town, London NW1 8HQ
Project Number: 1620008283	Figure No.: 3
Date: November 2019	Prepared By: BVK
Scale: Refer to scale bar	Issue: 1
Client	St George West London Limited

RAMBOLL

APPENDIX 2
EXPLORATORY HOLE LOGS

WINDOW SAMPLE LOG

Project Number: 1620008283

ID: WS01

Site: Morrisons Petrol Filling Station, Camden

Client: St George West London Ltd

Logged By: SMc

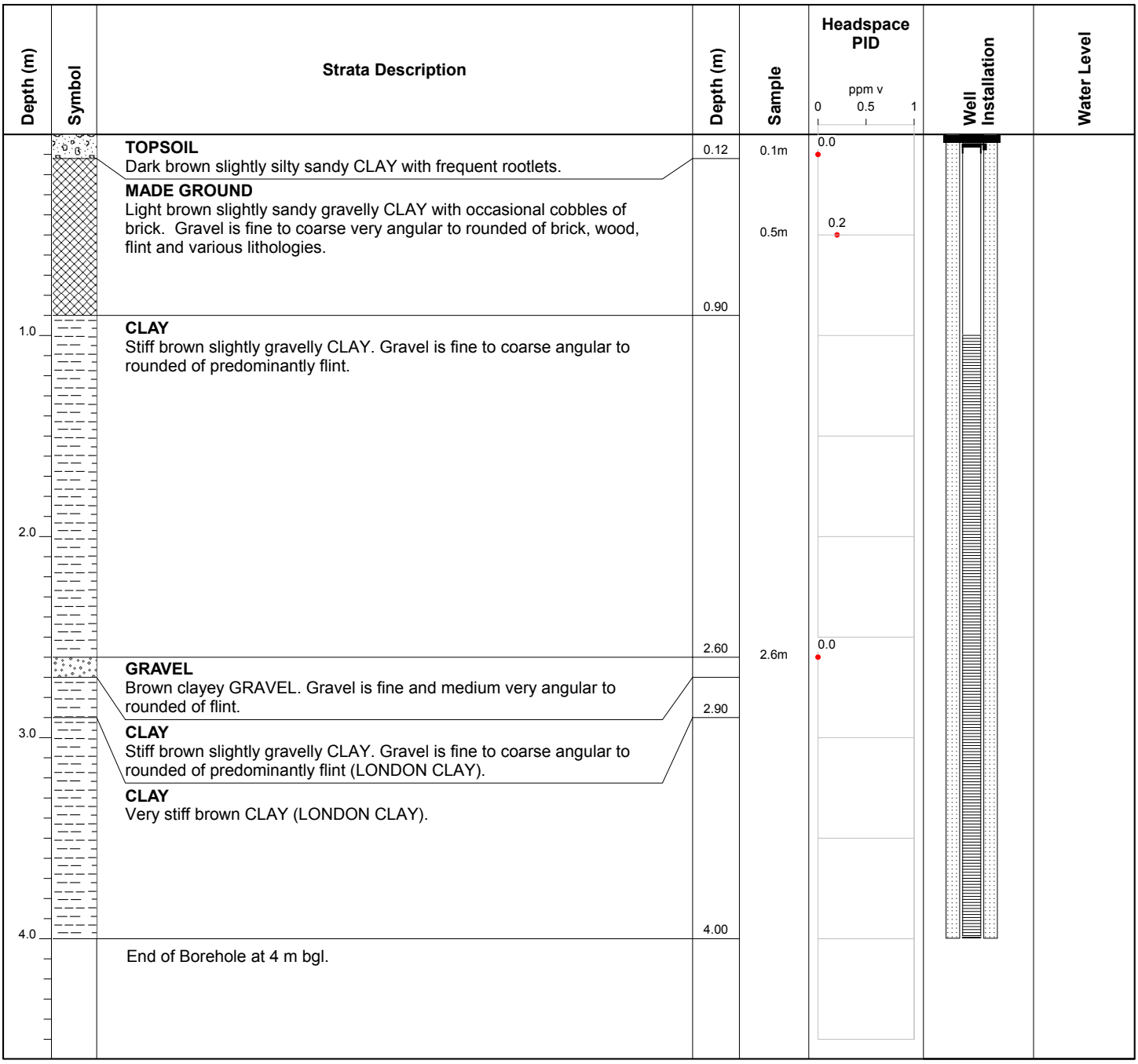
Ground Elevation: 0

Co-ordinates:

Date: November 2019

Equipment:

Diameter:



Temporary casing details:

Groundwater details: No groundwater encountered

Monitoring well standpipe diameter:

Other comments:

Well installation key:

Concrete | Bentonite seal | Arisings | Filter pack | Slotted pipe | Plain pipe

Checked by:

WINDOW SAMPLE LOG

Project Number: 1620008283

ID: WS02

Site: Morrisons Petrol Filling Station, Camden

Client: St George West London Ltd

Logged By: SMc

Ground Elevation: 0

Co-ordinates:

Date: November 2019

Equipment:

Diameter:

Depth (m)	Symbol	Strata Description	Depth (m)	Sample	Headspace PID (ppm v, 0 – 0.5 – 1)	Well Installation	Water Level
		TOPSOIL TOPSOIL : Firm brown silty CLAY with occasional rootlets.	0.10				
		MADE GROUND MADE GROUND: Dark brown very sandy gravelly CLAY. Gravel is fine to coarse very angular to well rounded of brick, quartzite, ceramic, coal and various lithologies.		0m	0.0		
			0.80				
		Window sample terminated at 0.8m bgl due to membrane and gravel being encountered. Assumed service beneath but not encountered. Hand pit undertaken 1 m to the south east of the first pit and encountered the same. Both hand pits to 0.8 m bgl backfilled.					
1.0		End of Borehole at 0.8 m bgl.					

Temporary casing details:

Groundwater details: No groundwater encountered

Monitoring well standpipe diameter:

Other comments:

Well installation key:

Concrete | Bentonite seal | Arisings | Filter pack | Slotted pipe | Plain pipe

Checked by:

WINDOW SAMPLE LOG

Project Number: 1620008283

ID: WS03

Site: Morrisons Petrol Filling Station, Camden

Client: St George West London Ltd

Logged By: SMc

Ground Elevation: 0

Co-ordinates:

Date: November 2019

Equipment:

Diameter:

Depth (m)	Symbol	Strata Description	Depth (m)	Sample	Headspace PID (ppm v, 0 – 0.5 – 1)	Well Installation	Water Level
0		**TOPSOIL** Dark brown slightly silty sandy CLAY with frequent rootlets. **MADE GROUND** Firm light brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse very angular to well rounded of brick and various lithologies.	1.10	0	0.0 0.2		
1.0		**CLAY** Grey mottled dark grey CLAY.	2.25				
2.0		**CLAY** Orangish brown mottled light grey slightly gravelly CLAY. Gravel is fine and medium very angular to subrounded of predominantly flint (LONDON CLAY).		0	0.0		
3.0				0			
4.0		Window sample complete at 4m bgl. No groundwater encountered. No visual or olfactory contamination observed. End of Borehole at 4 m bgl.	4.00				

Temporary casing details:

Groundwater details: No groundwater encountered

Monitoring well standpipe diameter:

Other comments:

Well installation key:

Concrete | Bentonite seal | Arisings | Filter pack | Slotted pipe | Plain pipe

Checked by:

WINDOW SAMPLE LOG

Project Number: 1620008283

ID: WS04

Site: Morrisons Petrol Filling Station, Camden

Client: St George West London Ltd

Logged By: SMc

Ground Elevation: 0

Co-ordinates:

Date: November 2019

Equipment:

Diameter:

Depth (m)	Symbol	Strata Description	Depth (m)	Sample	Headspace PID (ppm v, 0 – 0.5 – 1)	Well Installation	Water Level
		TOPSOIL Firm brown silty CLAY with occasional rootlets.		0.15m	0.0		
		MADE GROUND Light brown very gravelly sandy CLAY. Gravel is fine to coarse very angular to well rounded of brick and various lithologies.		0.9m	0.1		
1.0			1.20				
		CLAY Firm reddish brown CLAY (LONDON CLAY).		1.4m	0.0		
2.0							
3.0							
4.0			4.00				
		Window sample complete at 4m bgl. No groundwater encountered. No visual or olfactory contamination observed.					
		End of Borehole at 4 m bgl.					

Temporary casing details:

Groundwater details: No groundwater encountered

Monitoring well standpipe diameter:

Other comments:

Well installation key:

Concrete | Bentonite seal | Arisings | Filter pack | Slotted pipe | Plain pipe

Checked by:

WINDOW SAMPLE LOG

Project Number: 1620008283

ID: WS05

Site: Morrisons Petrol Filling Station, Camden

Client: St George West London Ltd

Logged By: SMc

Ground Elevation: 0

Co-ordinates:

Date: November 2019

Equipment:

Diameter:

Depth (m)	Symbol	Strata Description	Depth (m)	Sample	Headspace PID (ppm v, 0 – 0.5 – 1)	Well Installation	Water Level
		MADE GROUND BRICK PAVING.	0.08				
		MADE GROUND VOID.					
		MADE GROUND CONCRETE CORE.	0.27				
		MADE GROUND PLASTIC MEMBRANE.					
		MADE GROUND Brown slightly clayey very gravelly SAND. Gravel is fine and medium of shingle, brick and various lithologies.	0.50	0.4m	0.0		
1.0		**MADE GROUND** Loose grey slightly sandy GRAVEL. Gravel is medium subrounded to well rounded of pea gravel.	1.10				
		Window sample refused on second concrete slab at 1.0 m bgl and backfilled. No groundwater encountered. No visual or olfactory evidence of contamination observed.					
		End of Borehole at 1.1 m bgl.					

Temporary casing details:

Groundwater details: No groundwater encountered

Monitoring well standpipe diameter:

Other comments:

Well installation key:

Concrete | Bentonite seal | Arisings | Filter pack | Slotted pipe | Plain pipe

Checked by:

WINDOW SAMPLE LOG

Project Number: 1620008283

ID: WS06

Site: Morrisons Petrol Filling Station, Camden

Client: St George West London Ltd

Logged By: SMc

Ground Elevation: 0

Co-ordinates:

Date: November 2019

Equipment:

Diameter:

Depth (m)	Symbol	Strata Description	Depth (m)	Sample	Headspace PID (ppm v, 0 – 0.5 – 1)	Well Installation	Water Level
		MADE GROUND Brown slightly gravelly sandy CLAY with occasional rootlets. Gravel is fine and medium, angular to rounded of various lithologies.	0.09				
		MADE GROUND Brown slightly gravelly clayey SAND with rare inclusions of plastic, wrappers and wood. Gravel is fine and medium angular to well rounded of brick, sandstone.		0.3m	0.1		
		Copper earthing strip encountered and 0.45m in hand pit. Strip undamaged. Window sample terminated and backfilled. No groundwater encountered. No visual or olfactory evidence contamination observed.	0.45				
		End of Borehole at 0.45 m bgl.					
1.0							

Temporary casing details:

Groundwater details: No groundwater encountered

Monitoring well standpipe diameter:

Other comments:

Well installation key:

Concrete | Bentonite seal | Arisings | Filter pack | Slotted pipe | Plain pipe

Checked by:

WINDOW SAMPLE LOG

Project Number: 1620008283

ID: WS07

Site: Morrisons Petrol Filling Station, Camden

Client: St George West London Ltd

Logged By: SMc

Ground Elevation: 0

Co-ordinates:

Date: November 2019

Equipment:

Diameter:

Depth (m)	Symbol	Strata Description	Depth (m)	Sample	Headspace PID (ppm v, 0 – 0.5 – 1)	Well Installation	Water Level
		MADE GROUND BRICK PAVING.	0.08				
		MADE GROUND CONCRETE CORE	0.26				
		MADE GROUND PLASTIC MEMBRANE.					
		MADE GROUND Brown very sandy GRAVEL. Gravel is fine to coarse angular to rounded of predomianntly subbase..		0.7m	0.0		
			0.90				
1.0		Window sample refused at 0.9m bgl on second concrete slab. No groundwater encountered. No visual or olfactory contamination observed. Window sample installed to target shallow Made Ground on the forecourt. .					
		End of Borehole at 0.9 m bgl.					

Temporary casing details:

Groundwater details: No groundwater encountered

Monitoring well standpipe diameter:

Other comments:

Well installation key:

Concrete | Bentonite seal | Arisings | Filter pack | Slotted pipe | Plain pipe

Checked by:

WINDOW SAMPLE LOG

Project Number: 1620008283

ID: WS08

Site: Morrisons Petrol Filling Station, Camden

Client: St George West London Ltd

Logged By: SMc

Ground Elevation: 0

Co-ordinates:

Date: November 2019

Equipment:

Diameter:

Depth (m)	Symbol	Strata Description	Depth (m)	Sample	Headspace PID (ppm v, 0 – 0.5 – 1)	Well Installation	Water Level
		TOPSOIL Brown silty CLAY with rare rootlets. **MADE GROUND** Light brown sandy GRAVEL. Gravel is predominantly medium subangular to rounded of predominantly subbase.	0.95	0.25m	0.1		
1.0		**CLAY** Firm light grey mottled dark grey CLAY.		1.5m	0.0		
2.0			2.10				
		CLAY Stiff orangish brown CLAY (LONDON CLAY).		2.5m	0.0		
3.0							
4.0			4.00				
		Window sample complete at 4m bgl. No groundwater encountered. No visual or olfactory contamination observed. End of Borehole at 4 m bgl.					

Temporary casing details:

Groundwater details: No groundwater encountered

Monitoring well standpipe diameter:

Other comments:

Well installation key:

Concrete | Bentonite seal | Arisings | Filter pack | Slotted pipe | Plain pipe

Checked by:

WINDOW SAMPLE LOG

Project Number: 1620008283

ID: WS09

Site: Morrisons Petrol Filling Station, Camden

Client: St George West London Ltd

Logged By: SMc

Ground Elevation: 0

Co-ordinates:

Date: November 2019

Equipment:

Diameter:

Depth (m)	Symbol	Strata Description	Depth (m)	Sample	Headspace PID (ppm v, 0 – 0.5 – 1)	Well Installation	Water Level
		TOPSOIL Brown silty CLAY with rare rootlets.					
		MADE GROUND Brown slightly gravelly sandy CLAY. Gravel is fine and medium very angular to well rounded of brick, ceramic and various lithologies.		0.5m	0.0		
1.0			1.20	1.2m	0.0		
		CLAY Firm grey CLAY.	1.60				
		CLAY Stiff orangish brown slightly gravelly CLAY. Gravel is predominatly fine and medium angular to subrounded of flint (LONDON CLAY).					
2.0							
3.0							
				3.9m	0.0		
4.0			4.00				
		Window sample complete at 4m bgl. No groundwater encountered. No visual or olfactory contamination observed.					
		End of Borehole at 4 m bgl.					

Temporary casing details:

Groundwater details: No groundwater encountered

Monitoring well standpipe diameter:

Other comments:

Well installation key:

Concrete | Bentonite seal | Arisings | Filter pack | Slotted pipe | Plain pipe

Checked by:

WINDOW SAMPLE LOG

Project Number: 1620008283

ID: WS09A

Site: Morrisons Petrol Filling Station, Camden

Client: St George West London Ltd

Logged By: SMc

Ground Elevation: 0

Co-ordinates:

Date: November 2019

Equipment:

Diameter:

Depth (m)	Symbol	Strata Description	Depth (m)	Sample	Headspace PID (ppm v, 0 – 0.5 – 1)	Well Installation	Water Level
		MADE GROUND CONCRETE CORE PAVING SLAB.	0.05				
		MADE GROUND Yellow fine and medium SAND.	0.15				
		MADE GROUND CONCRETE.	0.18				
		Refusal with corer on second layer of CONCRETE. End of Borehole at 0.18 m bgl.					

Temporary casing details:

Groundwater details: No groundwater encountered

Monitoring well standpipe diameter:

Other comments:

Well installation key:

Concrete | Bentonite seal | Arisings | Filter pack | Slotted pipe | Plain pipe

Checked by:

APPENDIX 3
FIELD MONITORING RESULTS

Appendix 6 : Gas Monitoring Field Data													
Project:	**1620008283**							**Site:**	**Morrisons PFS, Camden**				
Monitored by:	**S McGeever**							**Date:**	**09/12/2019**				
Equipment:	Geotech Interface Dip Meter, PID Tiger, GFM Gas Analyser							**Weather**	**Sunny, Dry, 8 degrees**				
Atmospheric Pressure:	**1001 mb**												
Location	**Time**	**DTW (m bgl)**	**DTB (m bgl)**	**Time From (Secs)**	**Baro Pressure**	**Flow**	**CH4**	**CO2**	**O2**	**CO**	**H2S**	**PID**	**Notes**
					mb	**l/hr**	**% v/v**	**% v/v**	**% v/v**	**ppm**	**ppm**	**ppm**	**Comments**
WS01	09:35	3.67	4.00	30	1003	0	0	0.2	19.8	0	0	0.1	WS located on raised bank (highest point on site) by the substation. Not enough grounwater for sample.
				60		0	0	0.6	19.7	0	0	0.1	
				90		0.1	0	0.9	19.6	0	0	0	
				120		0.1	0	3.5	16.8	0	0	0	
				150		0	0	3.5	16.8	0	0	0	
				180		0	0	3.5	16.8	0	0	0	
WS04	09:55	2.87	3.90	30	1001	0.01	0	1.5	20	0	0	0	WS located by PFS vehicular entrance, close to UST fill points. Groundwater observed to be clear. No odour or sheen.
				60		0.01	0	1.5	20	0	0	0	
				90		0	0	2.9	18.3	0	0	0	
				120		0	0	2.9	18.3	0	0	0	
				150		0	0	3	17.8	0	0	0	
				180		0	0	3	17.8	0	0	0	
WS07	10:20	0.75	0.80	30	1001	0	0	0	20.1	0	0	0	Cover flooded and located on forecourt. Surface water entered WS at time of opening cover due to it being sunken.
				60		0	0	0	20.1	0	0	0	
				90		0	0	0	20.1	0	0	0	
				120		0	0	0	19.9	0	0	0	
				150		0	0	0	19.9	0	0	0	
				180		0	0	0	19.9	0	0	0	
WS08	10:45	0.9	4.02	30	1001	0.6	0	2.3	19	0	0	0	Groundwater observed to be light brown and silty. No odour or sheen.
				60		0.6	0	2.3	19	0	0	0	
				90		0.1	0	2.7	18.9	0	0	0	
				120		0.1	0	2.7	18.9	0	0	0	
				150		0	0	2.4	18.9	0	0	0	
				180		0	0	2.4	18.9	0	0	0	

WS09	11:20	0.74	3.67	30	1001	0	0	0.4	20.4	0	0	0	WS located downgradient of forecourt, close to drain in corner. Groundwater observed to be clear. No odour or sheen.
				60		0	0	0.8	20.2	0	0	0	
				90		0	0	0.8	20.2	0	0	0	
				120		0	0	0.8	20.2	0	0	0	
				150		0	0	2.4	18.9	0	0	0	
				180		0	0	2.4	18.9	0	0	0	

APPENDIX 4
LEGISLATIVE BACKGROUND AND DERIVATION OF ASSESSMENT CRITERIA

LEGISLATIVE BACKGROUND

ENGLAND

The regime for contaminated land was set out in Part 2A (ss.78A-78YC) of the Environmental Protection Act 1990 (EPA), as inserted by S.57 of The Environment Act 1995 and came into effect in England on 1st April 2000 as The Contaminated Land (England) Regulations 2000 (SI 2000/227). These regulations were subsequently revoked with the provision of The Contaminated Land (England) Regulations 2006 (SI 2006/1380) (as amended), which came into force in August 2006, and consolidated the previous regulations and amendments. Revised statutory guidance ("the Guidance") for local authorities on how to implement the regime, including the decision-making process on whether land is contaminated land in the legal sense, has been published by Defra and entered into force in April 2012.

Under Part 2A of the EPA Section 78A(2), "contaminated land" is defined as "land which appears… to be in such a condition, by reason of substances in, on or under the land, that –

a) significant harm is being caused or there is a significant possibility of such harm being caused[3]; or

b) significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused".

"Significant harm" is defined in the Guidance on risk based criteria and must be the result of one or more relevant 'contaminant linkages' relating to the land. The presence of a contaminant linkage relies on the Contaminant-pathway-receptor concept, where all three factors must be present and potentially or actually linked for a potential risk to exist. Under the Guidance, a 'significant contaminant linkage' is one which gives rise to a level of risk sufficient to justify a piece of land being determined as contaminated land. Should the authority consider that there is an unacceptably high probability, supported by robust science-based evidence that significant harm would occur if no action is taken to stop it, the land should be deemed a Category 1: Human Health. Land should be placed into Category 2 if the authority concludes, on the basis that there is a strong case for considering that the risks from the land are of sufficient concern, that the land poses a significant possibility of significant harm. Both Category 1 and Category 2 cases would be capable of being determined as contaminated land under Part 2A on the grounds of significant possibility of significant harm to human health. If the legal test for significant possibility of significant harm is not met, the authority should place the land into Category 3. If the local authority considers that there is no risk or that the level of risk posed is low, the land should be placed into Category 4.

For six common contaminants (benzo(a)pyrene, cadmium, arsenic, benzene, hexavalent chromium and lead), a set of screening values have been developed and endorsed for use by Defra[4] (the Category 4 Screening Levels, or C4SLs) that describe a level of risk just below the Category 3/4 boundary set in the Statutory Guidance, i.e. where concentrations are below the C4SL, there is no risk or the level of risk is acceptably low.

The pollution of controlled waters is defined in Section 78A(9) of the Act as "the entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter". The new Guidance stresses that the Part 2A regime is designed to identify and deal with 'significant pollution' and not lesser levels of pollution. As with human health risk, Categories 1 and 2 comprise land where the local authority considers that a significant possibility of significant

[3] Water Act 2003 (Commencement No. 11) Order 2012
[4] SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document, Defra, revised December 2014

pollution of controlled waters exists and Categories 3 and 4 comprises cases where the authority considers that a significant possibility of such pollution does not exist. The local authority should be satisfied that a substance is continuing to enter controlled waters or is likely to enter controlled waters.

GENERIC ASSESSMENT CRITERIA

Soils

In accordance with current UK guidance on legislation including Part 2A of the Environmental Protection Act 1990 and based on the principles of risk assessment, Ramboll Environment and Health has derived generic criteria for interpretation of soil and groundwater chemical analysis (Ramboll Generic Assessment Criteria – Ramboll GAC). The assessment of chemical data from an intrusive investigation is undertaken in a tiered approach, and the first stage is a Generic Quantitative Risk Assessment (GQRA). The Ramboll GAC are considered to be threshold based screening concentrations, at which a significant risk is not considered to be present to the relevant receptors.

The Soil Guideline Values (SGVs) for 11 compounds published in 2009 by the Environment Agency, are based on a sandy loam soil with 6% soil organic matter (SOM). The 6% SOM and sandy loam soil type is not considered by Ramboll to be realistic of 'typical' UK soil conditions, and EA guidance[5] states that at 6% SOM, SGVs may not be sufficiently protective (i.e. the values are too high to be sufficiently certain that they describe land where there is no risk to human health or the risk is negligible). For the Ramboll GAC, all the SGV inputs have been used apart from the SOM and soil type, which were amended to 1% and sand; thereby ensuring a suitably conservative Ramboll GAC appropriate for most soils and Made Ground encountered in the UK. It is noted that none of the screening criteria used in the UK, including the SGVs, have a statutory basis.

The Ramboll GAC for soil assessment are based on the generic scenarios outlined in the Contaminated Land Exposure Assessment (CLEA) methodology and guidance documents, and include inhalation, ingestion, dermal contact of soil and dust as pathways for commercial and residential scenarios; as well as ingestion of homegrown produce for residential with gardens scenario. In addition, Ramboll GAC have also been derived for the two Public Open Space land uses defined in C4SL guidance (outlined below). These have been calculated by use of two proprietary risk assessment models (CLEA Version 1.071 and the ASTM RBCA[6] Tool Kit Version 2.6 for Chemical Releases) which have been altered, where necessary, to reflect the current UK approach to human health risk assessment as set out in Land Contamination: Risk Management[7] (LCRM) and the CLEA guidance documents (incorporating Science Reports SC050021/SR2 (January 2009), SR3 (January 2009), SR4 (September 2009) and the SGV reports (2009)). The physiochemical data has been taken from or derived using the methodology detailed in SR7 (November 2008) and SGV reports (2009), where feasible. The toxicology data has been taken from the current published EA toxicology documents. We have referred to all current publications and guidance issued up until June 2019.

This approach by Ramboll follows the withdrawal of CLR 7-10 (and proposed withdrawal of CLR 11 in December 2019), CLEA UK (beta), and CLEA Model versions V1.04 to V1.07 by the Environment Agency and DEFRA. The approach has been applied to all contaminants with the exception of lead and nickel, as the respective SGV has been withdrawn by the Environment Agency.

In the absence of published EA data, reference has been made to further UK published guidance in the first instance.

[5] 'Using Soil Guideline Values' published by the Environment Agency March 2009 SC050021/SGV

[6] American Society for Testing Materials – Risk Based Corrective Action Model

[7] The Land Contamination: Risk Management guidance document (published by the Environment Agency on 5th June 2019) is based on the Model Procedures for the Management of Land Contamination - Contaminated Land Report (CLR11). The scope, framework and purpose remain the same. The EA proposes to withdraw CLR11 in December 2019.

Reference has been made to the Defra-funded research project (SP1010), which developed a methodology to derive Category 4 Screening Levels (C4SLs) for six contaminants (benzo-a-pyrene, cadmium, arsenic, benzene, hexavalent chromium and lead). SP1010 provides technical tools and advice to be developed to help regulators and others to conform to the requirements of revised Part 2A Statutory Guidance. The C4SLs are therefore less conservative than GAC developed in accordance with published CLEA guidance as they describe a low risk as opposed to minimal risk scenario. However, consistent with the developed GAC, sites below the C4SLs are within Category 4 (lowest risk category) and therefore considered suitable for use.

Defra's Policy Companion document[8] to the SP1010 project states that where a C4SL value has been derived for a contaminant where an SGV exists, it is anticipated that risk assessors will use the C4SL value in line with Part 2A Statutory Guidance. In the absence of a suitable C4SL, risk assessors should identify and select appropriate generic assessment criteria in accordance with established good practice. On this basis, Ramboll has adopted the use of C4SLs however minimal risk assumptions have been applied in-house Ramboll GAC for other contaminants of concern within our screening assessments.

Ramboll also attended the Land Quality Management and Chartered Institute of Environmental Health workshop for the collaborative development of 'Suitable 4 Use Levels' (S4ULs) and reference has been made to their publication 'The LQM/CIEH S4ULs for Human Health Risk Assessment, 2015'.

Review of additional UK organisation guidance including Contaminated Land: Applications in Real Environments (CL:AIRE) and partners GAC, including addendums up until 10 April 2012 has also been made. Finally, where necessary, other published sources of (non-UK) information, such as the RBCA V2.6 database has also been reviewed.

Water

ENGLAND & WALES

In the absence of relevant published water assessment criteria, the potential risk to human health from contaminated surface and groundwater and the potential risk to the aquatic environment from entry of pollutants (either directly or via a groundwater pathway) has been assessed using commonly accepted UK guidelines including the Water Supply (Water Quality) (England) Regulations 2000 (known as the Drinking Water Standards, or DWS) and the Environmental Quality Standards (EQS) defined in European legislation such as the Water Framework Directive (WFD) (2000/60/EC).

Revised EQS were published in December 2009 under the Priority Substances Directive (PSD) (2008/105/EC), a daughter directive of the WFD. The PSD establishes EQS for Priority Substances which have been set at levels of concentration which are safe for the aquatic environment and for human health. A list of such dangerous substances (including those from other European legislation e.g. the Dangerous Substances Directive (76/464/EC)) and EQS has been established and is listed in the August 2010 Direction to the Environment Agency, the River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Direction 2010. The EQS are detailed in Part 4 (Specific Pollutants) and Part 5 (Priority Substances) of the Directions.

For those determinants included in the analytical suite which do not have a corresponding UK drinking water or environmental screening criteria, reference is made to international guidance in accordance with Environment Agency guidance.

[8] SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document, Defra, revised December 2014

A methodology for the generation of the GAC for groundwater vapours (GAC_{gwvap}) was published by the Society of Brownfield Risk Assessment (SoBRA) in February 2017[1], which is based on the CLEA model. Ramboll has adopted SoBRA's approach and modified the model input parameters to reflect site conditions and generate site SSAC for groundwater contaminant sources designed to be protective of site users for a residential and/or commercial/industrial scenario as appropriate.

The SoBRA (GAC_{gwvap}) methodology uses the Environment Agency's CLEA software model. The CLEA software was originally provided for deriving assessment criteria for soils, not groundwater; however groundwater assessment criteria can be extracted from the calculations within CLEA. CLEA assumes a steady state equilibrium between the sorbed, water and vapour phase concentrations in soil. Consequently, as part of the process of calculating soil phase concentrations, the software also calculates the vapour phase concentration and the pore water dissolved concentration (soil solution concentration) at the soil GAC. Therefore, for given soil assessment criteria derived to be protective of health, a soil solution concentration is also available within the CLEA calculations which would give rise to this vapour concentration at the tolerable risk level. This soil solution concentration is used as an inferred groundwater SSAC.

The proprietary risk assessment model, the ASTM RBCA2 Tool Kit Version 2.6 for Chemical Releases, has been used for compounds which could not be run in CLEA. The RBCA model has been altered where necessary to reflect the current UK approach to human health risk assessment, as appropriate.

GROUND GAS ASSESSMENT

Ground gases can be produced as a result of the decomposition of organic materials and may also originate from natural sources, such as coal seams and organic-rich soils. The principal components of ground gas are methane and carbon dioxide, although other gases may be present in trace concentrations. Ground gas can present a hazard to site occupants and property as result of flammable/explosive hazards, physiological effects, odour and effects on vegetation.

There is no single specific guidance document relating to ground gas measurement methods, risk assessment, and gas protection measures. Several documents have been published since the early 1990s to provide guidance for new developments, some of which have been more recently revised.

The following guidance documents were used in this assessment:

Ground Gas	Reference Documents
Methane and Carbon Dioxide	• Assessing Risks Posed by Hazardous Ground Gases to Buildings. Report C665, Construction Industry Research and Information Association (CIRIA), 2007. • Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. BSi 8485:2015. • The Building Regulations, Approved Document C: site preparation and resistance to contaminants and moisture, (2004 as amended) • Guidance on Evaluation of Development Proposals on sites where Methane and Carbon Dioxide are Present. Report Edition No. 4, NHBC, March 2007.
Oxygen	• Waste Management Paper 27 – Guidelines for Building Houses near Landfill sites. Department of the Environment 1991.

It is recommended in CIRIA C665 that six rounds of ground gas monitoring are conducted over a period of three months in order to sufficiently understand a site's ground gas regime.

Methane and Carbon Dioxide

Guidance on undertaking ground gas risk assessment is provided in CIRIA Report C665 "Assessing Risks Posed by Hazardous Ground Gases to Buildings" (2007). The guidance consolidates the requirement for good practice in site investigation, collection of relevant data and monitoring programmes in the context of a risk based approach to gas contaminated ground.

Two semi-quantitative methods are set out in the guidance for the assessment of ground gas risk; one method for low rise housing with gardens (the NHBC "traffic light" system) and the other for all remaining development types, including commercial/industrial development (the "Modified Wilson and Card System").

With the exception of low rise housing, the method applicable for all developments is the Modified Wilson and Card Classification. This makes no assumption that an underfloor void is present within the development. The method by Wilson and Card was developed based on the method proposed in CIRIA publication R149 (1995).

This method uses gas concentrations and borehole flow rates to define a characteristic situation for the site, by calculating a site Gas Screening Value (SGSV). The SGSV is calculated using a worst case scenario (i.e. the maximum gas concentration and flow rates detected) across the entire site during the monitoring period. The SGSV is calculated for both methane and carbon dioxide, and the 'Characteristic Situation' is derived by comparison with a table relevant to each method. It is important to note that SGSVs are not absolute thresholds but guideline values.

The NHBC traffic light system described in Guidance on Evaluation of Development Proposals on sites where Methane and Carbon Dioxide are Present (NHBC, March 2007). The guidance defines

a series of 'Traffic Light' scenarios specific to a low-rise housing development with a clear ventilated sub floor void. The Traffic Lights include 'Typical Maximum Concentrations' which are provided for screening purposes and risk-based Gas Screening Values (GSVs) for consideration for situations where the Typical Maximum Concentrations are exceeded.

It is important to note that GSVs are not absolute thresholds but guideline values. The method makes a number of assumptions regarding the proposed structures and designers should ensure the design is appropriate to the ground gas condition identified.

The Building Regulations, Approved Document C (2004) states that where methane concentrations do not exceed 1% and that the floor of the building to be constructed is suspended and ventilated, no further protection needs to be provided. Above 1% by volume there is a need to consider possible measures to prevent gas ingress into new buildings.

Approved Document C also states that there is a need to consider possible measures to prevent gas ingress into new buildings if concentrations of carbon dioxide above 1.5% are detected in the ground, and that measures are definitely required at concentrations above 5%.

Oxygen

Waste Management Paper 27 (WMP27) states that a minimum concentration of 18% oxygen is required to prevent asphyxiation.

APPENDIX 5
SOIL ANALYTICAL RESULTS

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Ramboll Environ
Artillery House
11-19 Artillery Row
London
SW1P 1RT

Attention: Siobhán McGeever

CERTIFICATE OF ANALYSIS

Date of report Generation:	17 December 2019
Customer:	Ramboll Environ
Sample Delivery Group (SDG):	191211-116
Your Reference:	1620008283
Location:	Camden Site
Report No:	534367

This report has been revised and directly supersedes 534155 in its entirety.

We received 4 samples on Thursday November 28, 2019 and 4 of these samples were scheduled for analysis which was completed on Tuesday December 17, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21340103	WS01		0.10	27/11/2019
21340107	WS01		0.50	27/11/2019
21340108	WS01		2.60	27/11/2019
21340109	WS02		0.30	27/11/2019

Maximum Sample/Coolbox Temperature (°C) : **5.2**

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Results Legend

- X — Test
- N — No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

		Lab Sample No(s)	21340103		21340107			21340108			21340109		
		Customer Sample Reference	WS01		WS01			WS01			WS02		
		AGS Reference											
		Depth (m)	0.10		0.50			2.60			0.30		
		Container	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
		Sample Type	S	S	S	S	S	S	S	S	S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 3				X			X			X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 4	X		X			X			X		
Asbestos Quantification - Full	All	NDPs: 0 Tests: 1									X		
Boron Water Soluble	All	NDPs: 0 Tests: 3				X			X			X	
Chromium III	All	NDPs: 0 Tests: 3				X			X			X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3				X			X			X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 3				X			X			X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3					X			X			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3				X			X			X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 3				X			X			X	
PAH by GCMS	All	NDPs: 0 Tests: 3				X			X			X	
PCBs by GCMS	All	NDPs: 0 Tests: 3		X		X			X				
pH	All	NDPs: 0 Tests: 3				X			X			X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 3				X			X			X	
Sample description	All	NDPs: 0 Tests: 4		X		X			X			X	

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Results Legend

X **Test**

N **No Determination Possible**

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			21340103		21340107			21340108			21340109	
Customer Sample Reference			WS01		WS01			WS01			WS02	
AGS Reference												
Depth (m)			0.10		0.50			2.60			0.30	
Container			1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S	S	S	S	S	S	S	S	S
TPH CWG GC (S)	All	NDPs: 0 Tests: 3				X			X			X	
VOC MS (S)	All	NDPs: 0 Tests: 3					X			X			X

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Sample Descriptions

Grain Sizes

very fine	<0.063mm	**fine**	0.063mm - 0.1mm	**medium**	0.1mm - 2mm	**coarse**	2mm - 10mm	**very coarse**	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
21340103	WS01	0.10	Dark Brown	Sandy Clay Loam	Vegetation	Stones
21340107	WS01	0.50	Dark Brown	Clay Loam	Stones	Crushed Brick
21340108	WS01	2.60	Dark Brown	Silty Clay	None	None
21340109	WS02	0.30	Dark Brown	Sandy Clay Loam	Stones	Crushed Brick

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS01	WS01	WS01	WS02		
			Depth (m)	0.10	0.50	2.60	0.30		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	27/11/2019	27/11/2019	27/11/2019	27/11/2019		
			Sampled Time	.	.	.	.		
			Date Received	28/11/2019	28/11/2019	28/11/2019	28/11/2019		
			SDG Ref	191211-116	191211-116	191211-116	191211-116		
			Lab Sample No.(s)	21340103	21340107	21340108	21340109		
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		12	16	15	14		
Phenol	<0.01 mg/kg	TM062 (S)			<0.01 @ M	<0.01 @ M	<0.01 @ M		
Cresols	<0.01 mg/kg	TM062 (S)			<0.01 @ M	<0.01 @ M	<0.01 @ M		
Xylenols	<0.015 mg/kg	TM062 (S)			<0.015 @ M	<0.015 @ M	<0.015 @ M		
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)			<0.035 @ M	<0.035 @ M	<0.035 @ M		
pH	1 pH Units	TM133			7.96 M	8.22 M	8.79 M		
Chromium, Hexavalent	<0.6 mg/kg	TM151			<0.6 #	<0.6 #	<0.6 #		
Cyanide, Total	<1 mg/kg	TM153			<1 @ M	<1 @ M	<1 @ M		
PCB congener 28	<3 µg/kg	TM168		<3 M	<3 M	<3 M			
PCB congener 52	<3 µg/kg	TM168		<3 M	<3 M	<3 M			
PCB congener 101	<3 µg/kg	TM168		<3 M	<3 M	<3 M			
PCB congener 118	<3 µg/kg	TM168		<3 M	<3 M	<3 M			
PCB congener 138	<3 µg/kg	TM168		<3 M	<3 M	<3 M			
PCB congener 153	<3 µg/kg	TM168		<3 M	<3 M	<3 M			
PCB congener 180	<3 µg/kg	TM168		<3 M	<3 M	<3 M			
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168		<21	<21	<21			
Chromium, Trivalent	<0.9 mg/kg	TM181			20.4	33.5	18		
Arsenic	<0.6 mg/kg	TM181			10.9 M	21.9 M	17 M		
Beryllium	<0.01 mg/kg	TM181			0.655 M	1.16 M	0.918 M		
Cadmium	<0.02 mg/kg	TM181			0.227 M	0.318 M	0.615 M		
Chromium	<0.9 mg/kg	TM181			20.4 M	33.5 M	18 M		
Copper	<1.4 mg/kg	TM181			16.7 M	25.3 M	78.5 M		
Lead	<0.7 mg/kg	TM181			184 M	12.5 M	289 M		
Mercury	<0.14 mg/kg	TM181			<0.14 M	<0.14 M	0.412 M		
Nickel	<0.2 mg/kg	TM181			16 M	43.5 M	27 M		
Selenium	<1 mg/kg	TM181			<1 #	1.33 #	<1 #		
Vanadium	<0.2 mg/kg	TM181			44.1 #	76.8 #	40.7 #		
Zinc	<1.9 mg/kg	TM181			42.2 M	84.4 M	242 M		
Boron, water soluble	<1 mg/kg	TM222			1.37 M	1.37 M	<1 M		
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243			1.06 M	0.496 M	0.0298 M		
Asbestos Quantification - Gravimetric - %	<0.001 %	TM304					<0.001 #		
Asbestos Quantification - PCOM Evaluation - %	<0.001 %	TM304					<0.001 #		

Validated

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS01	WS01	WS01	WS02		
			Depth (m)	0.10	0.50	2.60	0.30		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	27/11/2019	27/11/2019	27/11/2019	27/11/2019		
			Sampled Time	-	-	-	-		
			Date Received	28/11/2019	28/11/2019	28/11/2019	28/11/2019		
			SDG Ref	191211-116	191211-116	191211-116	191211-116		
			Lab Sample No.(s)	21340103	21340107	21340108	21340109		
			AGS Reference						
Additional Asbestos Components (Using TM048)		TM304					None #		
Analysts Comments		TM304					N/C		
Asbestos Quantification - Total - %	<0.001 %	TM304					<0.001 #		

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

PAH by GCMS

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS01	WS01	WS02			
			Depth (m)	0.50	2.60	0.30			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	27/11/2019	27/11/2019	27/11/2019			
			Sampled Time	.	.	.			
			Date Received	28/11/2019	28/11/2019	28/11/2019			
			SDG Ref	191211-116	191211-116	191211-116			
			Lab Sample No.(s)	21340107	21340108	21340109			
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		93.2	91.5	89.9			
Acenaphthene-d10 % recovery**	%	TM218		94	92.1	85.9			
Phenanthrene-d10 % recovery**	%	TM218		94.3	93.2	87.1			
Chrysene-d12 % recovery**	%	TM218		85.2	84.9	78.4			
Perylene-d12 % recovery**	%	TM218		84.3	82.1	75.7			
Naphthalene	<9 µg/kg	TM218		<9 @ M	<9 @ M	52.6 @ M			
Acenaphthylene	<12 µg/kg	TM218		<12 @ M	<12 @ M	118 @ M			
Acenaphthene	<8 µg/kg	TM218		14.1 @ M	<8 @ M	116 @ M			
Fluorene	<10 µg/kg	TM218		<10 @ M	<10 @ M	141 @ M			
Phenanthrene	<15 µg/kg	TM218		124 @ M	<15 @ M	1830 @ M			
Anthracene	<16 µg/kg	TM218		19.1 @ M	<16 @ M	512 @ M			
Fluoranthene	<17 µg/kg	TM218		145 @ M	<17 @ M	3520 @ M			
Pyrene	<15 µg/kg	TM218		120 @ M	<15 @ M	2970 @ M			
Benz(a)anthracene	<14 µg/kg	TM218		62.4 @ M	<14 @ M	1670 @ M			
Chrysene	<10 µg/kg	TM218		54.6 @ M	<10 @ M	1330 @ M			
Benzo(b)fluoranthene	<15 µg/kg	TM218		94.5 @ M	<15 @ M	2240 @ M			
Benzo(k)fluoranthene	<14 µg/kg	TM218		29 @ M	<14 @ M	950 @ M			
Benzo(a)pyrene	<15 µg/kg	TM218		60.9 @ M	<15 @ M	1590 @ M			
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		43.8 @ M	<18 @ M	1270 @ M			
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		<23 @ M	<23 @ M	203 @ M			
Benzo(g,h,i)perylene	<24 µg/kg	TM218		47 @ M	<24 @ M	1310 @ M			
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		814	<118	19800			

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

TPH CWG (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS01	WS01	WS02			
			Depth (m)	0.50	2.60	0.30			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	27/11/2019	27/11/2019	27/11/2019			
			Sampled Time	.	.	.			
			Date Received	28/11/2019	28/11/2019	28/11/2019			
			SDG Ref	191211-116	191211-116	191211-116			
			Lab Sample No.(s)	21340107	21340108	21340109			
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		120	83 @	92			
Aliphatics >C5-C6	<10 µg/kg	TM089		<10	<10 @	<10			
Aliphatics >C6-C8	<10 µg/kg	TM089		<10	<10 @	<10			
Aliphatics >C8-C10	<10 µg/kg	TM089		<10	<10 @	<10			
Aliphatics >C10-C12	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aliphatics >C12-C16	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aliphatics >C16-C21	<1000 µg/kg	TM414		<1000	<1000	1890			
Aliphatics >C21-C35	<1000 µg/kg	TM414		2810	<1000	11800			
Aliphatics >C35-C44	<1000 µg/kg	TM414		1100	<1000	1480			
Total Aliphatics >C10-C44	<5000 µg/kg	TM414		<5000	<5000	15200			
Total Aliphatics & Aromatics >C10-C44	<10000 µg/kg	TM414		<10000	<10000	67500			
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10 @	<10			
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	<10 @	<10			
Aromatics >EC8-EC10	<10 µg/kg	TM089		<10	<10 @	<10			
Aromatics > EC10-EC12	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aromatics > EC12-EC16	<1000 µg/kg	TM414		<1000	<1000	<1000			
Aromatics > EC16-EC21	<1000 µg/kg	TM414		<1000	<1000	8890			
Aromatics > EC21-EC35	<1000 µg/kg	TM414		<1000	<1000	34700			
Aromatics >EC35-EC44	<1000 µg/kg	TM414		<1000	<1000	8150			
Aromatics > EC40-EC44	<1000 µg/kg	TM414		<1000	<1000	2050			
Total Aromatics > EC10-EC44	<5000 µg/kg	TM414		<5000	<5000	52300			
Total Aliphatics & Aromatics >C5-C44	<10000 µg/kg	TM414		<10000	<10000	67500			
Total Aliphatics >C5-C10	<50 µg/kg	TM089		<50	<50 @	<50			
Total Aromatics >EC5-EC10	<50 µg/kg	TM089		<50	<50 @	<50			
GRO >C5-C10	<20 µg/kg	TM089		<20	<20 @	<20			

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS01	WS01	WS02			
			Depth (m)	0.50	2.60	0.30			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	27/11/2019	27/11/2019	27/11/2019			
			Sampled Time	.	.	.			
			Date Received	28/11/2019	28/11/2019	28/11/2019			
			SDG Ref	191211-116	191211-116	191211-116			
			Lab Sample No.(s)	21340107	21340108	21340109			
			AGS Reference						
Dibromofluoromethane**	%	TM116		105 @	104 @	100 @			
Toluene-d8**	%	TM116		97.3 @	96.8 @	91 @			
4-Bromofluorobenzene**	%	TM116		88.7 @	94.8 @	75.6 @			
Dichlorodifluoromethane	µg/kg	TM116		<6 @ M	<6 @ M	<6 @ M			
Chloromethane	µg/kg	TM116		<7 @ #	<7 @ #	<7 @ #			
Vinyl Chloride	µg/kg	TM116		<6 @ M	<6 @ M	<6 @ M			
Bromomethane	µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
Chloroethane	µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
Trichlorofluoromethane	µg/kg	TM116		<6 @ M	<6 @ M	<6 @ M			
1,1-Dichloroethene	µg/kg	TM116		<10 @ #	<10 @ #	<10 @ #			
Carbon Disulphide	µg/kg	TM116		<7 @ M	<7 @ M	<7 @ M			
Dichloromethane	µg/kg	TM116		<10 @ #	29 @ #	108 @ #			
Methyl Tertiary Butyl Ether	µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
trans-1,2-Dichloroethene	µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
1,1-Dichloroethane	µg/kg	TM116		<8 @ M	<8 @ M	<8 @ M			
cis-1,2-Dichloroethene	µg/kg	TM116		<6 @ M	<6 @ M	<6 @ M			
2,2-Dichloropropane	µg/kg	TM116		<10 @	<10 @	<10 @			
Bromochloromethane	µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
Chloroform	µg/kg	TM116		<8 @ M	<8 @ M	<8 @ M			
1,1,1-Trichloroethane	µg/kg	TM116		<7 @ M	<7 @ M	<7 @ M			
1,1-Dichloropropene	µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
Carbontetrachloride	µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
1,2-Dichloroethane	µg/kg	TM116		<5 @ M	<5 @ M	<5 @ M			
Benzene	µg/kg	TM116		<9 @ M	<9 @ M	<9 @ M			
Trichloroethene	µg/kg	TM116		<9 @ #	<9 @ #	<9 @ #			
1,2-Dichloropropane	µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
Dibromomethane	µg/kg	TM116		<9 @ M	<9 @ M	<9 @ M			
Bromodichloromethane	µg/kg	TM116		<7 @ M	<7 @ M	<7 @ M			
cis-1,3-Dichloropropene	µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
Toluene	µg/kg	TM116		<7 @ M	<7 @ M	<7 @ M			
trans-1,3-Dichloropropene	µg/kg	TM116		<10 @	<10 @	<10 @			
1,1,2-Trichloroethane	µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS01	WS01	WS02			
			Depth (m)	0.50	2.60	0.30			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	27/11/2019	27/11/2019	27/11/2019			
			Sampled Time	-	-	-			
			Date Received	28/11/2019	28/11/2019	28/11/2019			
			SDG Ref	191211-116	191211-116	191211-116			
			Lab Sample No.(s)	21340107	21340108	21340109			
			AGS Reference						
1,3-Dichloropropane	<7 µg/kg	TM116		<7 @ M	<7 @ M	<7 @ M			
Tetrachloroethene	<5 µg/kg	TM116		<5 @ M	<5 @ M	<5 @ M			
Dibromochloromethane	<10 µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
1,2-Dibromoethane	<10 µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
Chlorobenzene	<5 µg/kg	TM116		<5 @ M	<5 @ M	<5 @ M			
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
Ethylbenzene	<4 µg/kg	TM116		<4 @ M	<4 @ M	<4 @ M			
p/m-Xylene	<10 µg/kg	TM116		<10 @ #	<10 @ #	<10 @ #			
o-Xylene	<10 µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
Styrene	<10 µg/kg	TM116		<10 @ #	<10 @ #	<10 @ #			
Bromoform	<10 µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
Isopropylbenzene	<5 µg/kg	TM116		<5 @ #	<5 @ #	<5 @ #			
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116		<10 @ #	<10 @ #	<10 @ #			
1,2,3-Trichloropropane	<16 µg/kg	TM116		<16 @ M	<16 @ M	<16 @ M			
Bromobenzene	<10 µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
Propylbenzene	<10 µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
2-Chlorotoluene	<9 µg/kg	TM116		<9 @ M	<9 @ M	<9 @ M			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116		<8 @ M	<8 @ M	<8 @ M			
4-Chlorotoluene	<10 µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
tert-Butylbenzene	<14 µg/kg	TM116		<14 @ M	<14 @ M	<14 @ M			
1,2,4-Trimethylbenzene	<9 µg/kg	TM116		<9 @ #	<9 @ #	<9 @ #			
sec-Butylbenzene	<10 µg/kg	TM116		<10 @	<10 @	<10 @			
4-Isopropyltoluene	<10 µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
1,3-Dichlorobenzene	<8 µg/kg	TM116		<8 @ M	<8 @ M	<8 @ M			
1,4-Dichlorobenzene	<5 µg/kg	TM116		<5 @ M	<5 @ M	<5 @ M			
n-Butylbenzene	<11 µg/kg	TM116		<11 @	<11 @	<11 @			
1,2-Dichlorobenzene	<10 µg/kg	TM116		<10 @ M	<10 @ M	<10 @ M			
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116		<14 @ M	<14 @ M	<14 @ M			
Tert-amyl methyl ether	<10 µg/kg	TM116		<10 @ #	<10 @ #	<10 @ #			
1,2,4-Trichlorobenzene	<20 µg/kg	TM116		<20 @	<20 @	<20 @			
Hexachlorobutadiene	<20 µg/kg	TM116		<20 @	<20 @	<20 @			
Naphthalene	<13 µg/kg	TM116		<13 @ M	<13 @ M	<13 @ M			

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS01	WS01	WS02			
			Depth (m)	0.50	2.60	0.30			
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
			Date Sampled	27/11/2019	27/11/2019	27/11/2019			
			Sampled Time	-	-	-			
			Date Received	28/11/2019	28/11/2019	28/11/2019			
			SDG Ref	191211-116	191211-116	191211-116			
			Lab Sample No.(s)	21340107	21340108	21340109			
			AGS Reference						
1,2,3-Trichlorobenzene	<20 µg/kg	TM116		<20 @ #	<20 @ #	<20 @ #			
1,3,5-Trichlorobenzene	<20 µg/kg	TM116		<20	<20	<20			
Sum of Detected Xylenes	<0.02 mg/kg	TM116		<0.02 @	<0.02 @	<0.02 @			
Sum of BTEX	<40 µg/kg	TM116		<40 @	<40 @	<40 @			

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Asbestos Identification - Solid Samples

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
*	Subcontracted test.
(F)	Trigger breach confirmed
1-5&♦§@	Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS01 0.10 SOLID 27/11/2019 00:00:00 28/11/2019 06:00:00 191211-116 21340103 TM048	12/12/19	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS01 0.50 SOLID 27/11/2019 00:00:00 28/11/2019 06:00:00 191211-116 21340107 TM048	12/12/2019	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS01 2.60 SOLID 27/11/2019 00:00:00 28/11/2019 06:00:00 191211-116 21340108 TM048	12/12/2019	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS02 0.30 SOLID 27/11/2019 00:00:00 28/11/2019 06:00:00 191211-116 21340109 TM048	12/12/2019	Lucy Caroe	Loose fibres in soil	Not Detected (#)	Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Asbestos Quantification - Full

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
*	Subcontracted test.
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

		Additional Asbestos Components	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM Evaluation	Asbestos Quantification - Total - %
Cust. Sample Ref.	WS02	None (#)	N/C	<0.001 (#)	<0.001 (#)	<0.001 (#)
Depth (m)	0.30					
Sample Type	SOLID					
Date Sampled	27/11/2019 00:00:00					
Date Receieved	28/11/2019 06:00:00					
SDG	191211-116					
Original Sample	21340109					
Method Number	TM304					

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Test Completion Dates

Lab Sample No(s)	21340103	21340107	21340108	21340109
Customer Sample Ref.	WS01	WS01	WS01	WS02
AGS Ref.				
Depth	0.10	0.50	2.60	0.30
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)		12-Dec-2019	12-Dec-2019	12-Dec-2019
Asbestos ID in Solid Samples	12-Dec-2019	12-Dec-2019	12-Dec-2019	12-Dec-2019
Asbestos Quantification - Full				17-Dec-2019
Boron Water Soluble		12-Dec-2019	12-Dec-2019	12-Dec-2019
Chromium III		12-Dec-2019	12-Dec-2019	12-Dec-2019
Cyanide Comp/Free/Total/Thiocyanate		13-Dec-2019	13-Dec-2019	13-Dec-2019
EPH CWG GC (S)		13-Dec-2019	13-Dec-2019	13-Dec-2019
GRO by GC-FID (S)		12-Dec-2019	12-Dec-2019	12-Dec-2019
Hexavalent Chromium (s)		12-Dec-2019	12-Dec-2019	12-Dec-2019
Metals in solid samples by OES		12-Dec-2019	12-Dec-2019	12-Dec-2019
PAH by GCMS		12-Dec-2019	12-Dec-2019	12-Dec-2019
PCBs by GCMS	13-Dec-2019	12-Dec-2019	12-Dec-2019	
pH		12-Dec-2019	12-Dec-2019	12-Dec-2019
Phenols by HPLC (S)		13-Dec-2019	13-Dec-2019	13-Dec-2019
Sample description	12-Dec-2019	11-Dec-2019	11-Dec-2019	11-Dec-2019
TPH CWG GC (S)		13-Dec-2019	13-Dec-2019	13-Dec-2019
VOC MS (S)		12-Dec-2019	12-Dec-2019	12-Dec-2019

ASSOCIATED AQC DATA

Boron Water Soluble

Component	Method Code	QC 2128
Water Soluble Boron	TM222	**95.0** 85.80 : 112.50

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2128
Free Cyanide	TM153	**88.4** 83.05 : 112.74
Thiocyanate	TM153	**83.83** 89.81 : 110.19
Total Cyanide	TM153	**91.43** 88.29 : 111.43

EPH CWG GC (S)

Component	Method Code	QC 2112
EPH >C8-C40 Raw	TM414	**101.24** 56.39 : 129.94
Total Aliphatics Raw	TM414	**108.89** 62.55 : 133.12
Total Aromatics Raw	TM414	**103.12** 57.00 : 150.27

GRO by GC-FID (S)

Component	Method Code	QC 2181	QC 2137
QC	TM089	**94.49** 72.28 : 114.54	**95.58** 72.28 : 114.54

Hexavalent Chromium (s)

Component	Method Code	QC 2194
Hexavalent Chromium	TM151	**102.0** 90.20 : 107.00

Metals in solid samples by OES

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Metals in solid samples by OES

Component	Method Code	QC 2152
Aluminium	TM181	**82.65** 77.84 : 119.01
Antimony	TM181	**82.93** 84.28 : 107.67
Arsenic	TM181	**97.09** 87.05 : 109.36
Barium	TM181	**88.07** 82.49 : 109.34
Beryllium	TM181	**95.9** 85.44 : 109.61
Boron	TM181	**84.81** 73.51 : 104.66
Cadmium	TM181	**93.0** 81.46 : 106.43
Chromium	TM181	**91.08** 82.26 : 104.55
Cobalt	TM181	**88.36** 86.54 : 106.87
Copper	TM181	**93.49** 82.40 : 105.45
Iron	TM181	**88.89** 82.95 : 110.58
Lead	TM181	**89.86** 78.24 : 104.05
Manganese	TM181	**107.5** 94.29 : 119.51
Mercury	TM181	**94.2** 83.74 : 105.34
Molybdenum	TM181	**96.71** 87.11 : 106.87
Nickel	TM181	**89.73** 81.92 : 102.18
Phosphorus	TM181	**105.45** 94.56 : 124.28
Selenium	TM181	**99.22** 86.28 : 110.48
Strontium	TM181	**85.52** 79.13 : 102.79
Thallium	TM181	**93.36** 82.94 : 111.86
Tin	TM181	**98.86** 90.25 : 108.86
Titanium	TM181	**78.63** 66.23 : 102.06
Vanadium	TM181	**89.01** 86.37 : 107.94
Zinc	TM181	**94.66** 84.68 : 113.99

PAH by GCMS

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

PAH by GCMS

Component	Method Code	QC 2162
Acenaphthene	TM218	**95.0** 70.00 : 130.00
Acenaphthylene	TM218	**93.0** 70.00 : 130.00
Anthracene	TM218	**92.5** 70.00 : 130.00
Benz(a)anthracene	TM218	**92.0** 68.12 : 118.39
Benzo(a)pyrene	TM218	**88.5** 71.72 : 115.31
Benzo(b)fluoranthene	TM218	**85.0** 66.89 : 120.40
Benzo(ghi)perylene	TM218	**88.5** 67.82 : 118.49
Benzo(k)fluoranthene	TM218	**90.5** 73.10 : 117.03
Chrysene	TM218	**89.0** 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	**84.5** 67.32 : 121.35
Fluoranthene	TM218	**94.0** 75.16 : 117.28
Fluorene	TM218	**94.0** 70.00 : 130.00
Indeno(123cd)pyrene	TM218	**87.5** 68.91 : 117.62
Naphthalene	TM218	**93.5** 70.00 : 130.00
Phenanthrene	TM218	**92.5** 70.00 : 130.00
Pyrene	TM218	**94.5** 75.68 : 119.23

PCBs by GCMS

Component	Method Code	QC 2168
PCB congener 101	TM168	**105.0** 79.46 : 109.70
PCB congener 105	TM168	**88.2** 66.33 : 105.75
PCB congener 114	TM168	**88.5** 66.41 : 106.49
PCB congener 118	TM168	**95.9** 70.33 : 110.29
PCB congener 123	TM168	**84.8** 65.01 : 99.81
PCB congener 126	TM168	**88.7** 59.31 : 109.23
PCB congener 138	TM168	**88.8** 63.95 : 107.63
PCB congener 153	TM168	**89.1** 62.65 : 108.85
PCB congener 156	TM168	**93.9** 61.69 : 112.27

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

PCBs by GCMS

		QC 2168
PCB congener 157	TM168	**88.5** 67.15 : 109.93
PCB congener 167	TM168	**92.0** 65.58 : 109.14
PCB congener 169	TM168	**90.8** 56.84 : 112.10
PCB congener 180	TM168	**94.6** 66.99 : 111.63
PCB congener 189	TM168	**93.0** 57.75 : 112.59
PCB congener 28	TM168	**95.9** 73.68 : 105.96
PCB congener 52	TM168	**91.3** 67.24 : 107.62
PCB congener 77	TM168	**90.2** 64.87 : 108.49
PCB congener 81	TM168	**101.0** 70.78 : 110.80

pH

Component	Method Code	QC 2150
pH	TM133	**98.6** 97.44 : 100.93

Phenols by HPLC (S)

Component	Method Code	QC 2182
2.3.5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	**92.86** 65.50 : 89.50
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	**88.3** 86.25 : 116.25
Catechol by HPLC (S)	TM062 (S)	**83.81** 19.39 : 135.70
Cresols by HPLC (S)	TM062 (S)	**88.31** 81.00 : 112.20
Napthol by HPLC (S)	TM062 (S)	**114.29** 57.50 : 102.50
Phenol by HPLC (S)	TM062 (S)	**100.66** 88.67 : 124.67
Resorcinol HPLC (S)	TM062 (S)	**91.19** 69.99 : 127.22
Xylenols by HPLC (S)	TM062 (S)	**94.79** 90.22 : 114.22

VOC MS (S)

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

VOC MS (S)

Component	Method Code	QC 2175
1,1,1,2-tetrachloroethane	TM116	**101.0** 77.56 : 115.55
1,1,1-Trichloroethane	TM116	**99.0** 73.73 : 118.05
1,1,2-Trichloroethane	TM116	**97.6** 77.12 : 116.04
1,1-Dichloroethane	TM116	**100.2** 74.46 : 129.15
1,2-Dichloroethane	TM116	**105.6** 92.38 : 131.65
1,4-Dichlorobenzene	TM116	**97.8** 72.76 : 126.34
2-Chlorotoluene	TM116	**92.6** 81.66 : 118.02
4-Chlorotoluene	TM116	**92.6** 66.90 : 112.46
Benzene	TM116	**96.8** 89.71 : 111.93
Carbon Disulphide	TM116	**92.2** 74.91 : 122.14
Carbontetrachloride	TM116	**109.0** 80.31 : 124.50
Chlorobenzene	TM116	**96.6** 86.73 : 118.34
Chloroform	TM116	**101.4** 87.40 : 122.49
Chloromethane	TM116	**100.2** 65.05 : 142.63
Cis-1,2-Dichloroethene	TM116	**100.8** 80.67 : 126.72
Dibromomethane	TM116	**105.0** 67.80 : 121.75
Dichloromethane	TM116	**109.4** 81.11 : 133.25
Ethylbenzene	TM116	**93.2** 75.92 : 110.41
Hexachlorobutadiene	TM116	**64.0** 12.82 : 152.73
Isopropylbenzene	TM116	**85.4** 54.21 : 117.17
Naphthalene	TM116	**98.2** 80.86 : 128.81
o-Xylene	TM116	**89.2** 69.99 : 108.74
p/m-Xylene	TM116	**89.7** 68.32 : 108.91
Sec-Butylbenzene	TM116	**76.0** 44.91 : 118.40
Tetrachloroethene	TM116	**102.8** 76.95 : 121.02
Toluene	TM116	**90.8** 74.24 : 107.42

VOC MS (S)

		QC 2175
Trichloroethene	TM116	**98.0** 77.61 : 111.54
Trichlorofluoromethane	TM116	**96.2** 84.55 : 133.27
Vinyl Chloride	TM116	**91.0** 70.29 : 138.58

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.
The figure detailed is the percentage recovery result for the AQC.
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

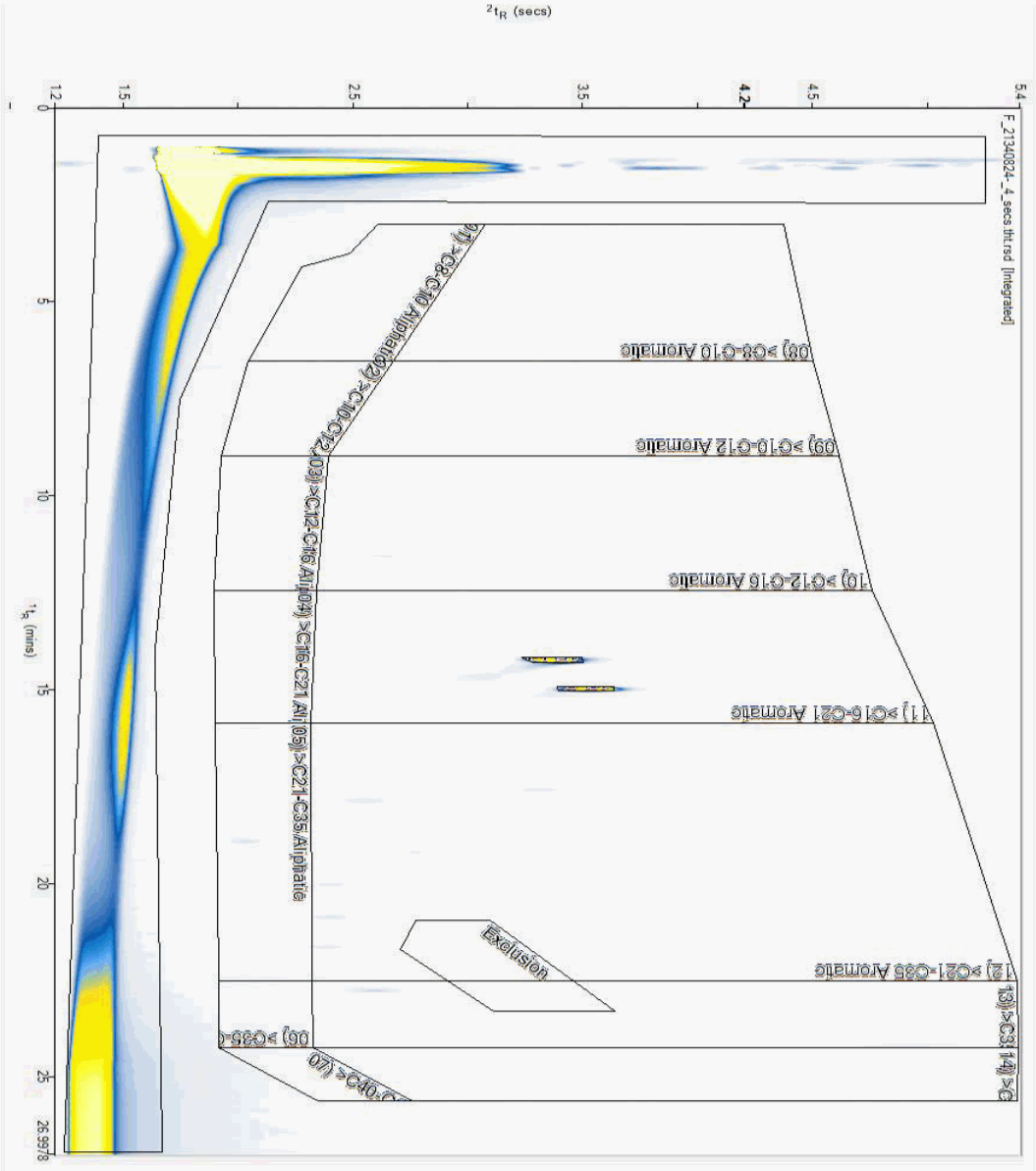
Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21340824
Sample ID : WS01

Depth : 2.60

```
   ChromSpace LIMS export
  Current batch
Sample Identity:  F_21340824-_4_secs.tht
Date Acquired  :  12/12/19 11:28:51
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
```



CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21340882
Sample ID : WS02

Depth : 0.30

```
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  Current batch
Sample Identity:  F_21340882-_4_secs.tht
Date Acquired  :  13/12/19 01:01:33
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
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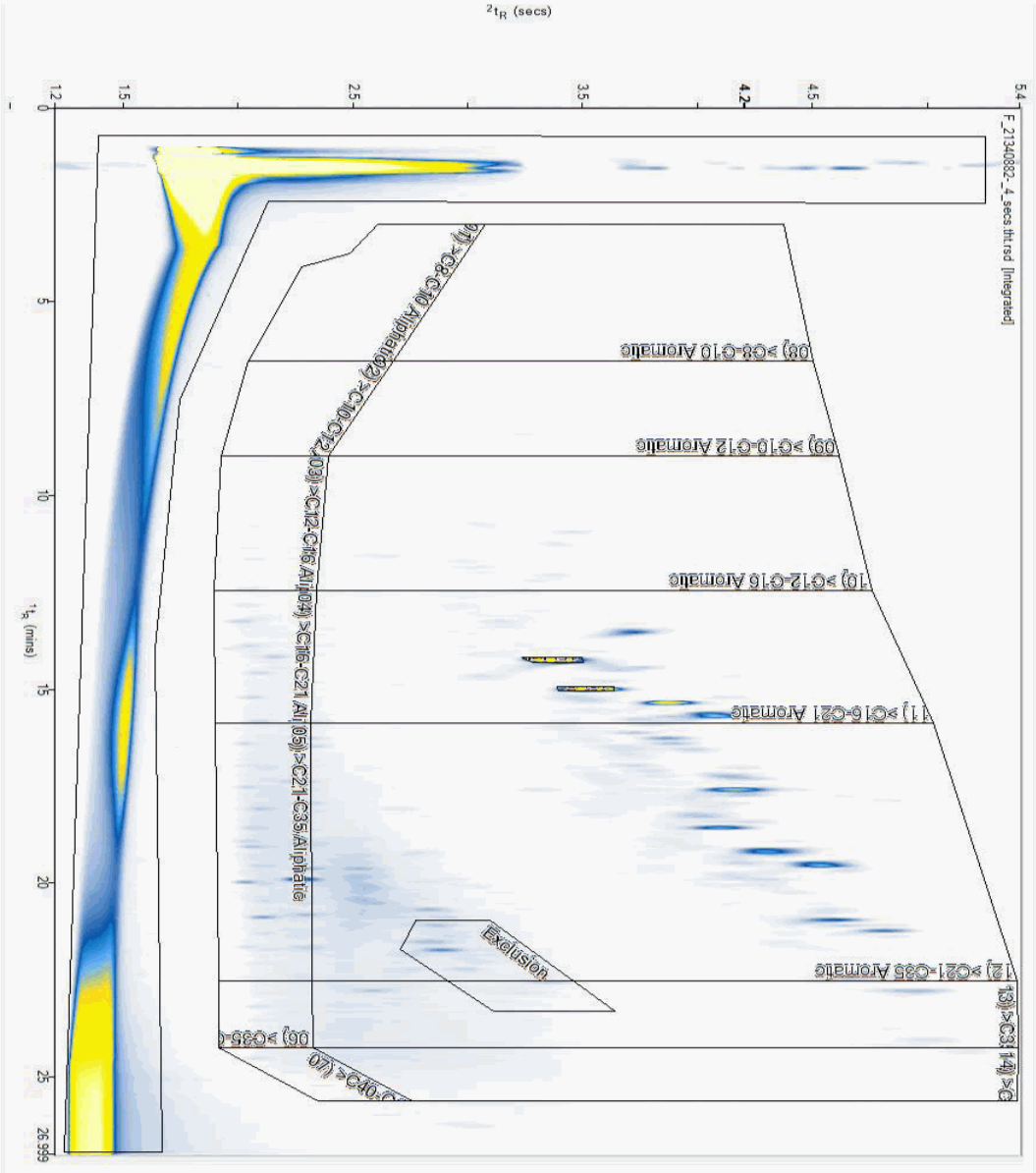

CERTIFICATE OF ANALYSIS

SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 21341003
Sample ID : WS01

Depth : 0.50

```
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  Current batch
Sample Identity:  F_21341003-_4_secs.tht
Date Acquired  :  13/12/19 12:30:39
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
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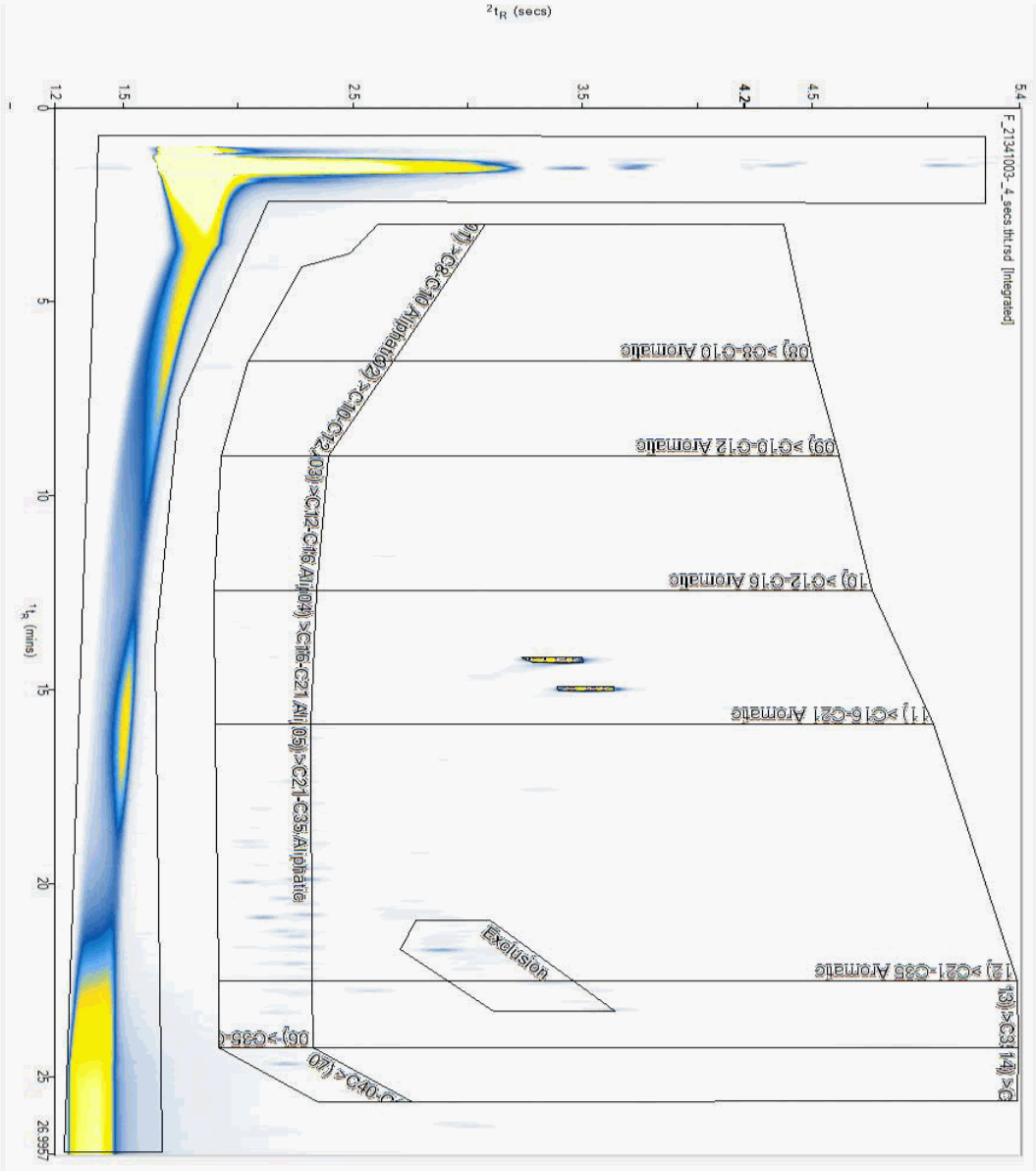


CERTIFICATE OF ANALYSIS

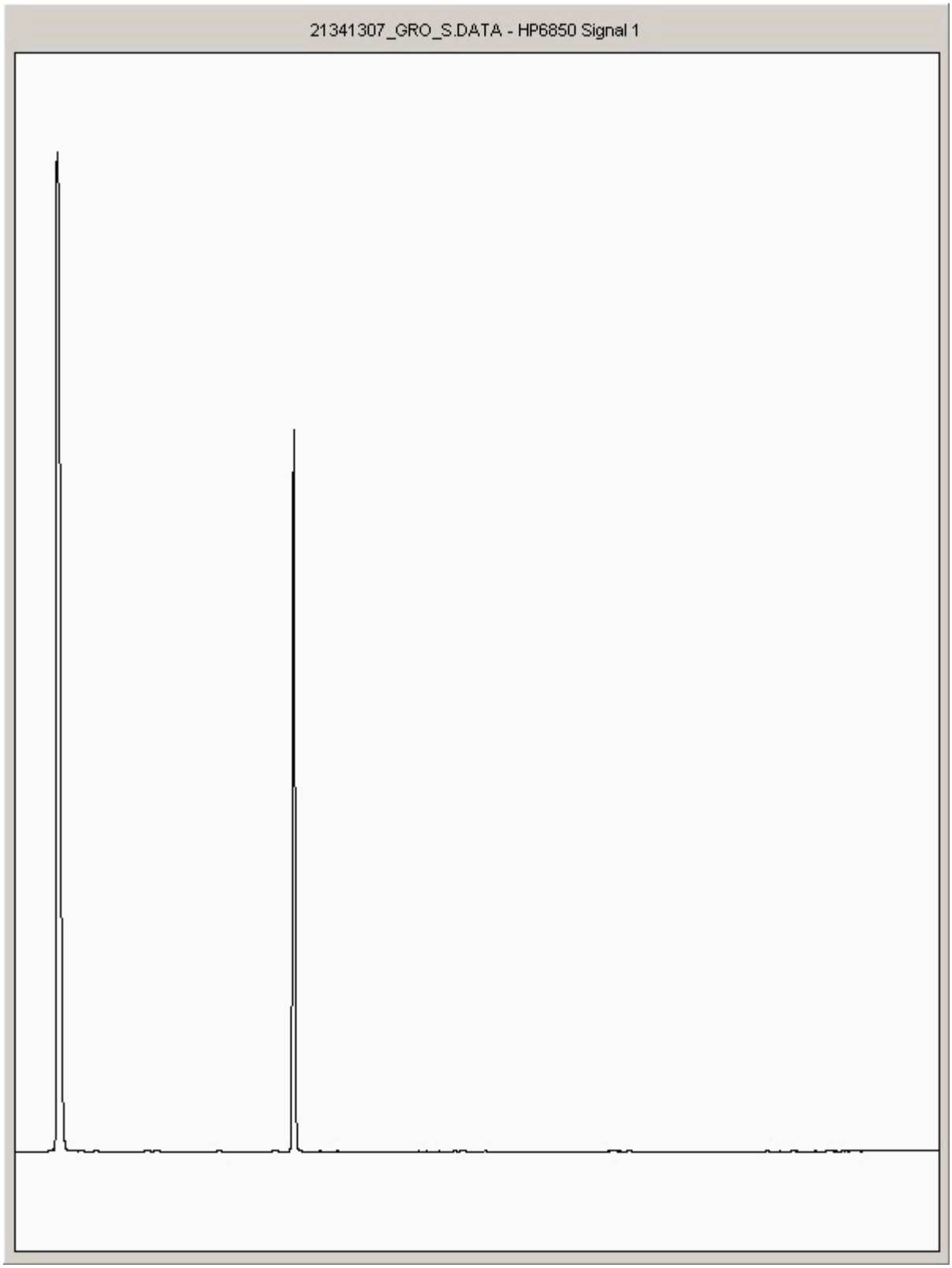
SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21341307
Sample ID : WS01

Depth : 0.50



CERTIFICATE OF ANALYSIS

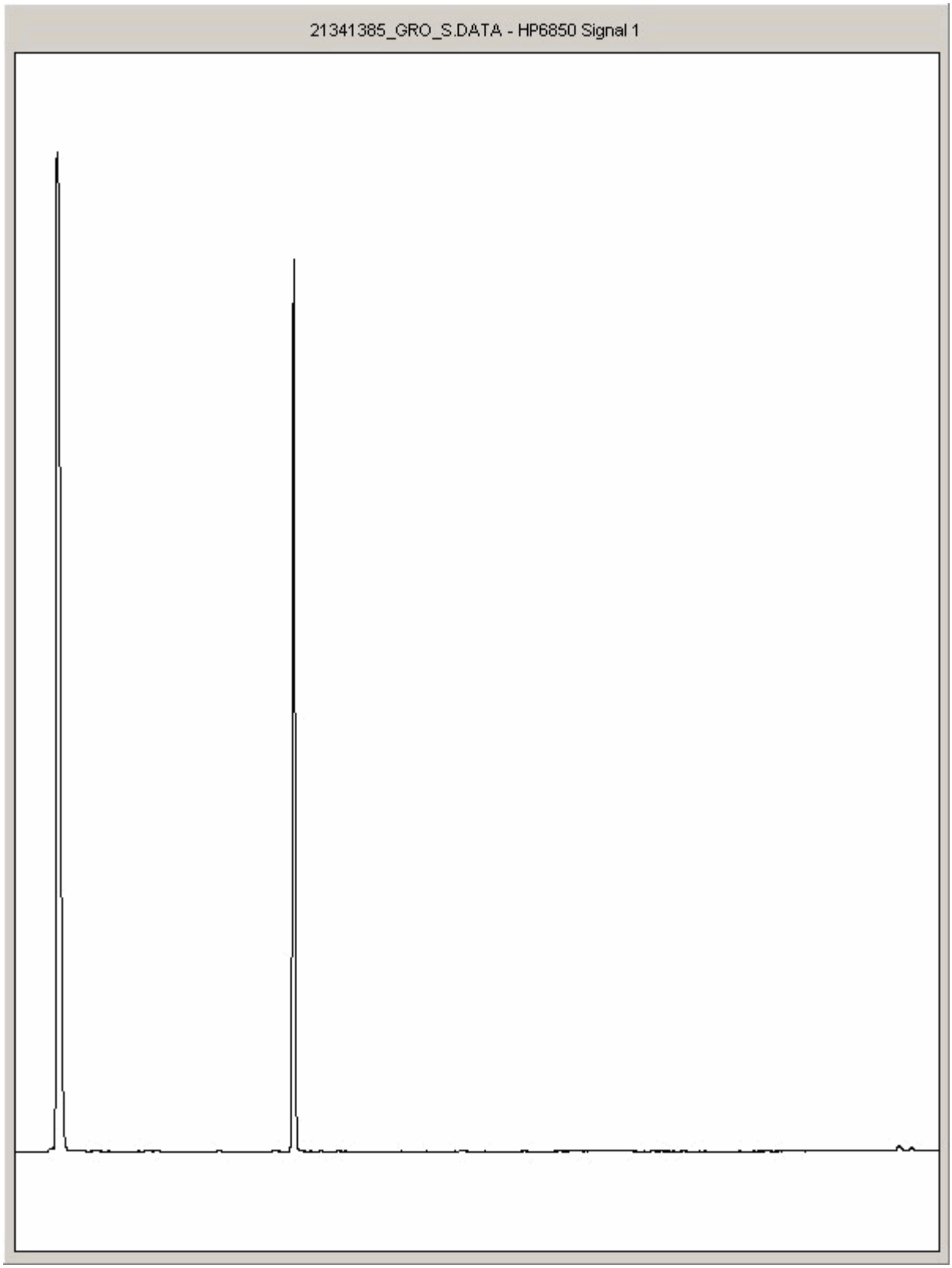
SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21341385
Sample ID : WS02

Depth : 0.30



CERTIFICATE OF ANALYSIS

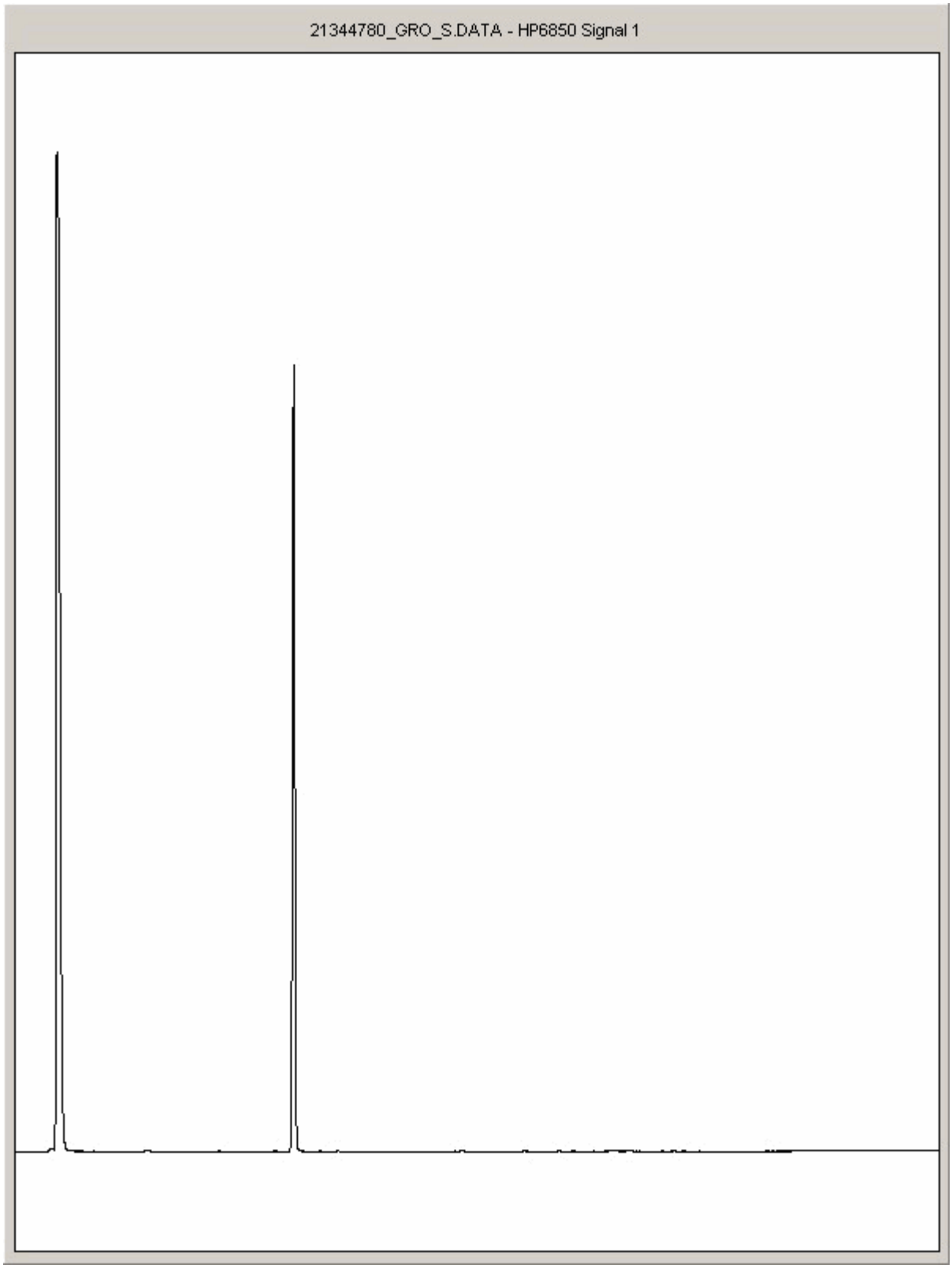
SDG:	191211-116	**Client Reference:**	1620008283	**Report Number:**	534367
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	534155

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21344780
Sample ID : WS01

Depth : 2.60



Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107).*

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Ramboll Environ
Artillery House
11-19 Artillery Row
London
SW1P 1RT

Attention: Siobhán McGeever

CERTIFICATE OF ANALYSIS

Date of report Generation:	12 December 2019
Customer:	Ramboll Environ
Sample Delivery Group (SDG):	191128-83
Your Reference:	1620008283
Location:	Camden Site
Report No:	533743

This report has been revised and directly supersedes 533231 in its entirety.

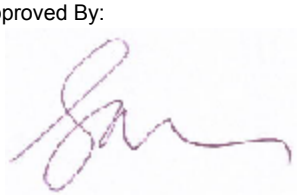
We received 15 samples on Wednesday November 27, 2019 and 14 of these samples were scheduled for analysis which was completed on Thursday December 12, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21247136	WS03		0.05	26/11/2019
21247137	WS03		3.50	26/11/2019
21247144	WS04		0.15	26/11/2019
21247140	WS04		0.90	26/11/2019
21247139	WS04		1.40	26/11/2019
21247141	WS05		0.40	26/11/2019
21247154	WS05		2.30	26/11/2019
21247142	WS06		0.30	26/11/2019
21247145	WS07		0.70	26/11/2019
21247146	WS08		0.25	26/11/2019
21247148	WS08		1.50	26/11/2019
21247149	WS08		2.50	26/11/2019
21247151	WS09		0.50	26/11/2019
21247152	WS09		1.20	26/11/2019
21247153	WS09		3.90	26/11/2019

Maximum Sample/Coolbox Temperature (°C) : **7.8**

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			21247136		21247137			21247144			21247140			21247139			21247141			21247142		
Customer Sample Reference			WS03		WS03			WS04			WS04			WS04			WS05			WS06		
AGS Reference																							
Depth (m)			0.05		3.50			0.15			0.90			1.40			0.40			0.30		
Container			1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 11		X					X						X			X			X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 12	X					X			X			X			X			X		
Asbestos Quantification - Full	All	NDPs: 0 Tests: 1																					
Chromium III	All	NDPs: 0 Tests: 11		X					X						X			X			X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 11		X					X						X			X			X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 11		X					X						X			X			X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 11			X					X						X			X				X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 11		X					X						X			X			X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 11		X					X						X			X			X		
PAH by GCMS	All	NDPs: 0 Tests: 11	X						X						X			X			X		
pH	All	NDPs: 0 Tests: 11		X					X						X			X			X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 11		X					X						X			X			X		
Sample description	All	NDPs: 0 Tests: 14		X		X			X			X			X			X			X		
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 5				X						X						X					
TPH CWG GC (S)	All	NDPs: 0 Tests: 11		X					X						X			X			X		

21247153	WS09		3.90	60g VOC (ALE215)	S							X								
				250g Amber Jar (ALE210)	S	X			X	X	X		X	X	X	X	X	X		X
				1kg TUB with Handle (ALE260)	S		X													
21247152	WS09		1.20	60g VOC (ALE215)	S							X								
				250g Amber Jar (ALE210)	S	X			X	X	X		X	X	X	X	X	X	X	X
				1kg TUB with Handle (ALE260)	S		X													
21247151	WS09		0.50	60g VOC (ALE215)	S							X								
				250g Amber Jar (ALE210)	S	X			X	X	X		X	X	X	X	X	X		X
				1kg TUB with Handle (ALE260)	S		X													
21247149	WS08		2.50	60g VOC (ALE215)	S							X								
				250g Amber Jar (ALE210)	S	X			X	X	X		X	X	X	X	X	X		X
				1kg TUB with Handle (ALE260)	S		X													
21247148	WS08		1.50	60g VOC (ALE215)	S															
				250g Amber Jar (ALE210)	S													X	X	
21247146	WS08		0.25	60g VOC (ALE215)	S							X								
				250g Amber Jar (ALE210)	S	X			X	X	X		X	X	X	X	X	X		X
				1kg TUB with Handle (ALE260)	S		X													
21247145	WS07		0.70	60g VOC (ALE215)	S							X								
				250g Amber Jar (ALE210)	S	X			X	X	X		X	X	X	X	X	X		X
				1kg TUB with Handle (ALE260)	S		X	X												

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Results Legend

X **Test**

N **No Determination Possible**

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
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UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			21247136			21247137			21247144			21247140			21247139			21247141			21247142		
Customer Sample Reference			WS03			WS03			WS04			WS04			WS04			WS05			WS06		
AGS Reference																							
Depth (m)			0.05			3.50			0.15			0.90			1.40			0.40			0.30		
Container	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
VOC MS (S)					X			X			X			X			X			X			X

All — NDPs: 0, Tests: 14

21247153	WS09		3.90			S	60g VOC (ALE215)
					X	S	250g Amber Jar (ALE210)
						S	1kg TUB with Handle (ALE260)
21247152	WS09		1.20			S	60g VOC (ALE215)
					X	S	250g Amber Jar (ALE210)
						S	1kg TUB with Handle (ALE260)
21247151	WS09		0.50			S	60g VOC (ALE215)
					X	S	250g Amber Jar (ALE210)
						S	1kg TUB with Handle (ALE260)
21247149	WS08		2.50			S	60g VOC (ALE215)
					X	S	250g Amber Jar (ALE210)
						S	1kg TUB with Handle (ALE260)
21247148	WS08		1.50			S	60g VOC (ALE215)
					X	S	250g Amber Jar (ALE210)
						S	1kg TUB with Handle (ALE260)
21247146	WS08		0.25			S	60g VOC (ALE215)
					X	S	250g Amber Jar (ALE210)
						S	1kg TUB with Handle (ALE260)
21247145	WS07		0.70			S	60g VOC (ALE215)
					X	S	250g Amber Jar (ALE210)
						S	1kg TUB with Handle (ALE260)

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Sample Descriptions

Grain Sizes

very fine	<0.063mm	**fine**	0.063mm - 0.1mm	**medium**	0.1mm - 2mm	**coarse**	2mm - 10mm	**very coarse**	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
21247136	WS03	0.05	Black	Sandy Loam	Vegetation	N/A
21247137	WS03	3.50	Light Brown	Sandy Silt Loam	Stones	None
21247139	WS04	1.40	Light Brown	Sandy Silt Loam	None	N/A
21247140	WS04	0.90	Light Brown	Sandy Loam	Stones	Brick
21247144	WS04	0.15	Light Brown	Loamy Sand	Stones	None
21247141	WS05	0.40	Light Brown	Sand	Stones	N/A
21247142	WS06	0.30	Dark Brown	Loamy Sand	Stones	Vegetation
21247145	WS07	0.70	Light Brown	Loamy Sand	Stones	N/A
21247146	WS08	0.25	Dark Brown	Silty Clay Loam	Stones	Vegetation
21247148	WS08	1.50	Dark Brown	Sandy Silt Loam	N/A	N/A
21247149	WS08	2.50	Light Brown	Sandy Silt Loam	N/A	None
21247151	WS09	0.50	Light Brown	Loamy Sand	Stones	N/A
21247152	WS09	1.20	Light Brown	Sandy Silt Loam	Vegetation	N/A
21247153	WS09	3.90	Light Brown	Sandy Silt Loam	N/A	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS03	WS03	WS04	WS04	WS04	WS05
			Depth (m)	0.05	3.50	0.15	0.90	1.40	0.40
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)
			Date Sampled	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019
			Sampled Time	.	.	.	.	.	.
			Date Received	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019
			SDG Ref	191128-83	191128-83	191128-83	191128-83	191128-83	191128-83
			Lab Sample No.(s)	21247136	21247137	21247144	21247140	21247139	21247141
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		16	19	22	20	21	11
Phenol	<0.01 mg/kg	TM062 (S)		<0.1		<0.01		<0.01	<0.01
Cresols	<0.01 mg/kg	TM062 (S)		<0.1		<0.01		<0.01	<0.01
Xylenols	<0.015 mg/kg	TM062 (S)		<0.15		<0.015		<0.015	<0.015
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035		<0.035		<0.035	<0.035
pH	1 pH Units	TM133		7.17		8.62		7.86	10
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6		<0.6		<0.6	<0.6
Cyanide, Total	<1 mg/kg	TM153		<1		<1		<1	<1
Chromium, Trivalent	<0.9 mg/kg	TM181		15.8		16.3		30.2	13.1
Arsenic	<0.6 mg/kg	TM181		7.38		13.6		12.6	10.3
Beryllium	<0.01 mg/kg	TM181		0.418		0.978		1.11	1.62
Boron	<0.7 mg/kg	TM181		12.5		10.7		10	18
Cadmium	<0.02 mg/kg	TM181		0.5		0.0874		<0.02	0.342
Chromium	<0.9 mg/kg	TM181		15.8		16.3		30.2	13.1
Copper	<1.4 mg/kg	TM181		95.5		47.4		15.2	100
Lead	<0.7 mg/kg	TM181		131		650		23.7	144
Mercury	<0.14 mg/kg	TM181		<0.14		1.53		<0.14	<0.14
Selenium	<1 mg/kg	TM181		<1		<1		<1	<1
Vanadium	<0.2 mg/kg	TM181		19.2		43.9		71.7	31
Zinc	<1.9 mg/kg	TM181		359		63.8		57.3	208
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243		0.0513		0.0576		0.0704	1.24

Validated

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	WS06	WS07	WS08	WS08	WS08	WS09
Customer Sample Ref.			WS06	WS07	WS08	WS08	WS08	WS09
Depth (m)			0.30	0.70	0.25	1.50	2.50	0.50
Sample Type			Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)
Date Sampled			26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019
Sampled Time			.	.	.	.	.	.
Date Received			27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019
SDG Ref			191128-83	191128-83	191128-83	191128-83	191128-83	191128-83
Lab Sample No.(s)			21247142	21247145	21247146	21247148	21247149	21247151
AGS Reference								
Moisture Content Ratio (% of as received sample)	%	PM024	16	10	11	28	21	11
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01		<0.01	<0.01
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01		<0.01	<0.01
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015	<0.015		<0.015	<0.015
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)	<0.035	<0.035	<0.035		<0.035	<0.035
pH	1 pH Units	TM133	8.33	8.5	9.18		8.08	8.67
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6	<0.6		<0.6	<0.6
Cyanide, Total	<1 mg/kg	TM153	<1	<1	<1		<1	<1
Chromium, Trivalent	<0.9 mg/kg	TM181	14.4	8.55	16.4		34.6	16
Arsenic	<0.6 mg/kg	TM181	13.5	5.36	17.7		11.9	9.35
Beryllium	<0.01 mg/kg	TM181	0.764	0.501	0.927		1.3	0.707
Boron	<0.7 mg/kg	TM181	12.8	10	8.68		20.9	7.25
Cadmium	<0.02 mg/kg	TM181	0.357	0.0703	0.409		0.0781	0.279
Chromium	<0.9 mg/kg	TM181	14.4	8.55	16.4		34.6	16
Copper	<1.4 mg/kg	TM181	54.2	17.7	84.1		26.5	52.3
Lead	<0.7 mg/kg	TM181	171	45.8	226		13.7	249
Mercury	<0.14 mg/kg	TM181	<0.14	<0.14	0.471		<0.14	0.365
Selenium	<1 mg/kg	TM181	<1	<1	<1		<1	<1
Vanadium	<0.2 mg/kg	TM181	29	16.5	37.5		77.3	33.2
Zinc	<1.9 mg/kg	TM181	188	38.1	202		82.1	156
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243	0.0512	0.585	0.12		2.63	0.0361
Asbestos Quantification - Gravimetric - %	<0.001 %	TM304		<0.001				
Asbestos Quantification - PCOM Evaluation - %	<0.001 %	TM304		<0.001				
Additional Asbestos Components (Using TM048)		TM304		Amosite detected.				
Analysts Comments		TM304		Soil containing debris				
Asbestos Quantification - Total - %	<0.001 %	TM304		<0.001				

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS09	WS09				
			Depth (m)	1.20	3.90				
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)				
			Date Sampled	26/11/2019	26/11/2019				
			Sampled Time	.	.				
			Date Received	27/11/2019	27/11/2019				
			SDG Ref	191128-83	191128-83				
			Lab Sample No.(s)	21247152	21247153				
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		25	21				
Phenol	<0.01 mg/kg	TM062 (S)		<0.01	<0.01				
Cresols	<0.01 mg/kg	TM062 (S)		<0.01	<0.01				
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015	<0.015				
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035	<0.035				
pH	1 pH Units	TM133		7.89	7.8				
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6	<0.6				
Cyanide, Total	<1 mg/kg	TM153		<1	<1				
Chromium, Trivalent	<0.9 mg/kg	TM181		42.8	33.7				
Arsenic	<0.6 mg/kg	TM181		9.01	14.8				
Beryllium	<0.01 mg/kg	TM181		1.3	1.32				
Boron	<0.7 mg/kg	TM181		13	20.6				
Cadmium	<0.02 mg/kg	TM181		<0.02	<0.02				
Chromium	<0.9 mg/kg	TM181		42.8	33.7				
Copper	<1.4 mg/kg	TM181		16.4	24.5				
Lead	<0.7 mg/kg	TM181		18.7	13.4				
Mercury	<0.14 mg/kg	TM181		<0.14	<0.14				
Selenium	<1 mg/kg	TM181		<1	<1				
Vanadium	<0.2 mg/kg	TM181		84.7	76.1				
Zinc	<1.9 mg/kg	TM181		66.9	79.2				
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243		0.175	2.7				

Validated

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

PAH by GCMS

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS03	WS04	WS04	WS05	WS06	WS07
			Depth (m)	0.05	0.15	1.40	0.40	0.30	0.70
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)
			Date Sampled	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019
			Sampled Time	.	.	.	.	.	.
			Date Received	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019
			SDG Ref	191128-83	191128-83	191128-83	191128-83	191128-83	191128-83
			Lab Sample No.(s)	21247136	21247144	21247139	21247141	21247142	21247145
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		94.3	82.9	76.1	93.3	96.7	85.6
Acenaphthene-d10 % recovery**	%	TM218		93.1	80.5	79.8	88.9	97.3	80.6
Phenanthrene-d10 % recovery**	%	TM218		100	79.9	84.3	88.3	99	85.6
Chrysene-d12 % recovery**	%	TM218		86.4	73.2	71.6	76	86.5	78.4
Perylene-d12 % recovery**	%	TM218		92.1	71.4	78.4	79.1	87.5	80
Naphthalene	<9 µg/kg	TM218		19.6	<9	<9	<45	26.8	10.7
Acenaphthylene	<12 µg/kg	TM218		41	<12	<12	112	48.8	34
Acenaphthene	<8 µg/kg	TM218		20.3	<8	<8	73.9	30.7	13.3
Fluorene	<10 µg/kg	TM218		17.8	<10	<10	63.3	24.9	14.9
Phenanthrene	<15 µg/kg	TM218		165	20.8	<15	795	359	291
Anthracene	<16 µg/kg	TM218		49.9	<16	<16	232	99.3	82.1
Fluoranthene	<17 µg/kg	TM218		359	33.2	<17	2080	1110	851
Pyrene	<15 µg/kg	TM218		322	28.8	<15	1820	975	752
Benz(a)anthracene	<14 µg/kg	TM218		168	25	<14	1080	577	439
Chrysene	<10 µg/kg	TM218		151	19.3	<10	802	493	430
Benzo(b)fluoranthene	<15 µg/kg	TM218		259	30.8	<15	1090	682	595
Benzo(k)fluoranthene	<14 µg/kg	TM218		94.2	<14	<14	495	249	254
Benzo(a)pyrene	<15 µg/kg	TM218		220	20	<15	1190	540	449
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		314	<18	<18	916	457	331
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		49.9	<23	<23	170	69.3	42.7
Benzo(g,h,i)perylene	<24 µg/kg	TM218		409	<24	<24	974	536	326
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		2660	178	<118	11900	6280	4910

Validated

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

PAH by GCMS

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS08	WS08	WS09	WS09	WS09
			Depth (m)	0.25	2.50	0.50	1.20	3.90
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)
			Date Sampled	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019
			Sampled Time	.	.	.	.	.
			Date Received	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019
			SDG Ref	191128-83	191128-83	191128-83	191128-83	191128-83
			Lab Sample No.(s)	21247146	21247149	21247151	21247152	21247153
			AGS Reference					
Naphthalene-d8 % recovery**	%	TM218		84.3	93.8	93.2	85.2	96.7
Acenaphthene-d10 % recovery**	%	TM218		86.7	93.7	94.3	81.5	95.3
Phenanthrene-d10 % recovery**	%	TM218		91.8	93.3	94.3	80.5	94.4
Chrysene-d12 % recovery**	%	TM218		78.7	81.6	82.7	73.8	86.9
Perylene-d12 % recovery**	%	TM218		90	78.9	86.6	74.4	84.6
Naphthalene	<9 µg/kg	TM218		56.5	<9	11	<9	<9
Acenaphthylene	<12 µg/kg	TM218		116	<12	36.8	<12	<12
Acenaphthene	<8 µg/kg	TM218		<40	<8	12.6	<8	<8
Fluorene	<10 µg/kg	TM218		<50	<10	11.8	<10	<10
Phenanthrene	<15 µg/kg	TM218		796	<15	194	<15	<15
Anthracene	<16 µg/kg	TM218		202	<16	52.6	<16	<16
Fluoranthene	<17 µg/kg	TM218		2220	<17	555	<17	<17
Pyrene	<15 µg/kg	TM218		1940	<15	495	<15	<15
Benz(a)anthracene	<14 µg/kg	TM218		1290	<14	301	<14	<14
Chrysene	<10 µg/kg	TM218		985	<10	247	<10	<10
Benzo(b)fluoranthene	<15 µg/kg	TM218		1730	<15	351	<15	<15
Benzo(k)fluoranthene	<14 µg/kg	TM218		612	<14	159	<14	<14
Benzo(a)pyrene	<15 µg/kg	TM218		1530	<15	333	<15	<15
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		1350	<18	261	<18	<18
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		203	<23	46.8	<23	<23
Benzo(g,h,i)perylene	<24 µg/kg	TM218		1200	<24	276	<24	<24
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		14200	<118	3340	<118	<118

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Semi Volatile Organic Compounds

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS03	WS04	WS05	WS08	WS09
			Depth (m)	3.50	0.90	0.40	1.50	1.20
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)
			Date Sampled	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019
			Sampled Time	.	.	.	.	.
			Date Received	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019
			SDG Ref	191128-83	191128-83	191128-83	191128-83	191128-83
			Lab Sample No.(s)	21247137	21247140	21247141	21247148	21247152
			AGS Reference					
Phenol	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Pentachlorophenol	<100 µg/kg	TM157		<100	<100	<200	<100	<100
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Nitrobenzene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Isophorone	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Hexachloroethane	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Hexachlorocyclopentadiene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Hexachlorobutadiene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Hexachlorobenzene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
n-Dioctyl phthalate	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Dimethyl phthalate	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Diethyl phthalate	<100 µg/kg	TM157		<100	<100	<200	<100	<100
n-Dibutyl phthalate	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Dibenzofuran	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Carbazole	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Butylbenzyl phthalate	<100 µg/kg	TM157		<100	<100	<200	<100	<100
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157		<100	<100	<200	<100	<100
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157		<100	<100	<200	<100	<100
bis(2-Chloroethyl)ether	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Azobenzene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
4-Nitrophenol	<100 µg/kg	TM157		<100	<100	<200	<100	<100
4-Nitroaniline	<100 µg/kg	TM157		<100	<100	<200	<100	<100
4-Methylphenol	<100 µg/kg	TM157		<100	<100	<200	<100	<100
4-Chlorophenylphenylether	<100 µg/kg	TM157		<100	<100	<200	<100	<100
4-Chloroaniline	<100 µg/kg	TM157		<100	<100	<200	<100	<100
4-Chloro-3-methylphenol	<100 µg/kg	TM157		<100	<100	<200	<100	<100
4-Bromophenylphenylether	<100 µg/kg	TM157		<100	<100	<200	<100	<100
3-Nitroaniline	<100 µg/kg	TM157		<100	<100	<200	<100	<100
2-Nitrophenol	<100 µg/kg	TM157		<100	<100	<200	<100	<100
2-Nitroaniline	<100 µg/kg	TM157		<100	<100	<200	<100	<100
2-Methylphenol	<100 µg/kg	TM157		<100	<100	<200	<100	<100
1,2,4-Trichlorobenzene	<100 µg/kg	TM157		<100	<100	<200	<100	<100

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Semi Volatile Organic Compounds

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS03	WS04	WS05	WS08	WS09
			Depth (m)	3.50	0.90	0.40	1.50	1.20
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)
			Date Sampled	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019
			Sampled Time	-	-	-	-	-
			Date Received	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019
			SDG Ref	191128-83	191128-83	191128-83	191128-83	191128-83
			Lab Sample No.(s)	21247137	21247140	21247141	21247148	21247152
			AGS Reference					
2-Chlorophenol	<100 µg/kg	TM157		<100	<100	<200	<100	<100
2,6-Dinitrotoluene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
2,4-Dinitrotoluene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
2,4-Dimethylphenol	<100 µg/kg	TM157		<100	<100	<200	<100	<100
2,4-Dichlorophenol	<100 µg/kg	TM157		<100	<100	<200	<100	<100
2,4,6-Trichlorophenol	<100 µg/kg	TM157		<100	<100	<200	<100	<100
2,4,5-Trichlorophenol	<100 µg/kg	TM157		<100	<100	<200	<100	<100
1,4-Dichlorobenzene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
1,3-Dichlorobenzene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
1,2-Dichlorobenzene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
2-Chloronaphthalene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
2-Methylnaphthalene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Acenaphthylene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Acenaphthene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Anthracene	<100 µg/kg	TM157		<100	<100	294	<100	<100
Benzo(a)anthracene	<100 µg/kg	TM157		<100	<100	1120	<100	<100
Benzo(b)fluoranthene	<100 µg/kg	TM157		<100	<100	655	<100	<100
Benzo(k)fluoranthene	<100 µg/kg	TM157		<100	<100	1070	<100	<100
Benzo(a)pyrene	<100 µg/kg	TM157		<100	<100	870	<100	<100
Benzo(g,h,i)perylene	<100 µg/kg	TM157		<100	<100	735	<100	<100
Chrysene	<100 µg/kg	TM157		<100	<100	1290	<100	<100
Fluoranthene	<100 µg/kg	TM157		<100	<100	2070	<100	<100
Fluorene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Indeno(1,2,3-cd)pyrene	<100 µg/kg	TM157		<100	<100	735	<100	<100
Phenanthrene	<100 µg/kg	TM157		<100	<100	859	<100	<100
Pyrene	<100 µg/kg	TM157		<100	<100	2150	<100	<100
Naphthalene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Dibenzo(a,h)anthracene	<100 µg/kg	TM157		<100	<100	<200	<100	<100
Bis(2-chloroisopropyl) ether	<100 µg/kg	TM157		<100	<100	<200	<100	<100

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

TPH CWG (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS03	WS04	WS04	WS05	WS06	WS07
			Depth (m)	0.05	0.15	1.40	0.40	0.30	0.70
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)
			Date Sampled	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019
			Sampled Time	.	.	.	.	.	.
			Date Received	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019
			SDG Ref	191128-83	191128-83	191128-83	191128-83	191128-83	191128-83
			Lab Sample No.(s)	21247136	21247144	21247139	21247141	21247142	21247145
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		48.8	87	88.6	108	92	97
Aliphatics >C5-C6	<10 µg/kg	TM089		13	<10	<10	<10	<10	<10
Aliphatics >C6-C8	<10 µg/kg	TM089		38.9	<10	<10	<10	<10	<10
Aliphatics >C8-C10	<10 µg/kg	TM089		46	<10	<10	<10	<10	<10
Aliphatics >C10-C12	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000	<1000	<1000
Aliphatics >C12-C16	<1000 µg/kg	TM414		4390	<1000	<1000	<1000	12700	<1000
Aliphatics >C16-C21	<1000 µg/kg	TM414		5300	<1000	<1000	1470	65400	<1000
Aliphatics >C21-C35	<1000 µg/kg	TM414		23000	<1000	<1000	7660	78500	4370
Aliphatics >C35-C44	<1000 µg/kg	TM414		1360	<1000	<1000	<1000	<1000	<1000
Total Aliphatics >C10-C44	<5000 µg/kg	TM414		34700	<5000	<5000	9560	158000	<5000
Total Aliphatics & Aromatics >C10-C44	<10000 µg/kg	TM414		765000	<10000	<10000	86100	217000	20200
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10	<10	<10	<10	<10
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	<10	<10	<10	<10	<10
Aromatics >EC8-EC10	<10 µg/kg	TM089		30.7	<10	<10	<10	<10	<10
Aromatics > EC10-EC12	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000	<1000	<1000
Aromatics > EC12-EC16	<1000 µg/kg	TM414		<1000	<1000	<1000	2120	1170	<1000
Aromatics > EC16-EC21	<1000 µg/kg	TM414		282000	<1000	<1000	19400	5370	2330
Aromatics > EC21-EC35	<1000 µg/kg	TM414		402000	2440	1620	44100	45800	11900
Aromatics >EC35-EC44	<1000 µg/kg	TM414		45000	<1000	<1000	10900	7090	<1000
Aromatics > EC40-EC44	<1000 µg/kg	TM414		9610	<1000	<1000	4450	2010	<1000
Total Aromatics > EC10-EC44	<5000 µg/kg	TM414		730000	<5000	<5000	76600	59400	15300
Total Aliphatics & Aromatics >C5-C44	<10000 µg/kg	TM414		765000	<10000	<10000	86100	217000	15300
Total Aliphatics >C5-C10	<50 µg/kg	TM089		97.9	<50	<50	<50	<50	<50
Total Aromatics >EC5-EC10	<50 µg/kg	TM089		<50	<50	<50	<50	<50	<50
GRO >C5-C10	<20 µg/kg	TM089		97.9	<20	<20	<20	<20	<20

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

TPH CWG (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS08	WS08	WS09	WS09	WS09
			Depth (m)	0.25	2.50	0.50	1.20	3.90
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)
			Date Sampled	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019
			Sampled Time	.	.	.	.	.
			Date Received	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019
			SDG Ref	191128-83	191128-83	191128-83	191128-83	191128-83
			Lab Sample No.(s)	21247146	21247149	21247151	21247152	21247153
			AGS Reference					
GRO Surrogate % recovery**	%	TM089		85	97	121	111	97
Aliphatics >C5-C6	<10 µg/kg	TM089		<10	<10	<10	<10	<10
Aliphatics >C6-C8	<10 µg/kg	TM089		<10	<10	12.4	<10	<10
Aliphatics >C8-C10	<10 µg/kg	TM089		<10	<10	18.1	<10	<10
Aliphatics >C10-C12	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000	<1000
Aliphatics >C12-C16	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000	<1000
Aliphatics >C16-C21	<1000 µg/kg	TM414		1870	<1000	<1000	<1000	<1000
Aliphatics >C21-C35	<1000 µg/kg	TM414		4810	<1000	7580	<1000	<1000
Aliphatics >C35-C44	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000	<1000
Total Aliphatics >C10-C44	<5000 µg/kg	TM414		7190	<5000	8980	<5000	<5000
Total Aliphatics & Aromatics >C10-C44	<10000 µg/kg	TM414		81100	<10000	45400	<10000	<10000
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10	<10	<10	<10
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	<10	<10	<10	<10
Aromatics >EC8-EC10	<10 µg/kg	TM089		<10	<10	12.4	<10	<10
Aromatics > EC10-EC12	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000	<1000
Aromatics > EC12-EC16	<1000 µg/kg	TM414		<1000	<1000	<1000	<1000	<1000
Aromatics > EC16-EC21	<1000 µg/kg	TM414		11700	<1000	4890	<1000	<1000
Aromatics > EC21-EC35	<1000 µg/kg	TM414		51600	1300	28300	1950	1700
Aromatics >EC35-EC44	<1000 µg/kg	TM414		9950	<1000	3100	<1000	<1000
Aromatics > EC40-EC44	<1000 µg/kg	TM414		2490	<1000	<1000	<1000	<1000
Total Aromatics > EC10-EC44	<5000 µg/kg	TM414		73900	<5000	36500	<5000	<5000
Total Aliphatics & Aromatics >C5-C44	<10000 µg/kg	TM414		81100	<10000	45500	<10000	<10000
Total Aliphatics >C5-C10	<50 µg/kg	TM089		<50	<50	<50	<50	<50
Total Aromatics >EC5-EC10	<50 µg/kg	TM089		<50	<50	<50	<50	<50
GRO >C5-C10	<20 µg/kg	TM089		<20	<20	<20	<20	<20

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS03	WS03	WS04	WS04	WS04	WS05
			Depth (m)	0.05	3.50	0.15	0.90	1.40	0.40
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)
			Date Sampled	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019
			Sampled Time	.	.	.	.	.	.
			Date Received	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019
			SDG Ref	191128-83	191128-83	191128-83	191128-83	191128-83	191128-83
			Lab Sample No.(s)	21247136	21247137	21247144	21247140	21247139	21247141
			AGS Reference						
Dibromofluoromethane**	%	TM116		96.1	103	102	97	96.1	116
Toluene-d8**	%	TM116		65.1	99.7	98.7	98.6	96.8	85.5
4-Bromofluorobenzene**	%	TM116		60.6	91.9	83.8	88	101	74.1
Dichlorodifluoromethane	<6 µg/kg	TM116			<6		<6		<6
Chloromethane	<7 µg/kg	TM116			<7		<7		<7
Vinyl Chloride	<6 µg/kg	TM116			<6		<6		<6
Bromomethane	<10 µg/kg	TM116			<10		<10		<10
Chloroethane	<10 µg/kg	TM116			<10		<10		<10
Trichlorofluoromethane	<6 µg/kg	TM116			<6		<6		<6
1,1-Dichloroethene	<10 µg/kg	TM116			<10		<10		<10
Carbon Disulphide	<7 µg/kg	TM116			<7		<7		<7
Dichloromethane	<10 µg/kg	TM116			<10		<10		<10
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116		<10	<10	<10	<10	<10	<10
trans-1,2-Dichloroethene	<10 µg/kg	TM116			<10		<10		<10
1,1-Dichloroethane	<8 µg/kg	TM116			<8		<8		<8
cis-1,2-Dichloroethene	<6 µg/kg	TM116			<6		<6		<6
2,2-Dichloropropane	<10 µg/kg	TM116			<10		<10		<10
Bromochloromethane	<10 µg/kg	TM116			<10		<10		<10
Chloroform	<8 µg/kg	TM116			<8		<8		<8
1,1,1-Trichloroethane	<7 µg/kg	TM116			<7		<7		<7
1,1-Dichloropropene	<10 µg/kg	TM116			<10		<10		<10
Carbontetrachloride	<10 µg/kg	TM116			<10		<10		<10
1,2-Dichloroethane	<5 µg/kg	TM116			<5		<5		<5
Benzene	<9 µg/kg	TM116		<9	<9	<9	<9	<9	<9
Trichloroethene	<9 µg/kg	TM116			<9		<9		<9
1,2-Dichloropropane	<10 µg/kg	TM116			<10		<10		<10
Dibromomethane	<9 µg/kg	TM116			<9		<9		<9
Bromodichloromethane	<7 µg/kg	TM116			<7		<7		<7
cis-1,3-Dichloropropene	<10 µg/kg	TM116			<10		<10		<10
Toluene	<7 µg/kg	TM116		<7	<7	<7	<7	<7	<7
trans-1,3-Dichloropropene	<10 µg/kg	TM116			<10		<10		<10
1,1,2-Trichloroethane	<10 µg/kg	TM116			<10		<10		<10

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS03	WS03	WS04	WS04	WS04	WS05
			Depth (m)	0.05	3.50	0.15	0.90	1.40	0.40
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)
			Date Sampled	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019
			Sampled Time	-	-	-	-	-	-
			Date Received	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019
			SDG Ref	191128-83	191128-83	191128-83	191128-83	191128-83	191128-83
			Lab Sample No.(s)	21247136	21247137	21247144	21247140	21247139	21247141
			AGS Reference						
1,3-Dichloropropane	<7 µg/kg	TM116		<7		<7		<7
Tetrachloroethene	<5 µg/kg	TM116		<5		<5		<5
Dibromochloromethane	<10 µg/kg	TM116		<10		<10		<10
1,2-Dibromoethane	<10 µg/kg	TM116		<10		<10		<10
Chlorobenzene	<5 µg/kg	TM116		<5		<5		<5
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116		<10		<10		<10
Ethylbenzene	<4 µg/kg	TM116	<4	<4	<4	<4	<4	<4
p/m-Xylene	<10 µg/kg	TM116	<10	<10	<10	<10	<10	<10
o-Xylene	<10 µg/kg	TM116	<10	<10	<10	<10	<10	<10
Styrene	<10 µg/kg	TM116		<10		<10		<10
Bromoform	<10 µg/kg	TM116		<10		<10		<10
Isopropylbenzene	<5 µg/kg	TM116		<5		<5		<5
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116		<10		<10		<10
1,2,3-Trichloropropane	<16 µg/kg	TM116		<16		<16		<16
Bromobenzene	<10 µg/kg	TM116		<10		<10		<10
Propylbenzene	<10 µg/kg	TM116		<10		<10		<10
2-Chlorotoluene	<9 µg/kg	TM116		<9		<9		<9
1,3,5-Trimethylbenzene	<8 µg/kg	TM116		<8		<8		<8
4-Chlorotoluene	<10 µg/kg	TM116		<10		<10		<10
tert-Butylbenzene	<14 µg/kg	TM116		<14		<14		<14
1,2,4-Trimethylbenzene	<9 µg/kg	TM116		<9		<9		<9
sec-Butylbenzene	<10 µg/kg	TM116		<10		<10		<10
4-Isopropyltoluene	<10 µg/kg	TM116		<10		<10		<10
1,3-Dichlorobenzene	<8 µg/kg	TM116		<8		<8		<8
1,4-Dichlorobenzene	<5 µg/kg	TM116		<5		<5		<5
n-Butylbenzene	<11 µg/kg	TM116		<11		<11		<11
1,2-Dichlorobenzene	<10 µg/kg	TM116		<10		<10		<10
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116		<14		<14		<14
Tert-amyl methyl ether	<10 µg/kg	TM116		<10		<10		<10
1,2,4-Trichlorobenzene	<20 µg/kg	TM116		<20		<20		<20
Hexachlorobutadiene	<20 µg/kg	TM116		<20		<20		<20
Naphthalene	<13 µg/kg	TM116		<13		<13		<13

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sampled Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			WS03	0.05	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247136	
			WS03	3.50	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247137	
			WS04	0.15	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247144	
			WS04	0.90	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247140	
			WS04	1.40	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247139	
			WS05	0.40	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247141	
1,2,3-Trichlorobenzene	<20 µg/kg	TM116		<20		<20					
1,3,5-Trichlorobenzene	<20 µg/kg	TM116		<20		<20					
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.02		<0.02		<0.02				
Sum of BTEX	<40 µg/kg	TM116	<40		<40		<40				

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sampled Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			WS06	0.30	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247142	
			WS07	0.70	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247145	
			WS08	0.25	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247146	
			WS08	1.50	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247148	
			WS08	2.50	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247149	
			WS09	0.50	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247151	
Dibromofluoromethane**	%	TM116	98.9								
			101								
			107								
			99.4								
			101								
			96.7								
Toluene-d8**	%	TM116	89.1								
			95								
			89.8								
			100								
			99.6								
			93.9								
4-Bromofluorobenzene**	%	TM116	79.6								
			91.6								
			73.7								
			91.4								
			90.9								
			97.3								
Dichlorodifluoromethane	<6 µg/kg	TM116									
			<6								
Chloromethane	<7 µg/kg	TM116									
			<7								
Vinyl Chloride	<6 µg/kg	TM116									
			<6								
Bromomethane	<10 µg/kg	TM116									
			<10								
Chloroethane	<10 µg/kg	TM116									
			<10								
Trichlorofluoromethane	<6 µg/kg	TM116									
			<6								
1,1-Dichloroethene	<10 µg/kg	TM116									
			<10								
Carbon Disulphide	<7 µg/kg	TM116									
			10.8								
Dichloromethane	<10 µg/kg	TM116									
			<10								
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10								
			<10								
			<10								
			<10								
			<10								
			<10								
trans-1,2-Dichloroethene	<10 µg/kg	TM116									
			<10								
1,1-Dichloroethane	<8 µg/kg	TM116									
			<8								
cis-1,2-Dichloroethene	<6 µg/kg	TM116									
			<6								
2,2-Dichloropropane	<10 µg/kg	TM116									
			<10								
Bromochloromethane	<10 µg/kg	TM116									
			<10								
Chloroform	<8 µg/kg	TM116									
			<8								
1,1,1-Trichloroethane	<7 µg/kg	TM116									
			<7								
1,1-Dichloropropene	<10 µg/kg	TM116									
			<10								
Carbontetrachloride	<10 µg/kg	TM116									
			<10								
1,2-Dichloroethane	<5 µg/kg	TM116									
			<5								
Benzene	<9 µg/kg	TM116	<9								
			<9								
			<9								
			<9								
			<9								
			<9								
Trichloroethene	<9 µg/kg	TM116									
			<9								
1,2-Dichloropropane	<10 µg/kg	TM116									
			<10								
Dibromomethane	<9 µg/kg	TM116									
			<9								
Bromodichloromethane	<7 µg/kg	TM116									
			<7								
cis-1,3-Dichloropropene	<10 µg/kg	TM116									
			<10								
Toluene	<7 µg/kg	TM116	<7								
			<7								
			<7								
			<7								
			<7								
			<7								
trans-1,3-Dichloropropene	<10 µg/kg	TM116									
			<10								
1,1,2-Trichloroethane	<10 µg/kg	TM116									
			<10								

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS06	WS07	WS08	WS08	WS08	WS09
			Depth (m)	0.30	0.70	0.25	1.50	2.50	0.50
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)	Unspecified Solid (UNS)
			Date Sampled	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019	26/11/2019
			Sampled Time	-	-	-	-	-	-
			Date Received	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019	27/11/2019
			SDG Ref	191128-83	191128-83	191128-83	191128-83	191128-83	191128-83
			Lab Sample No.(s)	21247142	21247145	21247146	21247148	21247149	21247151
			AGS Reference						
1,3-Dichloropropane	<7 µg/kg	TM116					<7		
Tetrachloroethene	<5 µg/kg	TM116					<5		
Dibromochloromethane	<10 µg/kg	TM116					<10		
1,2-Dibromoethane	<10 µg/kg	TM116					<10		
Chlorobenzene	<5 µg/kg	TM116					<5		
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116					<10		
Ethylbenzene	<4 µg/kg	TM116	<4	<4	<4	<4	<4	<4	
p/m-Xylene	<10 µg/kg	TM116	<10	<10	<10	<10	<10	<10	
o-Xylene	<10 µg/kg	TM116	<10	<10	<10	<10	<10	<10	
Styrene	<10 µg/kg	TM116					<10		
Bromoform	<10 µg/kg	TM116					<10		
Isopropylbenzene	<5 µg/kg	TM116					<5		
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116					<10		
1,2,3-Trichloropropane	<16 µg/kg	TM116					<16		
Bromobenzene	<10 µg/kg	TM116					<10		
Propylbenzene	<10 µg/kg	TM116					<10		
2-Chlorotoluene	<9 µg/kg	TM116					<9		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116					<8		
4-Chlorotoluene	<10 µg/kg	TM116					<10		
tert-Butylbenzene	<14 µg/kg	TM116					<14		
1,2,4-Trimethylbenzene	<9 µg/kg	TM116					<9		
sec-Butylbenzene	<10 µg/kg	TM116					<10		
4-Isopropyltoluene	<10 µg/kg	TM116					<10		
1,3-Dichlorobenzene	<8 µg/kg	TM116					<8		
1,4-Dichlorobenzene	<5 µg/kg	TM116					<5		
n-Butylbenzene	<11 µg/kg	TM116					<11		
1,2-Dichlorobenzene	<10 µg/kg	TM116					<10		
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116					<14		
Tert-amyl methyl ether	<10 µg/kg	TM116					<10		
1,2,4-Trichlorobenzene	<20 µg/kg	TM116					<20		
Hexachlorobutadiene	<20 µg/kg	TM116					<20		
Naphthalene	<13 µg/kg	TM116					<13		

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sampled Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			WS06	0.30	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247142	
			WS07	0.70	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247145	
			WS08	0.25	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247146	
			WS08	1.50	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247148	
			WS08	2.50	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247149	
			WS09	0.50	Unspecified Solid (UNS)	26/11/2019	.	27/11/2019	191128-83	21247151	
1,2,3-Trichlorobenzene	<20 µg/kg	TM116									
1,3,5-Trichlorobenzene	<20 µg/kg	TM116									
Sum of Detected Xylenes	<0.02 mg/kg	TM116	<0.02	<0.02	<0.02		<0.02	<0.02			
Sum of BTEX	<40 µg/kg	TM116	<40	<40	<40		<40	<40			

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS09	WS09				
			Depth (m)	1.20	3.90				
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)				
			Date Sampled	26/11/2019	26/11/2019				
			Sampled Time	.	.				
			Date Received	27/11/2019	27/11/2019				
			SDG Ref	191128-83	191128-83				
			Lab Sample No.(s)	21247152	21247153				
			AGS Reference						
Dibromofluoromethane**	%	TM116		103	94.5				
Toluene-d8**	%	TM116		98.1	96.2				
4-Bromofluorobenzene**	%	TM116		89.4	96.5				
Dichlorodifluoromethane	<6 µg/kg	TM116		<6					
Chloromethane	<7 µg/kg	TM116		<7					
Vinyl Chloride	<6 µg/kg	TM116		<6					
Bromomethane	<10 µg/kg	TM116		<10					
Chloroethane	<10 µg/kg	TM116		<10					
Trichlorofluorormethane	<6 µg/kg	TM116		<6					
1,1-Dichloroethene	<10 µg/kg	TM116		<10					
Carbon Disulphide	<7 µg/kg	TM116		<7					
Dichloromethane	<10 µg/kg	TM116		<10					
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116		<10	<10				
trans-1,2-Dichloroethene	<10 µg/kg	TM116		<10					
1,1-Dichloroethane	<8 µg/kg	TM116		<8					
cis-1,2-Dichloroethene	<6 µg/kg	TM116		<6					
2,2-Dichloropropane	<10 µg/kg	TM116		<10					
Bromochloromethane	<10 µg/kg	TM116		<10					
Chloroform	<8 µg/kg	TM116		<8					
1,1,1-Trichloroethane	<7 µg/kg	TM116		<7					
1,1-Dichloropropene	<10 µg/kg	TM116		<10					
Carbontetrachloride	<10 µg/kg	TM116		<10					
1,2-Dichloroethane	<5 µg/kg	TM116		<5					
Benzene	<9 µg/kg	TM116		<9	<9				
Trichloroethene	<9 µg/kg	TM116		<9					
1,2-Dichloropropane	<10 µg/kg	TM116		<10					
Dibromomethane	<9 µg/kg	TM116		<9					
Bromodichloromethane	<7 µg/kg	TM116		<7					
cis-1,3-Dichloropropene	<10 µg/kg	TM116		<10					
Toluene	<7 µg/kg	TM116		<7	<7				
trans-1,3-Dichloropropene	<10 µg/kg	TM116		<10					
1,1,2-Trichloroethane	<10 µg/kg	TM116		<10					

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS09	WS09				
			Depth (m)	1.20	3.90				
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)				
			Date Sampled	26/11/2019	26/11/2019				
			Sampled Time	-	-				
			Date Received	27/11/2019	27/11/2019				
			SDG Ref	191128-83	191128-83				
			Lab Sample No.(s)	21247152	21247153				
			AGS Reference						
1,3-Dichloropropane	<7 µg/kg	TM116		<7					
Tetrachloroethene	<5 µg/kg	TM116		<5					
Dibromochloromethane	<10 µg/kg	TM116		<10					
1,2-Dibromoethane	<10 µg/kg	TM116		<10					
Chlorobenzene	<5 µg/kg	TM116		<5					
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116		<10					
Ethylbenzene	<4 µg/kg	TM116		<4	<4				
p/m-Xylene	<10 µg/kg	TM116		<10	<10				
o-Xylene	<10 µg/kg	TM116		<10	<10				
Styrene	<10 µg/kg	TM116		<10					
Bromoform	<10 µg/kg	TM116		<10					
Isopropylbenzene	<5 µg/kg	TM116		<5					
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116		<10					
1,2,3-Trichloropropane	<16 µg/kg	TM116		<16					
Bromobenzene	<10 µg/kg	TM116		<10					
Propylbenzene	<10 µg/kg	TM116		<10					
2-Chlorotoluene	<9 µg/kg	TM116		<9					
1,3,5-Trimethylbenzene	<8 µg/kg	TM116		<8					
4-Chlorotoluene	<10 µg/kg	TM116		<10					
tert-Butylbenzene	<14 µg/kg	TM116		<14					
1,2,4-Trimethylbenzene	<9 µg/kg	TM116		<9					
sec-Butylbenzene	<10 µg/kg	TM116		<10					
4-Isopropyltoluene	<10 µg/kg	TM116		<10					
1,3-Dichlorobenzene	<8 µg/kg	TM116		<8					
1,4-Dichlorobenzene	<5 µg/kg	TM116		<5					
n-Butylbenzene	<11 µg/kg	TM116		<11					
1,2-Dichlorobenzene	<10 µg/kg	TM116		<10					
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116		<14					
Tert-amyl methyl ether	<10 µg/kg	TM116		<10					
1,2,4-Trichlorobenzene	<20 µg/kg	TM116		<20					
Hexachlorobutadiene	<20 µg/kg	TM116		<20					
Naphthalene	<13 µg/kg	TM116		<13					

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

VOC MS (S)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS09	WS09				
			Depth (m)	1.20	3.90				
			Sample Type	Unspecified Solid (UNS)	Unspecified Solid (UNS)				
			Date Sampled	26/11/2019	26/11/2019				
			Sampled Time	-	-				
			Date Received	27/11/2019	27/11/2019				
			SDG Ref	191128-83	191128-83				
			Lab Sample No.(s)	21247152	21247153				
			AGS Reference						
1,2,3-Trichlorobenzene	<20 µg/kg	TM116		<20					
1,3,5-Trichlorobenzene	<20 µg/kg	TM116		<20					
Sum of Detected Xylenes	<0.02 mg/kg	TM116		<0.02	<0.02				
Sum of BTEX	<40 µg/kg	TM116		<40	<40				

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Asbestos Identification - Solid Samples

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
*	Subcontracted test.
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS03 0.05 MISC_SOLID 26/11/2019 00:00:00 27/11/2019 06:00:00 191128-83 21247136 TM048	05/12/2019	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS04 0.15 MISC_SOLID 26/11/2019 00:00:00 27/11/2019 06:00:00 191128-83 21247144 TM048	05/12/2019	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS04 0.90 MISC_SOLID 26/11/2019 00:00:00 27/11/2019 06:00:00 191128-83 21247140 TM048	06/12/2019	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS04 1.40 MISC_SOLID 26/11/2019 00:00:00 27/11/2019 06:00:00 191128-83 21247139 TM048	05/12/2019	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS05 0.40 MISC_SOLID 26/11/2019 00:00:00 27/11/2019 06:00:00 191128-83 21247141 TM048	05/12/2019	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS06 0.30 MISC_SOLID 26/11/2019 00:00:00 27/11/2019 06:00:00 191128-83 21247142 TM048	05/12/2019	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS07 0.70 MISC_SOLID 26/11/2019 00:00:00 27/11/2019 06:00:00 191128-83 21247145 TM048	05/12/2019	Lucy Caroe	Loose fibres in soil	Not Detected (#)	Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS08 0.25 MISC_SOLID 26/11/2019 00:00:00 27/11/2019 06:00:00 191128-83 21247146 TM048	05/12/2019	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected

Validated

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS08 2.50 MISC_SOLID 26/11/2019 00:00:00 27/11/2019 06:00:00 191128-83 21247149 TM048	05/12/2019	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS09 0.50 MISC_SOLID 26/11/2019 00:00:00 27/11/2019 06:00:00 191128-83 21247151 TM048	05/12/2019	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS09 1.20 MISC_SOLID 26/11/2019 00:00:00 27/11/2019 06:00:00 191128-83 21247152 TM048	05/12/2019	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS09 3.90 MISC_SOLID 26/11/2019 00:00:00 27/11/2019 06:00:00 191128-83 21247153 TM048	05/12/19	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Asbestos Quantification - Full

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
*	Subcontracted test.
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

		Additional Asbestos Components	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM Evaluation	Asbestos Quantification - Total - %
Cust. Sample Ref.	WS07	Amosite detected. (#)	Soil containing debris typical of AIB.	<0.001 (#)	<0.001 (#)	<0.001 (#)
Depth (m)	0.70					
Sample Type	MISC_SOLID					
Date Sampled	26/11/2019 00:00:00					
Date Receieved	27/11/2019 06:00:00					
SDG	191128-83					
Original Sample	21247145					
Method Number	TM304					

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM243		Mixed Anions In Soils By Kone
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Test Completion Dates

Lab Sample No(s)	21247136	21247137	21247139	21247140	21247144	21247141	21247142	21247145	21247146	21247148
Customer Sample Ref.	WS03	WS03	WS04	WS04	WS04	WS05	WS06	WS07	WS08	WS08
AGS Ref.										
Depth	0.05	3.50	1.40	0.90	0.15	0.40	0.30	0.70	0.25	1.50
Type	Unspecified So	Unspecified So	Unspecified So	Unspecified So	Unspecified So	Unspecified So	Unspecified So	Unspecified So	Unspecified So	Unspecified So
Anions by Kone (soil)	05-Dec-2019		05-Dec-2019		05-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019	
Asbestos ID in Solid Samples	05-Dec-2019		05-Dec-2019	06-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019	
Asbestos Quantification - Full								12-Dec-2019		
Chromium III	05-Dec-2019		05-Dec-2019		05-Dec-2019	05-Dec-2019	04-Dec-2019	05-Dec-2019	05-Dec-2019	
Cyanide Comp/Free/Total/Thiocyanate	03-Dec-2019		03-Dec-2019		03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019	
EPH CWG GC (S)	03-Dec-2019		03-Dec-2019		03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019	
GRO by GC-FID (S)	05-Dec-2019		05-Dec-2019		04-Dec-2019	04-Dec-2019	04-Dec-2019	04-Dec-2019	04-Dec-2019	
Hexavalent Chromium (s)	05-Dec-2019		05-Dec-2019		04-Dec-2019	04-Dec-2019	04-Dec-2019	04-Dec-2019	05-Dec-2019	
Metals in solid samples by OES	05-Dec-2019		05-Dec-2019		05-Dec-2019	05-Dec-2019	04-Dec-2019	05-Dec-2019	05-Dec-2019	
PAH by GCMS	05-Dec-2019		05-Dec-2019		05-Dec-2019	06-Dec-2019	06-Dec-2019	05-Dec-2019	05-Dec-2019	
pH	05-Dec-2019		05-Dec-2019		05-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019	
Phenols by HPLC (S)	03-Dec-2019		03-Dec-2019		03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019	
Sample description	30-Nov-2019	30-Nov-2019	30-Nov-2019	30-Nov-2019	30-Nov-2019	30-Nov-2019	30-Nov-2019	30-Nov-2019	01-Dec-2019	30-Nov-2019
Semi Volatile Organic Compounds		05-Dec-2019		05-Dec-2019		04-Dec-2019				05-Dec-2019
TPH CWG GC (S)	05-Dec-2019		05-Dec-2019		04-Dec-2019	04-Dec-2019	04-Dec-2019	04-Dec-2019	04-Dec-2019	
VOC MS (S)	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019

Lab Sample No(s)	21247149	21247151	21247152	21247153
Customer Sample Ref.	WS08	WS09	WS09	WS09
AGS Ref.				
Depth	2.50	0.50	1.20	3.90
Type	Unspecified So	Unspecified So	Unspecified So	Unspecified So
Anions by Kone (soil)	05-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019
Asbestos ID in Solid Samples	05-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019
Chromium III	05-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019
Cyanide Comp/Free/Total/Thiocyanate	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019
EPH CWG GC (S)	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019
GRO by GC-FID (S)	04-Dec-2019	04-Dec-2019	05-Dec-2019	04-Dec-2019
Hexavalent Chromium (s)	04-Dec-2019	04-Dec-2019	04-Dec-2019	04-Dec-2019
Metals in solid samples by OES	05-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019
PAH by GCMS	06-Dec-2019	06-Dec-2019	05-Dec-2019	06-Dec-2019
pH	05-Dec-2019	05-Dec-2019	05-Dec-2019	05-Dec-2019
Phenols by HPLC (S)	04-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019
Sample description	30-Nov-2019	30-Nov-2019	30-Nov-2019	30-Nov-2019
Semi Volatile Organic Compounds			04-Dec-2019	
TPH CWG GC (S)	04-Dec-2019	04-Dec-2019	05-Dec-2019	04-Dec-2019
VOC MS (S)	03-Dec-2019	03-Dec-2019	03-Dec-2019	03-Dec-2019

ASSOCIATED AQC DATA

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2151	QC 2197
Free Cyanide	TM153	**93.9** 83.05 : 112.74	**92.8** 83.05 : 112.74
Thiocyanate	TM153	**96.41** 89.81 : 110.19	**95.81** 89.81 : 110.19
Total Cyanide	TM153	**99.29** 88.29 : 111.43	**99.29** 88.29 : 111.43

EPH CWG GC (S)

Component	Method Code	QC 2198	QC 2126
EPH >C8-C40 Raw	TM414	**106.9** 77.66 : 104.66	**96.5** 77.66 : 104.66
Total Aliphatics Raw	TM414	**115.37** 84.39 : 115.61	**104.87** 84.39 : 115.61
Total Aromatics Raw	TM414	**135.07** 81.11 : 118.89	**115.14** 81.11 : 118.89

GRO by GC-FID (S)

Component	Method Code	QC 2166	QC 2141
QC	TM089	**99.3** 72.28 : 114.54	**82.23** 70.75 : 114.19

Hexavalent Chromium (s)

Component	Method Code	QC 2138	QC 2195	QC 2140	QC 2108
Hexavalent Chromium	TM151	**100.0** 90.20 : 107.00	**104.0** 90.20 : 107.00	**100.0** 90.20 : 107.00	**106.0** 90.20 : 107.00

Metals in solid samples by OES

Component	Method Code	QC 2194	QC 2149	QC 2195	QC 2103
Aluminium	TM181	**90.27** 77.84 : 119.01	**94.69** 77.84 : 119.01	**86.37** 77.84 : 119.01	**91.15** 77.84 : 119.01
Antimony	TM181	**97.15** 84.28 : 107.67	**103.25** 84.28 : 107.67	**98.37** 84.28 : 107.67	**102.03** 84.28 : 107.67
Arsenic	TM181	**104.36** 87.05 : 109.36	**102.03** 87.05 : 109.36	**97.97** 87.05 : 109.36	**102.33** 87.05 : 109.36
Barium	TM181	**90.55** 82.49 : 109.34	**95.41** 82.49 : 109.34	**89.08** 82.49 : 109.34	**90.37** 82.49 : 109.34
Beryllium	TM181	**102.61** 85.44 : 109.61	**100.37** 85.44 : 109.61	**94.78** 85.44 : 109.61	**99.63** 85.44 : 109.61
Boron	TM181	**89.11** 73.51 : 104.66	**87.97** 73.51 : 104.66	**81.95** 73.51 : 104.66	**84.81** 73.51 : 104.66
Cadmium	TM181	**93.0** 81.46 : 106.43	**93.0** 81.46 : 106.43	**89.3** 81.46 : 106.43	**86.83** 81.46 : 106.43

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Metals in solid samples by OES

		QC 2194	QC 2149	QC 2195	QC 2103
Chromium	TM181	**95.33** 82.26 : 104.55	**94.93** 82.26 : 104.55	**89.05** 82.26 : 104.55	**93.91** 82.26 : 104.55
Cobalt	TM181	**95.28** 86.54 : 106.87	**91.82** 86.54 : 106.87	**87.74** 86.54 : 106.87	**91.19** 86.54 : 106.87
Copper	TM181	**93.13** 82.40 : 105.45	**95.95** 82.40 : 105.45	**91.55** 82.40 : 105.45	**94.37** 82.40 : 105.45
Iron	TM181	**90.48** 82.95 : 110.58	**97.62** 82.95 : 110.58	**91.27** 82.95 : 110.58	**94.44** 82.95 : 110.58
Lead	TM181	**98.65** 78.24 : 104.05	**96.4** 78.24 : 104.05	**89.19** 78.24 : 104.05	**93.02** 78.24 : 104.05
Manganese	TM181	**107.22** 94.29 : 119.51	**111.39** 94.29 : 119.51	**103.61** 94.29 : 119.51	**107.22** 94.29 : 119.51
Mercury	TM181	**100.72** 83.74 : 105.34	**97.83** 83.74 : 105.34	**96.38** 83.74 : 105.34	**99.28** 83.74 : 105.34
Molybdenum	TM181	**99.59** 87.11 : 106.87	**100.82** 87.11 : 106.87	**95.47** 87.11 : 106.87	**98.77** 87.11 : 106.87
Nickel	TM181	**93.89** 81.92 : 102.18	**92.91** 81.92 : 102.18	**88.51** 81.92 : 102.18	**92.18** 81.92 : 102.18
Phosphorus	TM181	**113.33** 94.56 : 124.28	**107.47** 94.56 : 124.28	**103.64** 94.56 : 124.28	**108.28** 94.56 : 124.28
Selenium	TM181	**103.53** 86.28 : 110.48	**101.18** 86.28 : 110.48	**97.65** 86.28 : 110.48	**103.14** 86.28 : 110.48
Strontium	TM181	**90.87** 79.13 : 102.79	**92.87** 79.13 : 102.79	**86.64** 79.13 : 102.79	**89.09** 79.13 : 102.79
Thallium	TM181	**63.27** 82.94 : 111.86	**99.56** 82.94 : 111.86	**94.25** 82.94 : 111.86	**97.35** 82.94 : 111.86
Tin	TM181	**102.28** 90.25 : 108.86	**101.52** 90.25 : 108.86	**97.34** 90.25 : 108.86	**101.52** 90.25 : 108.86
Titanium	TM181	**80.92** 66.23 : 102.06	**73.44** 66.23 : 102.06	**69.24** 66.23 : 102.06	**73.13** 66.23 : 102.06
Vanadium	TM181	**97.07** 86.37 : 107.94	**98.53** 86.37 : 107.94	**92.31** 86.37 : 107.94	**95.97** 86.37 : 107.94
Zinc	TM181	**99.59** 84.68 : 113.99	**102.46** 84.68 : 113.99	**95.69** 84.68 : 113.99	**99.38** 84.68 : 113.99

PAH by GCMS

Component	Method Code	QC 2174	QC 2116	QC 2145	QC 2136
Acenaphthene	TM218	**89.0** 80.97 : 105.99	**91.0** 80.97 : 105.99	**93.5** 70.00 : 130.00	**100.5** 70.00 : 130.00
Acenaphthylene	TM218	**88.5** 80.24 : 105.29	**90.5** 80.24 : 105.29	**92.5** 70.00 : 130.00	**100.5** 70.00 : 130.00
Anthracene	TM218	**84.5** 73.72 : 109.23	**93.0** 73.72 : 109.23	**92.5** 70.00 : 130.00	**96.5** 70.00 : 130.00
Benz(a)anthracene	TM218	**86.0** 79.72 : 116.84	**86.5** 79.72 : 116.84	**87.5** 68.12 : 118.39	**96.5** 68.12 : 118.39
Benzo(a)pyrene	TM218	**87.5** 69.58 : 110.26	**90.0** 69.58 : 110.26	**87.5** 71.72 : 115.31	**97.5** 71.72 : 115.31
Benzo(b)fluoranthene	TM218	**83.5** 77.35 : 112.97	**87.0** 77.35 : 112.97	**84.5** 66.89 : 120.40	**88.5** 66.89 : 120.40
Benzo(ghi)perylene	TM218	**93.5** 77.68 : 107.38	**96.5** 77.68 : 107.38	**84.5** 67.82 : 118.49	**97.5** 67.82 : 118.49
Benzo(k)fluoranthene	TM218	**86.0** 82.61 : 111.93	**88.5** 82.61 : 111.93	**88.0** 73.10 : 117.03	**99.5** 73.10 : 117.03

PAH by GCMS

		QC 2174	QC 2116	QC 2145	QC 2136
Chrysene	TM218	**81.0** 80.28 : 111.42	**85.5** 80.28 : 111.42	**83.5** 69.58 : 115.47	**95.0** 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	**94.0** 79.17 : 106.41	**101.5** 79.17 : 106.41	**89.0** 67.32 : 121.35	**95.0** 67.32 : 121.35
Fluoranthene	TM218	**88.5** 79.07 : 112.75	**85.0** 79.07 : 112.75	**96.0** 75.16 : 117.28	**102.0** 75.16 : 117.28
Fluorene	TM218	**87.0** 80.52 : 110.90	**93.5** 80.52 : 110.90	**92.5** 70.00 : 130.00	**99.0** 70.00 : 130.00
Indeno(123cd)pyrene	TM218	**88.0** 76.97 : 113.36	**95.5** 76.97 : 113.36	**80.0** 68.91 : 117.62	**93.5** 68.91 : 117.62
Naphthalene	TM218	**88.0** 83.50 : 110.02	**84.5** 83.50 : 110.02	**94.0** 70.00 : 130.00	**101.0** 70.00 : 130.00
Phenanthrene	TM218	**83.5** 79.34 : 111.91	**88.0** 79.34 : 111.91	**91.5** 70.00 : 130.00	**98.5** 70.00 : 130.00
Pyrene	TM218	**79.0** 74.43 : 114.36	**85.0** 74.43 : 114.36	**93.0** 75.68 : 119.23	**99.5** 75.68 : 119.23

pH

Component	Method Code	QC 2135	QC 2151
pH	TM133	**99.07** 97.44 : 100.93	**98.95** 97.79 : 100.58

Phenols by HPLC (S)

Component	Method Code	QC 2131	QC 2137
2.3.5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	**101.95** 83.23 : 109.71	**87.66** 65.50 : 89.50
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	**90.06** 76.34 : 104.11	**77.19** 86.25 : 116.25
Catechol by HPLC (S)	TM062 (S)	**86.67** 22.43 : 157.02	**44.76** 19.39 : 135.70
Cresols by HPLC (S)	TM062 (S)	**97.91** 85.60 : 112.00	**95.2** 81.00 : 112.20
Napthol by HPLC (S)	TM062 (S)	**113.57** 75.62 : 124.38	**62.86** 57.50 : 102.50
Phenol by HPLC (S)	TM062 (S)	**100.0** 79.53 : 120.47	**104.64** 95.33 : 123.33
Resorcinol HPLC (S)	TM062 (S)	**94.34** 71.43 : 129.59	**105.66** 69.99 : 127.22
Xylenols by HPLC (S)	TM062 (S)	**97.71** 89.90 : 107.23	**91.67** 90.22 : 114.22

Semi Volatile Organic Compounds

Component	Method Code	QC 2112
4-Bromophenylphenylether (Soil)	TM157	**88.5** 66.75 : 125.25
Benzo(a)anthracene (Soil)	TM157	**89.0** 67.40 : 120.50
Hexachlorobutadiene (Soil)	TM157	**95.0** 68.25 : 126.75

CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Semi Volatile Organic Compounds

		QC 2112
Naphthalene (Soil)	TM157	**93.5** 67.55 : 125.45
Nitrobenzene (Soil)	TM157	**83.5** 66.50 : 123.50
Phenol (Soil)	TM157	**97.0** 69.92 : 114.02

VOC MS (S)

Component	Method Code	QC 2192	QC 2133
1,1,1,2-tetrachloroethane	TM116	**100.2** 77.47 : 121.29	**106.6** 77.56 : 115.55
1,1,1-Trichloroethane	TM116	**90.0** 86.26 : 117.53	**106.6** 73.73 : 118.05
1,1,2-Trichloroethane	TM116	**87.4** 75.16 : 112.70	**100.6** 77.12 : 116.04
1,1-Dichloroethane	TM116	**80.4** 83.27 : 122.16	**108.0** 74.46 : 129.15
1,2-Dichloroethane	TM116	**101.2** 86.58 : 129.62	**111.6** 92.38 : 131.65
1,4-Dichlorobenzene	TM116	**97.0** 82.59 : 123.23	**99.2** 72.76 : 126.34
2-Chlorotoluene	TM116	**94.2** 66.81 : 118.43	**101.4** 81.66 : 118.02
4-Chlorotoluene	TM116	**91.2** 65.88 : 114.76	**96.6** 66.90 : 112.46
Benzene	TM116	**86.2** 93.16 : 123.63	**105.4** 89.71 : 111.93
Carbon Disulphide	TM116	**72.0** 75.11 : 124.81	**104.2** 74.91 : 122.14
Carbontetrachloride	TM116	**120.0** 82.35 : 126.46	**112.2** 80.31 : 124.50
Chlorobenzene	TM116	**89.6** 82.88 : 122.42	**102.4** 86.73 : 118.34
Chloroform	TM116	**87.2** 88.13 : 122.71	**106.6** 87.40 : 122.49
Chloromethane	TM116	**66.8** 55.37 : 133.35	**108.2** 65.05 : 142.63
Cis-1,2-Dichloroethene	TM116	**82.8** 78.27 : 128.90	**107.6** 80.67 : 126.72
Dibromomethane	TM116	**101.4** 77.47 : 121.29	**96.0** 67.80 : 121.75
Dichloromethane	TM116	**83.4** 81.68 : 125.21	**112.4** 81.11 : 133.25
Ethylbenzene	TM116	**91.8** 83.56 : 122.99	**103.8** 75.92 : 110.41
Hexachlorobutadiene	TM116	**116.4** 7.32 : 139.00	**104.4** 12.82 : 152.73
Isopropylbenzene	TM116	**90.4** 69.92 : 116.39	**108.0** 54.21 : 117.17
Naphthalene	TM116	**110.8** 79.29 : 125.59	**97.6** 80.86 : 128.81
o-Xylene	TM116	**88.4** 74.57 : 112.73	**97.8** 69.99 : 108.74

VOC MS (S)

		QC 2192	QC 2133
p/m-Xylene	TM116	**88.4** 77.41 : 112.71	**97.6** 68.32 : 108.91
Sec-Butylbenzene	TM116	**107.0** 44.71 : 117.87	**116.8** 44.91 : 118.40
Tetrachloroethene	TM116	**109.0** 81.43 : 126.65	**113.4** 76.95 : 121.02
Toluene	TM116	**83.4** 87.82 : 116.21	**97.6** 74.24 : 107.42
Trichloroethene	TM116	**91.2** 79.80 : 112.33	**102.6** 77.61 : 111.54
Trichlorofluoromethane	TM116	**89.8** 80.52 : 132.12	**107.2** 84.55 : 133.27
Vinyl Chloride	TM116	**66.2** 58.08 : 128.58	**106.8** 70.29 : 138.58

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.
The figure detailed is the percentage recovery result for the AQC.
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.

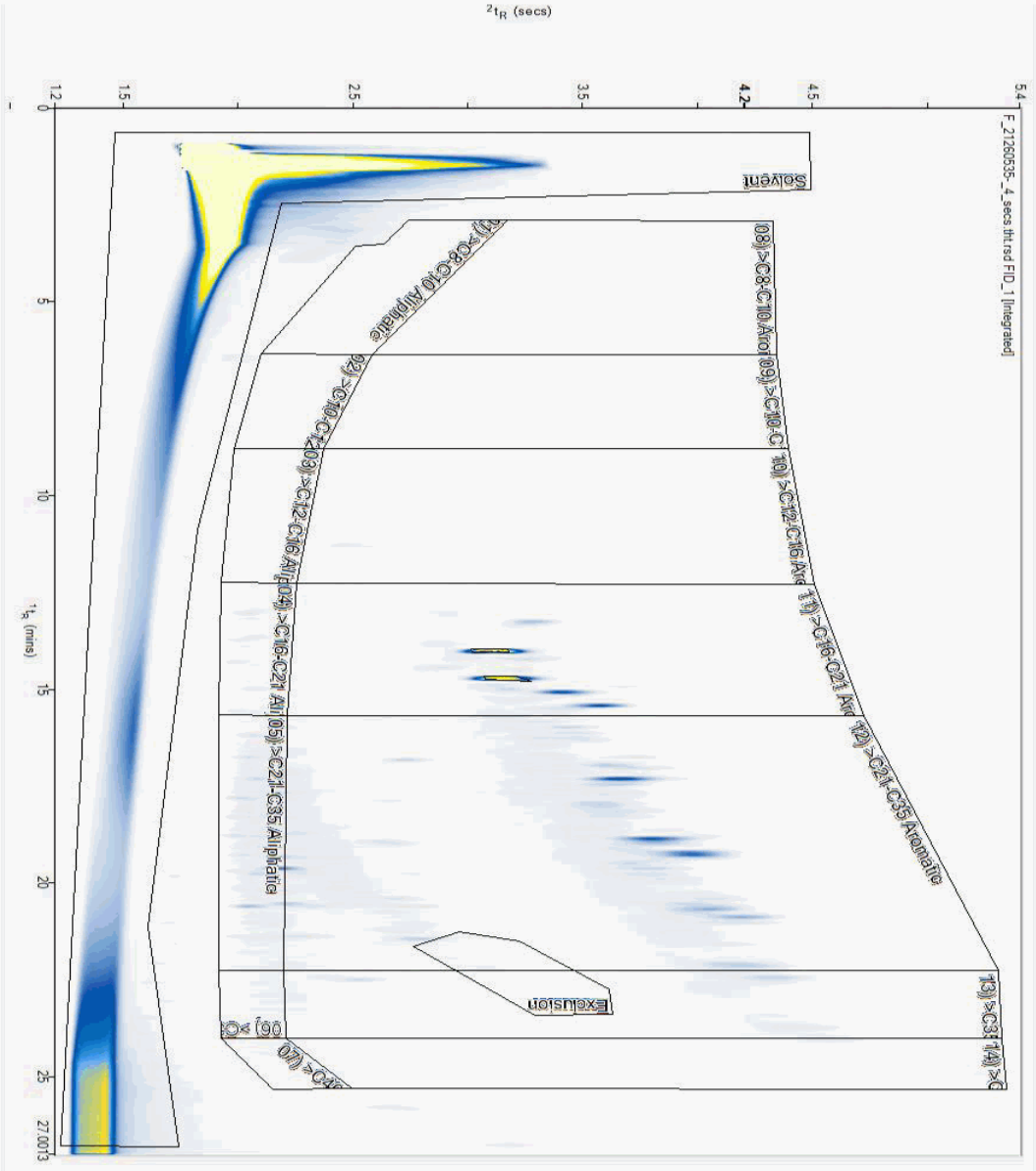
CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21260535 **Depth :** 0.50
Sample ID : WS09

```
   ChromSpace LIMS export
  Current batch
Sample Identity:  F_21260535-_4_secs.tht
Date Acquired  :  03/12/19 03:23:40
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
```



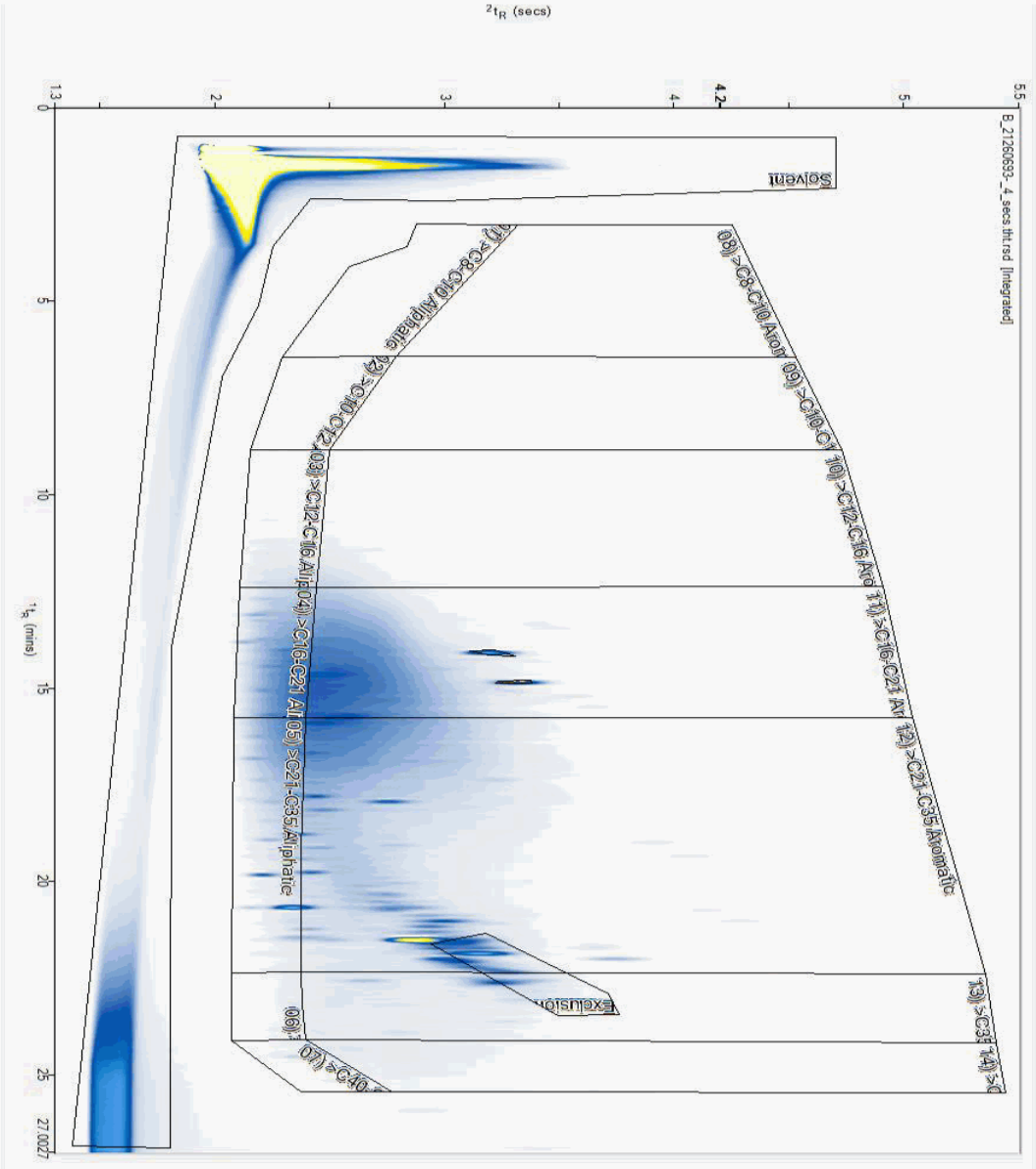
CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21260693 **Depth :** 0.05
Sample ID : WS03

```
   ChromSpace LIMS export
  Current batch
Sample Identity:  B_21260693-_4_secs.tht
Date Acquired  :  03/12/19 03:53:44
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
```



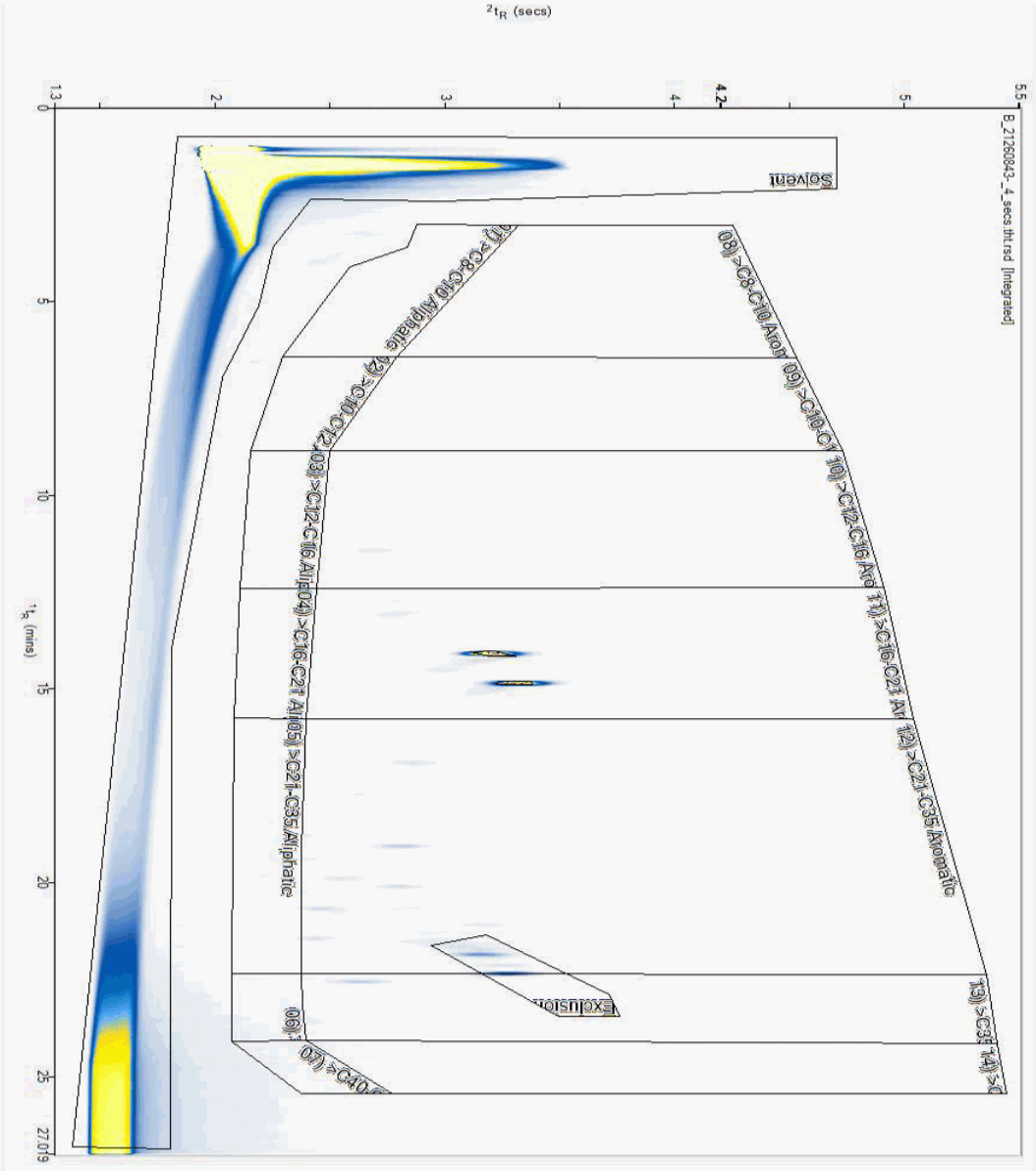
CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21260843 **Depth :** 2.50
Sample ID : WS08

```
   ChromSpace LIMS export
  Current batch
Sample Identity:  B_21260843-_4_secs.tht
Date Acquired  :  02/12/19 11:23:19
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
```



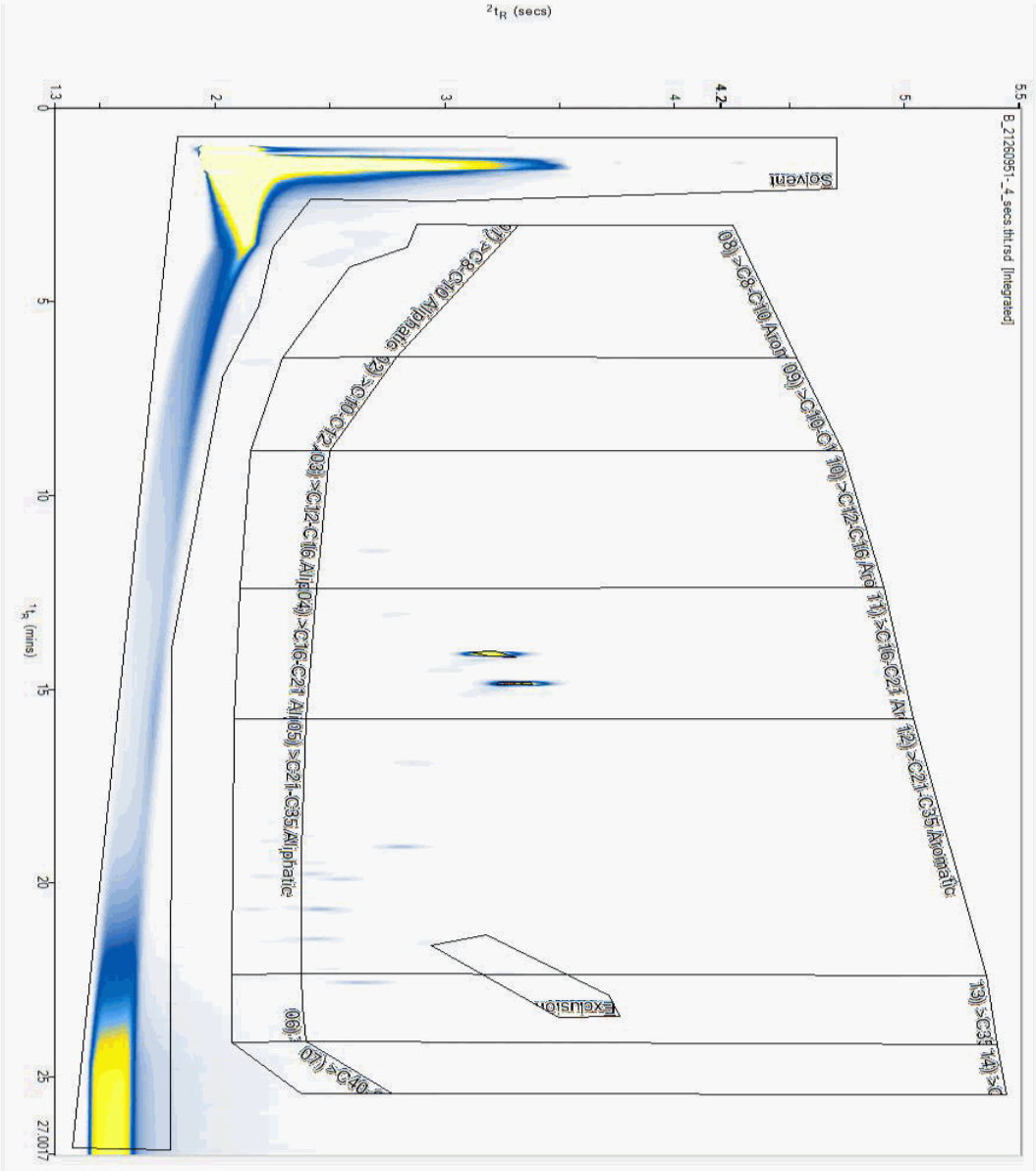
CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21260951 **Depth :** 1.40
Sample ID : WS04

```
   ChromSpace LIMS export
  Current batch
Sample Identity:  B_21260951-_4_secs.tht
Date Acquired  :  03/12/19 03:23:40
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
```



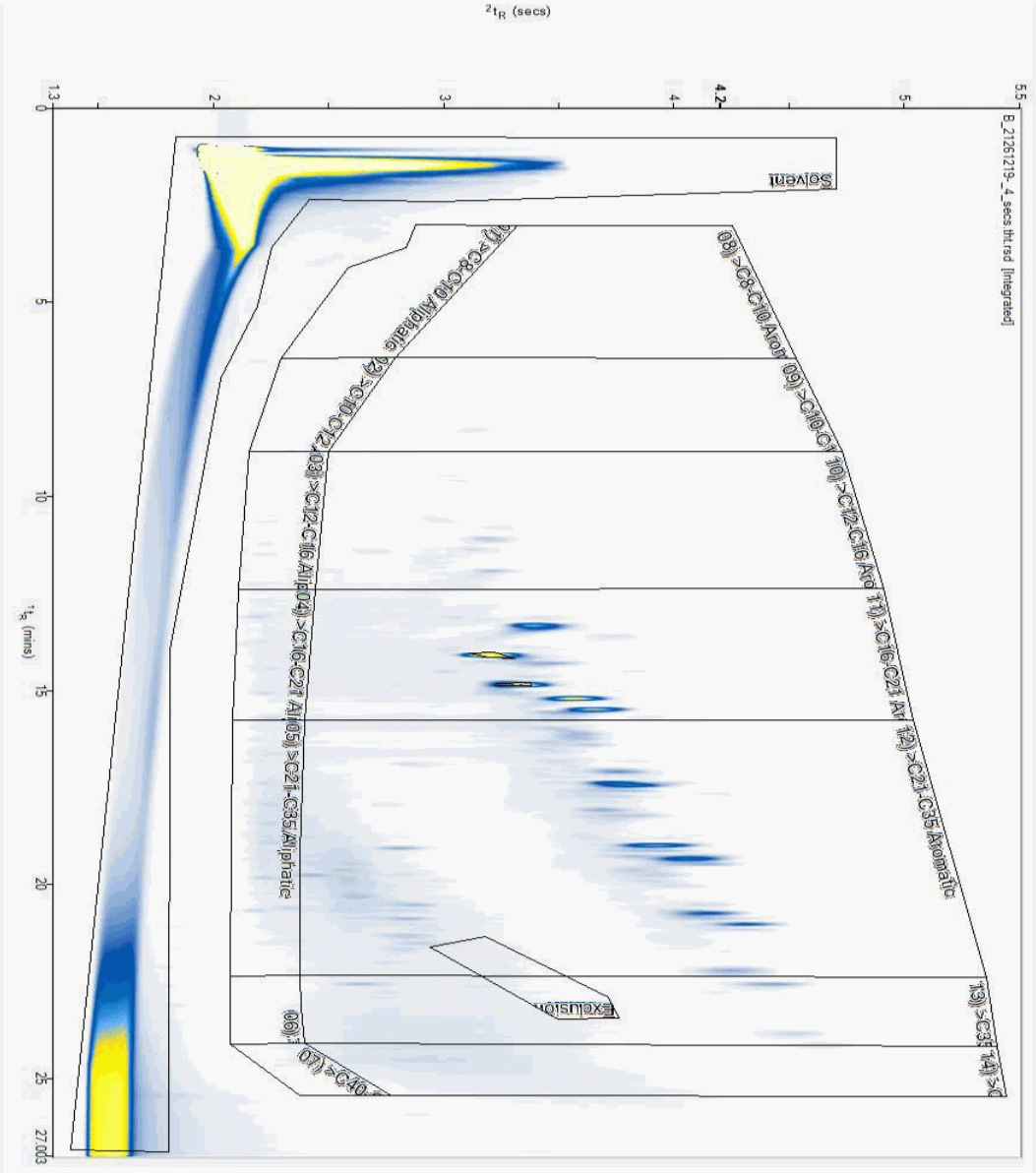
CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21261219 **Depth :** 0.40
Sample ID : WS05

```
  ChromSpace LIMS export
  Current batch
Sample Identity:  B_21261219-_4_secs.tht
Date Acquired  :  03/12/19 06:11:50
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
```



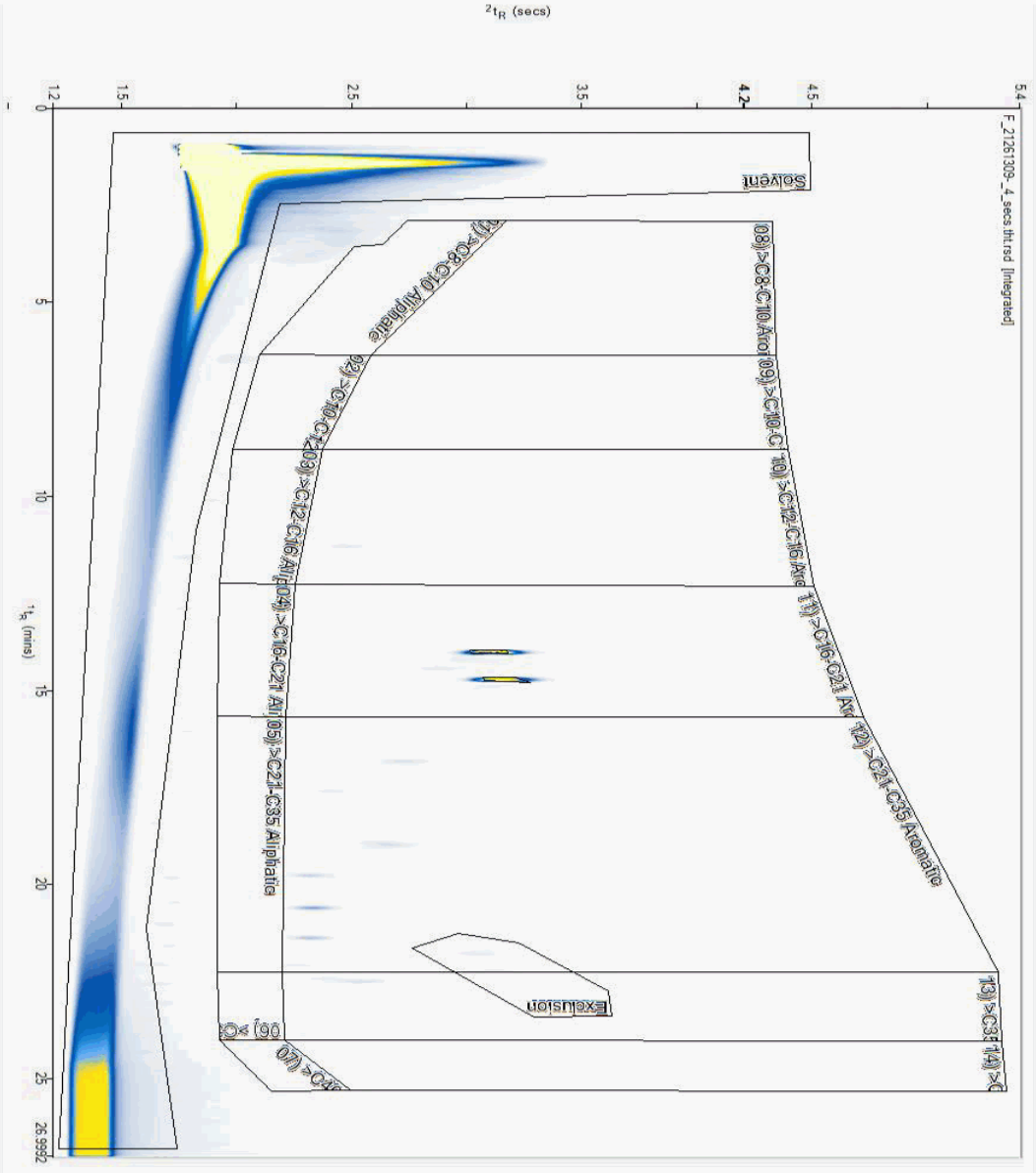
CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21261309 **Depth :** 3.90
Sample ID : WS09

```
   ChromSpace LIMS export
  Current batch
Sample Identity:  F_21261309-_4_secs.tht
Date Acquired  :  03/12/19 04:23:50
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
```



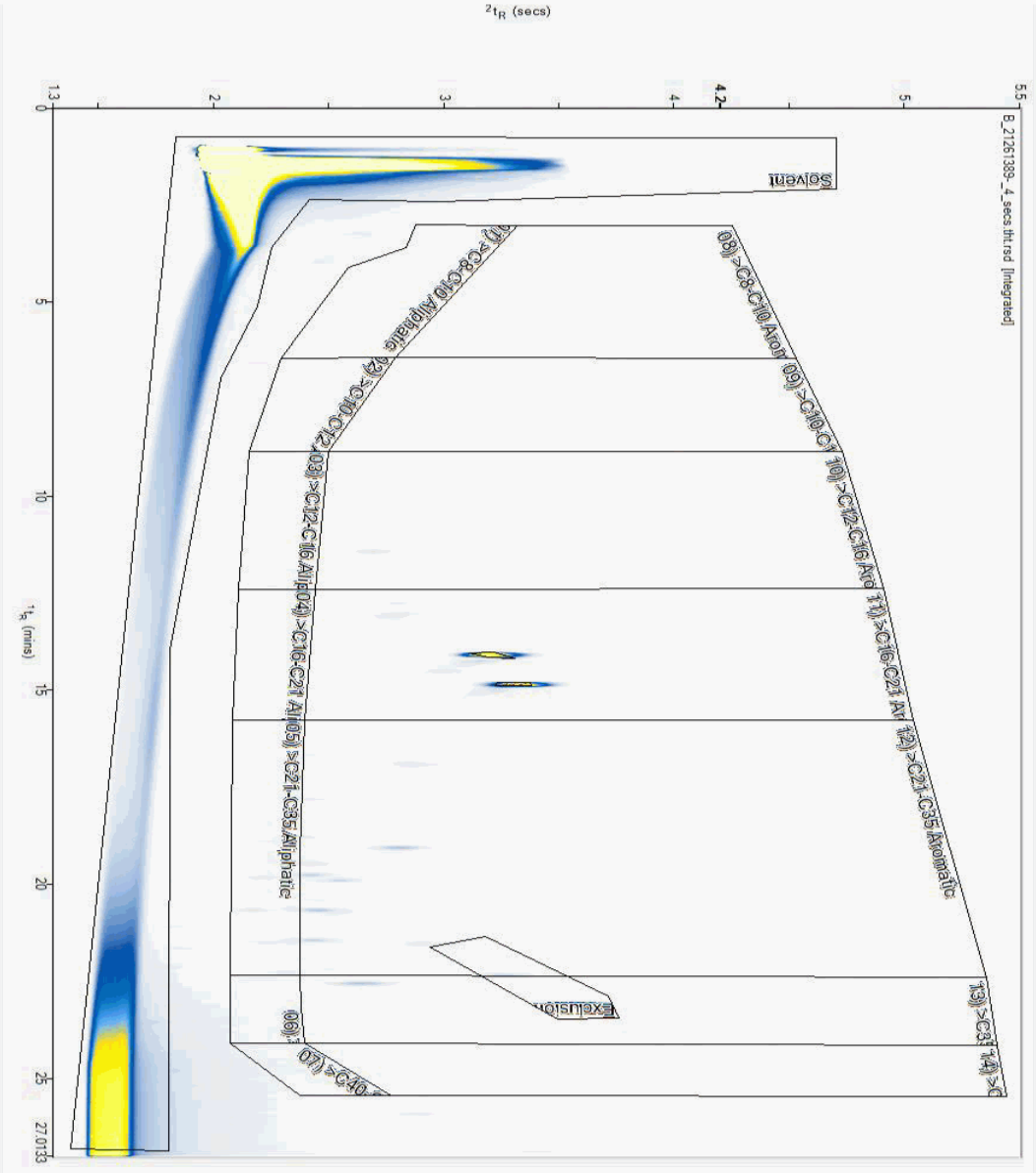
CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21261389 **Depth :** 1.20
Sample ID : WS09

```
   ChromSpace LIMS export
  Current batch
Sample Identity:  B_21261389-_4_secs.tht
Date Acquired   :  03/12/19 12:23:25
Units           :  ppm
Dilution        :  0
CF              :
Multiplier      :
```



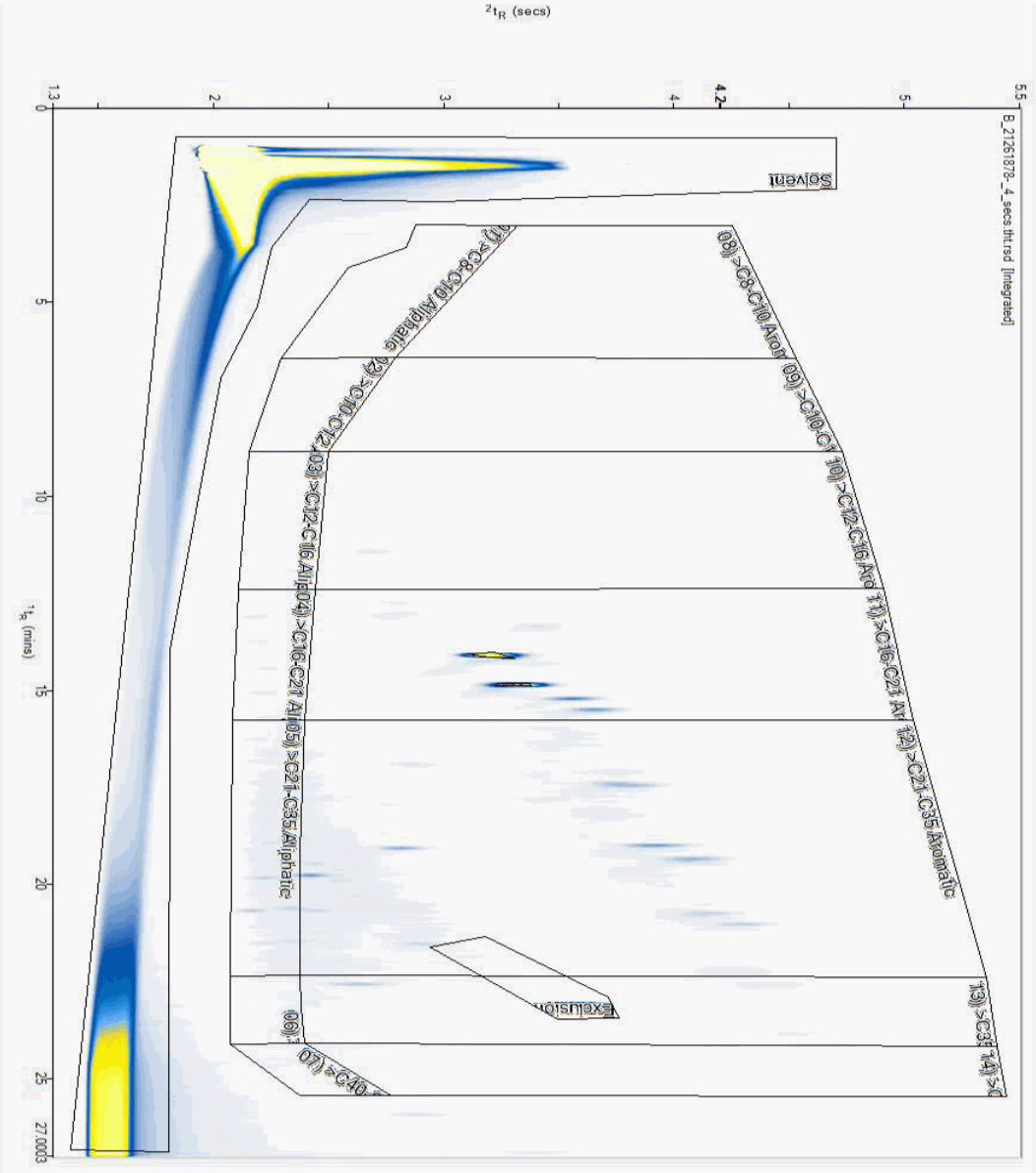
CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21261878 **Depth :** 0.70
Sample ID : WS07

```
   ChromSpace LIMS export
  Current batch
Sample Identity:  B_21261878-_4_secs.tht
Date Acquired  :  02/12/19 10:53:15
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
```



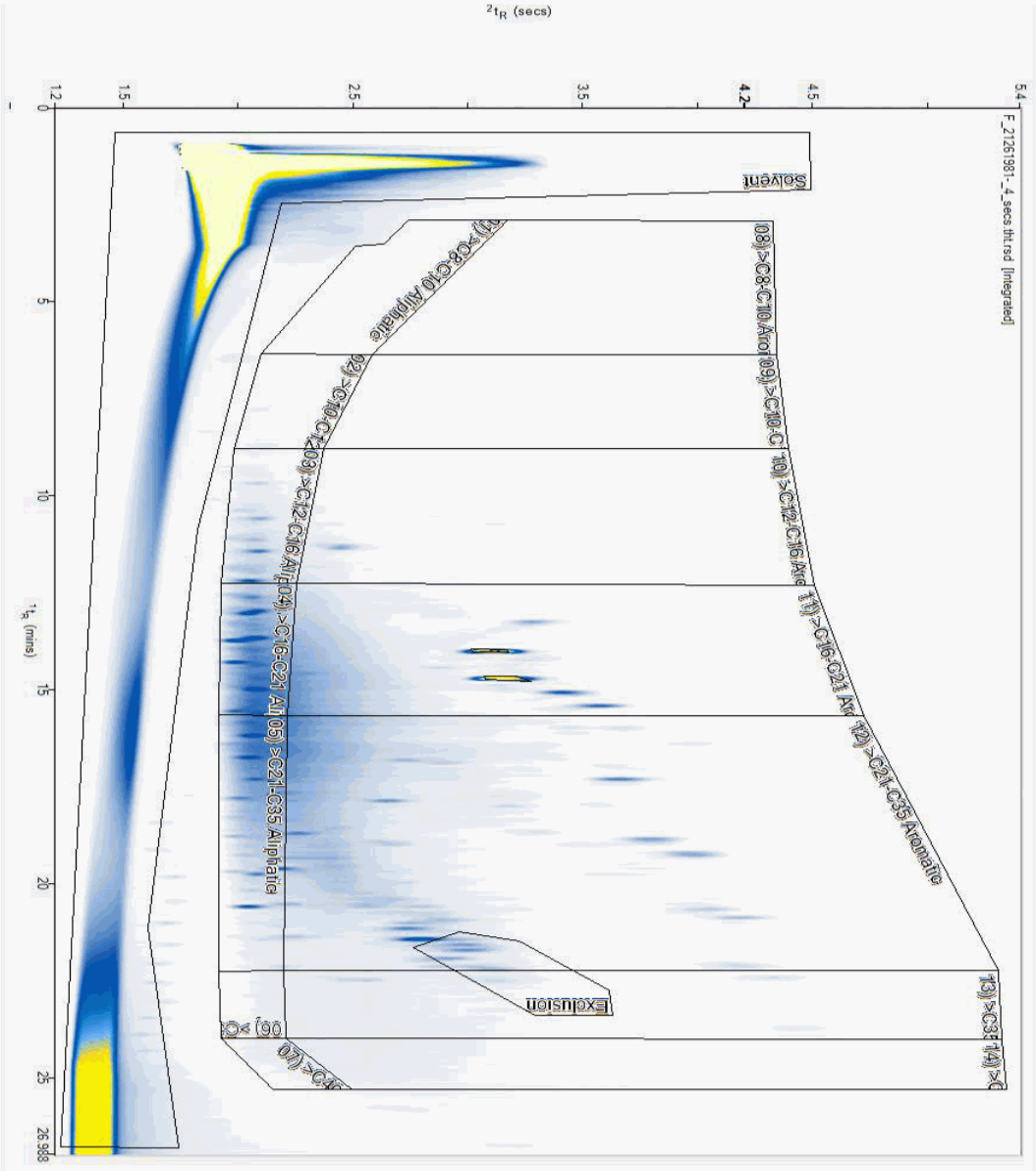
CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21261981 **Depth :** 0.30
Sample ID : WS06

```
   ChromSpace LIMS export
  Current batch
Sample Identity:  F_21261981-_4_secs.tht
Date Acquired  :  03/12/19 12:53:27
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
```



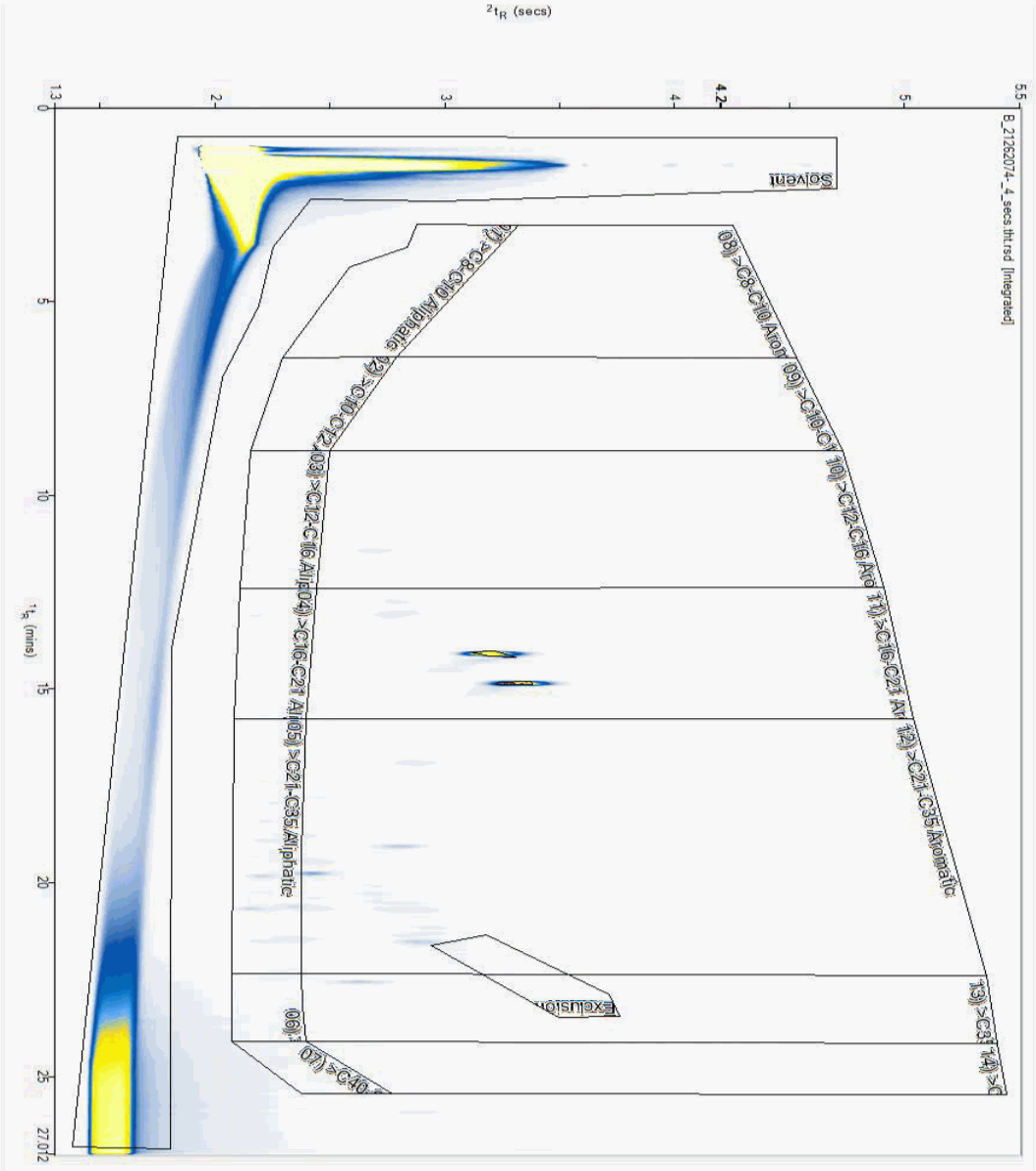
CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21262074 **Depth :** 0.15
Sample ID : WS04

```
   ChromSpace LIMS export
  Current batch
Sample Identity:  B_21262074-_4_secs.tht
Date Acquired  :  02/12/19 08:53:03
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
```



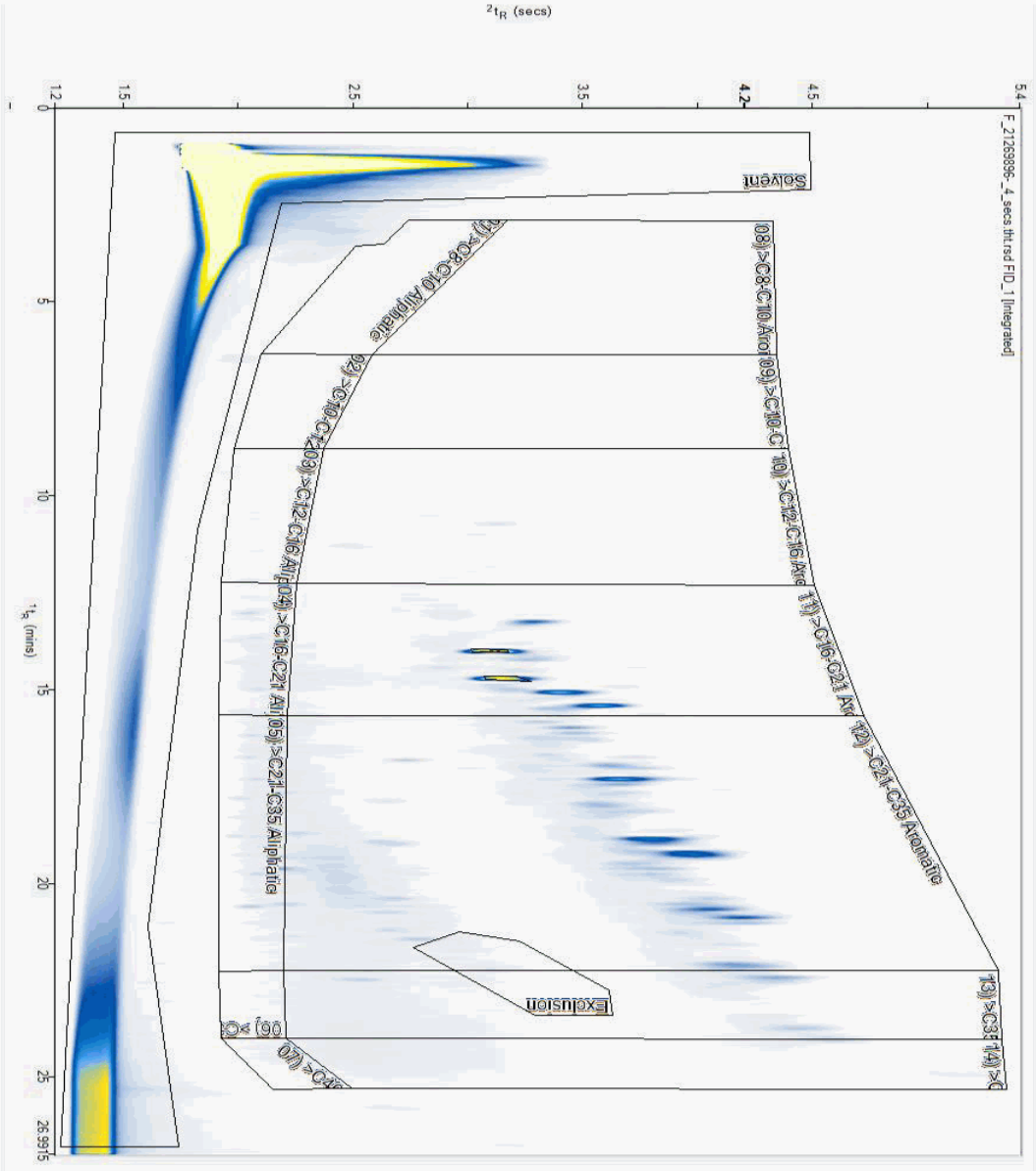
CERTIFICATE OF ANALYSIS

SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: EPH CWG GC (S) **Sample No :** 21269896 **Depth :** 0.25
Sample ID : WS08

```
   ChromSpace LIMS export
  Current batch
Sample Identity:  F_21269896-_4_secs.tht
Date Acquired  :  03/12/19 02:53:35
Units          :  ppm
Dilution       :  0
CF             :
Multiplier     :
```



CERTIFICATE OF ANALYSIS

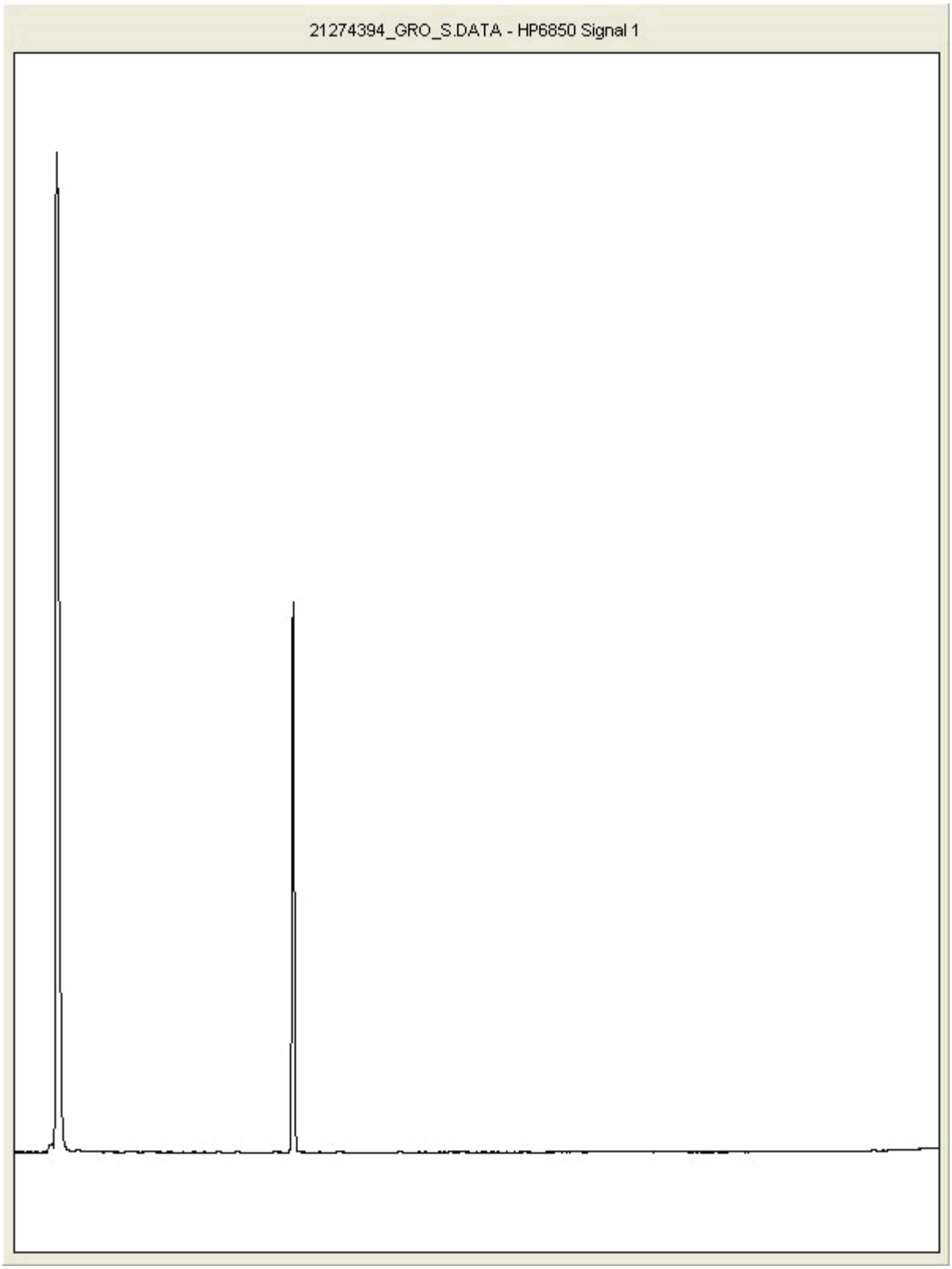
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21274394
Sample ID : WS03

Depth : 0.05



CERTIFICATE OF ANALYSIS

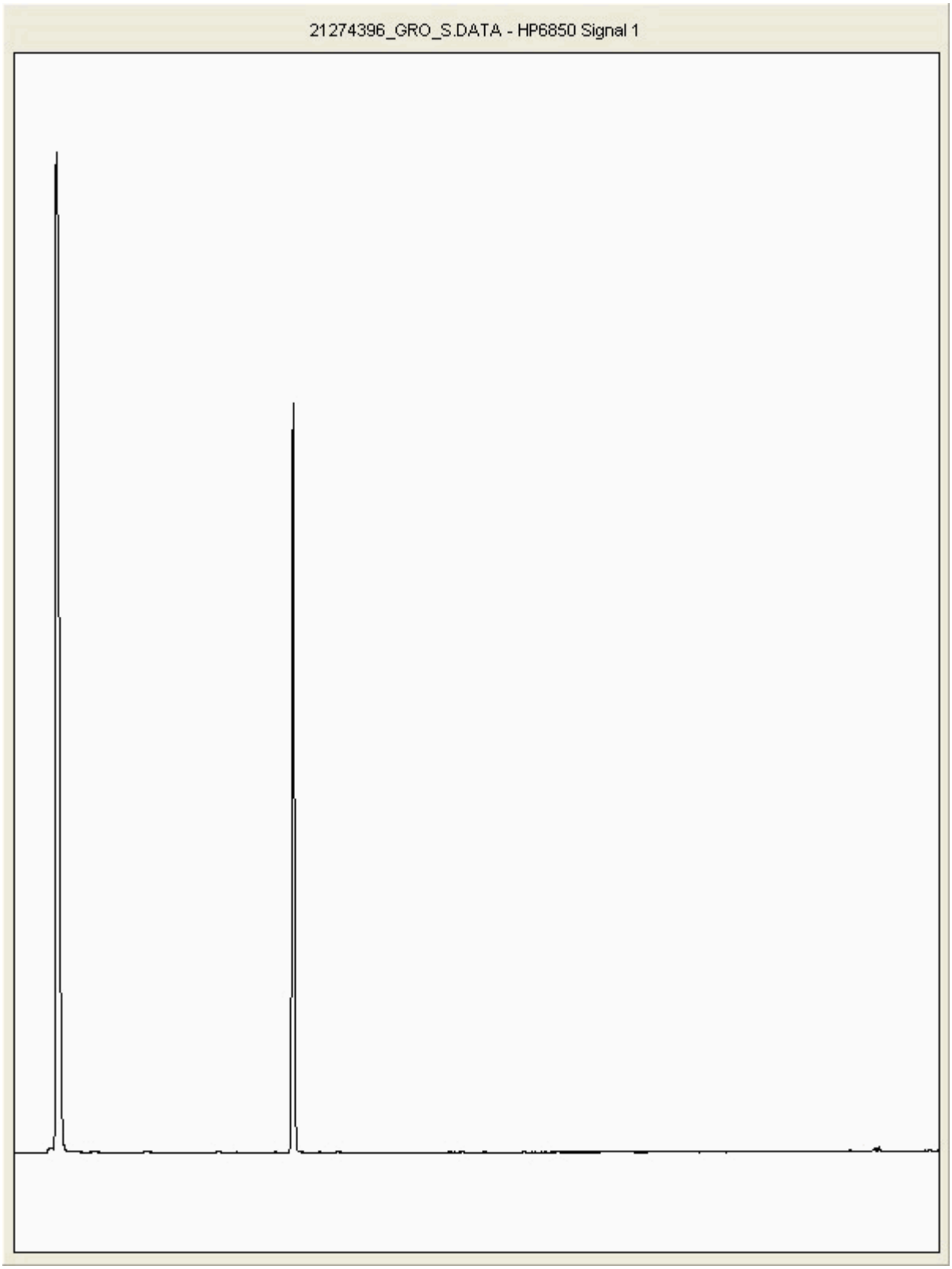
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21274396
Sample ID : WS06

Depth : 0.30



CERTIFICATE OF ANALYSIS

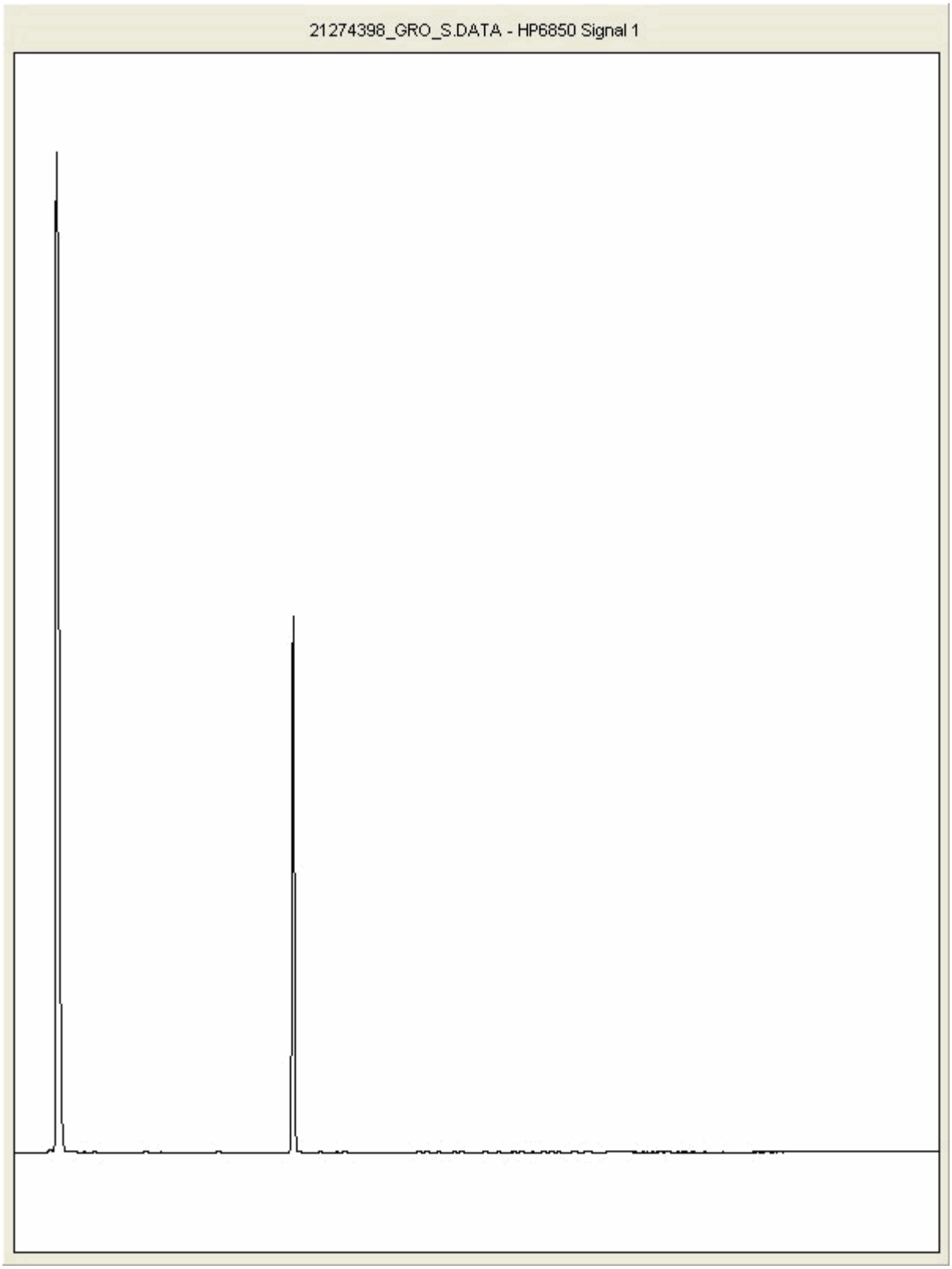
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21274398
Sample ID : WS09

Depth : 0.50



CERTIFICATE OF ANALYSIS

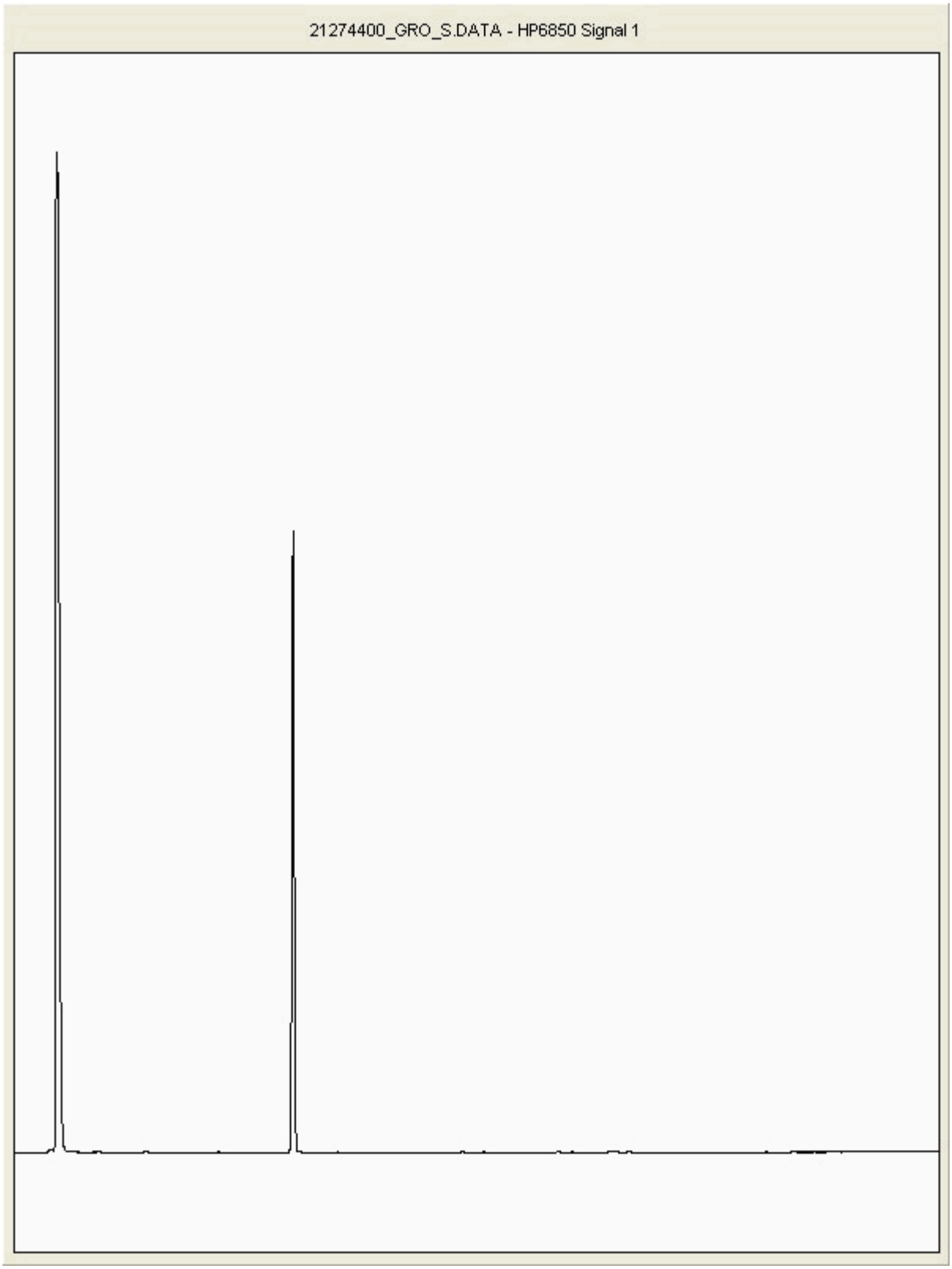
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21274400
Sample ID : WS04

Depth : 1.40



CERTIFICATE OF ANALYSIS

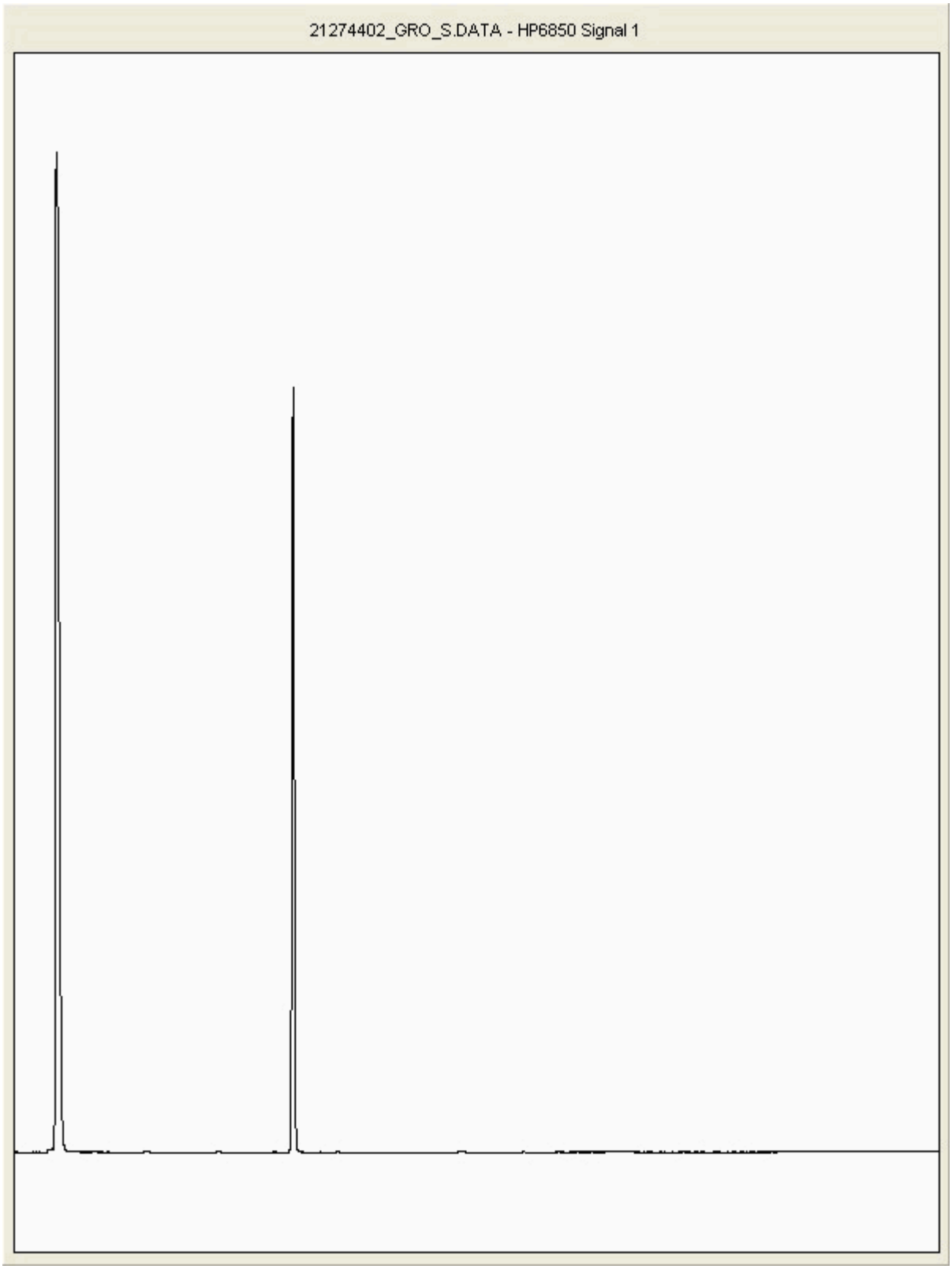
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21274402
Sample ID : WS09

Depth : 3.90



CERTIFICATE OF ANALYSIS

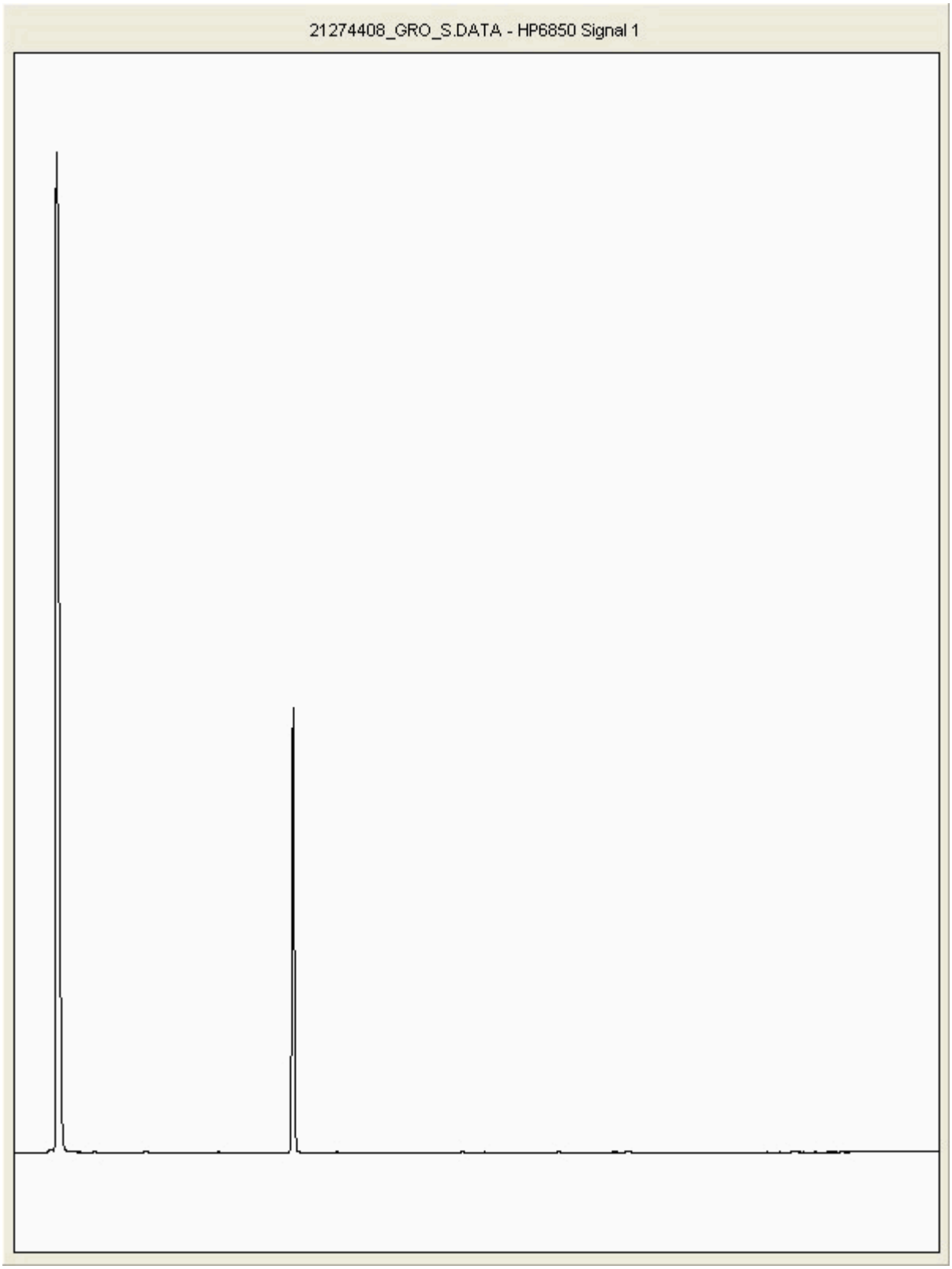
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21274408
Sample ID : WS07

Depth : 0.70



CERTIFICATE OF ANALYSIS

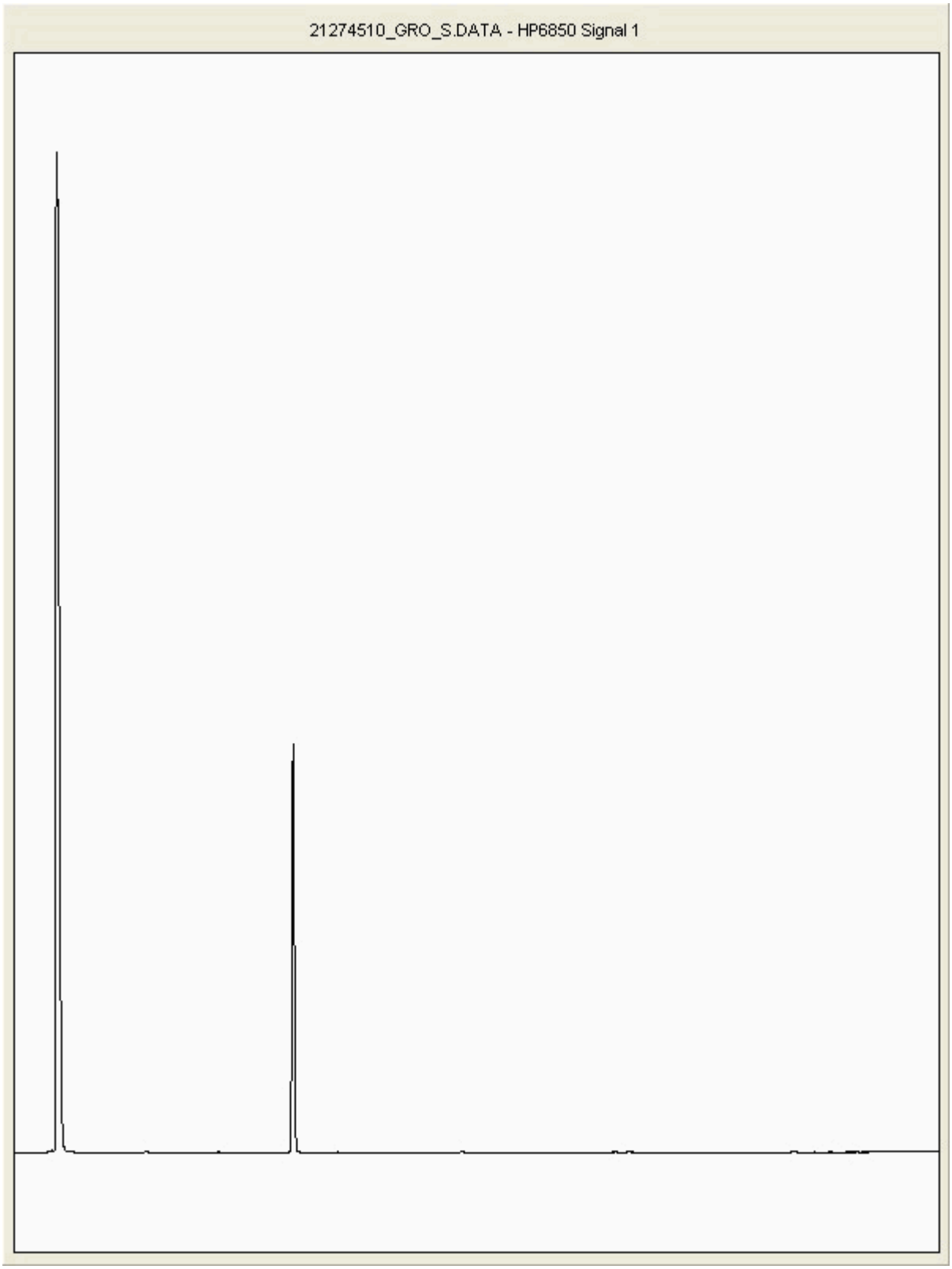
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21274510
Sample ID : WS08

Depth : 2.50



CERTIFICATE OF ANALYSIS

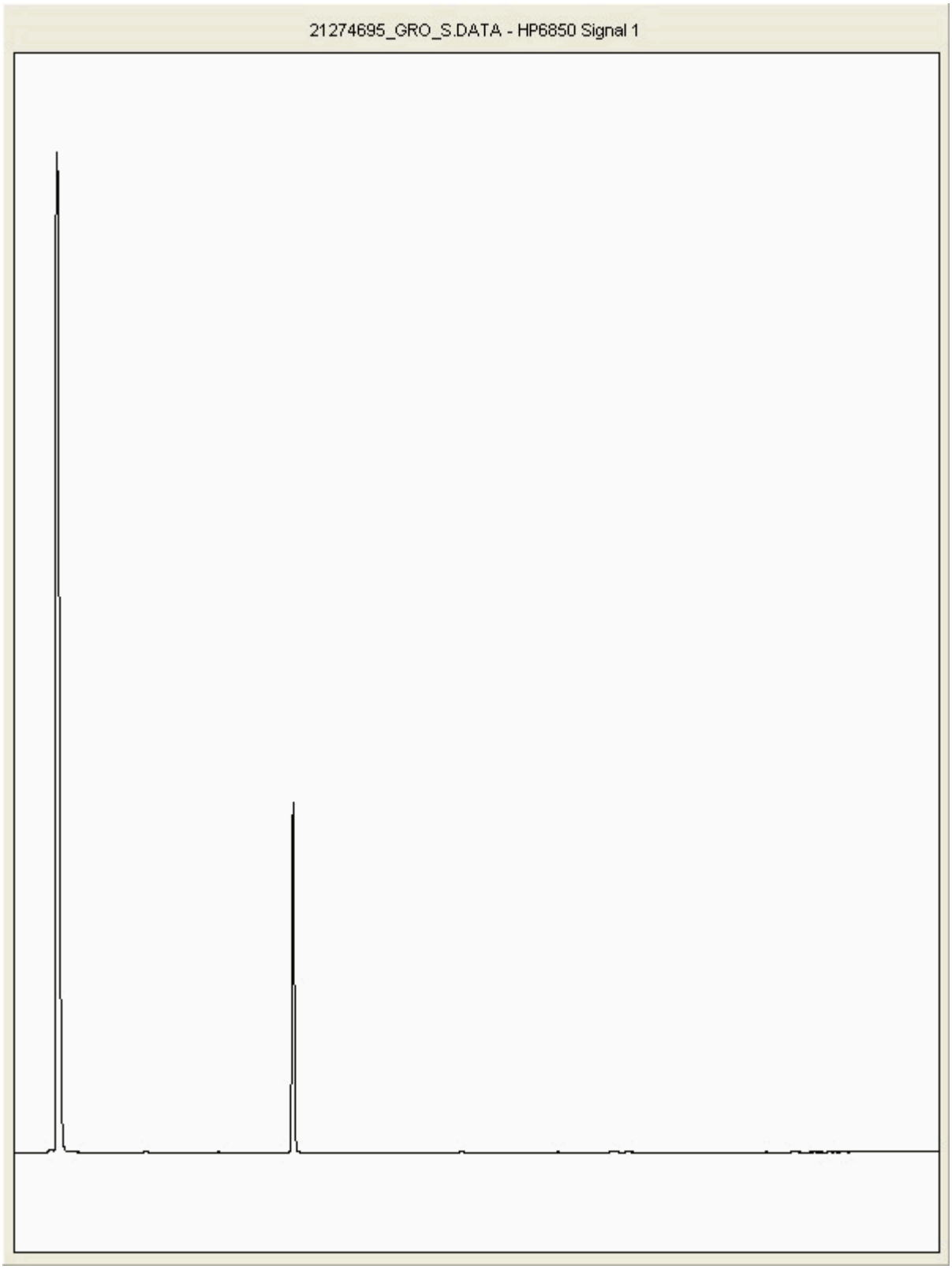
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21274695
Sample ID : WS08

Depth : 0.25



CERTIFICATE OF ANALYSIS

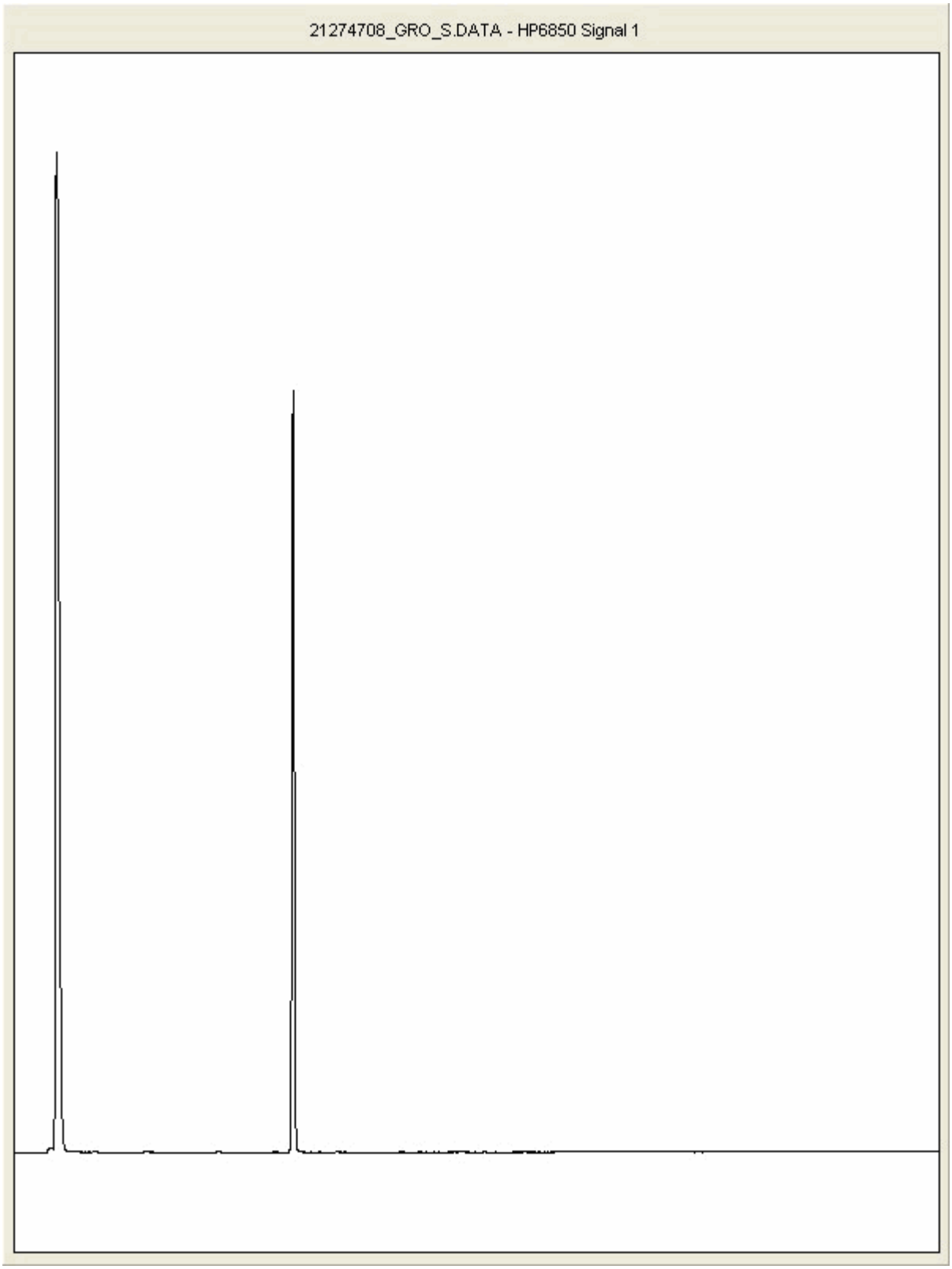
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21274708
Sample ID : WS04

Depth : 0.15



CERTIFICATE OF ANALYSIS

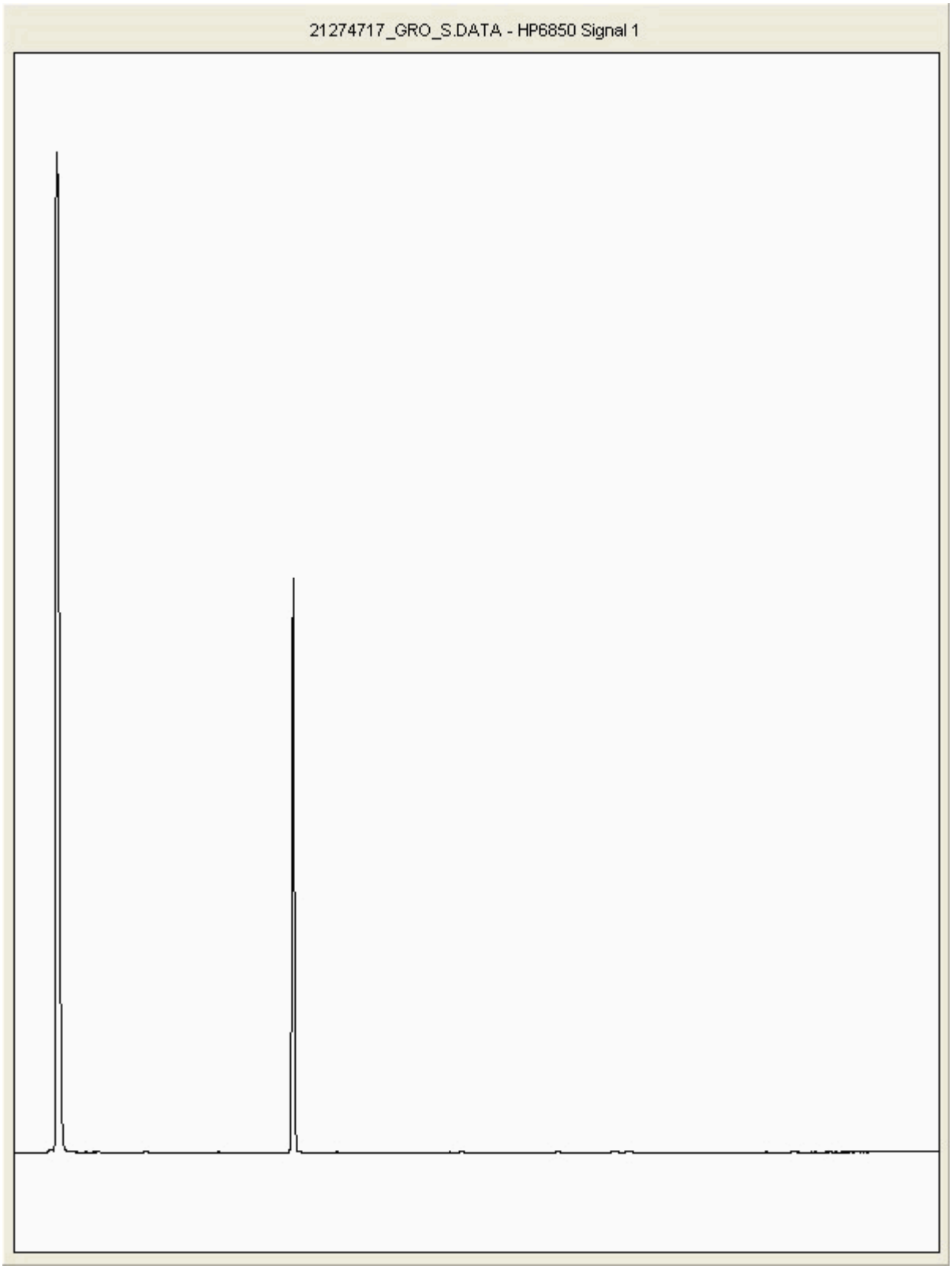
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21274717
Sample ID : WS09

Depth : 1.20



CERTIFICATE OF ANALYSIS

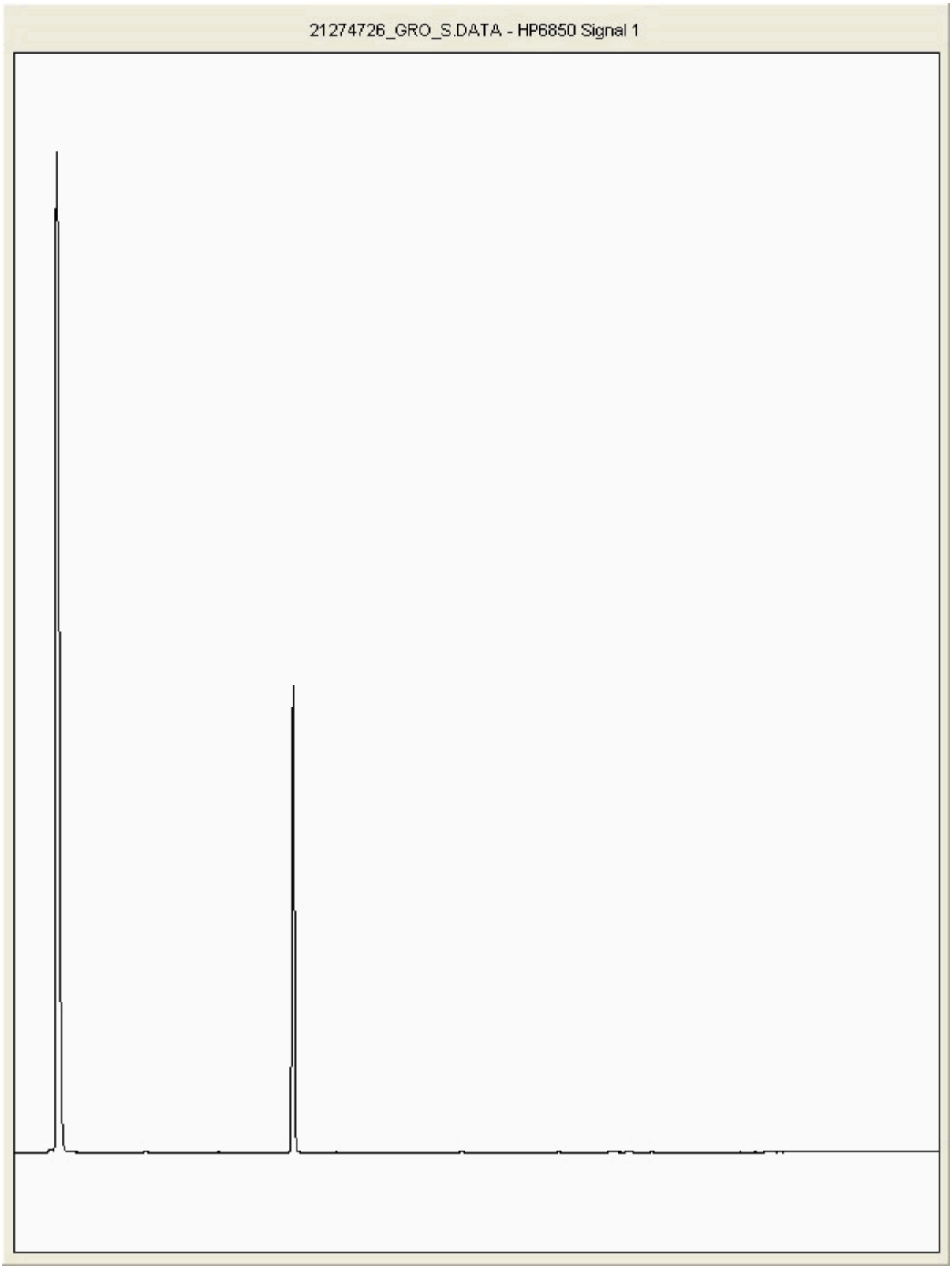
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21274726
Sample ID : WS05

Depth : 0.40



CERTIFICATE OF ANALYSIS

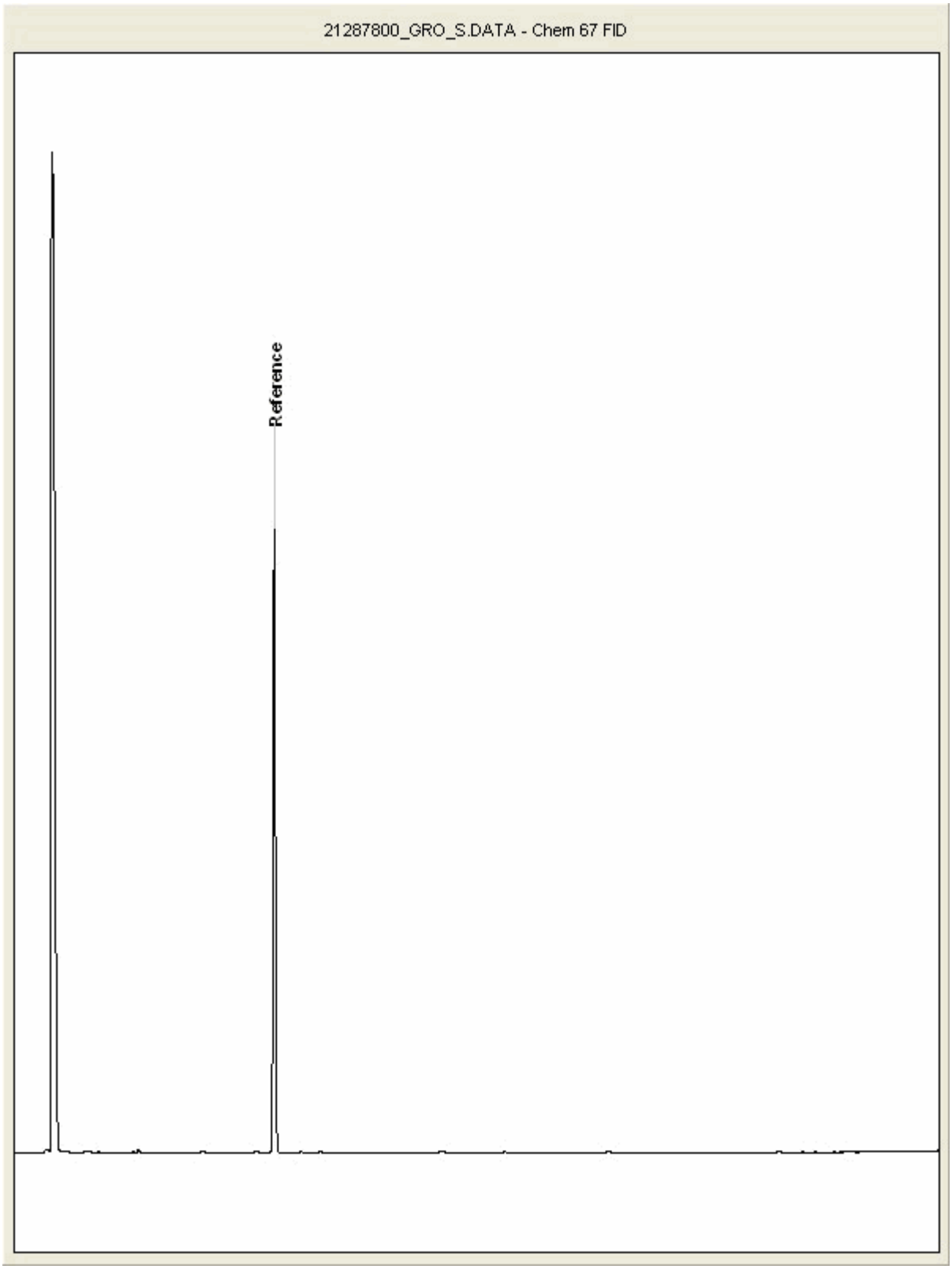
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21287800
Sample ID : WS09

Depth : 1.20



CERTIFICATE OF ANALYSIS

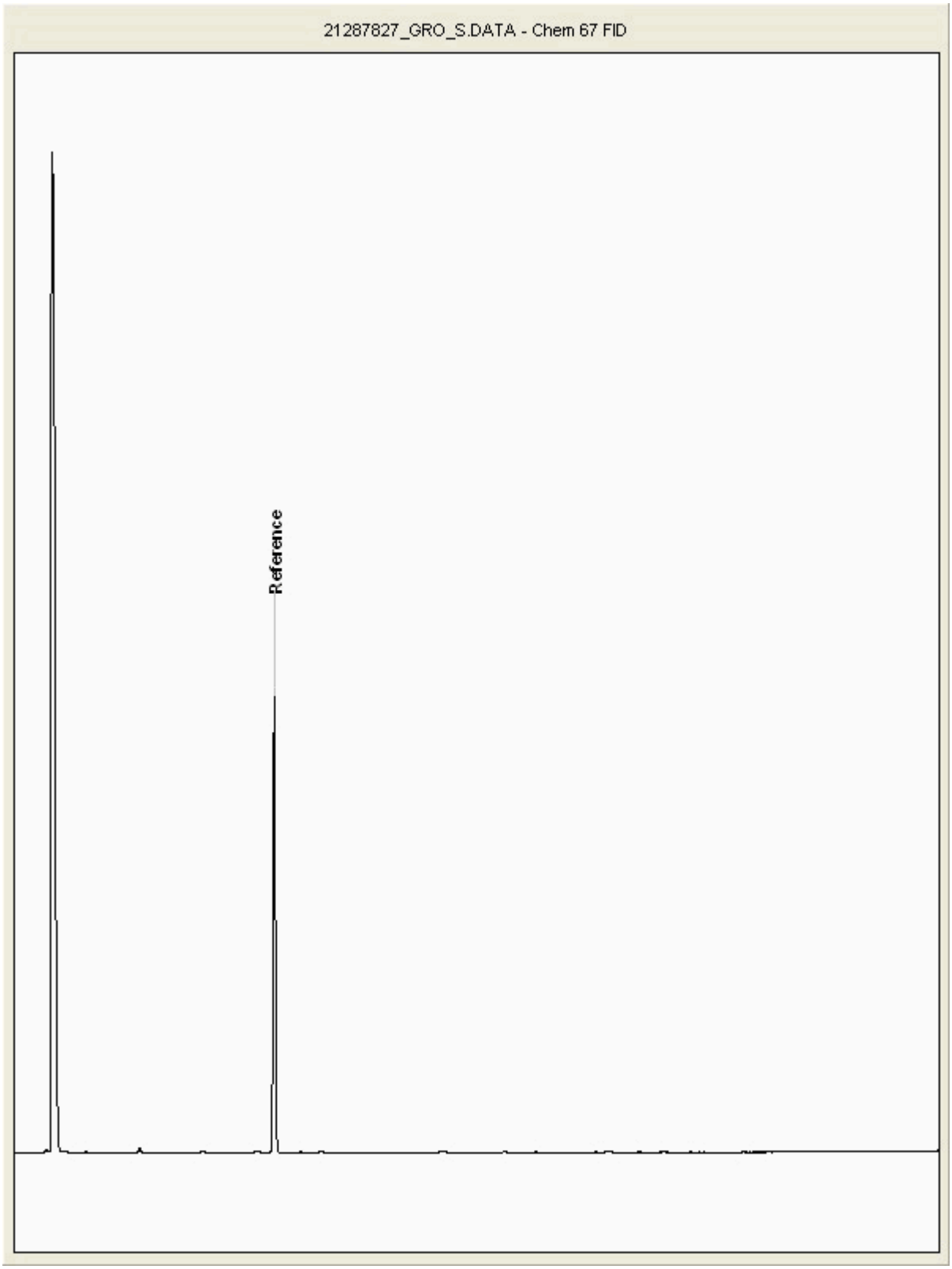
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21287827
Sample ID : WS04

Depth : 1.40



CERTIFICATE OF ANALYSIS

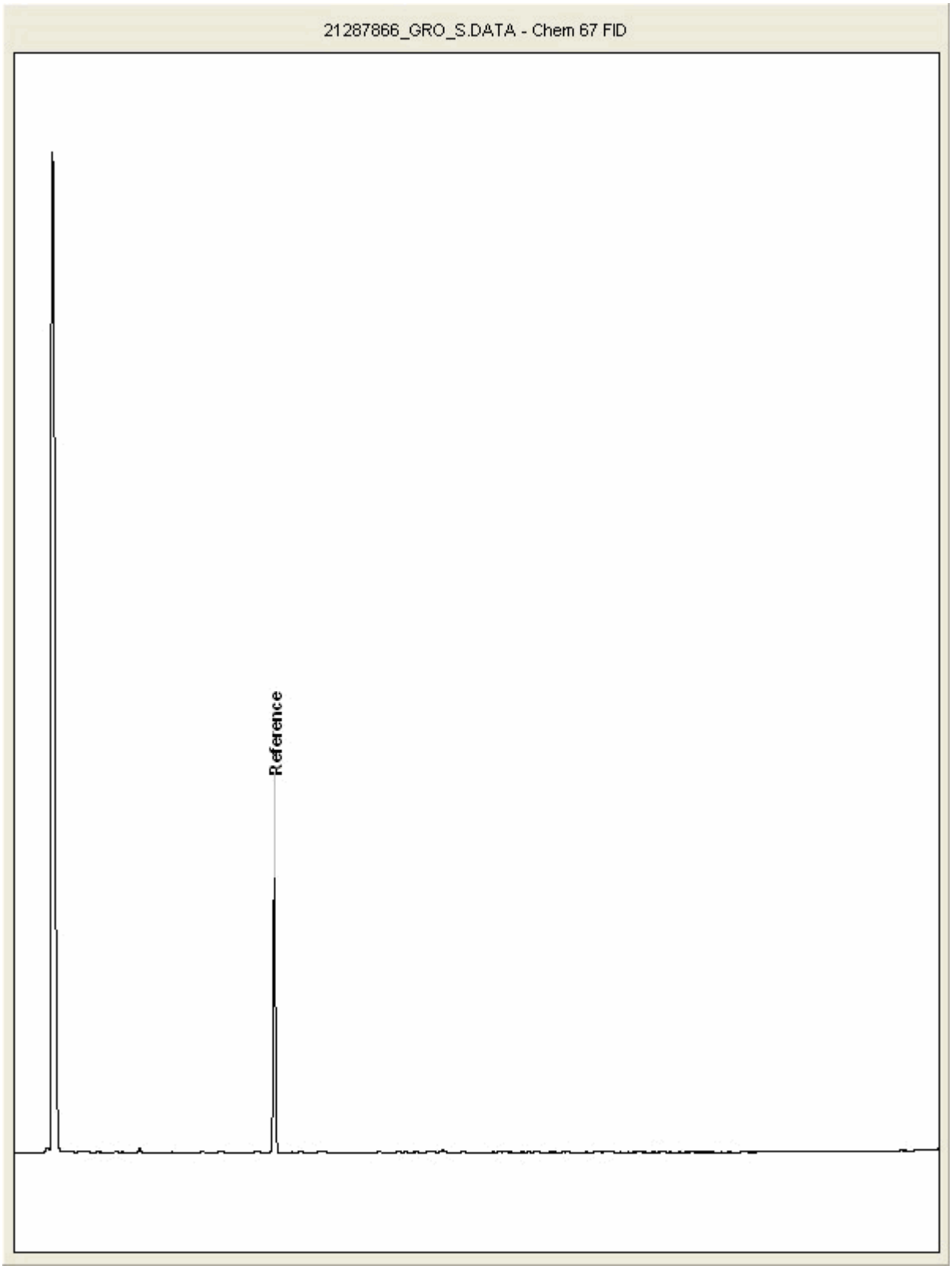
SDG:	191128-83	**Client Reference:**	1620008283	**Report Number:**	533743
Location:	Camden Site	**Order Number:**	1620031459	**Superseded Report:**	533231

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 21287866
Sample ID : WS03

Depth : 0.05



Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107).*

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

APPENDIX 6
GROUNDWATER ANALYTICAL RESULTS

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Ramboll Environ
Artillery House
11-19 Artillery Row
London
SW1P 1RT

Attention: Siobhán McGeever

CERTIFICATE OF ANALYSIS

Date of report Generation:	19 December 2019
Customer:	Ramboll Environ
Sample Delivery Group (SDG):	191210-18
Your Reference:	Not Specified
Location:	Camden
Report No:	534755

This report has been revised and directly supersedes 533948 in its entirety.

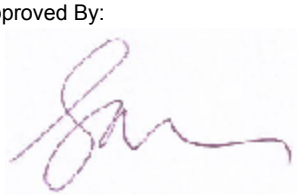
We received 3 samples on Tuesday December 10, 2019 and 3 of these samples were scheduled for analysis which was completed on Thursday December 19, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21324827	WS04			09/12/2019
21324828	WS08			09/12/2019
21324829	WS09			09/12/2019

Maximum Sample/Coolbox Temperature (°C) : 5.8

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)							21324827						21324828						21324829	
Customer Sample Reference							WS04						WS08						WS09	
AGS Reference																				
Depth (m)																				
Container							0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)		0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)		0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)
Sample Type							GW	GW	GW	GW	GW		GW	GW	GW	GW	GW		GW	GW	GW	GW	GW
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 3							X						X						X		
Anions by Kone (w)	All	NDPs: 0 Tests: 3						X						X						X			
Chromium III	All	NDPs: 0 Tests: 3								X						X						X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3						X						X						X			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3								X						X						X	
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 3	X					X					X										
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 3	X					X					X										
GRO by GC-FID (W)	All	NDPs: 0 Tests: 3					X					X						X					X
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 3		X					X					X						X			
Mercury Dissolved	All	NDPs: 0 Tests: 3				X				X						X						X	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 3	X					X					X										
PCB Congeners - Aqueous (W)	All	NDPs: 0 Tests: 1	X																				
pH Value	All	NDPs: 0 Tests: 3		X					X					X						X			
Phenols by HPLC (W)	All	NDPs: 0 Tests: 3			X					X					X						X		
Total Metals by ICP-MS	All	NDPs: 0 Tests: 3		X					X					X						X			

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Results Legend

X **Test**

N **No Determination Possible**

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)							21324827						21324828					21324829
Customer Sample Reference							WS04						WS08					WS09
AGS Reference																		
Depth (m)																		
Container							0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)
Sample Type							GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 3			X				X					X					X		
TPH CWG (W)	All	NDPs: 0 Tests: 3	X					X				X					X				
VOC MS (W)	All	NDPs: 0 Tests: 3					X				X					X					X

Validated

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS04	WS08	WS09			
			Depth (m)	.	.	.			
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)			
			Date Sampled	09/12/2019	09/12/2019	09/12/2019			
			Sampled Time	.	.	.			
			Date Received	10/12/2019	10/12/2019	10/12/2019			
			SDG Ref	191210-18	191210-18	191210-18			
			Lab Sample No.(s)	21324827	21324828	21324829			
			AGS Reference						
Organic Carbon, Total	<3 mg/l	TM090		22.9 #	19.9 #	16.2 #			
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099		<0.2 #	2.53 #	0.528 #			
Chromium, Trivalent	<0.03 mg/l	TM152		<0.03	<0.03	<0.03			
Arsenic (diss.filt)	<0.5 µg/l	TM152		1.44 #	2.6 #	0.916 #			
Beryllium (diss.filt)	<0.1 µg/l	TM152		<0.1 #	<0.1 #	<0.1 #			
Boron (diss.filt)	<10 µg/l	TM152		297 #	200 #	279 #			
Cadmium (diss.filt)	<0.08 µg/l	TM152		0.138 #	0.141 #	0.101 #			
Chromium (diss.filt)	<1 µg/l	TM152		5.02 #	1.1 #	13.7 #			
Copper (diss.filt)	<0.3 µg/l	TM152		7.81 #	13.3 #	8.53 #			
Lead (diss.filt)	<0.2 µg/l	TM152		1.25 #	1.39 #	0.689 #			
Nickel (diss.filt)	<0.4 µg/l	TM152		6.68 #	10.1 #	35 #			
Selenium (diss.filt)	<1 µg/l	TM152		1.37 #	7.29 #	35.8 #			
Vanadium (diss.filt)	<1 µg/l	TM152		1.26 #	1.25 #	<1 #			
Zinc (diss.filt)	<1 µg/l	TM152		84 #	38.7 #	30.3 #			
Hardness, Total as CaCO3 unfiltered	<0.35 mg/l	TM152		3270 2	1110 2	1070 2			
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	0.014 #	<0.01 #			
Sulphate	<2 mg/l	TM184		2600 #	556 #	568 #			
PCB congener 28	<0.015 µg/l	TM197		<0.015					
PCB congener 52	<0.015 µg/l	TM197		<0.015					
PCB congener 101	<0.015 µg/l	TM197		<0.015					
PCB congener 118	<0.015 µg/l	TM197		<0.015					
PCB congener 138	<0.015 µg/l	TM197		<0.015					
PCB congener 153	<0.015 µg/l	TM197		<0.015					
PCB congener 180	<0.015 µg/l	TM197		<0.015					
Sum of detected EC7 PCB's	<0.105 µg/l	TM197		<0.105					
Cyanide, Total	<0.05 mg/l	TM227		<0.05 2 #	<0.05 2 #	<0.05 2 #			
Chromium, Hexavalent	<0.03 mg/l	TM241		<0.03 #	<0.03 #	<0.03 #			
pH	<1 pH Units	TM256		7.37 #	7.4 #	7.38 #			
Phenol	<0.002 mg/l	TM259		<0.002 #	<0.002 #	<0.002 #			
Cresols	<0.006 mg/l	TM259		<0.006 #	<0.006 #	<0.006 #			
Xylenols	<0.008 mg/l	TM259		<0.008 #	<0.008 #	<0.008 #			
Phenols, Total Detected monohydric	<0.016 mg/l	TM259		<0.016 #	<0.016 #	<0.016 #			

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

PAH Spec MS - Aqueous (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS04	WS08	WS09			
			Depth (m)	.	.	.			
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)			
			Date Sampled	09/12/2019	09/12/2019	09/12/2019			
			Sampled Time	.	.	.			
			Date Received	10/12/2019	10/12/2019	10/12/2019			
			SDG Ref	191210-18	191210-18	191210-18			
			Lab Sample No.(s)	21324827	21324828	21324829			
			AGS Reference						
Naphthalene (aq)	<0.01 µg/l	TM178		0.0215 #	0.0191 #	0.0116 #			
Acenaphthene (aq)	<0.005 µg/l	TM178		<0.005 #	0.0171 #	<0.005 #			
Acenaphthylene (aq)	<0.005 µg/l	TM178		<0.005 #	0.124 #	<0.005 #			
Fluoranthene (aq)	<0.005 µg/l	TM178		0.017 #	1.09 #	0.0144 #			
Anthracene (aq)	<0.005 µg/l	TM178		<0.005 #	0.0874 #	<0.005 #			
Phenanthrene (aq)	<0.005 µg/l	TM178		0.00957 #	0.171 #	<0.005 #			
Fluorene (aq)	<0.005 µg/l	TM178		<0.005 #	0.0151 #	<0.005 #			
Chrysene (aq)	<0.005 µg/l	TM178		0.00822 #	0.696 #	0.00743 #			
Pyrene (aq)	<0.005 µg/l	TM178		0.0314 #	1.28 #	0.0184 #			
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178		0.0124 #	0.612 #	0.00642 #			
Benzo(b)fluoranthene (aq)	<0.005 µg/l	TM178		0.0241 #	1.62 #	0.0368 #			
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178		0.00998 #	0.73 #	0.00902 #			
Benzo(a)pyrene (aq)	<0.002 µg/l	TM178		0.0154 #	1.25 #	0.0112 #			
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178		<0.005 #	0.203 #	<0.005 #			
Benzo(g,h,i)perylene (aq)	<0.005 µg/l	TM178		0.0209 #	1.19 #	0.016 #			
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178		0.0147 #	0.969 #	0.00901 #			
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178		0.185 #	10.1 #	0.14 #			

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

TPH CWG (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS04	WS08	WS09			
			Depth (m)	.	.	.			
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)			
			Date Sampled	09/12/2019	09/12/2019	09/12/2019			
			Sampled Time	.	.	.			
			Date Received	10/12/2019	10/12/2019	10/12/2019			
			SDG Ref	191210-18	191210-18	191210-18			
			Lab Sample No.(s)	21324827	21324828	21324829			
			AGS Reference						
GRO Surrogate % recovery**	%	TM245		89	71	89			
GRO >C5-C12	<50 µg/l	TM245		<50 #	<50 #	<50 #			
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245		<3	<3	3			
Benzene	<7 µg/l	TM245		<7	<7	<7			
Toluene	<4 µg/l	TM245		<4	<4	<4			
Ethylbenzene	<5 µg/l	TM245		<5	<5	<5			
m,p-Xylene	<8 µg/l	TM245		<8	<8	<8			
o-Xylene	<3 µg/l	TM245		<3	<3	<3			
Sum of detected Xylenes	<11 µg/l	TM245		<11	<11	<11			
Sum of detected BTEX	<28 µg/l	TM245		<28	<28	<28			
Aliphatics >C5-C6	<10 µg/l	TM245		<10	<10	<10			
Aliphatics >C6-C8	<10 µg/l	TM245		<10	<10	<10			
Aliphatics >C8-C10	<10 µg/l	TM245		<10	<10	<10			
Aliphatics >C10-C12	<10 µg/l	TM245		<10	<10	<10			
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174		<10	<10	<10			
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174		<10	10	<10			
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174		<10	47	<10			
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174		<10	57	<10			
Aromatics >EC5-EC7	<10 µg/l	TM245		<10	<10	<10			
Aromatics >EC7-EC8	<10 µg/l	TM245		<10	<10	<10			
Aromatics >EC8-EC10	<10 µg/l	TM245		<10	<10	<10			
Aromatics >EC10-EC12	<10 µg/l	TM245		<10	<10	<10			
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174		<10	<10	<10			
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174		<10	<10	<10			
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174		<10	29	<10			
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174		<10	29	<10			
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174		<10	88	<10			
Aliphatics >C16-C35 Aqueous	<10 µg/l	TM174		<10	57	<10			

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+5@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS04	WS08	WS09			
			Depth (m)	.	.	.			
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)			
			Date Sampled	09/12/2019	09/12/2019	09/12/2019			
			Sampled Time	.	.	.			
			Date Received	10/12/2019	10/12/2019	10/12/2019			
			SDG Ref	191210-18	191210-18	191210-18			
			Lab Sample No.(s)	21324827	21324828	21324829			
			AGS Reference						
Dibromofluoromethane**	%	TM208		113	113	113			
Toluene-d8**	%	TM208		98.6	99.1	98.7			
4-Bromofluorobenzene**	%	TM208		96.3	94.1	93.8			
Dichlorodifluoromethane	<1 µg/l	TM208		<1	<1	<1			
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #	<3 #			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	2.22 #			
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1			
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Toluene	<1 µg/l	TM208		1.05 #	<1 #	<1 #			
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS04	WS08	WS09			
			Depth (m)	-	-	-			
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)			
			Date Sampled	09/12/2019	09/12/2019	09/12/2019			
			Sampled Time	-	-	-			
			Date Received	10/12/2019	10/12/2019	10/12/2019			
			SDG Ref	191210-18	191210-18	191210-18			
			Lab Sample No.(s)	21324827	21324828	21324829			
			AGS Reference						
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1			
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #			
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #			

Validated

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	WS04	WS08	WS09			
			Depth (m)	.	.	.			
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)			
			Date Sampled	09/12/2019	09/12/2019	09/12/2019			
			Sampled Time	.	.	.			
			Date Received	10/12/2019	10/12/2019	10/12/2019			
			SDG Ref	191210-18	191210-18	191210-18			
			Lab Sample No.(s)	21324827	21324828	21324829			
			AGS Reference						
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #			
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1			

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Table of Results - Appendix

Method No	Reference	Description
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM197	Modified: US EPA Method 8082.EA Method 174 and 5109631	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Waters
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Test Completion Dates

Lab Sample No(s)	21324827	21324828	21324829
Customer Sample Ref.	WS04	WS08	WS09
AGS Ref.			
Depth			
Type	Ground Water	Ground Water	Ground Water
Ammoniacal Nitrogen	12-Dec-2019	12-Dec-2019	12-Dec-2019
Anions by Kone (w)	13-Dec-2019	13-Dec-2019	13-Dec-2019
Chromium III	13-Dec-2019	13-Dec-2019	13-Dec-2019
Cyanide Comp/Free/Total/Thiocyanate	13-Dec-2019	13-Dec-2019	13-Dec-2019
Dissolved Metals by ICP-MS	13-Dec-2019	13-Dec-2019	13-Dec-2019
EPH CWG (Aliphatic) Aqueous GC (W)	13-Dec-2019	13-Dec-2019	13-Dec-2019
EPH CWG (Aromatic) Aqueous GC (W)	13-Dec-2019	13-Dec-2019	13-Dec-2019
GRO by GC-FID (W)	12-Dec-2019	12-Dec-2019	12-Dec-2019
Hexavalent Chromium (w)	11-Dec-2019	11-Dec-2019	11-Dec-2019
Mercury Dissolved	13-Dec-2019	13-Dec-2019	13-Dec-2019
PAH Spec MS - Aqueous (W)	13-Dec-2019	13-Dec-2019	13-Dec-2019
PCB Congeners - Aqueous (W)	19-Dec-2019		
pH Value	12-Dec-2019	12-Dec-2019	12-Dec-2019
Phenols by HPLC (W)	12-Dec-2019	12-Dec-2019	12-Dec-2019
Total Metals by ICP-MS	13-Dec-2019	13-Dec-2019	13-Dec-2019
Total Organic and Inorganic Carbon	13-Dec-2019	13-Dec-2019	13-Dec-2019
TPH CWG (W)	13-Dec-2019	13-Dec-2019	13-Dec-2019
VOC MS (W)	11-Dec-2019	11-Dec-2019	11-Dec-2019

ASSOCIATED AQC DATA

Ammoniacal Nitrogen

Component	Method Code	QC 2127
Ammoniacal Nitrogen as N	TM099	**101.6** 93.14 : 108.60

Anions by Kone (w)

Component	Method Code	QC 2100	QC 2145
Chloride	TM184		**104.0** 92.93 : 115.43
Sulphate (soluble)	TM184	**100.8** 90.53 : 113.03	**102.8** 90.53 : 113.03
TON as NO3	TM184	**101.0** 96.26 : 111.21	

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2169	QC 2102
Free Cyanide (W)	TM227	**98.75** 93.25 : 112.75	**99.0** 93.25 : 112.75
Thiocyanate (W)	TM227	**100.5** 94.00 : 112.00	**100.5** 94.00 : 112.00
Total Cyanide (W)	TM227	**96.0** 92.25 : 111.75	**97.5** 92.25 : 111.75

Dissolved Metals by ICP-MS

Component	Method Code	QC 2186
Aluminium	TM152	**105.67** 94.12 : 114.23
Antimony	TM152	**102.33** 97.20 : 119.80
Arsenic	TM152	**101.67** 88.00 : 112.00
Barium	TM152	**102.5** 88.00 : 112.00
Beryllium	TM152	**110.5** 94.92 : 115.52
Bismuth	TM152	**105.0** 91.90 : 112.20
Borate	TM152	**110.49** 88.00 : 112.00
Boron	TM152	**110.67** 96.48 : 114.93
Cadmium	TM152	**103.83** 98.47 : 110.87
Calcium	TM152	**107.33** 81.38 : 119.09
Chromium	TM152	**99.0** 94.62 : 110.87
Cobalt	TM152	**98.33** 88.00 : 112.00

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Dissolved Metals by ICP-MS

		QC 2186
Copper	TM152	**98.17** 92.47 : 118.11
Iron	TM152	**102.0** 92.00 : 113.00
Lead	TM152	**104.67** 88.00 : 112.00
Lithium	TM152	**108.83** 98.47 : 115.47
Magnesium	TM152	**104.67** 96.42 : 115.52
Manganese	TM152	**102.33** 97.94 : 109.97
Molybdenum	TM152	**97.5** 88.00 : 112.00
Nickel	TM152	**97.5** 88.00 : 112.00
Phosphorus	TM152	**102.0** 88.00 : 112.00
Potassium	TM152	**110.67** 98.67 : 116.86
Selenium	TM152	**104.5** 91.58 : 115.98
Silver	TM152	**99.17** 94.91 : 114.41
Sodium	TM152	**102.67** 95.92 : 112.85
Strontium	TM152	**102.67** 88.00 : 112.00
Tellurium	TM152	**102.67** 93.32 : 114.66
Thallium	TM152	**94.33** 88.00 : 112.00
Tin	TM152	**104.33** 91.00 : 109.00
Titanium	TM152	**106.0** 95.58 : 111.68
Tungsten	TM152	**99.0** 81.32 : 124.72
Uranium	TM152	**103.0** 88.00 : 112.00
Vanadium	TM152	**101.5** 88.00 : 112.00
Zinc	TM152	**102.0** 92.98 : 118.95

EPH CWG (Aliphatic) Aqueous GC (W)

Component	Method Code	QC 2133	QC 2180
Total Aliphatics >C10-C40	TM174	**119.31** 0.00 : 0.00	**112.05** 0.00 : 0.00

EPH CWG (Aromatic) Aqueous GC (W)

Component	Method Code	QC 2182	QC 2105
Total Aromatics >EC10-EC40	TM174	**92.68** 60.75 : 129.09	**97.07** 60.75 : 129.09

GRO by GC-FID (W)

Component	Method Code	QC 2106
Benzene by GC	TM245	**92.0** 81.54 : 119.70
Ethylbenzene by GC	TM245	**92.5** 80.99 : 121.09
m & p Xylene by GC	TM245	**91.75** 82.77 : 123.19
MTBE GC-FID	TM245	**93.0** 80.06 : 123.27
o Xylene by GC	TM245	**93.5** 84.26 : 121.50
QC	TM245	**90.22** 76.13 : 145.89
Toluene by GC	TM245	**90.5** 82.78 : 121.99

Hexavalent Chromium (w)

Component	Method Code	QC 2189
Hexavalent Chromium	TM241	**98.4** 94.17 : 106.17

Mercury Dissolved

Component	Method Code	QC 2117	QC 2166
Mercury Dissolved (CVAF)	TM183	**104.0** 76.80 : 117.12	**97.5** 76.80 : 117.12

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 2141	QC 2128
Acenaphthene by GCMS	TM178	**104.4** 94.00 : 122.80	**106.0** 94.00 : 122.80
Acenaphthylene by GCMS	TM178	**96.8** 91.66 : 114.36	**98.4** 91.66 : 114.36
Anthracene by GCMS	TM178	**103.6** 89.60 : 118.40	**101.6** 89.60 : 118.40
Benz(a)anthracene by GCMS	TM178	**94.8** 87.31 : 114.17	**95.2** 87.31 : 114.17

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

PAH Spec MS - Aqueous (W)

		QC 2141	QC 2128
Benzo(a)pyrene by GCMS	TM178	**94.8** 90.00 : 114.00	**97.6** 90.00 : 114.00
Benzo(b)fluoranthene by GCMS	TM178	**94.4** 88.00 : 114.40	**96.4** 88.00 : 114.40
Benzo(ghi)perylene by GCMS	TM178	**99.6** 96.80 : 113.60	**100.0** 96.80 : 113.60
Benzo(k)fluoranthene by GCMS	TM178	**100.0** 92.80 : 116.80	**102.4** 92.80 : 116.80
Chrysene by GCMS	TM178	**104.0** 100.00 : 121.60	**104.4** 100.00 : 121.60
Dibenzo(ah)anthracene by GCMS	TM178	**100.4** 88.00 : 114.40	**98.8** 88.00 : 114.40
Fluoranthene by GCMS	TM178	**111.2** 93.49 : 118.20	**109.6** 93.49 : 118.20
Fluorene by GCMS	TM178	**106.8** 94.39 : 118.66	**106.8** 94.39 : 118.66
Indeno(123cd)pyrene by GCMS	TM178	**97.6** 90.40 : 114.40	**95.2** 90.40 : 114.40
Naphthalene by GCMS	TM178	**102.0** 99.60 : 121.20	**104.0** 99.60 : 121.20
Phenanthrene by GCMS	TM178	**102.8** 99.20 : 116.00	**103.2** 99.20 : 116.00
Pyrene by GCMS	TM178	**110.4** 96.40 : 115.60	**111.2** 96.40 : 115.60

PCB Congeners - Aqueous (W)

Component	Method Code	QC 2121
PCB congener 101	TM197	**102.8** 85.28 : 119.60
PCB congener 105	TM197	**103.6** 81.16 : 119.80
PCB congener 114	TM197	**103.2** 88.32 : 118.08
PCB congener 118	TM197	**105.2** 87.76 : 117.04
PCB congener 123	TM197	**110.8** 86.80 : 117.28
PCB congener 126	TM197	**102.4** 84.56 : 116.00
PCB congener 138	TM197	**104.0** 83.00 : 117.80
PCB congener 153	TM197	**103.6** 84.12 : 117.00
PCB congener 156	TM197	**104.4** 82.24 : 119.20
PCB congener 157	TM197	**100.4** 84.96 : 116.40
PCB congener 167	TM197	**102.0** 81.64 : 119.32
PCB congener 169	TM197	**99.2** 84.60 : 117.96
PCB congener 180	TM197	**103.6** 80.40 : 119.04

PCB Congeners - Aqueous (W)

		QC 2121
PCB congener 189	TM197	**100.0** 81.56 : 119.00
PCB congener 28	TM197	**101.2** 83.20 : 117.04
PCB congener 52	TM197	**102.0** 81.84 : 119.52
PCB congener 77	TM197	**102.0** 81.96 : 117.24
PCB congener 81	TM197	**103.6** 82.28 : 120.20

pH Value

Component	Method Code	QC 2120
pH	TM256	**100.94** 99.87 : 102.29

Phenols by HPLC (W)

Component	Method Code	QC 2108
2.3.5 Trimethyl-Phenol by HPLC (W)	TM259	**100.0** 91.00 : 109.00
2-Isopropyl Phenol by HPLC (W)	TM259	**97.0** 90.00 : 114.00
Cresols by HPLC (W)	TM259	**107.0** 90.02 : 130.15
Napthol by HPLC (W)	TM259	**96.0** 86.00 : 128.00
Phenol by HPLC (W)	TM259	**103.0** 85.89 : 109.89
Xylenols by HPLC (W)	TM259	**100.67** 93.33 : 107.33

Total Metals by ICP-MS

Component	Method Code	QC 2195
Aluminium	TM152	**105.0** 93.76 : 113.87
Antimony	TM152	**101.67** 80.45 : 122.65
Arsenic	TM152	**101.17** 85.20 : 116.13
Barium	TM152	**101.5** 92.02 : 112.48
Beryllium	TM152	**105.83** 86.15 : 118.35
Bismuth	TM152	**101.5** 93.28 : 110.08
Boron	TM152	**107.0** 86.68 : 117.67
Cadmium	TM152	**102.33** 92.07 : 109.87

CERTIFICATE OF ANALYSIS

SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Total Metals by ICP-MS

		QC 2195
Calcium	TM152	**106.0** 86.60 : 124.32
Chromium	TM152	**99.17** 90.87 : 108.50
Cobalt	TM152	**99.67** 84.39 : 114.26
Copper	TM152	**100.5** 84.61 : 114.08
Iron	TM152	**102.0** 93.62 : 111.65
Lead	TM152	**101.67** 85.65 : 113.58
Lithium	TM152	**103.67** 89.26 : 119.04
Magnesium	TM152	**102.67** 93.89 : 113.04
Manganese	TM152	**101.67** 92.63 : 111.13
Molybdenum	TM152	**99.67** 87.00 : 108.89
Nickel	TM152	**99.5** 88.26 : 111.14
Phosphorus	TM152	**100.0** 84.62 : 109.56
Potassium	TM152	**107.33** 91.26 : 116.75
Selenium	TM152	**106.33** 88.44 : 113.86
Silver	TM152	**100.5** 88.22 : 124.02
Sodium	TM152	**103.33** 88.41 : 117.39
Strontium	TM152	**101.0** 90.72 : 114.82
Tellurium	TM152	**100.33** 91.91 : 111.61
Thallium	TM152	**93.5** 84.25 : 117.85
Tin	TM152	**103.5** 94.76 : 112.76
Titanium	TM152	**103.83** 86.77 : 109.67
Uranium	TM152	**100.83** 90.58 : 113.28
Vanadium	TM152	**100.0** 88.43 : 114.30
Zinc	TM152	**102.67** 86.52 : 115.27

Total Organic and Inorganic Carbon

Total Organic and Inorganic Carbon

Component	Method Code	QC 2187
Total Organic Carbon	TM090	**98.83** 95.80 : 111.10

VOC MS (W)

Component	Method Code	QC 2111
1,1,1,2-Tetrachloroethane	TM208	**96.0** 81.85 : 113.65
1,1,1-Trichloroethane	TM208	**98.0** 85.82 : 113.33
1,1-Dichloroethane	TM208	**106.5** 79.60 : 118.57
1,2-Dichloroethane	TM208	**105.0** 77.72 : 133.33
2-Chlorotoluene	TM208	**95.0** 82.89 : 116.61
4-Chlorotoluene	TM208	**96.0** 79.46 : 115.88
Benzene	TM208	**105.0** 81.22 : 118.60
Bromomethane	TM208	**97.0** 79.31 : 116.90
Carbontetrachloride	TM208	**102.0** 86.16 : 119.10
Chlorobenzene	TM208	**97.5** 87.25 : 116.65
Chloroform	TM208	**102.0** 83.01 : 121.64
Chloromethane	TM208	**108.0** 65.28 : 130.05
Cis-1,2-Dichloroethene	TM208	**100.5** 85.03 : 112.75
Dichloromethane	TM208	**104.5** 78.23 : 120.65
Ethylbenzene	TM208	**97.5** 79.55 : 110.51
Hexachlorobutadiene	TM208	**89.5** 67.63 : 111.28
o-Xylene	TM208	**95.0** 85.06 : 114.91
p/m-Xylene	TM208	**95.5** 84.45 : 113.50
Tert-butyl methyl ether	TM208	**97.0** 70.18 : 125.95
Tetrachloroethene	TM208	**99.0** 80.43 : 115.53
Toluene	TM208	**100.0** 79.88 : 116.83
Trichloroethene	TM208	**98.0** 82.30 : 112.45

VOC MS (W)

		QC 2111
Vinyl Chloride	TM208	**97.5** 71.34 : 122.34

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.
The figure detailed is the percentage recovery result for the AQC.
The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.

CERTIFICATE OF ANALYSIS

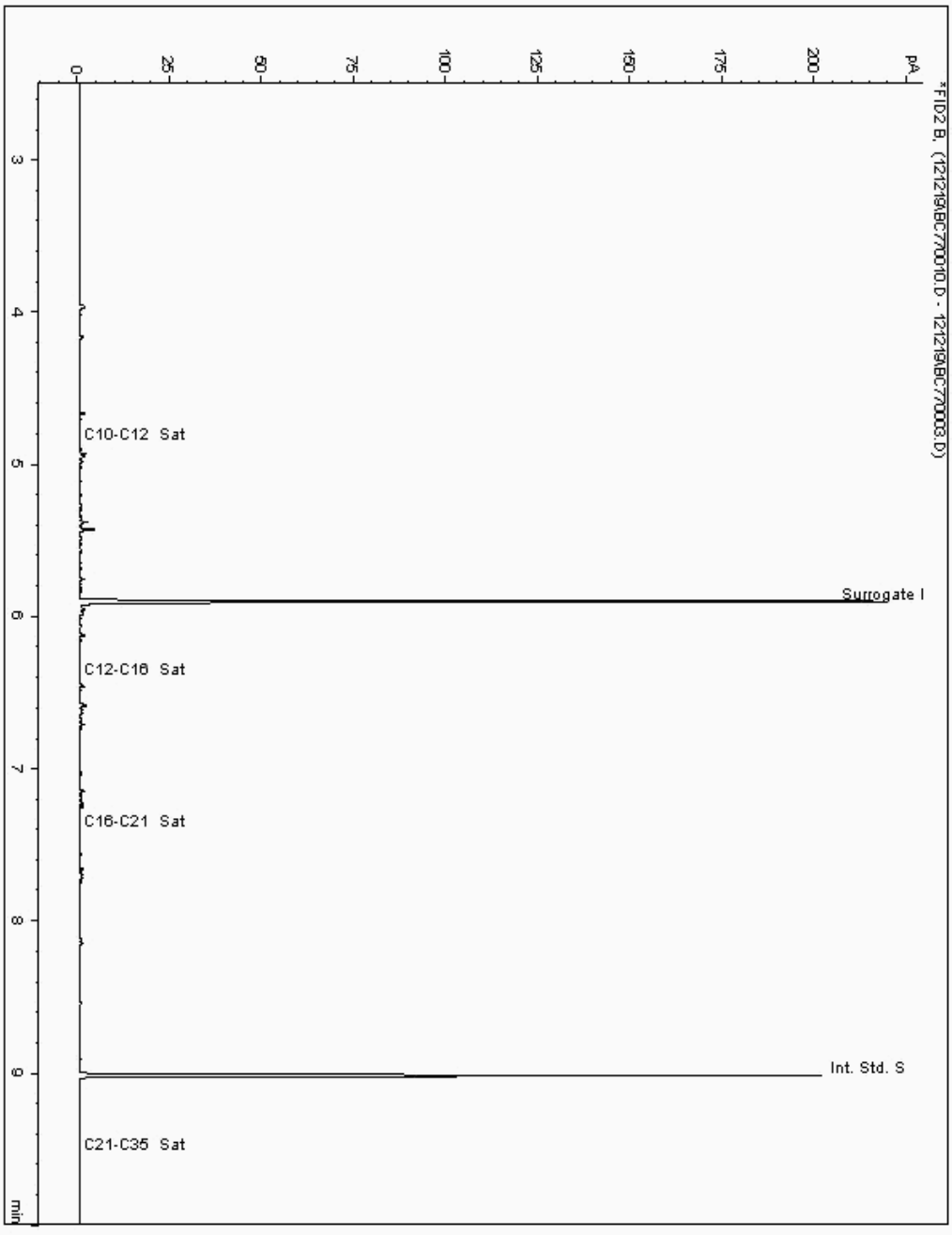
SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 21334161 **Sample ID :** WS09 **Depth :**

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 20034116-
Date Acquired : 12/12/2019 5:39:57 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



CERTIFICATE OF ANALYSIS

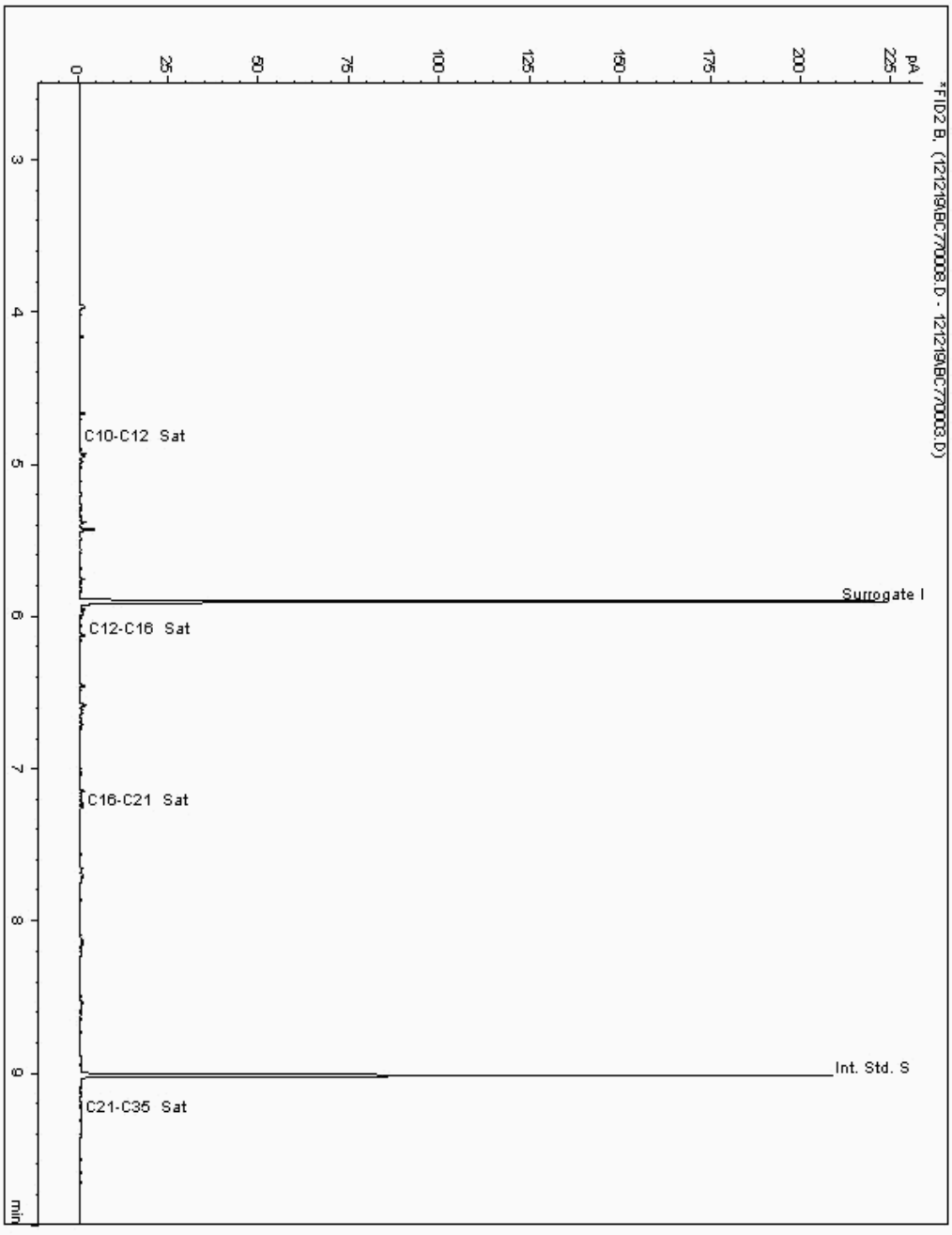
SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 21334169 **Sample ID :** WS08 **Depth :**

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 20034096-
Date Acquired : 12/12/2019 4:53:17 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



CERTIFICATE OF ANALYSIS

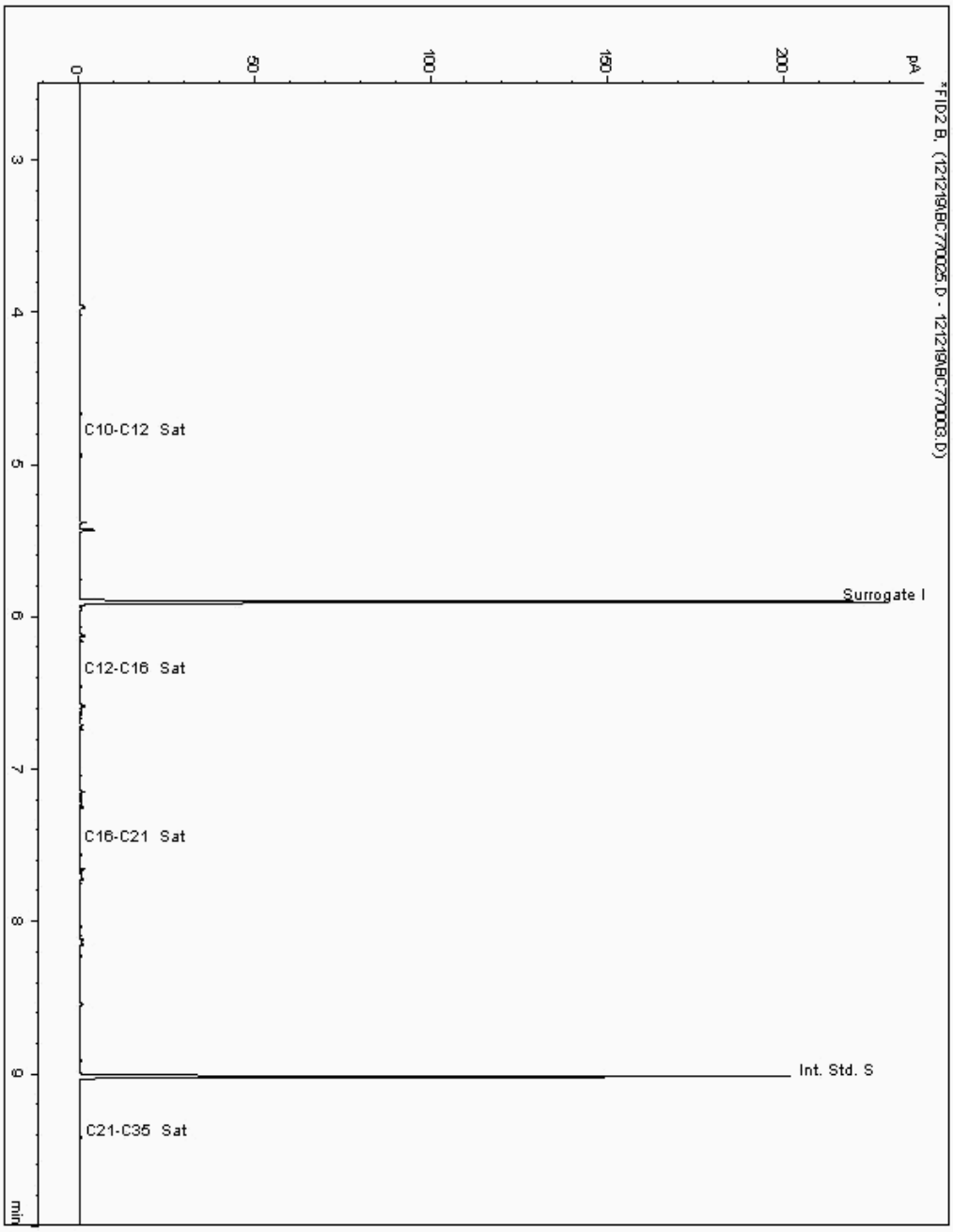
SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) **Sample No :** 21334179 **Depth :**
Sample ID : WS04

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 20034077-
Date Acquired : 12/12/2019 11:29:30 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



CERTIFICATE OF ANALYSIS

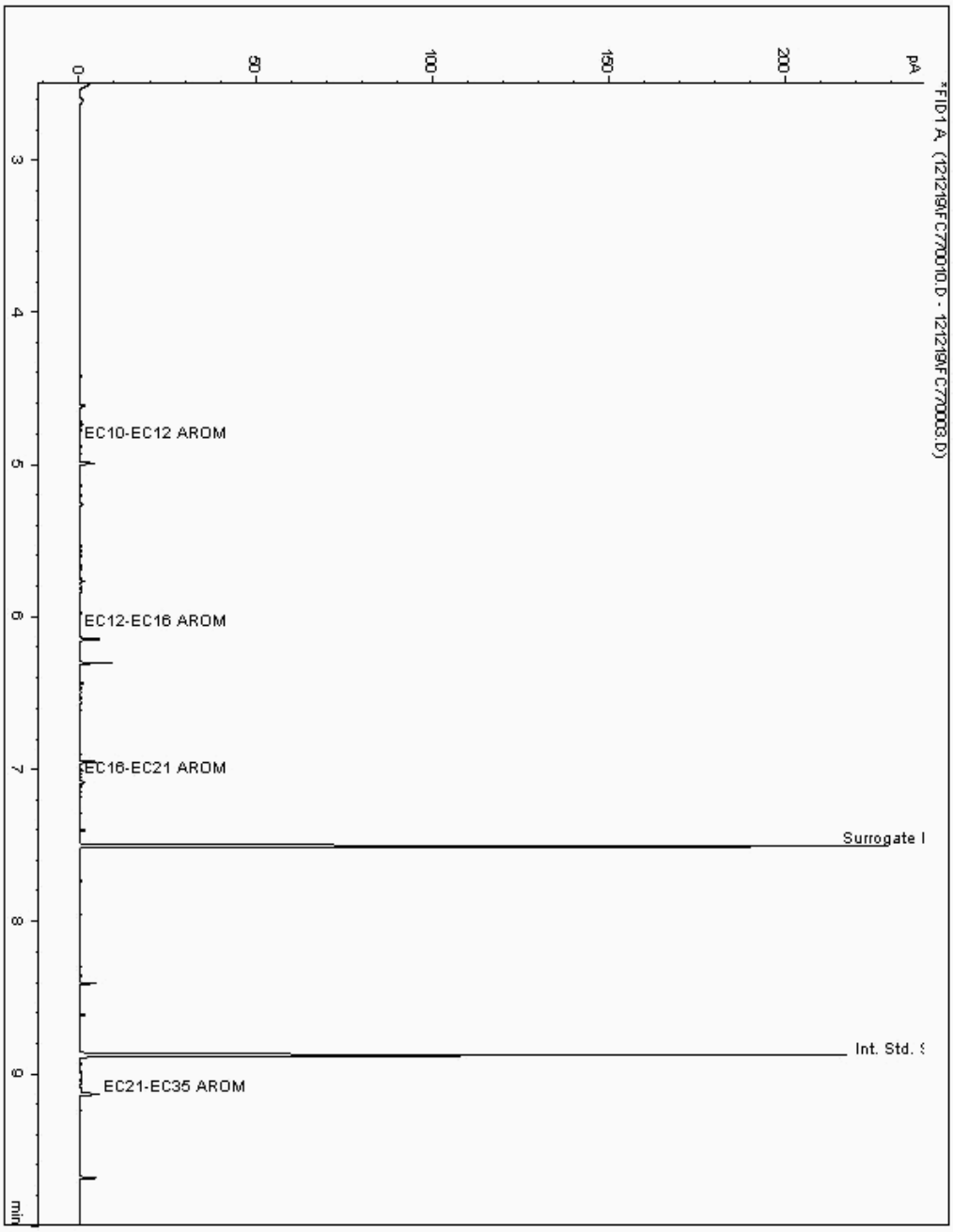
SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 21334161 **Depth :**
Sample ID : WS09

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 20034117-
Date Acquired : 12/12/2019 5:39:57 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



CERTIFICATE OF ANALYSIS

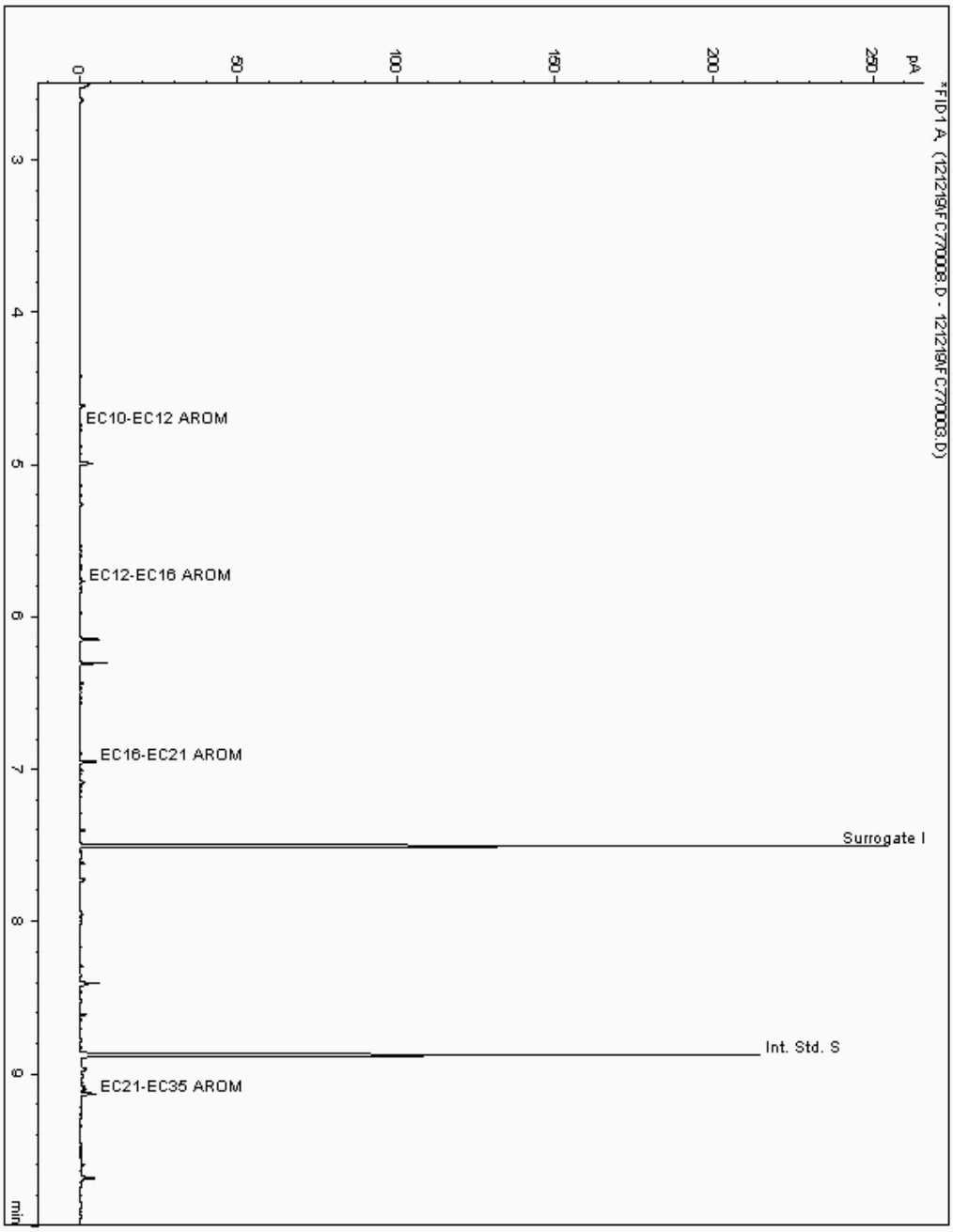
SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 21334169 **Depth :**
Sample ID : WS08

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 20034097-
Date Acquired : 12/12/2019 4:53:17 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



CERTIFICATE OF ANALYSIS

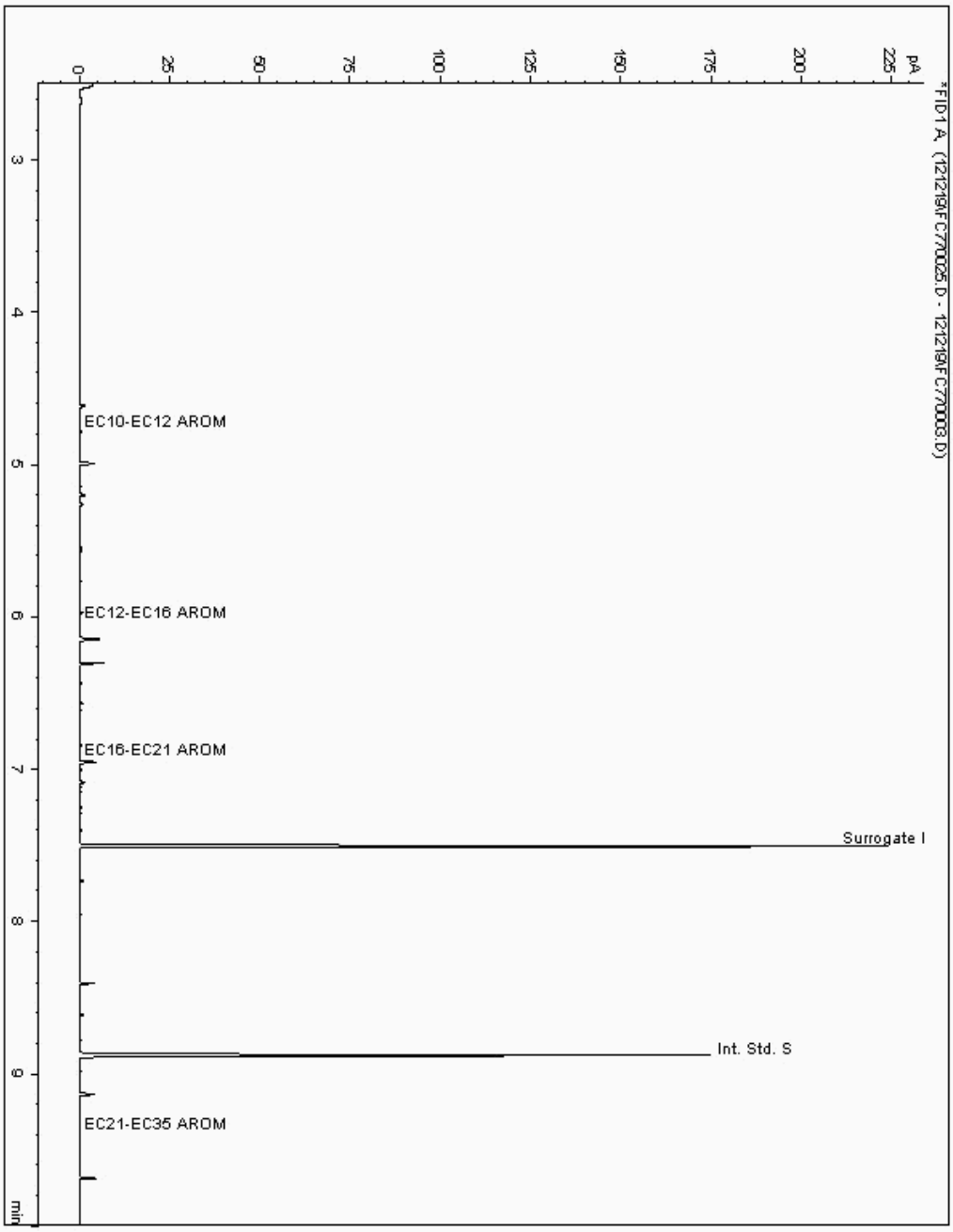
SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) **Sample No :** 21334179 **Depth :**
Sample ID : WS04

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 20034078-
Date Acquired : 12/12/2019 11:29:30 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025



CERTIFICATE OF ANALYSIS

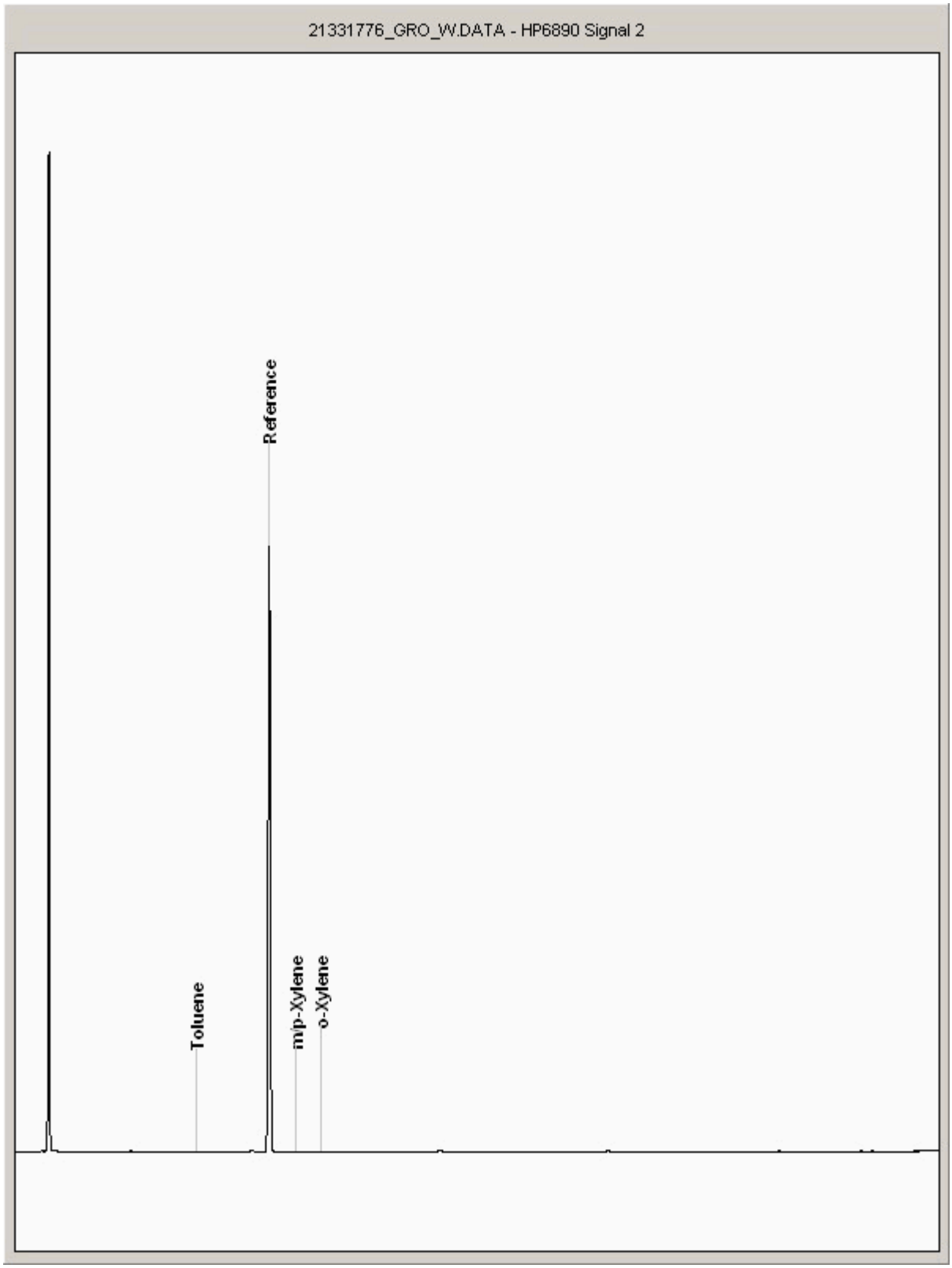
SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21331776
Sample ID : WS08

Depth :



CERTIFICATE OF ANALYSIS

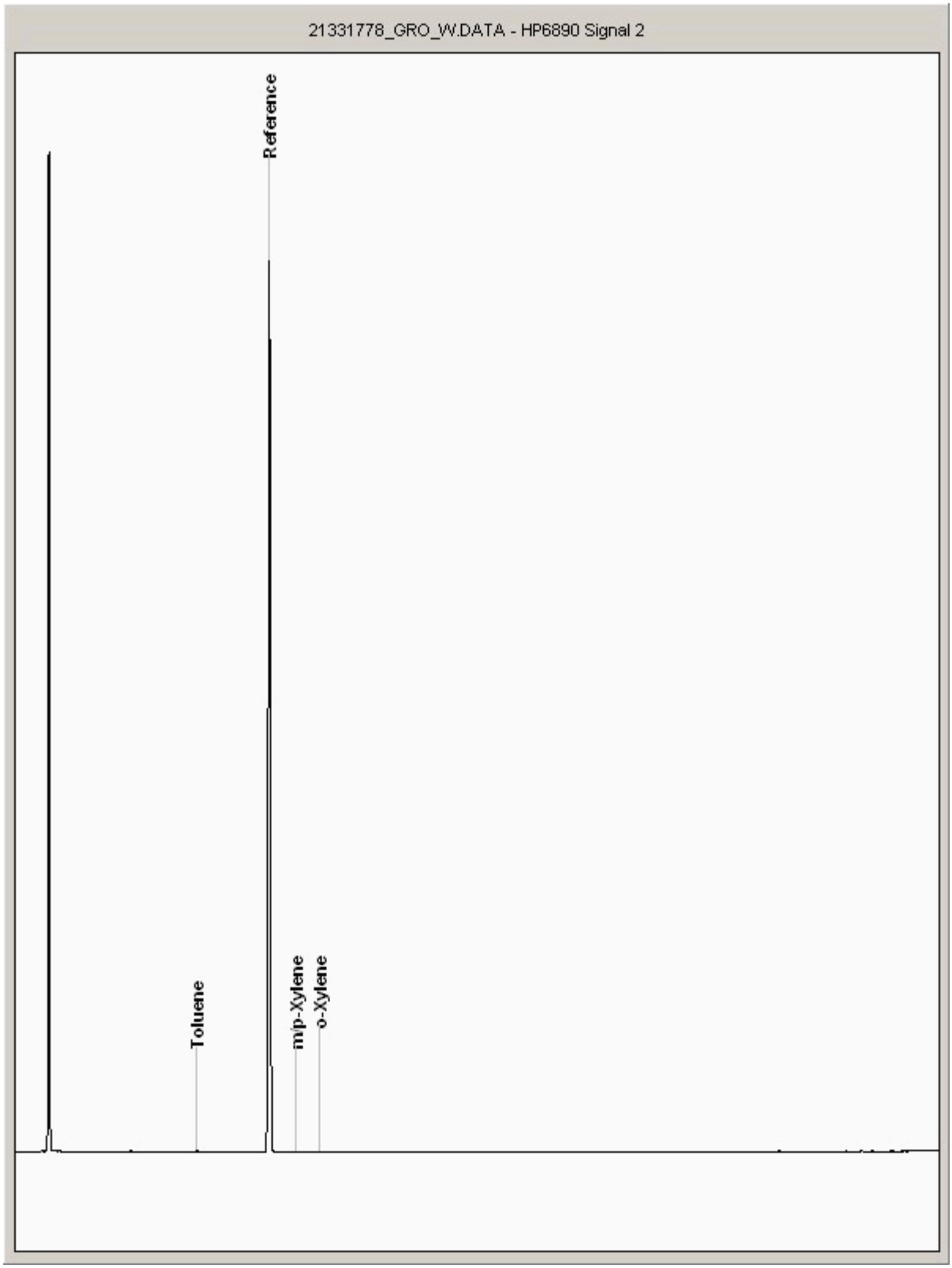
SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21331778
Sample ID : WS04

Depth :



CERTIFICATE OF ANALYSIS

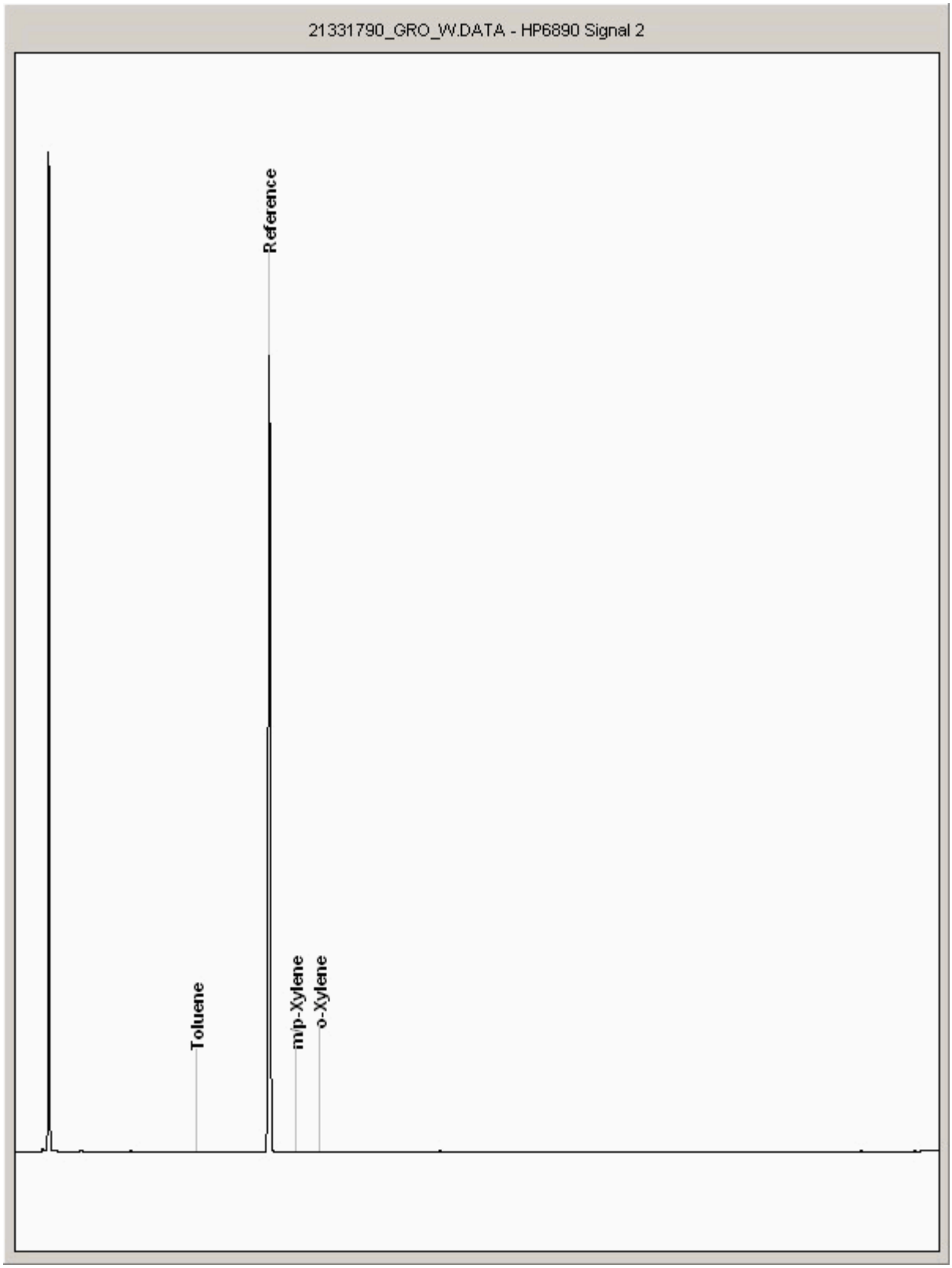
SDG:	191210-18	**Client Reference:**	Not Specified	**Report Number:**	534755
Location:	Camden	**Order Number:**		**Superseded Report:**	533948

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 21331790
Sample ID : WS09

Depth :



Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107).*

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.