Detailed Remediation Strategy and Verification Plan

Langley Park,

Chippenham

PREPARED BY:	FOR:	DATE:	REFERENCE:
Jubb Consulting Engineers Ltd.	Countryside Partnerships	August 2023	23166-JCE-XX-XX-RMS-RP-001 P1

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Project Information

Project Information

Client	Countryside Partnerships

Project Details

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1. Introduction

1.1 Instruction and Objectives

This report has been prepared by Jubb Consulting Engineers Limited (Jubb) to detail the proposed remedial works and verification plan in support of the planned redevelopment of Langley Park site, Chippenham as shown on Thrive Architect drawing – Coloured Site Layout, Ref: VIST220215, CSL01, Rev H, dated 18.03.22.

The report provides proposed mitigation measures for addressing identified contamination at the site, with a discovery strategy for areas requiring further investigation and a verification plan for the works.

This Remediation Strategy and Verification Plan has been prepared to mitigate the potential risk(s) to human health and controlled waters as identified in various previous reports (as set out below).

This report is for the sole use of the client, Countryside Partnerships (to whom alone is owed a duty of care) and their professional advisors and consultees; it may not be relied upon or reproduced by any third party for any use without the written agreement of both Jubb and Countryside.

This report has been prepared based on the fee proposal ref PP230311 dated 20/03/2023 and subsequent email instruction from the client, dated 22/03/2023.

1.2 Site Location and Description

The site is located at approximate National Grid Reference 392323, 174147, in Langley Park Industrial Estate, Chippenham, Wiltshire.

The site is situated on the western edge of an industrial estate and is formerly part of the wider Siemens Chippenham plant. The site contains several former industrial and office buildings with associated parking. In the west and south of the site, several former industrial buildings have been demolished to slab level, leaving several stockpiles of what is believed to comprise crush and demolition rubble. An electricity substation that services the building is present on its eastern side.

The topography of the site slopes gently from the northeast to the southwest before levelling out where the large disused car park is situated west of the Siemens building.

1.3 The Proposed Development

The proposed development layout plan (**Appendix A**) shows both low-rise and apartments with private gardens, areas of communal hard and soft landscaping, access roads and car parking. No basements are proposed.

Various buildings, structures and concrete and bound surfaces are present associated with historical development and will require demolition.

1.4 Planning Status

Outline planning consent was obtained for the wider development in 2017 by Chippenham Properties and Langley Properties Ltd under planning reference 16/03515/OUT. The consent covered demolition of existing buildings and redevelopment to provide up to 400 residential units hotel, café, discount food store and commercial units, along with road infrastructure.

The following reports were submitted as part of this outline application:

- Preliminary Environmental Risk Assessment, Waterman, WIB15376-103.R.1.1.7.JC, for Chippenham Properties and Langley Properties Ltd, March 2016.

- Environmental Site Appraisal, Waterman, EED14318-100-R-1.3.2-MA, for Langley Properties Limited, July 2014.
- Preliminary Remediation Strategy, Waterman, WIB15376-103.S.1.1.6-ALM, March 2016

A Reserved Matters (RM) application was submitted for the site area now under the ownership of Countryside Partnerships in 2019 (reference 19/12100/REM), for the appearance, landscaping, layout and scale of 333 dwellings and related access roads and infrastructure.

A search of the planning portal indicates that no additional GI information was submitted as part of the RM application.

Under the above Outline Planning Reference, Pre-commencement Condition 15 was applied with respect to contamination, calling for site characterisation, submission of remediation scheme, implementation of approved remediation scheme, reporting of unexpected contamination (if encountered) and verification of remedial works.

Beyond the documents listed above, no further information further is understood to have been submitted with respect to discharge of Condition 15. Jubb have not been made aware of any correspondence between planners and past or current site owners with respect to land contamination and Condition 15.

1.5 Previous GI Reports

The following GI reports relevant to the site, have been provided by the client or obtained from the planning portal.

The following reports were provided by the client, and the client has reliance upon these:

- Updated 2014 Ground Investigation at Langley Park (Environmental Site Appraisal), Waterman, WIE19206-100-R-1-1-3-ESA, for Vistry Partnerships West, July 2022 - *client has reliance on this report.*
- Preliminary Risk Assessment, Waterman, WIE19206-100-R-2-2-1-PRA, for Vistry Partnerships West, November 2022 - c*lient has reliance on this report.*
- Geo-Environmental Interpretative Report, Waterman, Ref WIE19206-100-R-3-2-1-GIR, for Vistry Partnerships West, November 2022 – *client has reliance on this report.*
- Supplementary Due Diligence Geo-Environmental Interpretative Report, Waterman, Ref WIE18542-100-R-1-4-1-GIR, December 2021 – *client has reliance on this report.*
- Preliminary Remediation Strategy Report, Waterman, WIE18542-100-R-2-1-3-RS, December 2021 – *client has reliance on this report.*

The following additional reports were reviewed from the Planning Portal:

- Environmental Site Appraisal, Waterman, EED14318-100-R-1.3.2-MA, for Langley Properties Limited, July 2014 - *not undertaken for current client, but has been reproduced for client in updated version, as referenced below*
- Preliminary Environmental Risk Assessment, Waterman, WIB15376-103.R.1.1.7.JC, for Chippenham Properties and Langley Properties Ltd, March 2016 - *not undertaken for current client, available on the planning portal.*
- Preliminary Remediation Strategy, Waterman, WIB15376-103.S.1.1.6-ALM, March 2016 - *not undertaken for current client, available on the planning portal.*

The above reports should be referred to in conjunction with this Remediation Strategy report.

2. Site Conditions and Summary of Risks

2.1 Site Background Data

2.1.1 Site History

The site and wider Langley Park Industrial Estate has historically been used for a wide variety of industrial processes including gas manufacture, metal fabrication, brake manufacture and electrical component manufacture. A brake and signalling works associated with the railway industry has been on site since the 1930s. Since 2015, the wider industrial estate has been subject to various planning applications relating to proposed redevelopment which has resulted in the localised demolition of some former industrial buildings on the site area (and across the wider development area).

2.1.2 Ground Conditions

The Ground conditions across the site have been found to comprise the following.

- Variable depth of Made Ground between 0.2 – 3.0m thick has been encountered across the site. Concrete and bound hardstanding underlain by sand, gravel, and clay of varying proportions, with intermixed fragments of ash, wood, brick, concrete, clinker, and rootlets.
- This is underlain by the Kellaways Sand and Clay Formations in the east of the site and the Cornbrash Formation which underlies it and crops to surface in the west.

Below ground concrete obstructions were noted in central site areas (currently occupied by a car park) which were previously occupied by various industrial buildings.

Historically, the eastern area of the site was also occupied by a gas works, and further below ground structures associated with this use (gas holders etc) should be anticipated.

2.1.3 Groundwater

Various rounds of groundwater monitoring have been taken at the site, in 2014, 2021 and 2023.

Groundwater monitoring undertaken in 2014 across the wider site area appeared to encounter reasonably consistent groundwater levels within the Cornbrash Formation, with groundwater gradient falling towards the southeast (as would be expected here). A groundwater gradient plot is provided below:

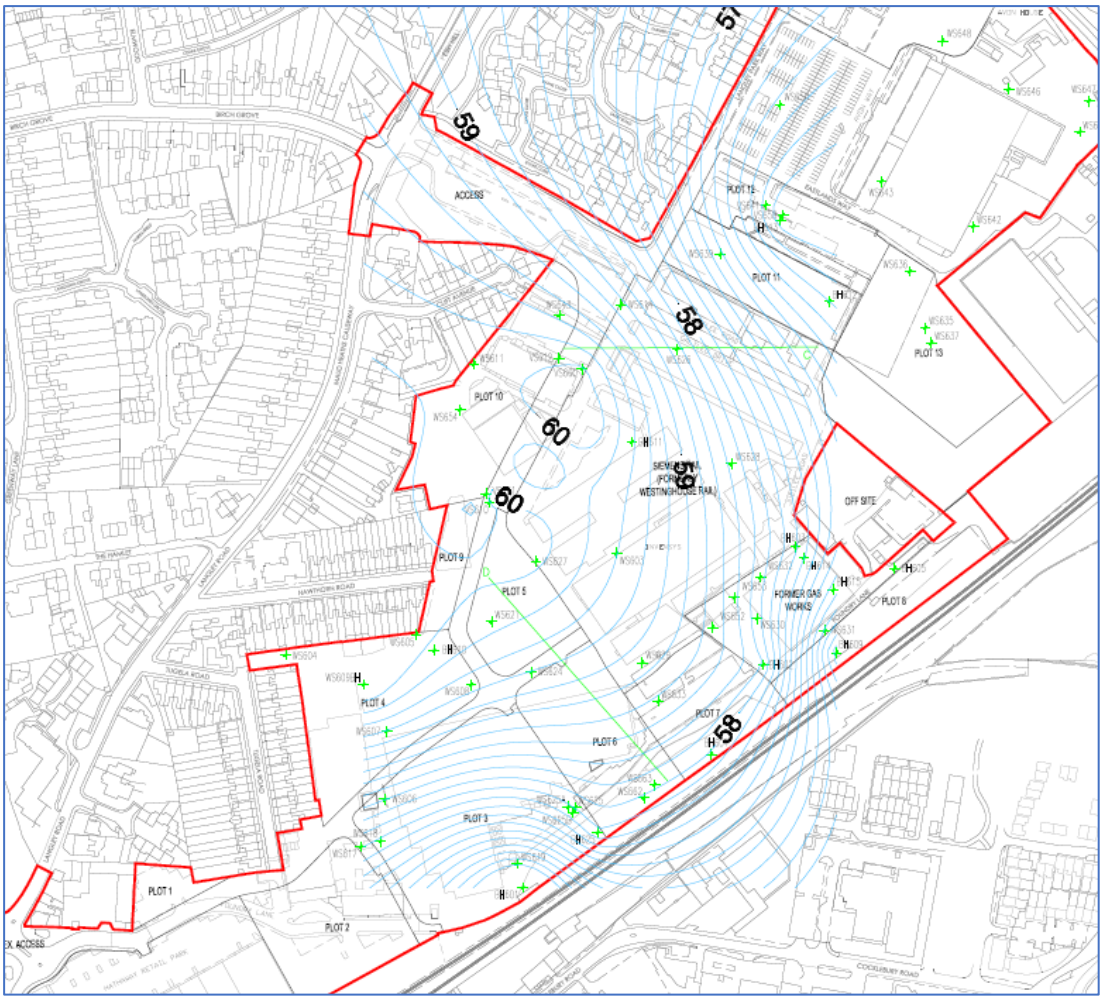

Figure 1: Cornbrash Groundwater Gradients in 2014 (m AOD)

Groundwater monitoring undertaken in 2021 did not encounter groundwater in the 13 no. holes monitored.

An additional 3 no rounds of groundwater monitoring were undertaken by Jubb in 2023 within existing serviceable boreholes. Groundwater levels were encountered within 5 no. of the 12 no. locations monitored, with water levels typically encountered at between 2.0 – 2.7m bgl.

2.2 Summary of Contamination

2.2.1 Phase 1 (desk study) - Key Findings

Historical site knowledge and available previous reports indicate the site and surrounding industrial estate has had significant industrial usage with potentially contaminative land uses dating back to the 1900's, with numerous reconfigurations of site buildings and structures.

A review of desk based information indicates the sites industrial use included a Gas Works (from 1923), Brake and Signal Works (from 1936), and unspecified Industrial Buildings (from 1960), and together with the various reconfigurations of buildings within the site significant Made Ground and contamination was considered likely.

Identified sources of historic contamination include a chemical store to the northern end of the site (outside the current RMA planning boundary), a paint and plating shop in the eastern area, and a TCE store in the central area.

An updated Radon Report (2023) indicates the site is within an area where less than 1% of homes are estimated to be at or above the action level (not a radon affected area).

2.2.2 Phase 2 - Visual and Olfactory Evidence of Contamination

Visual and olfactory evidence contamination encountered during the various phases of GI work is summarised below.

In 2014 a site wide investigation by Waterman recorded indicated numerous cases of slight organic odour, hydrocarbon odour and coal fragments, with more isolated cases of tar (in the south of the site), and slag and ash (in the central-south area). Visual evidence of oils had been recorded in the western area in proximity to the railway line, and around the TCE store. Visual and olfactory evidence of contamination had been noted from BH625, in the form of hydrocarbon odours and 'tar-like' substances.

In 2021, hydrocarbon or organic odours were noted in TP21/4, TP21/5 and WS21/14. No visual evidence of asbestos at this time.

Trial pits undertaken in 2023 did not indicate any visual or olfactory indications of contamination.

Refer to the relevant GI reports for fully description of visual and olfactory contamination.

2.2.3 Phase 2 – Soil Contamination

Site wide laboratory testing in 2014 and 2021 was undertaken on between 90-130 samples and indicated a number of determinant elevations in respect to human health risk, these include metals, hydrocarbons, and VOC/SVOCs, typically from shallow soils above the groundwater levels. Contaminant concentrations were compared to Generic Assessment Criteria for Residential Use with Plant Uptake.

Metals were commonly encountered above laboratory limit of detections across the site with no particular pattern. However, a number of GAC exceedances are present and predominantly recorded in the southern area of the site, associated with the metal fabrication and manufacturing activities.

Total Petroleum Hydrocarbons (Aromatic C8-C35) concentrations above the laboratory limit of detections were recorded in a number of made ground samples across the site, with GAC exceedances typically from exploratory holes within the southern area. Standout elevations of MTBE and chlorinated solvents were also recorded in WS629 (southeastern area) from shallow soil samples.

VOC testing was typically undertaken at and around contamination sources in the shallow soils generally within the southern area of the site. These indicated the presence of VOC's within all locations from the majority of tested depths.

Asbestos was recorded within 5/87 samples tested in screen testing in 2014, the presence of asbestos on a site of this history it to be expected.

2.2.4 Phase 2 - Groundwater Contamination

Groundwater sampling and testing undertaken in 2014 was compared to Environmental Quality Standards (EQS) values.

Organic contaminants have been identified across the site within the groundwater.

Elevated VOCs (TCE and related products) were recorded near and down gradient of the TCE Store and the former Paint and Plating shop, and more widely across the site.

Polyaromatic hydrocarbons (PAHs) were identified within groundwater samples from near and down gradient of the TCE Store, Retort House and Paint and Plating Shop.

Impacted areas within the site can be considered as; the former Paint and Plating Shop; the former TCE Store; the area of the Retort House, and a hotspot around BH625 (southern area).

2.2.5 Phase 2 – Ground Gas and Vapour Results

Ground Gas

Ground gas monitoring has been undertaken during both 2014 and 2021 phases of GI. This comprised monitoring of ground gas in various borehole across the wider site area in 2014 and across the specific site area now under consideration in 2021.

The monitoring in 2014 comprised a single round of monitoring of 48 no. wells across the wider site area, which did not encounter any elevated carbon dioxide or methane.

Monitoring in 2021 comprised 3 rounds of monitoring of 13 no. holes in September and October 2021. This monitoring indicated some sporadic elevations of both Carbon Dioxide and Methane, and flow rates consistently below 0.1 l/hr.

Elevated methane was encountered in WS21/3 and R21/1. WS21/3 is close to the plating works and is likely to be indicative of VOCs in soils at this location.

R21/1, however, is not close to any expected VOC source, and is likely to be indicative of localised organic material in the soil at this location. Some elevated CO2 was also encountered in this location.

Further monitoring at this location is recommended, as detailed below.

Subsequent gas monitoring was undertaken of various additional boreholes in 2023 which did not encounter any elevated CO2 or CH4, and gas flow rates were found to be zero.

Volatile Vapours

VOC vapour monitoring of various boreholes was undertaken in both 2014 and 2021, with subsequent monitoring undertaken in 2023.

Initial vapour monitoring results were compared with modified Health Criteria Values (mHCVs), and significant elevations of Trichloroethene (TCE), Tetrachloroethene (PCE) and Cis 1,2 Dichloroethene are noted in certain holes (VS610, VS660, VS612, VS661, BH615, WS604) especially during monitoring taken in 2014, and to a lesser extent in 2021.

These holes are noted as being close to expected VOC source areas, some also correlated with elevated soil concentrations of VOCs (i.e. BH615).

TCE is also noted as being elevated above mHCV in 7 of the 11 locations monitored in 2023, but at significantly lower concentrations that during previous monitoring undertaken.

2.3 Summary of Risk Assessment Findings

2.3.1 Human Health

Chemical testing undertaken as part of Waterman investigations recorded various exceedances of heavy metals, asbestos, PAHs and VOCs within the soils when compared to human health Generic Assessment Criteria (GAC) for a residential scenario. This was noted to correlate with the findings of the previous investigations undertaken by others.

Spatially, the human health GAC exceedances have been primarily recorded in the central and southern areas of the site where there is a history of heavy industry and TCE storage.

No significant contamination was recorded in the northern site extents, which sits up gradient of the identified contaminant sources. However testing here was extremely limited (WS21/1 only), as much of the made ground contamination across the site is pervasive and typically located above levels influenced by the groundwater table, contamination in the northeast of the site cannot be discounted.

Assessments have concluded that the shallow soils across the site present a potential risk to human health under a residential land use scenario and as such, remedial measures will be required.

2.3.2 Controlled Waters

Detailed Quantitative Risk Assessments of the potential risk to Controlled Water receptors from recorded contamination was undertaken as part of the 2014 Waterman Environmental Site Appraisal using the EA Remedial Targets Methodology (RTM), which was used to model the down gradient impact of TCE concentrations recorded in borehole BH303 (location of the former Paint and Plating Shop), 1,1,1-trichloroethane, carbon tetrachloride and TCE concentrations recorded in boreholes BH602, BH603 and BH604 (located near the southern site boundary) and PAHs recorded in borehole BH625.

With regards to BH303 and TCE concentrations recorded, the results of the assessment indicated compliance with EQS would occur at between 50m and 90m from the source, thereby implying the contamination was not capable of migrating a significant distance. This is supported by the results from boreholes BH611 and BH201, where TCE was recorded as being absent from the groundwater.

With regards to the chlorinated solvent concentrations recorded in boreholes BH602 – BH604, no exceedances of EQS were predicted to be present at the 50m compliance point.

With regards to the PAH concentrations recorded in borehole BH625, the results of the assessment indicated only fluoranthene and benz(g,h,i)perylene would exceed their respective EQS at the 50m compliance point. The model predicted these contaminants would achieve compliance at about 95m and 130m respectively. Therefore, while these contaminants would theoretically be detected beyond the 50m compliance point they were not considered to pose a considerable risk to the quality of the secondary aquifer down gradient of the site or the River Avon.

It was also recognised the PAH contamination recorded in BH625 was likely to be associated with the potentially infilled former tank cradle, recorded in nearby WS625.

IDOM undertook some remedial works in this area in 2019, to remove and dispose of an identified tank, interceptor and grossly impacted soils. While this is not within the site area for the RMA, it is noted that these works will have contributed to risk reduction to the groundwater environment.

In summary, the risk to controlled waters (groundwater and offsite surface waters) have been assessed as low without a need for remedial action.

2.3.3 Ground Gas and Vapour

Ground Gas and Radon

Ground gas monitoring results from 2014, 2021, and 2023, show the site can be considered to be Characteristic Situation 1 (Very low risk) when assessed in accordance with CIRIA 665 and BS8485, and no further gas protection measures are required.

Further ground gas monitoring of R21/1 is to be undertaken to confirm that not elevated CO2/CH4 or flow rates are evident.

The updated site-specific radon report obtained from the BGS confirms that no radon protection measures are required for the development.

Volatile Vapours

An initial evaluation of the chlorinated solvents risk at the site was undertaken as part of the 2014 Waterman investigation through the installation of 10 No. dedicated vapour sampling boreholes in areas of previously recorded contamination. These boreholes were sampled, and the results subject to DQRA. The results of that assessment indicated a potential

for vapour accumulation into future buildings within *'impacted areas'* however, did not define the extents of the '*impacted areas'*.

To confirm the findings of previous works and refine the areas of potential impacted, a further 6 No. samples of vapour were obtained from historical borehole installations and subject to laboratory analysis as part of the 2021 Waterman investigation. 4 No. of the boreholes selected for vapour analysis were in areas of known chlorinated solvent impact, to allow direct comparison against of 2014 concentrations (VS610, VS612, VS660 and VS661). A further 2 No. boreholes were selected to provide an indication of potential chlorinated hydrocarbon contamination generally across the site (WS604 and BH615). The results of the analysis identified vapour concentrations in all six borehole locations.

To further understand the vapour risk, selected contaminants were brought forward for additional site- specific risk assessment using the 2017 Johnson and Ettinger Model, which accounts for vapour attenuation prior to migration into the building.

As a result of this work, Watermans concluded a potential unacceptable vapour risk was present in certain locations close to the former TCE Store, Plating Works and Gas Works. It was determined vapour protection measures would be required in these areas, while recognising that additional monitoring would be required across the site to refine this assessment.

In 2023, Jubb reviewed all available soil, groundwater, and vapour test results to determine the potential extent of VOC/SVOC's contamination at the site. This review confirmed the findings of Watermans in suggesting the contamination to be largely associated with the former TCE Store, Plating Works and Gas Works with migration in a southerly direction, likely associated with groundwater.

Jubb undertook further vapour sampling and testing from an additional 12 no. boreholes across the wider site area and beyond these areas previously investigated. The results of the additional vapour sampling were assessed along with those previously obtained by Waterman using the Johnson and Ettinger spreadsheets.

This reappraisal of data confirms that the vapour risks at the site is confined to areas close to the TCE store, Plating Works and former Gas works areas (VS612, VS660, VS610 and BH615), and these are the areas that will require vapour protection measures.

Jubb's updated DQRA for vapour assessment is appended to this report (**Appendix D).**

2.4 Unidentified Contamination

2.4.1 Former Gas Works Site

It is noted that the eastern end the site was formerly occupied by a town gas and that structures associated with this past use appear likely to in part remain in the ground. The location of these former structures is plotted on the Proposed Remediation Plan in **Appendix B** for information. This includes one gas holder and a number of buildings of unidentified use, including a probable Retort House.

The gas holder structure spans the site boundary, is located beneath the adjacent existing warehouse structure, and sits beneath a proposed plot foundation in this area. Window Sample WS653 was located within the former gas holder and refused at 2.3mbgl on a concrete obstruction (likely the gas holder foundation). While this window sample hole did not record any gross contamination, it's is possible that further contamination associated with the gas works could be present within the gas holder.

2.4.2 Other Historic Structures (TCE Store area and Plating Works/Paint Shop)

Similarly, other historic structures associated with potential contamination have been identified elsewhere on site. The former TCE Store was in the vicinity of VS610 and VS661, and plating works/paint shop building is situated adjacent to

VS612 and VS660 (refer to Remediation Plan for details). Ground investigation evidence suggests these buildings are likely to have been the principle source of TCE contamination, as such it remains possible that areas of gross contamination remain in the ground associated with these locations.

3. Conceptual Site Model

The updated conceptual model for the site, identifying the key pollutant linkages that require addressing during the remediation works is presented in Table 2.

Source	Linkage	Receptor	Risk	Justification / Mitigation	Residual Risk (after mitigation)
Human Health					
Elevated contaminants in the Made Ground	Direct contact, ingestion, and inhalation	Future site users	Medium	Investigations undertaken to date have confirmed the presence of elevated contaminants within the Made Ground at the site, including asbestos fibres. A risk exists where future site users could come into direct contact with these contaminants. In areas of hardstanding and building footprints the pollutant linkage will be broken through pathway removal. In gardens and soft landscaped areas, a pollutant linkage will exist which will require implementation of a robust cover system to mitigate the risk	**Very Low**
Ground Gas	Migration to and accumulation in confined spaces	Future site users	Very Low	Assessment of the site's gas conceptual model confirms a significant ground gas regime is absent. Gas monitoring indicates CS 1 classification. No protection measures will be required in future properties with respect to carbon dioxide or methane.	**Very Low**
Volatile vapours as a result of VOC in soils and groundwater.	Migration to and accumulation in buildings	Future site users	Medium	Investigations and modelling undertaken have confirmed limited localised vapour risk from volatiles in certain areas of the site. Vapour protection measures required in certain plots to prevent migration to buildings, to be designed and specified in accordance with BS 8485.	**Low**
Contaminants in the made ground and groundwater. Volatile contaminants	Direct contact, and accumulation in confined spaces	Construction workers	Medium	During construction, and in the absence of mitigation, workers may be exposed to elevated contaminant concentrations recorded within the Made Ground soils and shallow groundwater, asbestos fibres and unacceptable vapour levels in confined spaces. Construction workers should wear the appropriate PPE, RPE, adhere to good hygiene and safety measures, the Confined Space Regulations 1997, and the Control of Asbestos Regulations 2012	**Low**
Contaminants in the made ground and groundwater. Volatile contaminants	Dispersion off-Site through wind entrainment leading to direct contact and inhalation	Off-site users	Medium	During construction potential exists for the dispersion of contaminants off-site either through wind entrainment or through the volatilisation of volatile contaminants exposed during earthworks. Sensitive receptors and developments are present in the surrounding area. To mitigate the risk, dust suppression methods will be required throughout the construction works to limit dust generation and transport off-site. Details of the methodology required should be set out in a Construction Environmental Management Plan (CEMP).	**Low**
Contaminants in the made ground and groundwater. Volatile contaminants	Lateral Migration of volatile contaminants in groundwater	Off-site users	Low	The modelled direction of groundwater flow is such that chlorinated solvent impacted groundwater is considered to be away from identified adjacent residential receptors. Furthermore, attenuation of contaminants is expected during lateral migration and within the aerobic unsaturated zone. As such, a risk to off-site receptors from volatile contaminants is considered to be absent	**Low**
Controlled Waters					
Impact as a result of the presence of known historic contamination, notably chlorinated solvents.	Lateral and vertical migration through made ground and underlying geology	Groundwater and surface water bodies	Low	Taking into consideration the results of the previous DQRA, observances and soils results from the current investigation, the impact of historical chlorinated solvent contamination on downgradient Controlled Waters receptors is low and no further assessment is considered to be necessary	**Low**

Table 1: Conceptual Site Model

4. Remediation Design

4.1 General

This Remediation Strategy is based on the findings of the various ground investigation works, undertaken in the period 2014 – 2021 by Waterman, and in 2023 by Jubb, including quantitative and detailed quantitative risk assessment, and is designed to ensure the pollutant linkages identified are adequately mitigated as part of the proposed development.

Where there are gaps or uncertainties in the assessment undertaken to date, recommendations for further investigation or clarification are provided.

A Principal Contractor or their sub-contractors will undertake the mitigation works to an appropriate standard. Following completion, Contractors will provide the necessary information for a Validation Report to be prepared.

A verification plan detailing the expected content of the Verification Report is outlined in Section 6.

The key remediation items to be implemented at the site are as follows:

i. Decommissioning of all installed boreholes.
ii. Demolition of existing structures and removal of all foundations and other in-ground obstructions associated with past uses.
iii. Inspection of formation and discovery strategy to comprise a grid of trial pits in areas with significant potential for hotspots of gross contamination, to identify any significant visual or olfactory indications of contamination. This includes the former gas works area, the former TCE store and the plating works/paint shop. If areas of significant contamination are identified which warrant further remedial action, this may comprise off-site disposal, in-situ treatment or ex-situ treatment and reuse.
iv. Installation and verification of vapour protection measures within plots considered to be above areas of potential risk.
v. Installation of a Cover System within soft landscaping / garden areas of site areas considered to be above areas of potential risk.
vi. Preparation and implementation of an Asbestos Risk Management Plan (ARMP) and Asbestos Discovery Plan (ADP) during the earthworks and construction works to allow suitable management of ACMs and asbestos fibres;

4.2 Decommissioning of SI Boreholes

Within the site area, best endeavours should be made to locate boreholes drilled during the various phases of ground investigations so they can be decommissioned prior to works commencing. The methodology used should be in accordance with Environment Agency guidance 'Good Practice for Decommissioning Redundant Boreholes and Wells' (2012).

4.3 Demolition and Site Clearance

Existing buildings will require demolition by a specialist contractor. Ahead of demolition, appropriate asbestos surveys should be undertaken and any asbestos containing materials removed and disposed of in accordance with current legislation.

All hardstanding surfaces shall be removed to expose the underlying soils and any below ground structures. Blacktop surfacing shall be stripped and stockpiled for further sampling to ascertain whether Coal Tar is present. Where Coal Tar is found to be present, the material may be disposed of off-site to a suitably licenced facility or reused on site in accordance with EA Regulatory Position Statement 075.

Where encountered, below ground structures/ obstructions shall be excavated and the walls, foundations and bases etc. grubbed out. Targeted excavations should be undertaken for foundations and structures associated with past

phases of development to allow any residual structures to be identified and removed. The demolition contractor should provide proposals for consideration on how this is to be achieved, notably in relation to areas requiring a discovery strategy. Particular attention is drawn to the area of the former Town Gas Works where evidence suggests that below ground structures may remain in-situ.

Redundant services will be confirmed as dead and investigated for the presence of liquids prior to disturbance and excavation. If found to contain liquid, this will either be disposed of in accordance with a discharge consent granted by Wessex Water or pumped to an IBC, subject to chemical testing and disposed to an appropriate waste disposal site.

Following demolition of existing buildings and structures and removal of foundations and hardstanding surfacing, ground surfaces should be inspected to confirm the absence of visual or olfactory evidence of contamination. Any observations shall be photographed and recorded.

4.4 Earthworks and Excavations

Materials expected to be encountered during the works are listed below:

vii. Recycled aggregate – recovered from demolition of buildings, paved areas, buried structures and roads;
viii. Soil including topsoil, Made Ground, Kellaway Clay Formation, Kellaway Sand Formation, Cornbrash Formation and granular sub-base – recovered during removal of hardstanding surfaces, excavation of contaminated areas and/or re-levelling of the site if necessary.

4.4.1 Materials Management Plan

The reuse, movement and/or treatment of soils on the site should be in accordance with the CL:AIRE Definition of Waste: Development Industry Code of Practice V2 (CL:AIRE DoWCoP).

The MMP should cover the management and re-use of excavated materials and their removal from the site. In line with DoWCoP, the appointed Qualified Person will review evidence relating to the proposed use of material on-site as set out in the MMP and if satisfied will issue a Declaration to the EA.

The MMP will include:

ix. Details of the parties that will be involved with the implementation of the MMP;
x. Details of the potential use of materials and relative quantities;
xi. Details of the specification for use of materials against which proposed materials will be assessed, underpinned by appropriate risk assessment related to the place they are to be used;
xii. Details of where and how these materials will be stored;
xiii. Details of the final destination of the materials;
xiv. Details of how the materials are to be tracked;
xv. Contingency arrangements for out of specification material and / or surplus materials;
xvi. A verification plan.

Full records of the quantities of materials disposed off-site and the receiving facilities should be kept during the works. In addition, waste transfer and consignment notes for the materials should be collated.

On completion of the works the Verification Report should record how material was reused in line with the MMP.

4.4.2 Recycled Aggregates Produced on-site

Secondary aggregates generated on-site for reuse should be either:

i. shown to have been produced in accordance with EA Regulatory Position Statement 075 or WRAP Quality Protocol for the production of aggregates from inert waste and confirmed free of visual and olfactory

evidence of contamination, including (but not limited to) the visual presence of asbestos containing materials, bituminous materials containing coal-tar, and hydrocarbon staining and odours;

ii. re-used under a U1 waste exemption: use of waste in construction, allowing up to 5,000 tonnes of non-hazardous concrete, bricks, tiles and ceramics or a mixture of these; or

iii. reused under the DoWCoP MMP (course materials recovered from made ground).

Records should be collected, detailing the total volume of material re-used on-site and their location of use.

4.4.3 Stockpiles

The generation of stockpiles of excavated material should be minimised as far as is reasonably practical. Any soils that are stockpiled on site should be managed in a controlled way. Different material types should be segregated and clearly labelled. Each stockpile should be identified based on the assumed or confirmed categorisation, source, type and deposition date, and details of any chemical analyses.

Stockpiles should be physically separated to avoid cross contamination and temporary road access provided for placement and loading. Stockpiles should be positioned on impervious surfaces to collect drainage and prevent loss of entrained water and leachate to ground.

Mitigation measures should be employed to minimise wind whip from stockpiled materials. The future Contractor should determine the methods for appropriate handling and storage of materials which may include damping down, covering of stockpiles where necessary and table topping stockpiles.

Stockpiles should be sited away from surface waters as far as is reasonably practicable and measures employed (e.g. constructing new or maintaining existing bunds) to ensure run-off from stockpiles cannot enter a watercourse.

Proposed stockpiling locations and tracking methods should be included within the MMP.

4.4.4 Soils – Topsoil, Made Ground, Natural Soils and Granular Sub-base

Made Ground, natural soils and granular sub-base should be subject to visual and olfactory assessment, further chemical and geotechnical testing and should be stockpiled accordingly. The reuse of these materials shall be subject to the appropriate protocols and subject to the materials being geotechnically and chemically suitable for the locations they are to be placed.

Any topsoil recovered from the site should be stockpiled separately and, subject to testing, can be re-used as topsoil cover in the proposed development. Re-use of topsoil will be covered by the CL:AIRE Code of Practice.

4.4.5 Off-Site Disposal

For waste soils that require removal off site, waste classification analysis should be undertaken to confirm the correct waste classification of the material and identify a suitable licenced facility to accept the waste. Copies of all relevant licences for the disposal / treatment site should be provided prior to the waste being taken off-site.

4.5 Discovery Strategy

4.5.1 Inspection and Grid Trial Pitting (Former Gas Works Area, Plating Works and TEC Store Area)

The former gas works area is currently occupied by buildings and hardstanding preventing detailed investigation. Once these are removed to below slab level, the formation will be inspected for visual and olfactory signs of significant contamination. Foundations to existing buildings should be grubbed out and efforts made to identify any residual historic obstructions / structures within the ground requiring removal. A watching brief should be maintained throughout these works for evidence of significant contamination.

Over and above removal of known and suspected obstructions, a 10m grid of trial pits shall be competed to the base of the Made Ground to identify and areas of significant visual and olfactory contamination. Should the grid testing indicate any areas that are contaminated, further targeted sampling and testing will be undertaken to determine extent of contamination, and these soils will be excavated for on-site treatment, or offsite disposal (as above).

Where visual or olfactory evidence of significant contamination is observed, the works should be stopped while a plan of investigation and treatment is agreed. Should any visual or olfactory contamination be encountered then this will be sampled, tested and areas excavated for on-site treatment, or off-site disposal (depending upon the nature of the contamination encountered). Where any significantly impacted soils are encountered requiring removal, these shall either be removed directly to waggons for off-site disposal or placed within a bunded area for further sampling and potential treatment.

Refer to Remediation Plan drawing for extent of former gas works area.

Based on the available ground investigation data, it is considered unlikely that volumes of impacted soil will justify on site treatment, as such off-site disposal is considered likely to be preferable.

4.6 Import of Soil and Aggregate

4.6.1 Topsoil and Subsoil

Topsoil and subsoil import will be required to construct the clean cover systems to landscaped areas. No further import of topsoil or subsoil is envisaged to be required.

Imported topsoil and sub soil will be from a known source and appropriate for its use. Chemical certification shall be provided for all materials imported to site, as follows. Source testing in accordance with the chemical analysis listed in **Appendix C** shall be carried out at a rate of one sample per 500m^3 or a minimum of three samples of soil per source to confirm suitability prior to import to site.

In addition to meeting the chemical criteria discussed above, imported materials must be free from anthropogenic materials such as bricks, wood, concrete, glass, metal and plastic, and no visual or olfactory evidence of contamination should be present.

4.6.2 Aggregates

Primary aggregates imported to site should be supported by quarry certificates to demonstrate suitability for use.

Secondary aggregates imported to site should be shown to have been produced in accordance with the WRAP Quality Protocol for the production of aggregates from inert waste and confirmed free of visual and olfactory evidence of contamination, including (but not limited to) the visual presence of asbestos containing materials and bituminous materials containing coal-tar, and hydrocarbon straining and odours. Records should also be collected detailing the total volume of imported materials and their locations of use.

Recycled aggregates imported to site should be subject to sampling and chemical analysis at a rate of one sample per 100m^3 or a minimum of three samples of soil per source and is required to meet the chemical test criteria in **Appendix C** to demonstrate absence of contamination.

4.7 Protection of Site End Users

4.7.1 Installation of Capping Layer

The principal remedial action to protect site end users is to provide a capping layer in areas of proposed soft landscaping, to isolate end-users from elevation of contaminants in shallow Made Ground.

Where buildings and hardstanding are present, this will provide adequate protection and no additional capping is required in these areas.

In limited areas of soft landscaping on the site, a specific topsoil and geotextile engineered capping layer will be required.

Based on the contamination identified in the 2021 Waterman Due Diligence report, a capping layer was calculated following BRE465. The capping layer will require to comprise a total thickness of 600mm, comprising a basal geotextile marker and layer, overlain by clean imported topsoil.

The geotextile marker layer will comprise high visibility marker/separator layer, such as a Lotrak Alarm High Vis Geotextile Membrane or similar.

The topsoil and subsoil capping layer will be installed on top of the geotextile marker layer and will provide a suitable growing medium for plants. Specification, testing, handling and importation of topsoil should be in accordance with BS 3882:2015 Specification for Topsoil.

Tree pits (if any) will not have a marker layer and the location and size will be appropriate to the chosen tree species, and with due regard to the proximity of the proposed planting to sensitive structures.

4.7.2 Vapour Protection Measures

Vapour protection measures are to be installed in selected plots where a vapour risk has been identified. These comprise the following specific plots:

- **Plots 15-23, 37 – 41, 165 - 321**

Vapour protection measures will comprise a hydrocarbon and volatile vapour proof membrane being installed in the floor slab of the plots listed above.

The membrane installed will be sufficient to resist vapour intrusion by TCE and related VOC substances and will need to be designed and specified to ensure appropriate sealing around service entries and other entries through the floor slab or subfloor.

The specific details of the vapour protection measures will need to be designed by the structural engineer (and will vary depending upon the structural floor slab solution to be adopted) and will need to comply with requirements set out in *BS 8485 2015 + A1 2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings* and *CIRIA C716 Remediating and mitigating risks from volatile organic compound (VOC) vapours from land affected by contamination.*

The specific plots for which vapour protection is required are indicated on plan in **Appendix B**.

4.7.3 Use of Suitable Water Pipe Materials

Drinking water supply pipes should be resistant to the ground conditions present and should meet the requirements of Wessex Water. Given the contamination encountered and the brownfield nature of the site, barrier pipes are considered necessary to provide sufficient protection for the supply of drinking water.

4.8 Protection of Construction Workers

This Remediation Strategy focuses on chronic (long-term) risks to human health, but there exists a potential for acute (short-term) impacts to construction workers and future workers from site soils.

It is recommended that as a minimum task-specific PPE is always worn, that construction dust and road cleansing is managed, and that adequate messing and hand-washing facilities are provided for all site staff.

Toolbox talks should be provided to inform workers of risks of handling soils and need to observe suitable hygiene practices.

In addition, information relating to the condition of site soils should be passed onto the Client in line with the requirements of the CDM Regulations so that potential risks arising during future earthworks at the site can be avoided or mitigated.

There also remains a risk regarding unforeseen contamination, notably asbestos, being encountered during site works, and relevant contingency measures should be in put in place to deal with unexpected contamination (as set out in Section 5.0).

There also remains a risk regarding volatile hydrocarbon vapours from underlying hydrocarbon contaminated soils, particularly within confined spaces and excavations. Adequate temporary ventilation measures may be required in this regard.

Works should take place in accordance with the Control of Asbestos Regulation (CAR) 2012 and the Confined Spaces Regulations 1997. The Construction Design Management (CDM) Regulation 2015 will also apply to the works.

A Construction Environmental Management Plan (CEMP) should be prepared for the redevelopment works. The CEMP should set out the standards of construction logistics and practices that will minimise (if not eliminate) the impacts of the project upon the local environment and local community surrounding the site.

4.9 Asbestos Risk Management Plan

Asbestos screening and quantification analysis undertaken to date has identified the presence of asbestos locally within the Made Ground soils. Guidance should be sought from the CIRIA Document 'Asbestos in Soil and Made Ground: A Guide to Understanding and Managing the Risks' for works in relation to soil excavations.

To allow the works to progress an Asbestos Risk Management Plan (ARMP) should be prepared which will comply with the Control of Asbestos at Work Regulations (2012) for use during the earthworks and construction works. The requirement for air monitoring or similar shall be considered by ARMP.

To manage potential fibre release, dust suppression techniques should be employed when excavating the site soils.

Future Contractors should develop an Asbestos Discovery Plan to be implemented in the event of unforeseen/ previously unknown asbestos materials being encountered during the earthworks and construction works proposed at the site.

4.10 Disposal of Contaminated or Unsuitable Material

If waste soils require removal and disposal off-site, the future Contractor should undertake waste classification analysis to confirm the waste classification of the material and identify a suitable licensed facility to accept the waste. Copies of all relevant licences for the disposal / treatment site should be provided prior to the waste being taken off site. Any material exported from site to landfill should be hauled by a registered waste carrier in accordance with the requirements of the Duty of Care Regulations and the Landfill (England & Wales) Regulations 2005.

A transfer note should be completed, signed and retained by the parties involved. The transfer note should include the volume of waste, the nature of the material and a statement of its chemical composition, details of the source and destination sites, and details of the haulier.

The removal of contaminated soils and/or solid waste will require the Contractor to make available onsite all supporting documentation as required under:

i. Part II of the Environmental Protection Act 1990;
ii. The Landfill (England and Wales) Regulations 2005;

iii. All Waste Management documentation shall be made available for inspection and auditing by the Environmental Engineer and the Regulatory authorities;
iv. All waste activities and Environmental Permitting activities shall be undertaken in accordance with the Environmental Permitting Regulations 2007.

4.11 Statutory Approvals

All necessary approvals from the statutory authorities, including Wiltshire Council, the Environment Agency and Wessex Water, will be obtained for the works undertaken.

A Validation Report will be submitted to Wiltshire Council at the appropriate time.

The works will be carried out and comply with all current applicable standards, codes, regulations, planning conditions, guidance notes, legislation and health and safety conditions.

5. Unforeseen Contamination

5.1 General

A 'watching brief' will be maintained during ground works to ensure any unidentified or unexpected contamination is identified and adequately dealt with (outside and beyond the area identified for specific remedial works above).

5.2 Procedure for Dealing with Unexpected Contamination

In the event that suspect materials (soils, groundwater, free phase hydrocarbons, unidentified liquids or solids, etc.) are encountered:

1. The site engineer will inspect the suspected material and will make a judgment call based on odour and discoloration of material. If the material is identified as requiring further assessment, or a structure has been identified which is retaining pollutants (such as a tank or building foundation etc.) works will cease in that area and Jubb notified immediately to inspected and test (as appropriate).

2. If excavated materials are identified as potentially containing unexpected contamination, they will need to be stockpiled separately to allow testing to be undertaken.

3. On the basis of the above assessment, materials can then be:

    a) Left in-situ;
    b) Excavated and quarantined pending treatment and re-use on-site or offsite disposal;
    c) Removed immediately to a waste treatment facility.

4. In the case that a significant new source of contamination is identified, the Local Planning Authority will be informed, and further assessment will be required to determine need for remediation.

5. Once the appropriate method has been identified and agreed with the Local Planning Authority, validation and verification testing will be carried out to show that the remedial activity has been successful and these findings, along with any Waste Regulations duty-of-care paperwork will be added to the final Verification Report.

6. Verification Plan and Reporting

6.1 Verification Report

A Verification Report will be compiled in line with the methodology outlined in Model Procedures for the Management of Land Contamination (CLR 11) to demonstrate that the works set out in the Remediation Strategy (above) have been completed.

The report will contain the following elements:

6.1.1 Site Capping Layer Validation

The soils used to form the capping layer will comprise clean imported subsoil and topsoil, which will be inspected, tested and approved prior to being imported to site. In addition, a watching brief will be maintained during placement of the imported soils with any out-of-specification soils being rejected and removed from site.

Verification testing and checking of 'as installed' depths shall be undertaken in the rear garden areas of 1 in 4 plots and within any significant areas of open space/landscaping. Inspections shall visually confirm the suitability of the soils used, the placed depth, the presence of the marker layer (with photographic evidence). Samples of topsoil and sub-soil taken for confirmatory laboratory testing from each plot inspected and tested for compliance in line with the import criteria set out in **Appendix C**.

Verifications letters shall be produced as required on a rolling basis as plots are completed.

6.1.2 Vapour Membrane Verification

Verification of the installation and construction of the vapour membrane will need to be undertaken in accordance with the verification requirements set in *BS 8485 2015 + A1 2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings* and *CIRIA C716 Remediating and mitigating risks from volatile organic compound (VOC) vapours from land affected by contamination.*

This will comprise collation of the following information by the installer/verifying party:

- a description of measures installed and type of VOC resistant membrane installed (as photographic records or by as-built construction drawings) including any variations to the pre-construction design should be fully detailed and justification(s) presented.
- details of who installed the measures;
- details of who inspected or verified the installation/s and a description of how this took place, together with any constraints (i.e. areas that could not be inspected or tested) or other issues of uncertainty
- any defects identified, together with corrective actions and subsequent verification checks.

Where appropriate, the report content should also include:

- copies of regulatory correspondence/sign off;
- manufacturers' specifications, warranties and/or guarantees;
- personnel details (such as relevant qualifications); and
- maintenance requirements and/or limitations of the system.

In all circumstances, the report should provide a concluding comment about the suitability (or otherwise) of installed gas measures and include the name of the author, company details and date of issue.

6.1.3 Validation of Imported Materials

Records are to be maintained of material importation, including details of the source of material, relevant verification testing and location deposited on site.

Validation testing requirements for imported topsoil materials are set out in **Appendix C**.

6.1.4 Unexpected Contamination (if encountered)

If encountered, unexpected contamination will need to be dealt with as per the methodology set out in Section 5. The Verification Report will include relevant plans identifying areas where unforeseen contamination was identified, and details of how this was addressed, if appropriate.

6.1.5 Waste Management

The Verification Report will also need to include duty-of-care reporting under the Waste Regulations.

Should a Materials Management Plan be employed at the site, a separate MMP Verification Report will be compiled in accordance with the CLAIRE DoW CoP, detailing the re-use of site-won and imported material(s), as appropriate.

Appendix A: Proposed Site Development Plan

A0

OM

House Type	No of Bedrooms	Occupancy	GIA(SqM)	GIA(SqFt)	No	Total SqFt
Cherry	2B	4P	79.1	851	5	4255
Hazel	3B	4P	86.6	932	24	22364
Spruce	3B	5P	102.2	1,100	7	7697
Beech	3B	5P	104.5	1,124	7	7871
Juniper	4B	5P	113.1	1,218	12	14610
F01L	1B	2P	51.4	553	12	6635
F03L	2B	3P	61.7	664	81	53766
F01+	1B	2P	61.1	746	4	2984
Mountford	3B	5P	90.2	971	2	1942
Eveliegh	3B	5P	80.3	864	4	3456
Pembroke	4B	8P	125.9	1,355	4	5420
TOTALS					**162**	**131000**

F01L	1B	2P	51.4	553	18	9952
F03L	2B	3P	61.7	664	56	37172
Atkins	2B	3P	70.9	763	35	26719
Francis	3B	5P	80.0	862	35	30156
Allum	4B	5P	103.8	1,117	9	10056
TOTALS					**153**	**114054**

S106 Affordable

House Type	No of Bedrooms		GIA(SqM)	GIA(SqFt)	No	Total SqFt
F01L	1B	2P	51.4	553	8	4423
Atkins	2B	3P	70.9	763	6	4580
TOTALS					**14**	**9003**

SITE TOTALS	**329**	**254058**

Affordable Tenure Key

- Rented
- Shared Ownership
- S106 required plot

scale 1:500 (0, 10m, 20m, 30m)

N

Romsey Office
Building 300, The Grange,
Romsey Road,
Michelmersh, Romsey,
Hampshire, SO51 0AE
T:01794 367703 F:01794 367276

Portishead Office
Unit 5, Middle Bridge Business Park
Bristol Road,
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Bristol, BS20 6PN
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Rev	Description	Date	Au	Ch
A	Issued for Planning	06.2022	KK	MS
B	Issued for Planning	07.2022	KK	MS
C	Flat Block 11 updated.	08.2022	EBE	MS
D	Affordable Tenure locations amended.	08.2022	EBE	MS
E	Plots 1-18 amended. Southeastern connection amended.	10.2022	KK	MS
E1	Plots 1-18,121-128,242-253 amended. Southeastern connection amended.Plot nos & parking numbers updated.Some additional gates & fences added for security.	08.11.2022	KK	MS
E2	Access to gas holder site widend to 4.8m. Visitor Cycle parking added.Cycle path on western corner widend to 3.0mt.	09.11.2022	KK	MS
E3	Plots 1-14 amended. Cycle Parking stores amended.	11.11.2022	KK	MS
F	Landscape Information updated.	15.11.2022	KK	MS
G	Garden Gates added as per comments from LA.	02.02.2023	KK	MS
H	Highways information added on spine road. Radii to access roads changed in south east corner. Two Substations Added. Plots 1-31 renumbered, plots 1-3 & 26-31, 106-120& 317-329 amended.	02.2023	KK	MS

Project **Langley Park, Chippenham**

Drawing **Coloured Site Layout**

Client	**Vistry Partnerships**				
Job no.	**VIST220215**			Date	**18.03.22**
Dwg no.	**CSL.01**			Revision	**H**
Author	**RP**	Checked	**MS**	Scale	**1:500 at A0**
Status	PLANNING			Office	**Portishead**
Client ref.					

thrive. architects

Appendix B: Proposed Remediation Plan

392000 392100 392200 392300 392400 392500 392600

174400 174300 174200 174100 174000 173900

VS617 VS660 VS610 BH415

N

0 50 100 200 300 400 500 Meters

Legend

- Site Boundary from Planning
- Discovery Strategy and Inspection Areas
- Vapour Protection to be provided to buildings
- Proposed Layout - Roads & Plots
- Proposed Layout - Buildings and Plot Numbers

* - Locations of historic contaminative site use inferred from Waterman GI reports and historic OS Mapping only.

Locations of BH200, BH300, BH400 series located from Waterman Drawing only - Co-ordinates not available.
Drawing not to be used for setting out, for information only.

Information Sources:
1936, 1963, and 1978 OS Mapping,
WSP Drawing WIB15376-103_GR_PERA_A4A

By:	DW	Date:	21/07/2023
Check:	PW	Date:	21/07/2023

Project
Langley Park, Chippenham

Title
Remediation Strategy Plan

Client
Countryside Partnerships

Scale at A3: 1:2,100

Job No.	Drawing No.	Rev.
23166	GES06	A

Appendix C: Importation Criteria

F1 Soil Importation for Capping

1.1 Specification

It is expected that most of the material for the engineered capping layer will comprise clean topsoil imported to site from commercial sources, and which has previously been tested and determined as clean and fit for purpose.

Imported topsoil shall be obtained wherever possible from a single source, which has been tested and approved in advance by the Contractor.

For each proposed source of topsoil to be used on the site, on site sampling shall be carried out at a ratio of 1 to 100m^3 of imported volume (or a minimum of three representative samples obtained for each source, whichever is greater).

The soil samples from the proposed sources of imported topsoil and subsoil shall be tested for the full range of contaminants listed below. The results of the laboratory testing shall be compared to the remediation criteria listed below. If one of the determinants (or the 95% upper confidence limits of all the test results) exceeds the specified acceptance criteria, then the proposed source of the soil will not be used.

On completion of the placement of the capping layer, validation inspections to verify that the minimum required thickness of clean topsoil has been placed (including the basal geotextile marker layer if specified) shall be carried out. At the same time a visual inspection of the topsoil shall be undertaken to ensure that the materials are consistent with the previously approved sources of soils. A photographic record of the validation inspection at each nominated location will be undertaken.

1.2 Importation Criteria

All imported topsoil shall be visually inspected to ensure the material comprises clean, naturally occurring soils. No visual or olfactory contamination is permitted (i.e. fragments of asbestos, obvious hydrocarbon or heavy organic odours, oily soils or liquids.). Soils should be free from man-made inclusions (bricks/concrete/plastic/wire etc.).

The soils shall be tested by a UKAS accredited laboratory for the following determinants, and laboratory results shall be provided to indicate that the soils are below the relevant thresholds.

Specification, testing, handling and importation of topsoil should be in accordance with *BS 3882:2015 Specification for Topsoil.*

Testing of soils to meet the following criteria, prior to importation.

Contaminant	Importation Criteria (mg/kg)	Source
Metals, Semi-metals, Others		
Arsenic	40	C4SL
Cadmium	10	CLEA
Chromium III	3000	CIEH
Chromium IV	4.3	CIEH
Lead	310	C4SL
Mercury	170	CLEA
Selenium	350	CLEA
Copper	2330	CIEH
Nickel	130	CLEA
Zinc	3750	CIEH
Total Cyanide	480	CLEA
Phenol	3200	CLEA
Asbestos ID	None permitted (as fibres or fragments)	
Asbestos (visual check for identifiable fragments in soil mass/sample)	None permitted	
Speciated Hydrocarbons		
Aliphatic C5-C6	42	S4UL
Aliphatic C6-C8	100	S4UL
Aliphatic C8-C10	27	S4UL
Aliphatic C10-C12	130	S4UL
Aliphatic C12-C16	1100	S4UL
Aliphatic C16-C21	65000	S4UL
Aliphatic C21-C35	65000	S4UL
Aromatic C5-C7	70	S4UL
Aromatic C7-C8	130	S4UL
Aromatic C8-C10	34	S4UL
Aromatic C10-C12	74	S4UL
Aromatic C12-C16	140	S4UL

Aromatic C16-C21	260	S4UL
Aromatic C21-C35	110	S4UL
Poly-aromatic Hydrocarbons		
Acenaphthene	210	S4UL
Acenaphthylene	170	S4UL
Anthracene	2300	S4UL
Benz[a]anthracene	3.1	S4UL
Benzo[a]pyrene	0.83	S4UL
Benzo[b]fluoranthene	5.6	S4UL
Benzo[ghi]perylene	44	S4UL
Benzo[k]floranthene	8.5	S4UL
Chrysene	6	S4UL
Dibenz[ah]anthracene	0.76	S4UL
Fluoranthene	260	S4UL
Fluorene	160	S4UL
Indeno[123-cd]pyrene	3.2	S4UL
Naphthalene	1.5	S4UL
Phenathrene	92	S4UL
Pyrene	560	S4UL

Appendix D: Ground Gas and Vapour Risk Assessment - Technical Note

Title:	Ground Gas Risk and Vapour Risk Assessment
Site:	Langley Park, Chippenham
Date:	08/08/2023
Prepared:	P Webber
Checked:	R Hooker
Version:	P2

1. Introduction

1.1 Commission and Objectives

Jubb Consultant Engineers Limited (Jubb) were commissioned by Countryside Partnerships (Countryside) to undertake a volatile vapour and ground gas risk assessment for the Langley Park site in Chippenham.

Previous ground investigations by others have established a volatile vapour risk at the site, related to various historic sources of contamination. A potential ground gas risk had also previously been identified at the site, but the nature and extent of mitigations had not been confirmed. Furthermore, where updated radon guidance was published in December 2022, an updated radon repot is required for the site.

This Technical Note reports on works to refine the extent and nature of the ground gas and vapour risk and provide recommendations for vapour and ground gas protection for the proposed development at the site.

These works have been undertaken in accordance with Jubb's email fee quotation ref PP230311 V2, dated 20/03/2023, and the Client's instructions to proceed via email dated 22/03/2023.

This report is for the sole use of Countryside (to whom alone is owed a duty of care), their professional advisors and consultees; it may not be relied upon or reproduced by any third party for any use without the written agreement of both Jubb and Countryside.

Several Ground Investigation reports have been prepared by Watermans Ltd, and the relevant sections of these as they relate to gas or vapour investigations at the site have been summarised below.

Supplementary monitoring and sampling has been undertaken by Jubb relating to ground gas and vapour, entail further in-situ gas monitoring of existing wells on the site and laboratory testing of gas samples, as detailed in Section 4 below.

A risk assessment is presented for both ground gas and volatile vapours (Section 6) and a summary with recommendations for mitigation measures is provided (Section 7).

1.2 Previous Reports

The following GI reports have been provided by the Client or obtained from the planning portal, and these are reviewed below in the context of ground gas and vapours.

Reports upon which the client has reliance.

- Updated 2014 Ground Investigation at Langley Park (Environmental Site Appraisal), Waterman, WIE19206-100-R-1-1-3-ESA, for Vistry Partnerships West, July 2022 - *client has reliance on this report.*
- Preliminary Risk Assessment, Waterman, WIE19206-100-R-2-2-1-PRA, for Vistry Partnerships West, November 2022 - *client has reliance on this report.*
- Geo-Environmental Interpretative Report, Waterman, Ref WIE19206-100-R-3-2-1-GIR, for Vistry Partnerships West, November 2022 – *client has reliance on this report.*
- Supplementary Due Diligence Geo-Environmental Interpretative Report, Waterman, Ref WIE18542-100-R-1-4-1-GIR, December 2021 – client has reliance on this report.Preliminary Remediation Strategy Report, Waterman, WIE18542-100-R-2-1-3-RS, December 2021 – client has reliance on this report.

Additional reports obtained from the Planning Portal

- Environmental Site Appraisal, Waterman, EED14318-100-R-1.3.2-MA, for Langley Properties Limited, July 2014 - *not undertaken for current client, but has been reproduced for client in updated version, as referenced below*
- Preliminary Environmental Risk Assessment, Waterman, WIB15376-103.R.1.1.7.JC, for Chippenham Properties and Langley Properties Ltd, March 2016 - *not undertaken for current client, available on the planning portal.*
- Preliminary Remediation Strategy, Waterman, WIB15376-103.S.1.1.6-ALM, March 2016 - *not undertaken for current client, available on the planning portal.*

2. Site Overview

The site is situated in central Chippenham with access from Westinghouse Way on the northern side of the site.

The site is a derelict former industrial site, comprising several large-scale industrial metal-clad and brick buildings, a car park and area of unoccupied land. The site is reasonable flat and level, topographic levels range 61m in the south to 68m on the northern boundary.

The site and wider Langley Park Industrial Estate has historically been used for a wide variety of industrial processes including gas manufacture, metal fabrication, brake manufacture and electrical component manufacture. Brake and signalling works associated with the railway industry have been on site since the 1930s. Since 2015, the wider industrial estate has been subject to various planning applications relating to proposed redevelopment which has resulted in the localised demolition of some former industrial buildings, resulting in stockpiles of materials left on site. The site extent is indicated on the figure below.



Figure 1: Site Extents

3. Planning Context

Outline planning consent was obtained for the wider development in 2017 by Chippenham Properties and Langley Properties Ltd under planning reference 16/03515/OUT. The consent covered demolition of existing buildings and

redevelopment to provide up to 400 residential units hotel, café, discount food store and commercial units, along with road infrastructure.

The following reports were submitted as part of this outline application:

The Waterman Ltd Environmental Site Appraisal (Ref EED14318-100-R-1.3.2-MA, March 2016) was submitted as

- Preliminary Environmental Risk Assessment, Waterman, WIB15376-103.R.1.1.7.JC, for Chippenham Properties and Langley Properties Ltd, March 2016.
- Environmental Site Appraisal, Waterman, EED14318-100-R-1.3.2-MA, for Langley Properties Limited, July 2014.
- Preliminary Remediation Strategy, Waterman, WIB15376-103.S.1.1.6-ALM, March 2016

A Reserved Matters (RM) application was submitted for the site area now under the ownership of Countryside Partnerships in 2019, under reference 19/12100/REM, for 333 dwellings and related access roads and infrastructure.

A search of the planning portal indicates that no additional GI information was submitted as part of the RM application.

Under the above Outline Planning Reference, Pre-commencement Condition 15 was applied with respect to contamination, calling for site characterisation, submission of remediation scheme, implementation of approved remediation scheme, reporting of unexpected contamination (if encountered) and verification of remedial works.

Remediation information has been submitted to partially discharge Condition 15, submitted under planning reference 19/08832/DOC, but this relates to removal of a UST and interceptors on a part of the outline application site area that is outside the reserved matters planning boundary now under consideration, and is therefore not considered of relevance.

No further information has been submitted to discharge planning Condition 15 within the reserved matters site area.

4. Report Review

4.1 Environmental Site Appraisal, Waterman, 2014

This report comprises an environmental appraisal and investigation of the wider 'outline application' site, which included the industrial units to the immediate northeast of the site area now under consideration.

The investigation works comprised approximately 41 no. window sample boreholes, 10 no. vapour monitoring wells, 14 rotary boreholes, ground gas and vapour monitoring, contamination analysis (91 no. soils samples, 27 no. groundwater samples) and interpretative reporting.

Many of the investigation locations were outside of the current site area. Some of the holes beyond the site boundary but situated close to it will be of relevance when assessing the vapour risk associated with TCE and related substances.

In terms of ground conditions, these were found to comprise a veneer of made ground proven to thickness of between 1.5m – 2.0m across the site. Made Ground is underlain by Cornbrash Formation in the central, southern and western areas of the site, which comprises gravel of limestone or orange brown sandy gravelly clay. Kellaways Clay/Sand was encountered across the remainder of the site.

Groundwater monitoring undertaken in 2014 across the wider site area appeared to encounter reasonably consistent groundwater levels within the Cornbrash Formation, with groundwater gradient falling towards the southeast (as would be expected here).

This report identified the following principal historic contamination sources on the site, relevant to vapours and ground gas:

- Former Paint and Platting Shop.
- Former Retort House associated with the Town Gas Works.
- Former TCE Store.

These point sources of contamination are shown on plan in Figure 1 below.

A detailed vapour modelling assessment was undertaken, which indicated potentially harmful elevated VOCs in the following locations on site:

- Plating and Paint Shop (on site) – VS612 and VS660.
- TCE Store (on site) – VS661 and VS610.

And the following locations off site.

- Westcode Semi-conductors (off site to the north) – VS645, VS655, VS656 and VS657.
- Chemical store (off site to the north) – VS641 and VS658.

These locations are shown on Plan in **Annex 1**.

These locations were determined as being at an unacceptable risk of vapour accumulation in future site buildings within the impacted areas of the site (and recommended vapour barriers in buildings in these areas of the site). However, further monitoring was recommended to confirm these conclusions because of the limited data set available.

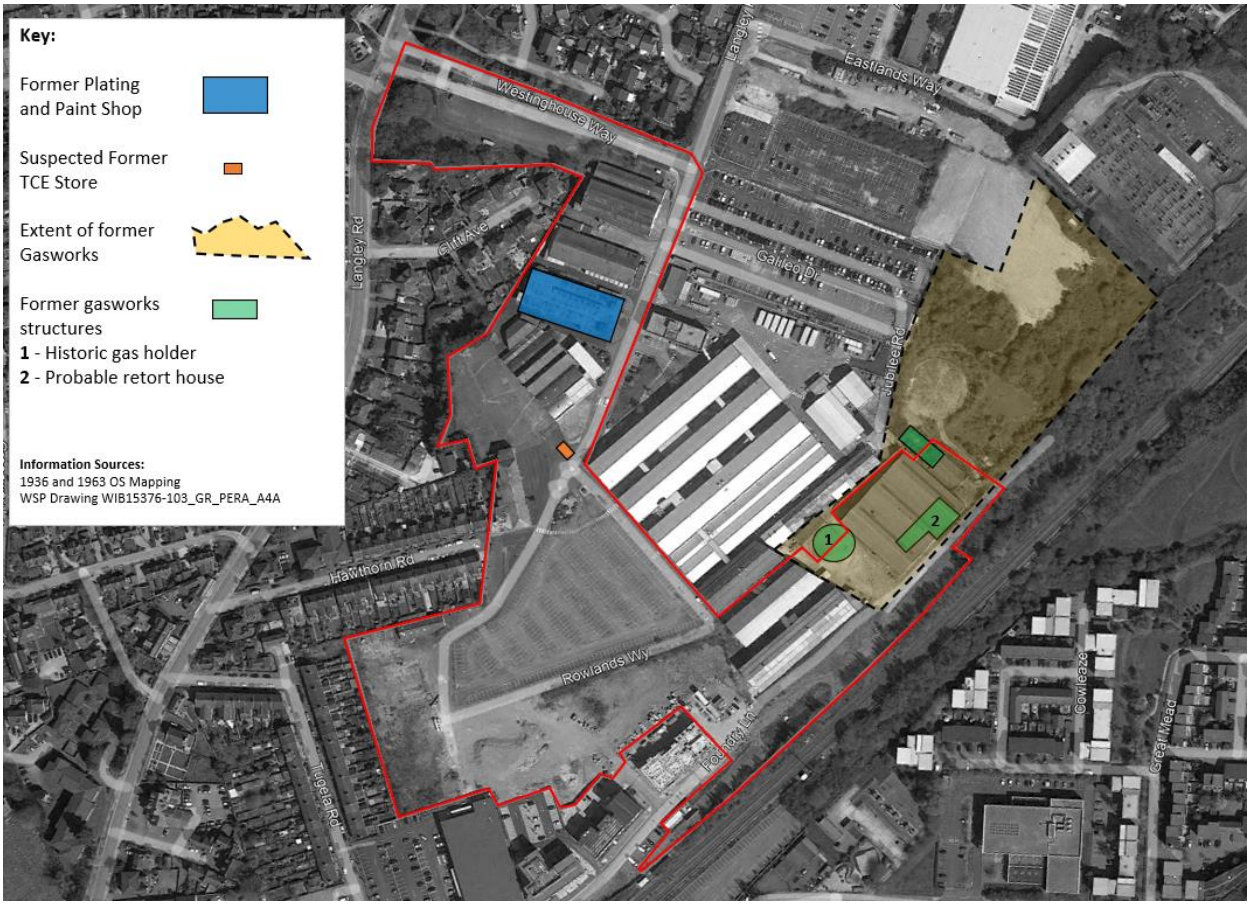

Figure 2 - Principal Contamination Point Sources

The ground gas assessment undertaken indicated a limited potential for the generation of ground gas, and lack of significant organic material. However, further ground gas monitoring was recommended due to the limited data set available.

4.2 Preliminary Risk Assessment, Waterman, 2022

This report was undertaken in 2022 on behalf of Vistry Partnerships West (VPW) and provides a preliminary assessment of contamination risk for the site. The objectives of the report are stated as *"it is intended that this report will assist in*

the discharge of Condition 15 (i) 'Site Characterisation' of Wiltshire Council Application Reference Number 16/03515/OUT".

The report presents no new information and summarises earlier information regarding potential site risks. It presents the following potential contamination linkages regarding ground gas and vapours:

- Ingress of vapours into new structures in impacted areas may create a risk to future Site residents and structures.

In summary, the report remained inconclusive with respect to recommendations for vapour or ground gas protection measures across the site, and recommended additional ground gas monitoring be carried out to confirm the ground gas regime.

4.3 Geo-Environmental Interpretative Report, Waterman, 2022

This report was undertaken in 2022 on behalf of Vistry Partnerships West (VPW) to detail the findings of supplementary ground investigations. The objectives were "to provide a ground investigation and prepare a Geo-Environmental Interpretative Report", as follows:

- "*Verify the findings and recommendations of previous phases of investigation with respect to the current Site and provide further information on ground conditions and contamination within areas of the Site not investigated to date, with the overall goal of updating the Site's conceptual model to reflect development proposals;*
- *Identify and determine whether there is any additional requirement for information from the data collected and assessed as part of the ground investigation.*
- *Provide recommendations related to ground contamination to facilitate the proposed Development;*
- *Prepare an updated outline Remediation Strategy for the Site;*
- *Make preliminary recommendations on suitable foundation types; and*
- *Prepare a Preliminary Foundation Zoning Plan (issued under separate cover)."*

Additional ground investigation works were undertaken including vapour samples collected from 6no. borehole installations and tested for volatile suite, bulk gases, and hydrocarbons.

The following conclusions were drawn from the updated contamination assessment:

> *Ground Gas Regime - Based on the monitoring data collected as part of the recent investigation and previous 2014 investigation, the Site is provisionally classified as CS-1 with respect to ground gas, whereby ground gas protection measures are not considered to be necessary in future properties.*
>
> *Vapour Regime - Vapour modelling has confirmed a potential for vapour intrusion into future residential properties associated with locally elevated TCE and consequently vapour protection measures will be required. However, due to the localised nature of the exceedances, a blanket approach to the use of vapour protection measures is likely to be overly conservative. It is considered there would be benefit in undertaking further investigation and DQRA as future development plots are taken forward to determine whether there is a plot-specific requirement for vapour protection. No risk is considered to off-Site receptors from volatile contaminants migrating in the groundwater."*

Whilst the supplementary investigations presented within the above report are of use and support the conclusions drawn by Watermans in their previous reports, it is not clear why further vapour monitoring was not completed, given the stated objectives.

5. Supplementary Ground Investigation Works

Based on review of above reports, acquisition of further data remains necessary to;

a) adequately characterise the ground gas regime below the site and the risk (if any) this poses to the development;

b) confirm the radon protection requirements for the site; and
c) allow vapour protection measures to be specified.

Therefore, a program of further investigation was undertaken at the site, comprising:

- A reconnaissance site visit to identify serviceable boreholes that could be utilised for further gas and vapour monitoring (focusing on areas outside these previously investigated, to refine and extend the assessment).
    - The intention was also to target holes that had been tested previously to determine any change over time, but it was largely not possible to identify these holes (i.e. holes obscured or destroyed), or the holes were found not to be serviceable (blocked or broken pipework).
- 4 no. return visits for gas monitoring purposes (CO2 & CH4).
- Collection of gas samples for bulk gas, hydrocarbon and volatile analysis (12 no samples).
- Procurement of a Radon Report for the site.

The details of the boreholes used for monitoring and sampling purposes are set out below:

Table 1: Gas and Vapour Monitoring - Borehole Summary

Borehole	Well Depth (m bgl)	Response Zone Depth (m bgl)	Target Strata	Groundwater Levels during monitoring (m bgl)
WS611	4.0	2.0 - 4.0	Cornbrash Formation	2.71
VS612	3.5	0.5 – 3.5	Made Ground & Cornbrash Formation	Dry
R21/2	1.0	0.5 - 1.0	Made Ground	Dry
WS21/3	6.0	3.0 - 6.0	Kellaway Formation	2.26
WS652	4.0	2.0 – 4.0	Kellaway Formation	2.78
WS21/14	2.4	0.5 – 2.4	Made Ground	2.77
BH610	16.50	12.5 - 16.5	Kellaway Formation	Dry
WS21/4	2.0	0.5 – 2.0	Cornbrash Formation	2.0
WS21/5	1.0	0.5 – 1.0	Cornbrash Formation	Dry
WS21/11	2.0	0.5 – 2.0	MG and Cornbrash Formation	Dry
WS604	1.5	1.0 – 1.5m	Kellaway Formation	Dry
R21/1	10	5.7 – 10m	Kellaway Formation	Dry

The boreholes utilised for the monitoring and sampling works are indicated on the figure below and are shown on plan in **Annex 1**.

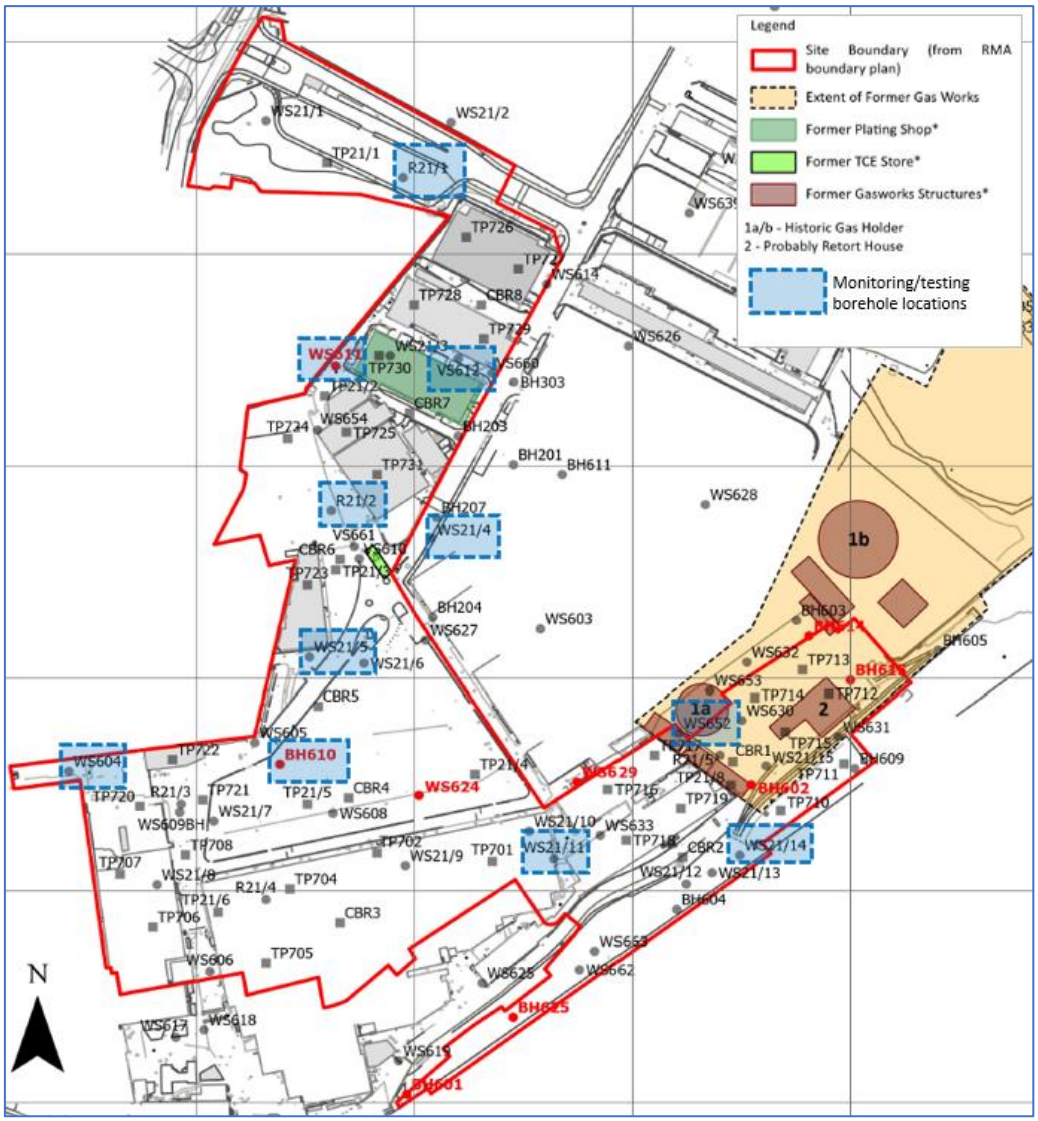

Figure 3: Ground Gas and Vapour Monitoring Locations (2023)

6. Risk Assessment

6.1 Introduction

The following section provides an assessment of both ground gas risks and vapour risks, and is based on an assessment of all data contained within the reports upon which the client has reliance (i.e. these listed in section 1.2.2 above).

Accordingly, all relevant data from these previous reports has been used and summarised in the assessment below.

6.2 Ground Gas - Generic Quantitative Risk Assessment

Ground gas risk assessment has been carried out in accordance with CIRIA C665, 2007, and BS 8385: 2015 + A1:2019.

As reported above, a previous ground gas risk assessment has been undertaken by Waterman. This comprised monitoring of ground gas in various borehole across the wider site area in 2014 and across the specific site area now under consideration in 2021.

The monitoring in 2014 comprised a single round of monitoring of 48 no. wells across the wider site area, which did not encounter any elevated carbon dioxide or methane.

Monitoring in 2021 comprised 3 rounds of monitoring of 13 no. holes in September and October 2021. This monitoring indicated some sporadic elevations of both Carbon Dioxide and Methane, and flow rates consistently below 0.1 l/hr.

Elevated methane and carbon dioxide was encountered in R21/1, and elevated methane in WS21/3.

WS21/3 is close to the plating works and thee elevated methane is likely to be indicative of VOCs in soils at this location.

R21/1 is not close to any expected VOC source, and the source of the gas here is unclear. Reference to the borehole log for R21/1 does not indicate any made ground (although the log is noted to be lacking in detail). The relevant proportions of ground gases are likely indicative of a general made ground source, although existing drainage runs or other unidentified sources (such as localised organic material in made ground) cannot be discounted. Further supplementary monitoring of borehole R21/1 (in 2023) did not encounter any elevated ground gas. However, an additional 3 rounds of monitoring are recommended to fully confirm the assessment set out below.

The ground gas assessment was summarised by Waterman as follows:

> *"Based on the monitoring data collected as part of the recent investigation and previous 2014 investigation, the Site is provisionally classified as CS-1 with respect to ground gas, whereby ground gas protection measures are not considered to be necessary in future properties."*

However, further monitoring was indicated as being necessary, which has been reported below.

Gas Screening Values have been calculated on a hole by hole and worse case basis, and relevant Characteristic Situation has been determined based on the supplementary monitoring undertaken.

Table 2: Gas Monitoring Results

Date	Hole Position	Water Level (mbgl)	Max Gas Flow (l/hr)	Max Oxygen (%/vol)	Max CO2 (%/vol)	Max CH4 (%/vol)	GSV (CO2)	CS (CO2)	GSV (CH4)	CS (CH4)
06/04/2023	WS21/14	-	0	18	0.3	0	0	CS1	0	CS1
	WS21/2	-	0	20	0	0	0	CS1	0	CS1
	WS21/3	-	0	18	0.1	1.6*	0	CS1	0	CS1
	WS627	-	0	19.9	0	0	0	CS1	0	CS1
	WS21/5	-	0	19.9	0	0	0	CS1	0	CS1
	BH13	-	0	18	1.1	0	0	CS1	0	CS1
	BH305	-	0	18	1.5	0	0	CS1	0	CS1
	BH118	-	0	20	0	0	0	CS1	0	CS1
	VS610	-	0	18.5	1	0	0	CS1	0	CS1
13/04/2023	WS611	2.71	0	20.1	0	0	0	CS1	0	CS1
	VS612	-	0	13.2	1.2	0	0	CS1	0	CS1
	R21/2	-	0	20.6	0.1	0	0	CS1	0	CS1
	WS21/3	2.22	0	20.2	0	0	0	CS1	0	CS1
	WS652	2.78	0	20.9	0	0	0	CS1	0	CS1
	WS21/14	2.77	0	20.2	0.3	0	0	CS1	0	CS1
	BH610	-	0	20.7	0	0	0	CS1	0	CS1
	WS21/4	2.0	0	18.8	0	0	0	CS1	0	CS1
	WS21/5	-	0	15.6	0.6	0	0	CS1	0	CS1
20/04/2023	WS611	2.71	0	20.3	0	0	0	CS1	0	CS1
	VS612	-	0	13.2	1.1	0	0	CS1	0	CS1
	R21/2	-	0	20.6	0.2	0	0	CS1	0	CS1
	WS21/3	2.16	0	20.9	0	0	0	CS1	0	CS1
	WS652	2.8	0	20.2	0	0	0	CS1	0	CS1

Date	Hole Position	Water Level (mbgl)	Max Gas Flow (l/hr)	Max Oxygen (%/vol)	Max CO2 (%/vol)	Max CH4 (%/vol)	GSV (CO2)	CS (CO2)	GSV (CH4)	CS (CH4)
	WS21/14	2.77	0	20.4	0.3	0	0	CS1	0	CS1
	BH610	-	0	20.5	0	0	0	CS1	0	CS1
	WS21/4	1.98	0	18.5	0.6	0	0	CS1	0	CS1
	WS21/5	-	0	13	2.2	0	0	CS1	0	CS1
	WS21/11	-	0	18.2	1.5	0	0	CS1	0	CS1
	WS604	-	0	14.8	1.9	0	0	CS1	0	CS1
	R21/1	0.5	0	20	1.5	0	0	CS1	0	CS1
26/05/2023	WS611	2.71	0	20.1	0	0	0	CS1	0	CS1
	VS612	-	0	13.2	1.1	0	0	CS1	0	CS1
	R21/2	-	0	20.6	0.2	0	0	CS1	0	CS1
	WS21/3	2.26	0	20.9	0	0	0	CS1	0	CS1
	WS652	2.78	0	21	0	0	0	CS1	0	CS1
	WS21/14	2.77	0	20.4	0.4	0	0	CS1	0	CS1
	BH610	-	0	20.6	0	0	0	CS1	0	CS1
	WS21/4	2.00	0	18	0.7	0	0	CS1	0	CS1
	WS21/5	-	0	14.2	2	0	0	CS1	0	CS1
	WS21/11	-	0	16.9	2	0	0	CS1	0	CS1
	WS604	-	0	12.8	2.4	0	0	CS1	0	CS1
	R21/1	0.46	0	20.1	1.3	0	0	CS1	0	CS1

*noted to be in the vicinity of the former TCE store, CH4 reading therefore likely attributable to VOC contamination opposed to organic degradation.

As indicated on the table above, gas flows during all monitoring rounds were found to be zero. Given the ground conditions encountered previously, and lack of any significant source of ground gas (other than thin mantle of made ground), negligible gas flow rates would be expected.

Methane was found to be absent during all monitoring apart from one minor elevation of 1.6% in WS21/3 (which is likely attributable to elevated volatiles or hydrocarbon, would can potentially provide a 'false positive' reading for methane). Carbon Dioxide was generally found to be absent or encountered at levels below 1.5%.

In summary, Characteristic Situation 1 has been determined for boreholes monitored. No significant elevation of CO2 of CH4 have been determined.

These findings confirm and agree with the previous assessments by Waterman Ltd, which indicate that the gas regime for the whole site can be considered to be Characteristic Situation 1 – Very Low Risk, for which no protection measures are required.

No further consideration of ground gas (i.e. Carbon Dioxide and Methane) is required, but volatile vapours are considered further below.

6.3 Radon

An updated radon report has also been obtained as part of this assessment, which has confirmed that no radon protection measures are required as part of the development. The Radon report is contained in **Annex 5**.

6.4 Volatile Vapour – Detailed Quantitative Risk Assessment

6.4.1 Previous Assessment Works

The Phase 1 (desk study) of the site identified former Paint and Platting Shop, Former TCE Store and Former Retort House (associated with the Town Gas Works) to be potential sources of SVOC and VOC contamination.

Several rounds of Phase 2 intrusive investigations by Waterman in 2014 and 2021 have confirmed the presence of SVOC and VOC contamination in the ground in the vicinity of the former Paint and Plating Shop and the former TCE Store. Generic Quantitative Risk Assessment undertaken has confirmed these identified concentrations to present a potentially unacceptable risk to human health via the vapour inhalation pathway.

A DQRA focusing on vapour inhalation for chlorinated solvents was subsequently undertaken in 2014 based on samples taken from 10 No. targeted supplementary vapour sampling boreholes constructed in areas of previously recorded contamination from across the wider outline consent development area, with 4 no. samples being from within the area now defined under the reserved matters application. The DQRA confirmed a potential for vapour accumulation into future buildings within impacted areas (i.e. the former Paint and Plating Shop and the former TCE Store), but concluded that the existing data set was inadequate to zone the site into affected and unaffected areas.

Further DQRA was undertaken in 2021, based on a further 6 no. samples of vapour obtained from existing boreholes. 4 No. of the boreholes selected for vapour analysis were in areas of known chlorinated solvent impact, to allow direct comparison against 2014 concentrations (VS610, VS612, VS660 and VS661). A further 2 No. boreholes were selected to provide an indication of potential chlorinated hydrocarbon contamination generally across the site (WS604 BH and BH615). The result of the revised DQRA in 2021 indicated a potentially unacceptable risk of vapour intrusion into proposed buildings, from TCE in boreholes VS612, VS660 and BH615.

Following a review of previous information by Jubb, and identification of boreholes of suitable construction which remained serviceable, further vapour sampling has been commissioned from a more extensive spread of boreholes across the site, as detailed in Figure 3 and Table 1. This added an additional 12 samples to the existing data set of 10 samples. Collectively, the previous and recent samples represent 22 no. samples, collected from 17 no. locations as shown on drawing GES03 in **Annex 1**.

6.4.2 Distribution of SVOC/VOC Contamination in Soils and Groundwaters

The desk study information suggests that there are three principal potential sources of VOC/SVOC contamination at the site, as follows:

- TCE Store.
- Plating and Paint Shop.
- Structures associated with former Gasworks (Retort House mainly).

Extensive VOC/SVOC testing of soils and groundwater was undertaken on numerous samples during the 2014 investigation, as detailed below.

32 no. soil samples were tested from 18 no separate borehole or window sample locations within the current site boundary (with an additional 36 no. samples tested from the wider outline application area). Of these 32 no. samples tested, a total of 28 no. found quantifiable concentrations (i.e., above Laboratory Method Detection limits) of the principal VOC/SVOC substances.

In terms of the spatial distribution of these substance in soils, while some of the most significant elevations are noted close to expected source locations (i.e., BH614, WS631 close to gas works retort house) others are in areas of the site not associated with potential SVOC/VOCs (such as WS629 and BH606). WS629 at 0.5 and 1.0m bgl in particular indicates the highest concentrations of VOC substances tested on the site.

With regard to VOC/SVOC in groundwaters, a total of 6 no. groundwater samples were tested from across the site area in 2014 (with an additional 20 no. tested from across the wider 'outline application' site area). Of these six samples, five were found to be contain volatile substances in quantifiable concentrations (i.e., above Laboratory Method Detection limits). A further five samples were tested from boreholes immediately adjacent to the site boundary, of which four were found to contain quantifiable substances of VOC/SVOC.

While some of the groundwater samples are clustered close to the identified point sources, there are others that are well away from these areas, and no specific source for these can be identified. The results are potentially indicative of plumes of groundwater contamination spreading to the south or southeast from the principal sources identified.

In summary, the results suggest principal sources associated with the Gas Works, Plating Works and potentially TCE store, with likely groundwater plumes extending to the southeast within the groundwater. Soil samples where elevations are recorded are spread widely across the site area, and do not appear to fall into an explainable pattern based on the principal point source locations identified in previous reports (i.e., plating shop, TCE store, retort house). Rather, the random and fairy widespread distribution is indicative of frequent spillage to the ground across the site, as well as more concentrated occurrences in the areas of the principal sources.

The distribution of VOC/SVOC in both soils and groundwaters on the site is indicated on plan in drawings GES02 and GES03, contained in **Annex 1**. The results are also tabulated in **Annex 2**.

Based on the above assessment of distribution of VOC/SVOC substances within soils and groundwaters, further vapour monitoring and a DQRA was undertaken, which has been based on an approach of widespread sampling of available hole, rather than targeted sampling.

6.4.3 DQRA Methodology

The risk to future site users from volatile vapours has been assessed through comparison of vapour samples against calculated modified Health Criteria Values (HCV) for a residential end use, in accordance with CIRIA C682 (VOC Handbook).

Health Criteria Values are an estimated contaminant concentration that would pose a tolerable or minimal risk to human health. HCV values for inhalation exposure pathways are derived from either a Tolerable Daily Intake (TDI) in the case of threshold compounds (non-carcinogenic) or an Index Dose (ID) in the case of non-threshold compounds (carcinogenic).

In accordance with CIRIA C682 the TDI or ID for soil ingestion can be modified into an acceptable inhalation Health Criteria Value ($\mu g/m^3$) for the most sensitive receptor to allow comparison against the vapour concentrations established during gas sampling.

The assessed end use scenario is residential, with the most sensitive receptor a female child (body weight of 13.3kg) with an estimated inhalation rate (11.85m3/day). The modified HCV's have been based upon this scenario and receptor.

The modified HCVs established have then been compared directly with the vapour concentrations encountered during sampling of the boreholes, as an initial screening exercise.

While this initial screening approach takes no account of any physical barriers (buildings) or air mixing that might occur within or below buildings, or in the soils (as accounted for in the Johnson and Ettinger modelling undertaken below) it does provide a direct comparison of borehole vapour concentrations with mHCVs. This is potentially relevant for areas where service trenches (or other highly vapour permeable media) are constructed across areas of known contamination, and where such services could lead directly into the subfloor void or buildings, allowing a pathway of direct vapour transmission to the building.

Where the vapour concentrations are found to exceed the modified Health Criteria Values, a further phase of Detailed Quantitative Risk Assessment has been undertaken, entailing the modelling of vapour transmission through the soil and into indoor air space.

This has been undertaken using the Johnson & Ettinger model, which is an established risk assessment tool for this purpose, developed by the US EPA. The model calculates an attenuation factor that relates steady-state gas concentrations at the source (the vapour within soil) to indoor air concentration based on soil and building characteristics, and then generates an "infinite source building concentration" which is equivalent to a modelled indoor air concentration for the contaminant.

This generated concentration can then be compared to the modified HCV for each individual compounds, and any exceedances of the HCV can be assumed to pose a potential risk to human health (and therefore indicate that mitigation measures are required or should be considered).

6.4.4 Preliminary Risk Assessment

The vapour results from the various boreholes have been compared against the modified HCV values below.

Table 3: Vapour results from monitoring, compared against modified HCVs (all phases of investigation 2014 – 2023)

Contaminant	mHCV µg/m³	Borehole VOC Vapour Monitoring Results µg/m³																				
		Jubb 2023												Waterman 2021						Waterman 2014			
		WS611	VS612	R21/2	WS21/3	WS652	WS21/14	BH610	WS21/4	WS21/5	WS21/11	WS604	R21/1	VS610	VS612	VS660	VS661	BH615	WS604	VS612	VS660	VS661	VS610
Trichloroethene (TCE)	**5.8**	1.9	10.6	<0.6	4.3	151.2	19.6	<0.6	11	<0.6	149.2	<0.6	<0.6	176.3	249.4	2186.7	183.8	2240.4	65.6	1100	160	190	340,000
Tetrachloroethene (PCE)	**79.7**	3.5	1.3	31.8	1.2	4.1	2.4	1.1	1.9	13.6	6.9	1.7	0.7	7.2	345.7	<4.7	36.4	27.7	1010.8	250	120	440	250
Cis 1,2 Dichloroethene	**0.8**	<0.6	<0.6	<0.6	<0.6	0.8	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.60	<4	75	948	8	182	<4	2000	410	31	28,000
1,1 Dichloroethane	**0.2**	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<6.1	8.9	<6.1	<6.1	<6.1	45.7	<20	<30	<30	<30
Benzene	**1.6**	1.1	0.6	8	0.9	0.7	0.9	1.1	2	2.1	1.1	0.9	1.1	8	75.7	<4.8	<4.8	<4.8	239	<40	<50	<40	54
1,1,1 Trichloroethane	**673**	38.2	<0.4	<0.4	<0.4	3.7	1.8	<0.4	<0.4	0.9	82.7	9.7	0.5	<8.2	<8.2	<8.2	<8.2	<8.2	1743.4	-	-	-	-
1,3,5-Trimethylbenzene	**224**	85.5	2.7	158.3	0.6	<0.6	1.4	1.5	<0.6	0.6	<0.6	<0.6	<0.6	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	**224**	201	11.6	269.6	2.5	0.8	5.2	6.5	<0.6	0.6	1.1	<0.6	0.6	-	-	-	-	-	-	<40	<50	<40	<40

As noted on the table above, significant elevations of Trichloroethene (TCE), Tetrachloroethene (PCE) and Cis 1,2 Dichloroethene are noted in certain holes (VS610, VS660, VS612, VS661, BH615, WS604) especially during monitoring taken in 2014, and to a lesser extent in 2021.

These holes are noted as being close to expected VOC source areas, some also correlated with elevated soil concentrations of VOCs (i.e. BH615).

TCE is also noted as being elevated above mHCV in 7 of the 11 locations monitored in 2023, but at significantly lower concentrations that during previous monitoring undertaken.

Locations of ground gas vapour monitoring are shown on plan in **Annex 1**.

6.4.5 Detailed Quantitative Risk Assessment

Vapour exceedances have been identified above modified Health Criteria Values for the following contaminants.

- Trichloroethene (TCE)
- Tetrachloroethene (PCE)
- Cis 1,2 Dichloroethene
- 1,1 Dichloroethane
- Benzene
- 1,2,4-Trimethylbenzene

These contaminants have been subject to further detailed site-specific risk assessment using the Johnson and Ettinger Model.

As detailed above, the model generates a "infinite source building concentration" which is equivalent to an indoor air concentration, which can then be screened against the mHCVs established on Table 3 above. The model has been run using the vapour concentrations recorded in each location, for all locations where an exceedance of the mHCV values have been noted during the screening exercise.

The model can be adjusted to account for different land use types, building characteristics and soil conditions. For consistency, model parameters adopted have been the same as those used during earlier assessments and are considered appropriate to site conditions encountered. These parameters are summarised on the table below.

To inform the modelling, a two-storey residential development has been assumed, as a conservative worst case. Where specific building parameters are unknown literature values have been used.

Where any exceedances of the mHCV are observed, further consideration or remedial action is considered necessary.

Table 4: Johnson and Ettinger Model Parameters

Parameter	Modelled Value	Justification
Soil characteristics	Sandy Clay	Made Ground varied on-site but was generally granular in nature with varying quantities of cohesive elements. Therefore, a sand clay has been chosen.
Foundation Slab Thickness	0.15m	Table 4.21 CLEA SR3 – standard parameter
Soil Vapour sampling depth	0.5m	SI Data (average)
Average Soil Temperature (Vadose Zone)	10oC	Annual average soil temperatures representative of UK surface soils. Section 4.3.1 CLEA SR3
Exposure Frequency Residential	350 days	Weighted using occupancy period of 23 hours per day for 365 days a year
Enclosed space floor area	92m2	Ministry of Housing Communities and Local Government – English Housing Survey 2018. Page 14 *"In 2012, the average floor area of the English housing stock was around 92m²"*

Building Mixing Height	4.8m	Table 4.21 CLEA SR3 – average building height (internal) of two storey dwelling.
Building Air Exchange Rate Residential	0.5hr-1	Table 4.21 CLEA SR3 – average rate for all residential buildings.
Fraction of foundation area with cracks	0.002	Based on equation A3 CLEA SR3
Moisture Content	10.9	Average of site data
Bulk Density	2.18Mg/m3	Average of site data
Water Filled Porosity	0.214	From Waterman data
Total Porosity	0.295	From Waterman data

The modelled indoor vapour concentrations established by the modelling are indicated in Table 5 below, and the model spreadsheets are included in **Annex 4**.

Table 5: Modelled Vapour Concentrations and comparison with mHCVs

Contaminant	mHCV µg/m³	Modelled Indoor Vapour Concentrations µg/m³																				
		Jubb 2023												Waterman 2021						Waterman 2014			
		WS611	VS612	R21/2	WS21/3	WS652	WS21/14	BH610	WS21/4	WS21/5	WS21/11	WS604	R21/1	VS610	VS612	VS660	VS661	BH615	WS604	VS612	VS660	VS661	VS610
Trichloroethene (TCE)	**5.8**	0.0057	0.0318	-	0.0129	0.45	0.058	-	0.033	-	0.44	-	-	0.52	0.75	6.6	0.55	6.72	0.19	3.3	0.48	0.57	1020
Tetrachloroethene (PCE)	**79.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	1.03	-	-	-	3.03	0.75	0.36	1.32	0.75
Cis 1,2 Dichloroethene	**0.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	2.8	0.024	0.54	0.012	6	1.23	0.093	84
1,1 Dichloroethane	**0.2**	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	-	-		0.14	0.06	0.09	0.09	0.09
Benzene	**1.6**	-	-	0.024	-	-	-	-	0.006	0.006	-	-	-	0.024	0.23	0.014	0.014	0.014	0.72	0.12	0.15	0.12	0.162
1,1,1 Trichloroethane	**673**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.2	-	-	-	-
1,3,5-Trimethylbenzene	**224**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	**224**	-	-	0.80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

As indicated in the table above, a number of exceedances of the mHCV have been established during monitoring undertaken in previous phases of investigation, as follows.

- VS660 indicated elevated Cis 1,2 Dichloroethene in both 2014 and 2021, and Trichloroethene in 2021.
- VS610 indicated elevated Cis 1,2 Dichloroethene and Trichloroethene in 2014, but no elevations were noted in from the 2021 testing.
- VS612 indicated elevated Cis 1,2 Dichloroethene in 2014 but no elevations in 2021 or 2023.

Based on the above, it would appear that there is at least some element of natural breakdown of volatile over time, and reduction of vapour concentrations are noted in holes that have been monitored on multiple occasions.

None of the additional holes monitored in 2023 have indicated any vapour concentrations that result in elevated indoor vapour concentrations above mHCVs.

Therefore, potential volatile vapour intrusion is only considered to be a localised issue in certain areas of the site, and vapour protection measures will be required in those area of the site.

The locations of the various exceedances are shown on plan in **Annex 1**.

7. Discussion

Vapour intrusion modelling (undertaken by both Waterman and Jubb) has indicated that volatile vapour concentrations recorded within the soils could potentially lead to unacceptable indoor vapour concentrations (in exceedance of modified Health Criteria Values) which pose a potential risk to human health. A summary table is provided below, setting out all locations monitored, dates of assessment, and vapour exceedances where appropriate.

Table 6: Summary of volatile vapours assessment (all phases)

GI Phase / Date	Location	Modelling Indicates Unacceptable Risk?	Contaminant	mHCV µg/m³	Modelled Indoor Air Concentration µg/m³
Waterman 2014	VS612	**Yes**	Cis 1,2 Dichloroethene	0.8	**6**
	VS660	**Yes**	Cis 1,2 Dichloroethene	0.8	**1.23**
	VS661	No	-	-	-
	VS610	**Yes**	Cis 1,2 Dichloroethene Trichloroethene (TCE)	0.8 5.8	**84** **1020**
Waterman / 2021	VS610	No	-	-	-
	VS612	No	-	-	-
	VS660	**Yes**	Cis 1,2 Dichloroethene Trichloroethene (TCE)	0.8 5.8	**2.8** **6.6**
	VS661	No	-	-	-
	BH615	**Yes**	Trichloroethene (TCE	5.8	**6.7**
	WS604	No	-	-	-
Jubb / 2023	WS611	No	-	-	-
	VS612	No	-	-	-
	R21/2	No	-	-	-
	WS21/3	No	-	-	-
	WS652	No	-	-	-
	WS21/14	No	-	-	-
	BH610	No	-	-	-
	WS21/4	No	-	-	-
	WS21/5	No	-	-	-
	WS21/11	No	-	-	-
	WS604	No	-	-	-
	R21/1	No	-	-	-

8. Summary and Recommendations

Previous phases of investigation work by Waterman Ltd in 2014 and 2021 have recommended that further confirmatory ground gas monitoring and volatile vapour assessment was required at the site. Jubb have therefore reviewed the existing data and supplemented the vapour data set with additional testing.

As detailed above, these works have been undertaken, comprising an additional 3 no. rounds of ground gas monitoring, and vapour sampling of selected boreholes, along with additional detailed quantitative risk assessment.

The ground gas regime at the site (based on an assessment of all results) has been deemed as Characteristic Situation 1 – Very Low Risk, for which no ground gas protection measures will be required.

However, R21/1 indicated some elevated methane and carbon dioxide concentrations during monitoring in 2021 (although flow rates remained zero), and a further 3 rounds of supplementary monitoring are required here to confirm the assessment undertaken thus far.

Radon Reporting has indicated that no radon protection measures are required at the site.

The existing soil and groundwater VOC/SVOC results have been reviewed to establish the distribution across the site. This has shown the highest concentrations in the soils to be associated with the sources identified in the Phase 1 study (i.e. Plating Works/Paint Spraying, Gas Works and TCE Store), and the south east trending distribution of groundwater results indicates likely plumes associated with these sources. The remaining soil contamination distribution comprises generally low sporadic concentrations of VOC/SVOC, with several 'hotspot' areas of higher concentration at shallow depth, which is likely evidence of spillage or widespread use of VOCs across the site during operation. A similar pattern has been identified in groundwater samples.

In terms of the risk of TCE and associated volatile vapours, these have been assessed based on testing of ground gas samples undertaken during various phases of site investigation. Further vapour modelling has been undertaken using the Johnson and Ettinger model, which has determined that vapour risks at the site are limited to specific areas and contaminants.

The results of the vapour assessment are summarised on drawing GES04 in **Annex 1**.

Unacceptable vapour risks relating to Trichloroethene (TCE) and Cis 1,2 Dichloroethene have been identified, and are limited to the following areas of the site:

- VS612, VS660 (Plating Works/Paint Spraying) – Cis 1,2 Dichloroethene & Trichloroethene (TCE)
- VS610 (Former TCE Store) – Cis 1,2 Dichloroethene & Trichloroethene (TCE)
- BH615(Former Gas Works area) –Trichloroethene (TCE)

The elevated vapour results correlate well with the expected source areas identified, and all are located close to the known sources of SVOC/VOC.

While there is some evidence that vapour concentrations are declining with time, a precautionary approach should be taken with respect to protection measures, and these should be provided for site areas where a risk is identified.

Therefore, vapour protection measures are only deemed necessary for the impacted areas of the site, or those areas where remnant groundwater plumes could potentially lead to a risk of further vapour risks in the future (i.e. to the south or southeast of identified sources). Broadly, vapour protection will be limited to the southeastern site area (the former Gas Works), the central eastern site boundary, and areas around the former TCE Store and Plating Works. These areas will be defined on plan in the Remediation Strategy.

Annex 1 – Drawings

392000 392100 392200 392300 392400 392500 392600 392700

174400 174300 174200 174100 174000 173900

WS648 WS646 WS647 WS602 WS650 WS643 WS642 WS639 WS636 WS635 WS637 WS626 WS628 WS603 WS627 WS632 WS653 WS630 WS652 WS631 WS629 WS633 WS625 WS662 WS663 WS604 WS605 WS606 WS608 WS609BH WS611 WS613 WS614 WS617 WS618 WS619 WS624

VS641 VS658 VS660 VS661 VS610 VS612

BH401 BH612 BH303 BH203 BH201 BH611 BH207 BH204 BH603 BH614 BH605 BH615 BH609 BH602 BH604 BH625 BH601 BH610

WS21/1 WS21/2 WS21/3 WS21/4 WS21/5 WS21/6 WS21/7 WS21/8 WS21/9 WS21/10 WS21/11 WS21/12 WS21/13 WS21/14 WS21/15

TP21/1 TP21/2 TP21/3 TP21/4 TP21/5 TP21/6 TP21/8

R21/1 R21/2 R21/3 R21/4 R21/5

CBR1 CBR2 CBR3 CBR4 CBR5 CBR6 CBR7 CBR8

TP726 TP727 TP728 TP729 TP730 TP731 TP724 TP725 TP723 TP722 TP720 TP721 TP708 TP707 TP704 TP706 TP705 TP702 TP701 TP716 TP719 TP718 TP717 TP715 TP714 TP713 TP712 TP711 TP710

N

0 50 100 200 300 400 500 Meters

Legend

- Site Boundary (from RMA boundary plan)
- Approximate extents of Cornbrash Formation
- Approximate extents of Kellaways Clay & Sand Member

Ground Investigation

- 2008, 2014, 2021, and 2023 exploratory borehole locations
- 2008, 2014, 2021, and 2023 exploratory trial pit locations

Locations of BH200, BH300, BH400 series located from Waterman Drawing only - Co-ordinates not available.
Drawing not to be used for setting out, for information only.

Information Sources:
1936, 1963, and 1978 OS Mapping,
WSP Drawing WIB15376-103_GR_PERA_A4A

By:	DW	Date:	21/07/2023
Check:	PW	Date:	21/07/2023

Project
Langley Park, Chippenham

Title
Exploratory Hole Location and Geology Plan

Client
Countryside Partnerships

Scale at A3: 1:2,500

Job No.	Drawing No.	Rev.
23166	GES02	A

392000 392100 392200 392300 392400 392500 392600 392700

174400 174300 174200 174100 174000 173900

WS648 WS646 WS647 WS650 WS602 WS643 WS642 WS639 WS636 WS635 WS637 WS626 WS628 WS603 WS604 WS605 WS606 WS607 WS608 WS609BH WS610 WS611 WS612 WS613 WS614 WS617 WS618 WS619 WS620 WS621 WS622 WS623 WS624 WS625 WS627 WS629 WS630 WS631 WS632 WS633 WS652 WS653 WS654 WS660 WS661 WS662 WS663

BH401 BH601 BH602 BH603 BH604 BH605 BH609 BH610 BH611 BH612 BH614 BH615 BH625 BH201 BH203 BH204 BH207 BH303

VS641 VS658 VS660 VS661

TP21/1 TP21/2 TP21/3 TP21/4 TP21/5 TP21/6 TP21/8 TP701 TP702 TP704 TP705 TP706 TP707 TP708 TP711 TP712 TP713 TP714 TP715 TP716 TP717 TP718 TP719 TP720 TP721 TP722 TP723 TP724 TP725 TP726 TP727 TP728 TP729 TP730 TP731

WS21/1 WS21/2 WS21/3 WS21/4 WS21/5 WS21/6 WS21/7 WS21/8 WS21/9 WS21/10 WS21/11 WS21/12 WS21/13 WS21/14 WS21/15

R21/1 R21/2 R21/3 R21/4 R21/5

CBR1 CBR2 CBR3 CBR4 CBR5 CBR6 CBR7 CBR8

1a 1b 2

N

0 30 60 120 180 240 300 Meters

BH303
Vinyl Chloride – 10ug/l
1,1-Dichloroethene – 22ug/l
trans 1,2-Dichloroethene – 6ug/l
cis 1,2-Dichloroethene – 1190ug/l
Trichloroethene – 25,300ug/l

BH203
trans 1,2-Dichloroethene – 4ug/l
cis 1,2-Dichloroethene – 46ug/l
Trichloroethene – 16ug/l

BH207
cis 1,2-Dichloroethene – 3ug/l
Trichloroethene – 16ug/l

BH204
cis 1,2-Dichloroethene – 59ug/l
Trichloroethene – 19ug/l

BH610
No elevations above MDL

WS609(BH)
1,1-Dichloroethane – 3ug/l
1,1,1-Trichloroethane – 15ug/l

BH609
cis 1,2-Dichloroethene – 5ug/l

BH602
Chloroform – 8ug/l
Carbon Tetrachloride – 3.72ug/l

BH604
1,1-Dichloroethene – 14ug/l
1,1-Dichloroethane – 124ug/l
cis 1,2-Dichloroethene – 11ug/l
1,1,1-Trichloroethane – 339ug/l

BH625 (Deep)
1,1-Dichloroethane – 2ug/l
1,1,1-Trichloroethane – 5ug/l
BH625 (Shallow)
1,1-Dichloroethane – 2ug/l
1,1,1-Trichloroethane – 8ug/l

Legend

- Site Boundary (from RMA boundary plan)
- Extent of Former Gas Works
- Former Plating Shop*
- Former TCE Store*
- Former Gasworks Structures*

1a/b - Historic Gas Holder
2 - Probably Retort House

Ground Investigation

- 2008, 2014, 2021, and 2023 exploratory borehole locations
- 2008, 2014, 2021, and 2023 exploratory trial pit locations
- Waterman 2014 – Groundwater sample tested, elevated TCE and/or chlorinated solvents encountered
- Waterman 2014 – Groundwater sample tested, no elevated TCE and/ or chlorinated solvents encountered

* - Locations of historic contaminative site use inferred from Waterman GI reports and historic OS Mapping only.

Locations of BH200, BH300, BH400 series located from Waterman Drawing only - Co-ordinates not available.
Drawing not to be used for setting out, for information only.

Information Sources:
1936, 1963, and 1978 OS Mapping,
WSP Drawing WIB15376-103_GR_PERA_A4A

By:	DW	Date:	21/07/2023
Check:	PW	Date:	21/07/2023

Project: Langley Park, Chippenham

Title: Summary of TCE & Volatile Contamination in Groundwater

Client: Countryside Partnerships

Scale at A3: 1:2,500

Job No.	Drawing No.	Rev.
23166	GES03	A

Jubb



Location	Depth (m)	Contaminant (ug/kg)					Exceedances of other VOC/SVOCs
		1,1-Dichloroethane	cis 1,2-Dichloroethene	1,1,1-Trichloroethane	Trichloroethene	Tetrachloroethene	
BH601	0.5-0.8	<1	<6	<1	<1	<4	Yes
BH602	1.5	23	15	46	42	6	Yes
BH606	0.5	<1	<6	<1	<1	<4	No
BH606	1.0	<1	13	<1	665	<4	No
BH606	3.4	<1	16	<1	792	<3	No
BH610	0.3	<1	<6	<1	2	<3	Yes
BH614	0.3	13	13	28	812	4	Yes
BH614	0.3	15	15	33	946	5	Yes
BH615	0.6	13	7	22	24	<3	Yes
BH615	0.6	15	8	26	28	<4	Yes
BH625	0.5	<1	<6	<1	3	<3	Yes
BH625	1.0	<1	<6	<1	<1	<3	No
BH625	5.0	<1	<6	<1	<1	<4	Yes
WS611	0.5	11	11	12	75	8	Yes
WS611	0.5	12	12	13	84	9	Yes
WS624	0.5	29	25	26	36	7	Yes
WS629	0.5	763	364	855	432	234	Yes
WS629	1.0	1290	545	26800	5510	4450	Yes
WS630	0.5	28	13	18	35	3	Yes
WS631	0.5	256	91	125	85	8	Yes
WS633	0.5	26	13	158	10	5	Yes
WS652	0.5	11	9	7	15	<3	Yes
WS653	0.5	5	9	2	14	<4	Yes
WS654	0.5	14	18	5	18	<3	Yes

Legend

- Site Boundary (from RMA boundary plan)
- Extent of Former Gas Works
- Former Plating Shop*
- Former TCE Store*
- Former Gasworks Structures*

1a/b - Historic Gas Holder
2 - Probably Retort House

Ground Investigation

- 2008, 2014, 2021, and 2023 exploratory borehole locations
- 2008, 2014, 2021, and 2023 exploratory trial pit locations
- Waterman 2014 – Soil sample tested, elevated TCE and/or chlorinated solvents encountered
- Waterman 2014 – Soil sample tested, no elevated TCE and/ or chlorinated solvents encountered

* - Locations of historic contaminative site use inferred from Waterman GI reports and historic OS Mapping only.

Locations of BH200, BH300, BH400 series located from Waterman Drawing only - Co-ordinates not available.
Drawing not to be used for setting out, for information only.

Information Sources:
1936, 1963, and 1978 OS Mapping,
WSP Drawing WIB15376-103_GR_PERA_A4A

By:	DW	Date:	21/07/2023
Check:	PW	Date:	21/07/2023

Project: Langley Park, Chippenham

Title: Summary of TCE & Volatile Contamination in Soils

Client: Countryside Partnerships

Scale at A3: 1:2,500

Job No.	Drawing No.	Rev.
23166	GES04	A



Legend

- Site Boundary (from RMA boundary plan)
- Extent of Former Gas Works
- Former Plating Shop*
- Former TCE Store*
- Former Gasworks Structures*

1a/b - Historic Gas Holder
2 - Probably Retort House

Ground Investigation

- 2008, 2014, 2021, and 2023 exploratory borehole locations
- 2008, 2014, 2021, and 2023 exploratory trial pit locations
- Waterman 2014 – Vapour testing and modelling undertaken, exceedance of mHCV noted.
- Waterman 2014 – Vapour testing and modelling undertaken, no exceedance of mHCVs noted.

* - Locations of historic contaminative site use inferred from Waterman GI reports and historic OS Mapping only.

Locations of BH200, BH300, BH400 series located from Waterman Drawing only - Co-ordinates not available.
Drawing not to be used for setting out, for information only.

Information Sources:
1936, 1963, and 1978 OS Mapping,
WSP Drawing WIB15376-103_GR_PERA_A4A

By:	DW	Date:	21/07/2023
Check:	PW	Date:	21/07/2023

Project: Langley Park, Chippenham

Title: Summary of Vapour Monitoring Concentration Results

Client: Countryside Partnerships

Scale at A3: 1:2,500

Job No.	Drawing No.	Rev.
23166	GES05	A

Annex 2 – Soils, Groundwater and Gas Sample Contamination Laboratory Results and Summary Tables

Element Materials Technology
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Deeside
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W: www.element.com

Waterman Infrastructure & Environment Limited
Third Floor
8 Nelson Mandela Place
Glasgow
G2 1BT

Attention :	Paul Latta
Date :	1st November, 2021
Your reference :	WIE18542-100
Our reference :	Test Report 21/16235 Batch 1
Location :	Langley Park, Chippenham
Date samples received :	15th October, 2021
Status :	Final Report
Issue :	1

Eight samples were received for analysis on 15th October, 2021 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Simon Gomery BSc
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 10 Lower Grosvenor Place, London, SW1W 0EN
Company Registration No: 11371415

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta
EMT Job No: 21/16235

Report : Gas

EMT Sample No.	1	2	3	4	5	6					LOD/LOR	Units	Method No.
Sample ID	VS610	VS612	VS660	VS661	BH615	WS604 BH							
Depth													
COC No / misc													
Containers	BV	BV	BV	BV	BV	BV							
Sample Date	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021	13/10/2021							
Sample Type	Gas	Gas	Gas	Gas	Gas	Gas							
Batch Number	1	1	1	1	1	1							
Date of Receipt	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021	15/10/2021							
Carbon Dioxide	0.22	0.53	0.64	1.06	0.09	<0.05					<0.05	%	TM69/PM0
Carbon Monoxide	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05					<0.05	%	TM69/PM0
Hydrogen	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	%	TM69/PM0
Methane	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05					<0.05	%	TM69/PM0
Methane	<5	<5	<5	<5	<5	<5					<5	ppmV	TM69/PM0
Nitrogen	79.0	79.4	79.1	79.5	79.0	83.5					<0.5	%	TM69/PM0
Oxygen	20.8	20.1	20.2	19.4	20.9	16.5					<0.5	%	TM69/PM0
Methane	<5	<5	<5	<5	<5	<5					<5	ppmV	TM45/PM0
Ethane	<5	<5	<5	<5	<5	<5					<5	ppmV	TM45/PM0
Propane	<5	<5	<5	<5	<5	<5					<5	ppmV	TM45/PM0
Butane	<5	<5	<5	<5	<5	<5					<5	ppmV	TM45/PM0
Pentane	<5	<5	<5	<5	<5	<5					<5	ppmV	TM45/PM0
Hexane	<5	<5	<5	<5	<5	<5					<5	ppmV	TM45/PM0
Heptane	<5	<5	<5	<5	<5	<5					<5	ppmV	TM45/PM0
Ethene	<5	<5	<5	<5	<5	<5					<5	ppmV	TM45/PM0
Total of 8 named gases	<5	<5	<5	<5	<5	<5					<5	ppmV	TM45/PM0
Number of other gases	0	0	0	0	0	0						None	TM45/PM0
Total of other gases	<5	<5	<5	<5	<5	<5					<5	ppmV	TM45/PM0
Grand Total C1-C7 Gases	<5	<5	<5	<5	<5	<5					<5	ppmV	TM45/PM0

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: VS610
Depth:
EMT Job No: 21/16235
EMT Sample No: 1
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 261 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight	Compound	Q*	RESULT ppbv	RESULT ug/m^3	RL ppbv	MDL ppbv	RL ug/m^3	MDL ug/m^3
75-45-6	86.77	Chlorodifluoromethane (HCFC-22)		<2	<7	<2	<2	<7	<7
75-71-8	120.91	Dichlorodifluoromethane (F-12)		<2.5	<12.4	<2.5	<2.5	<12.4	<12.4
74-87-3	50.49	Chloromethane		<1.5	<3.1	<1.5	<1.5	<3.1	<3.1
76-14-2	170.92	1,2-Dichlorotetrafluoroethane (F-114)		<1.5	<10.5	<1.5	<1.5	<10.5	<10.5
115-11-7	56.12	Isobutene		<1.5	<3.4	<1.5	<1.5	<3.4	<3.4
106-99-0	54.09	1,3-Butadiene		<1.5	<3.3	<1.5	<1.5	<3.3	<3.3
74-83-9	94.95	# Bromomethane		<1.5	<5.8	<1.5	<1.5	<5.8	<5.8
75-00-3	64.52	# Chloroethane		<1.5	<4	<1.5	<1.5	<4	<4
64-17-5	46.07	Ethanol		<100	<188.4	<100	<100	<188.4	<188.4
75-05-8	41.05	Acetonitrile		<1.5	<2.5	<1.5	<1.5	<2.5	<2.5
107-02-8	56.06	Acrolein		<2.5	<5.7	<2.5	<2.5	<5.7	<5.7
	58.08	Acetone + Propanal		16	38	<6	<6	<14	<14
75-69-4	137.36	# Trichlorofluoromethane (F-11)		<1.5	<8.4	<1.5	<1.5	<8.4	<8.4
67-63-0	60.09	2-Propanol		<6	<15	<6	<6	<15	<15
109-66-0	72.15	Pentane		<1.5	<4.4	<1.5	<1.5	<4.4	<4.4
78-79-5	68.12	Isoprene		<2	<6	<2	<2	<6	<6
74-88-4	141.94	Methyl Iodide		<1.5	<8.7	<1.5	<1.5	<8.7	<8.7
75-35-4	96.95	# 1,1-Dichloroethene (1,1 DCE)		<1.5	<5.9	<1.5	<1.5	<5.9	<5.9
75-09-2	84.94	# Methylene Chloride		<14.4	<50	<14.4	<14.4	<50	<50
76-13-1	187.37	# Trichlorotrifluoroethane		<1.5	<11.5	<1.5	<1.5	<11.5	<11.5
75-15-0	76.14	Carbon Disulfide		2.3	7.2	<1.5	<1.5	<4.7	<4.7
71-23-8	60.09	1-Propanol		<1.5	<3.7	<1.5	<1.5	<3.7	<3.7
78-85-3	70.09	Methylacrolein		<1.5	<4.3	<1.5	<1.5	<4.3	<4.3
75-34-3	98.97	# 1,1-Dichloroethane		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
287-92-3	70.14	Cyclopentane		<1.5	<4.3	<1.5	<1.5	<4.3	<4.3
78-94-4	70.09	Methyl Vinyl Ketone		<1.6	<4.6	<1.6	<1.6	<4.6	<4.6
1634-04-4	88.15	Methyl tertiary butyl ether		<1.5	<5.4	<1.5	<1.5	<5.4	<5.4
108-05-4	86.09	Vinyl Acetate		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
123-72-8	72.11	Butanal		<2	<6	<2	<2	<6	<6
78-93-3	72.1	2-Butanone (MEK)		<2	<6	<2	<2	<6	<6
156-59-2	96.94	# cis-1,2-Dichloroethene		1	<4	<1	<1	<4	<4
110-54-3	86.17	Hexane		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
67-66-3	119.39	# Chloroform		<1.5	<7.3	<1.5	<1.5	<7.3	<7.3
107-06-2	98.96	# 1,2-Dichloroethane		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
71-55-6	133.42	# 1,1,1-Trichloroethane		<1.5	<8.2	<1.5	<1.5	<8.2	<8.2
71-36-3	74.12	1-Butanol		<3	<9	<3	<3	<9	<9
71-43-2	78.11	# Benzene		2.5	8	<1.5	<1.5	<4.8	<4.8
56-23-5	153.84	# Carbon Tetrachloride		<1.5	<9.4	<1.5	<1.5	<9.4	<9.4
110-82-7	84.16	Cyclohexane		<2	<7	<2	<2	<7	<7

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: VS610
Depth:
EMT Job No: 21/16235
EMT Sample No: 1
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 261 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight		Compound	Q*	RESULT	RESULT	RL	MDL	RL	MDL
					ppbv	ug/m^3	ppbv	ppbv	ug/m^3	ug/m^3
107-87-9	86.13		2-Pentanone		**<1.5**	**<5.3**	<1.5	<1.5	<5.3	<5.3
110-62-3	86.13		Pentanal		**<1.5**	**<5.3**	<1.5	<1.5	<5.3	<5.3
96-22-0	86.13		3-Pentanone		**<1.5**	**<5.3**	<1.5	<1.5	<5.3	<5.3
78-87-5	112.99	#	1,2-Dichloropropane		**<1.5**	**<6.9**	<1.5	<1.5	<6.9	<6.9
75-27-4	163.83		Bromodichloromethane		**<1.5**	**<10.1**	<1.5	<1.5	<10.1	<10.1
123-91-1	88.11		1,4-Dioxane		**<2**	**<7**	<2	<2	<7	<7
79-01-6	131.4	#	Trichloroethene (TCE)		**32.8**	**176.3**	<1.5	<1.5	<8.1	<8.1
10061-01-5	110.97	#	cis-1,3-Dichloropropene		**<1.5**	**<6.8**	<1.5	<1.5	<6.8	<6.8
108-10-1	100.16		4-Methyl-2-pentanone		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
10061-02-6	110.97	#	trans-1,3-Dichloropropene		**<1.5**	**<6.8**	<1.5	<1.5	<6.8	<6.8
79-00-5	133.4	#	1,1,2-Trichloroethane		**<1.5**	**<8.2**	<1.5	<1.5	<8.2	<8.2
108-88-3	92.13	#	Toluene		**<1.5**	**<5.7**	<1.5	<1.5	<5.7	<5.7
589-38-8	100.16		3-Hexanone		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
591-78-6	100.16		2-Hexanone		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
66-25-1	100.16		Hexanal		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
106-93-4	187.86	#	1,2-Dibromoethane		**<1.5**	**<11.5**	<1.5	<1.5	<11.5	<11.5
127-18-4	165.85	#	Tetrachloroethene (PCE)		**5.4**	**36.6**	<1.5	<1.5	<10.2	<10.2
108-90-7	112.56	#	Chlorobenzene		**<1.5**	**<6.9**	<1.5	<1.5	<6.9	<6.9
100-41-4	106.16	#	Ethylbenzene		**<1.5**	**<6.5**	<1.5	<1.5	<6.5	<6.5
179601-23-1	106.17	#	m/p-Xylene		**<1.5**	**<6.5**	<1.5	<1.5	<6.5	<6.5
75-25-2	252.77		Bromoform		**<1.5**	**<15.5**	<1.5	<1.5	<15.5	<15.5
100-42-5	104.14	#	Styrene		**<1.5**	**<6.4**	<1.5	<1.5	<6.4	<6.4
79-34-5	167.85	#	1,1,2,2-Tetrachloroethane		**<1.5**	**<10.3**	<1.5	<1.5	<10.3	<10.3
95-47-6	106.17	#	o-Xylene		**<1.5**	**<6.5**	<1.5	<1.5	<6.5	<6.5
108-67-8	120.2	#	1,3,5-Trimethylbenzene		**<1.5**	**<7.4**	<1.5	<1.5	<7.4	<7.4
95-63-6	120.19	#	1,2,4-Trimethylbenzene		**<1.5**	**<7.4**	<1.5	<1.5	<7.4	<7.4
541-73-1	147.01	#	1,3-Dichlorobenzene		**<1.5**	**<9**	<1.5	<1.5	<9	<9
100-44-7	126.58		Benzyl Chloride		**<1.5**	**<7.8**	<1.5	<1.5	<7.8	<7.8
106-46-7	147.01	#	1,4-Dichlorobenzene		**<1.5**	**<9**	<1.5	<1.5	<9	<9
526-73-8	120.2		1,2,3-Trimethylbenzene		**<1.5**	**<7.4**	<1.5	<1.5	<7.4	<7.4
95-50-1	147	#	1,2-Dichlorobenzene		**<1.5**	**<9**	<1.5	<1.5	<9	<9
120-82-1	181.46		1,2,4-Trichlorobenzene		**<1.5**	**<11.1**	<1.5	<1.5	<11.1	<11.1
91-20-3	128.17		Naphthalene		**<0.32**	**<1.7**	<0.32	<0.32	<1.7	<1.7
			Sum of VOC TO15 compounds		**60**	**266.1**				
460-00-4			4-Bromofluorobenzene Surrogate Recovery		**109%**		0%	0%		
75-01-4	62.5	#	Vinyl Chloride		**<1.5**	**<3.8**	<1.5	<1.5	<3.8	<3.8
	81		Aliphatic >C4-C6		**<10**	**<33**	<10	<10	<33	<33
	100		Aliphatic >C6-C8		**<10**	**<41**	<10	<10	<41	<41
	130		Aliphatic >C8-C10		**<10**	**<53**	<10	<10	<53	<53

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: VS610
Depth:
EMT Job No: 21/16235
EMT Sample No: 1
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 261 0.55
Sample Train Serial number: -

Q* - Qualifiers

B	Indicates analyte found in associated method blank
++	Indicates value exceeds calibration range

Key

MDL	Method Detection Limit
RL	Reporting Limit
#	ISO 17025 (UKAS) accredited

Cas No	Molecular Weight	Compound	Q*	RESULT	RESULT	RL	MDL	RL	MDL
				ppbv	ug/m^3	ppbv	ppbv	ug/m^3	ug/m^3
	160	Aliphatic >C10-C12		**<10**	**<65**	<10	<10	<65	<65
	78.11	Aromatic >C5-EC7 (Benzene)		**2.5**	**8**	<1.5	<1.5	<4.8	<4.8
	92.13	Aromatic >EC7-EC8 (Toluene)		**<1.5**	**<5.7**	<1.5	<1.5	<5.7	<5.7
	120	Aromatic >EC8-EC10		**<10**	**<49**	<10	<10	<49	<49
	130	Aromatic >EC10-EC12		**<10**	**<53**	<10	<10	<53	<53

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: VS612
Depth:
EMT Job No: 21/16235
EMT Sample No: 2
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 1159 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight		Compound	Q*	RESULT	RESULT	RL	MDL	RL	MDL
					ppbv	ug/m^3	ppbv	ppbv	ug/m^3	ug/m^3
75-45-6	86.77		Chlorodifluoromethane (HCFC-22)		<2	<7	<2	<2	<7	<7
75-71-8	120.91		Dichlorodifluoromethane (F-12)		<2.5	<12.4	<2.5	<2.5	<12.4	<12.4
74-87-3	50.49		Chloromethane		1.8	3.7	<1.5	<1.5	<3.1	<3.1
76-14-2	170.92		1,2-Dichlorotetrafluoroethane (F-114)		<1.5	<10.5	<1.5	<1.5	<10.5	<10.5
115-11-7	56.12		Isobutene		<1.5	<3.4	<1.5	<1.5	<3.4	<3.4
106-99-0	54.09		1,3-Butadiene		<1.5	<3.3	<1.5	<1.5	<3.3	<3.3
74-83-9	94.95	#	Bromomethane		<1.5	<5.8	<1.5	<1.5	<5.8	<5.8
75-00-3	64.52	#	Chloroethane		<1.5	<4	<1.5	<1.5	<4	<4
64-17-5	46.07		Ethanol		<100	<188.4	<100	<100	<188.4	<188.4
75-05-8	41.05		Acetonitrile		<1.5	<2.5	<1.5	<1.5	<2.5	<2.5
107-02-8	56.06		Acrolein		<2.5	<5.7	<2.5	<2.5	<5.7	<5.7
	58.08		Acetone + Propanal		605	1437	<6	<6	<14	<14
75-69-4	137.36	#	Trichlorofluoromethane (F-11)		<1.5	<8.4	<1.5	<1.5	<8.4	<8.4
67-63-0	60.09		2-Propanol		<6	<15	<6	<6	<15	<15
109-66-0	72.15		Pentane		<1.5	<4.4	<1.5	<1.5	<4.4	<4.4
78-79-5	68.12		Isoprene		<2	<6	<2	<2	<6	<6
74-88-4	141.94		Methyl Iodide		<1.5	<8.7	<1.5	<1.5	<8.7	<8.7
75-35-4	96.95	#	1,1-Dichloroethene (1,1 DCE)		<1.5	<5.9	<1.5	<1.5	<5.9	<5.9
75-09-2	84.94	#	Methylene Chloride		<14.4	<50	<14.4	<14.4	<50	<50
76-13-1	187.37	#	Trichlorotrifluoroethane		<1.5	<11.5	<1.5	<1.5	<11.5	<11.5
75-15-0	76.14		Carbon Disulfide		111	345.7	<1.5	<1.5	<4.7	<4.7
71-23-8	60.09		1-Propanol		<1.5	<3.7	<1.5	<1.5	<3.7	<3.7
78-85-3	70.09		Methylacrolein		<1.5	<4.3	<1.5	<1.5	<4.3	<4.3
75-34-3	98.97	#	1,1-Dichloroethane		2.2	8.9	<1.5	<1.5	<6.1	<6.1
287-92-3	70.14		Cyclopentane		<1.5	<4.3	<1.5	<1.5	<4.3	<4.3
78-94-4	70.09		Methyl Vinyl Ketone		<1.6	<4.6	<1.6	<1.6	<4.6	<4.6
1634-04-4	88.15		Methyl tertiary butyl ether		<1.5	<5.4	<1.5	<1.5	<5.4	<5.4
108-05-4	86.09		Vinyl Acetate		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
123-72-8	72.11		Butanal		<2	<6	<2	<2	<6	<6
78-93-3	72.1		2-Butanone (MEK)		11	32	<2	<2	<6	<6
156-59-2	96.94	#	cis-1,2-Dichloroethene		19	75	<1	<1	<4	<4
110-54-3	86.17		Hexane		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
67-66-3	119.39	#	Chloroform		<1.5	<7.3	<1.5	<1.5	<7.3	<7.3
107-06-2	98.96	#	1,2-Dichloroethane		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
71-55-6	133.42	#	1,1,1-Trichloroethane		<1.5	<8.2	<1.5	<1.5	<8.2	<8.2
71-36-3	74.12		1-Butanol		<3	<9	<3	<3	<9	<9
71-43-2	78.11	#	Benzene		23.7	75.7	<1.5	<1.5	<4.8	<4.8
56-23-5	153.84	#	Carbon Tetrachloride		<1.5	<9.4	<1.5	<1.5	<9.4	<9.4
110-82-7	84.16		Cyclohexane		4	14	<2	<2	<7	<7

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: VS612
Depth:
EMT Job No: 21/16235
EMT Sample No: 2
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 1159 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight		Compound	Q*	RESULT	RESULT	RL	MDL	RL	MDL
					ppbv	ug/m^3	ppbv	ppbv	ug/m^3	ug/m^3
107-87-9	86.13		2-Pentanone		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
110-62-3	86.13		Pentanal		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
96-22-0	86.13		3-Pentanone		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
78-87-5	112.99	#	1,2-Dichloropropane		<1.5	<6.9	<1.5	<1.5	<6.9	<6.9
75-27-4	163.83		Bromodichloromethane		<1.5	<10.1	<1.5	<1.5	<10.1	<10.1
123-91-1	88.11		1,4-Dioxane		<2	<7	<2	<2	<7	<7
79-01-6	131.4	#	Trichloroethene (TCE)		46.4	249.4	<1.5	<1.5	<8.1	<8.1
10061-01-5	110.97	#	cis-1,3-Dichloropropene		<1.5	<6.8	<1.5	<1.5	<6.8	<6.8
108-10-1	100.16		4-Methyl-2-pentanone		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
10061-02-6	110.97	#	trans-1,3-Dichloropropene		<1.5	<6.8	<1.5	<1.5	<6.8	<6.8
79-00-5	133.4	#	1,1,2-Trichloroethane		<1.5	<8.2	<1.5	<1.5	<8.2	<8.2
108-88-3	92.13	#	Toluene		7.4	27.9	<1.5	<1.5	<5.7	<5.7
589-38-8	100.16		3-Hexanone		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
591-78-6	100.16		2-Hexanone		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
66-25-1	100.16		Hexanal		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
106-93-4	187.86	#	1,2-Dibromoethane		<1.5	<11.5	<1.5	<1.5	<11.5	<11.5
127-18-4	165.85	#	Tetrachloroethene (PCE)		1.5	<10.2	<1.5	<1.5	<10.2	<10.2
108-90-7	112.56	#	Chlorobenzene		<1.5	<6.9	<1.5	<1.5	<6.9	<6.9
100-41-4	106.16	#	Ethylbenzene		<1.5	<6.5	<1.5	<1.5	<6.5	<6.5
179601-23-1	106.17	#	m/p-Xylene		<1.5	<6.5	<1.5	<1.5	<6.5	<6.5
75-25-2	252.77		Bromoform		<1.5	<15.5	<1.5	<1.5	<15.5	<15.5
100-42-5	104.14	#	Styrene		<1.5	<6.4	<1.5	<1.5	<6.4	<6.4
79-34-5	167.85	#	1,1,2,2-Tetrachloroethane		<1.5	<10.3	<1.5	<1.5	<10.3	<10.3
95-47-6	106.17	#	o-Xylene		<1.5	<6.5	<1.5	<1.5	<6.5	<6.5
108-67-8	120.2	#	1,3,5-Trimethylbenzene		<1.5	<7.4	<1.5	<1.5	<7.4	<7.4
95-63-6	120.19	#	1,2,4-Trimethylbenzene		<1.5	<7.4	<1.5	<1.5	<7.4	<7.4
541-73-1	147.01	#	1,3-Dichlorobenzene		<1.5	<9	<1.5	<1.5	<9	<9
100-44-7	126.58		Benzyl Chloride		<1.5	<7.8	<1.5	<1.5	<7.8	<7.8
106-46-7	147.01	#	1,4-Dichlorobenzene		<1.5	<9	<1.5	<1.5	<9	<9
526-73-8	120.2		1,2,3-Trimethylbenzene		<1.5	<7.4	<1.5	<1.5	<7.4	<7.4
95-50-1	147	#	1,2-Dichlorobenzene		<1.5	<9	<1.5	<1.5	<9	<9
120-82-1	181.46		1,2,4-Trichlorobenzene		<1.5	<11.1	<1.5	<1.5	<11.1	<11.1
91-20-3	128.17		Naphthalene		<0.32	<1.7	<0.32	<0.32	<1.7	<1.7
			Sum of VOC TO15 compounds		833	2269.3				
460-00-4			4-Bromofluorobenzene Surrogate Recovery		109%		0%	0%		
75-01-4	62.5	#	Vinyl Chloride		<1.5	<3.8	<1.5	<1.5	<3.8	<3.8
	81		Aliphatic >C4-C6		53	176	<10	<10	<33	<33
	100		Aliphatic >C6-C8		25	102	<10	<10	<41	<41
	130		Aliphatic >C8-C10		<10	<53	<10	<10	<53	<53

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: VS612
Depth:
EMT Job No: 21/16235
EMT Sample No: 2
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 1159 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight	Compound	Q*	RESULT ppbv	RESULT ug/m^3	RL ppbv	MDL ppbv	RL ug/m^3	MDL ug/m^3
	160	Aliphatic >C10-C12		**15**	**98**	<10	<10	<65	<65
	78.11	Aromatic >C5-EC7 (Benzene)		**23.7**	**75.7**	<1.5	<1.5	<4.8	<4.8
	92.13	Aromatic >EC7-EC8 (Toluene)		**7.4**	**27.9**	<1.5	<1.5	<5.7	<5.7
	120	Aromatic >EC8-EC10		**<10**	**<49**	<10	<10	<49	<49
	130	Aromatic >EC10-EC12		**<10**	**<53**	<10	<10	<53	<53

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: VS660
Depth:
EMT Job No: 21/16235
EMT Sample No: 3
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 20274 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight		Compound	Q*	RESULT ppbv	RESULT ug/m^3	RL ppbv	MDL ppbv	RL ug/m^3	MDL ug/m^3
75-45-6	86.77		Chlorodifluoromethane (HCFC-22)		<2	<7	<2	<2	<7	<7
75-71-8	120.91		Dichlorodifluoromethane (F-12)		<2.5	<12.4	<2.5	<2.5	<12.4	<12.4
74-87-3	50.49		Chloromethane		<1.5	<3.1	<1.5	<1.5	<3.1	<3.1
76-14-2	170.92		1,2-Dichlorotetrafluoroethane (F-114)		<1.5	<10.5	<1.5	<1.5	<10.5	<10.5
115-11-7	56.12		Isobutene		<1.5	<3.4	<1.5	<1.5	<3.4	<3.4
106-99-0	54.09		1,3-Butadiene		<1.5	<3.3	<1.5	<1.5	<3.3	<3.3
74-83-9	94.95	#	Bromomethane		<1.5	<5.8	<1.5	<1.5	<5.8	<5.8
75-00-3	64.52	#	Chloroethane		<1.5	<4	<1.5	<1.5	<4	<4
64-17-5	46.07		Ethanol		<100	<188.4	<100	<100	<188.4	<188.4
75-05-8	41.05		Acetonitrile		<1.5	<2.5	<1.5	<1.5	<2.5	<2.5
107-02-8	56.06		Acrolein		<2.5	<5.7	<2.5	<2.5	<5.7	<5.7
	58.08		Acetone + Propanal		12	29	<6	<6	<14	<14
75-69-4	137.36	#	Trichlorofluoromethane (F-11)		<1.5	<8.4	<1.5	<1.5	<8.4	<8.4
67-63-0	60.09		2-Propanol		<6	<15	<6	<6	<15	<15
109-66-0	72.15		Pentane		<1.5	<4.4	<1.5	<1.5	<4.4	<4.4
78-79-5	68.12		Isoprene		<2	<6	<2	<2	<6	<6
74-88-4	141.94		Methyl Iodide		<1.5	<8.7	<1.5	<1.5	<8.7	<8.7
75-35-4	96.95	#	1,1-Dichloroethene (1,1 DCE)		1.8	7.1	<1.5	<1.5	<5.9	<5.9
75-09-2	84.94	#	Methylene Chloride		<14.4	<50	<14.4	<14.4	<50	<50
76-13-1	187.37	#	Trichlorotrifluoroethane		<1.5	<11.5	<1.5	<1.5	<11.5	<11.5
75-15-0	76.14		Carbon Disulfide		<1.5	<4.7	<1.5	<1.5	<4.7	<4.7
71-23-8	60.09		1-Propanol		<1.5	<3.7	<1.5	<1.5	<3.7	<3.7
78-85-3	70.09		Methylacrolein		<1.5	<4.3	<1.5	<1.5	<4.3	<4.3
75-34-3	98.97	#	1,1-Dichloroethane		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
287-92-3	70.14		Cyclopentane		<1.5	<4.3	<1.5	<1.5	<4.3	<4.3
78-94-4	70.09		Methyl Vinyl Ketone		<1.6	<4.6	<1.6	<1.6	<4.6	<4.6
1634-04-4	88.15		Methyl tertiary butyl ether		<1.5	<5.4	<1.5	<1.5	<5.4	<5.4
108-05-4	86.09		Vinyl Acetate		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
123-72-8	72.11		Butanal		<2	<6	<2	<2	<6	<6
78-93-3	72.1		2-Butanone (MEK)		<2	<6	<2	<2	<6	<6
156-59-2	96.94	#	cis-1,2-Dichloroethene		239	948	<1	<1	<4	<4
110-54-3	86.17		Hexane		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
67-66-3	119.39	#	Chloroform		<1.5	<7.3	<1.5	<1.5	<7.3	<7.3
107-06-2	98.96	#	1,2-Dichloroethane		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
71-55-6	133.42	#	1,1,1-Trichloroethane		<1.5	<8.2	<1.5	<1.5	<8.2	<8.2
71-36-3	74.12		1-Butanol		<3	<9	<3	<3	<9	<9
71-43-2	78.11	#	Benzene		<1.5	<4.8	<1.5	<1.5	<4.8	<4.8
56-23-5	153.84	#	Carbon Tetrachloride		<1.5	<9.4	<1.5	<1.5	<9.4	<9.4
110-82-7	84.16		Cyclohexane		<2	<7	<2	<2	<7	<7

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: VS660
Depth:
EMT Job No: 21/16235
EMT Sample No: 3
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 20274 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight		Compound	Q*	RESULT	RESULT	RL	MDL	RL	MDL
					ppbv	ug/m^3	ppbv	ppbv	ug/m^3	ug/m^3
107-87-9	86.13		2-Pentanone		**<1.5**	**<5.3**	<1.5	<1.5	<5.3	<5.3
110-62-3	86.13		Pentanal		**<1.5**	**<5.3**	<1.5	<1.5	<5.3	<5.3
96-22-0	86.13		3-Pentanone		**<1.5**	**<5.3**	<1.5	<1.5	<5.3	<5.3
78-87-5	112.99	#	1,2-Dichloropropane		**<1.5**	**<6.9**	<1.5	<1.5	<6.9	<6.9
75-27-4	163.83		Bromodichloromethane		**<1.5**	**<10.1**	<1.5	<1.5	<10.1	<10.1
123-91-1	88.11		1,4-Dioxane		**<2**	**<7**	<2	<2	<7	<7
79-01-6	131.4	#	Trichloroethene (TCE)		**406.9**	**2186.7**	<1.5	<1.5	<8.1	<8.1
10061-01-5	110.97	#	cis-1,3-Dichloropropene		**<1.5**	**<6.8**	<1.5	<1.5	<6.8	<6.8
108-10-1	100.16		4-Methyl-2-pentanone		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
10061-02-6	110.97	#	trans-1,3-Dichloropropene		**<1.5**	**<6.8**	<1.5	<1.5	<6.8	<6.8
79-00-5	133.4	#	1,1,2-Trichloroethane		**<1.5**	**<8.2**	<1.5	<1.5	<8.2	<8.2
108-88-3	92.13	#	Toluene		**<1.5**	**<5.7**	<1.5	<1.5	<5.7	<5.7
589-38-8	100.16		3-Hexanone		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
591-78-6	100.16		2-Hexanone		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
66-25-1	100.16		Hexanal		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
106-93-4	187.86	#	1,2-Dibromoethane		**<1.5**	**<11.5**	<1.5	<1.5	<11.5	<11.5
127-18-4	165.85	#	Tetrachloroethene (PCE)		**<1.5**	**<10.2**	<1.5	<1.5	<10.2	<10.2
108-90-7	112.56	#	Chlorobenzene		**<1.5**	**<6.9**	<1.5	<1.5	<6.9	<6.9
100-41-4	106.16	#	Ethylbenzene		**<1.5**	**<6.5**	<1.5	<1.5	<6.5	<6.5
179601-23-1	106.17	#	m/p-Xylene		**<1.5**	**<6.5**	<1.5	<1.5	<6.5	<6.5
75-25-2	252.77		Bromoform		**<1.5**	**<15.5**	<1.5	<1.5	<15.5	<15.5
100-42-5	104.14	#	Styrene		**<1.5**	**<6.4**	<1.5	<1.5	<6.4	<6.4
79-34-5	167.85	#	1,1,2,2-Tetrachloroethane		**<1.5**	**<10.3**	<1.5	<1.5	<10.3	<10.3
95-47-6	106.17	#	o-Xylene		**<1.5**	**<6.5**	<1.5	<1.5	<6.5	<6.5
108-67-8	120.2	#	1,3,5-Trimethylbenzene		**<1.5**	**<7.4**	<1.5	<1.5	<7.4	<7.4
95-63-6	120.19	#	1,2,4-Trimethylbenzene		**<1.5**	**<7.4**	<1.5	<1.5	<7.4	<7.4
541-73-1	147.01	#	1,3-Dichlorobenzene		**<1.5**	**<9**	<1.5	<1.5	<9	<9
100-44-7	126.58		Benzyl Chloride		**<1.5**	**<7.8**	<1.5	<1.5	<7.8	<7.8
106-46-7	147.01	#	1,4-Dichlorobenzene		**<1.5**	**<9**	<1.5	<1.5	<9	<9
526-73-8	120.2		1,2,3-Trimethylbenzene		**<1.5**	**<7.4**	<1.5	<1.5	<7.4	<7.4
95-50-1	147	#	1,2-Dichlorobenzene		**<1.5**	**<9**	<1.5	<1.5	<9	<9
120-82-1	181.46		1,2,4-Trichlorobenzene		**<1.5**	**<11.1**	<1.5	<1.5	<11.1	<11.1
91-20-3	128.17		Naphthalene		**<0.32**	**<1.7**	<0.32	<0.32	<1.7	<1.7
			Sum of VOC TO15 compounds		**684.5**	**3234.2**				
460-00-4			4-Bromofluorobenzene Surrogate Recovery		**109%**		0%	0%		
75-01-4	62.5	#	Vinyl Chloride		**24.8**	**63.4**	<1.5	<1.5	<3.8	<3.8
	81		Aliphatic >C4-C6		**<10**	**<33**	<10	<10	<33	<33
	100		Aliphatic >C6-C8		**<10**	**<41**	<10	<10	<41	<41
	130		Aliphatic >C8-C10		**<10**	**<53**	<10	<10	<53	<53

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: VS660
Depth:
EMT Job No: 21/16235
EMT Sample No: 3
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 20274 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight	Compound	Q*	RESULT ppbv	RESULT ug/m^3	RL ppbv	MDL ppbv	RL ug/m^3	MDL ug/m^3
	160	Aliphatic >C10-C12		**28**	**183**	<10	<10	<65	<65
	78.11	Aromatic >C5-EC7 (Benzene)		**<1.5**	**<4.8**	<1.5	<1.5	<4.8	<4.8
	92.13	Aromatic >EC7-EC8 (Toluene)		**<1.5**	**<5.7**	<1.5	<1.5	<5.7	<5.7
	120	Aromatic >EC8-EC10		**<10**	**<49**	<10	<10	<49	<49
	130	Aromatic >EC10-EC12		**<10**	**<53**	<10	<10	<53	<53

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: VS661
Depth:
EMT Job No: 21/16235
EMT Sample No: 4
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 1241 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight		Compound	Q*	RESULT ppbv	RESULT ug/m^3	RL ppbv	MDL ppbv	RL ug/m^3	MDL ug/m^3
75-45-6	86.77		Chlorodifluoromethane (HCFC-22)		<2	<7	<2	<2	<7	<7
75-71-8	120.91		Dichlorodifluoromethane (F-12)		<2.5	<12.4	<2.5	<2.5	<12.4	<12.4
74-87-3	50.49		Chloromethane		<1.5	<3.1	<1.5	<1.5	<3.1	<3.1
76-14-2	170.92		1,2-Dichlorotetrafluoroethane (F-114)		<1.5	<10.5	<1.5	<1.5	<10.5	<10.5
115-11-7	56.12		Isobutene		<1.5	<3.4	<1.5	<1.5	<3.4	<3.4
106-99-0	54.09		1,3-Butadiene		<1.5	<3.3	<1.5	<1.5	<3.3	<3.3
74-83-9	94.95	#	Bromomethane		<1.5	<5.8	<1.5	<1.5	<5.8	<5.8
75-00-3	64.52	#	Chloroethane		<1.5	<4	<1.5	<1.5	<4	<4
64-17-5	46.07		Ethanol		<100	<188.4	<100	<100	<188.4	<188.4
75-05-8	41.05		Acetonitrile		<1.5	<2.5	<1.5	<1.5	<2.5	<2.5
107-02-8	56.06		Acrolein		<2.5	<5.7	<2.5	<2.5	<5.7	<5.7
	58.08		Acetone + Propanal		25	59	<6	<6	<14	<14
75-69-4	137.36	#	Trichlorofluoromethane (F-11)		<1.5	<8.4	<1.5	<1.5	<8.4	<8.4
67-63-0	60.09		2-Propanol		<6	<15	<6	<6	<15	<15
109-66-0	72.15		Pentane		<1.5	<4.4	<1.5	<1.5	<4.4	<4.4
78-79-5	68.12		Isoprene		<2	<6	<2	<2	<6	<6
74-88-4	141.94		Methyl Iodide		<1.5	<8.7	<1.5	<1.5	<8.7	<8.7
75-35-4	96.95	#	1,1-Dichloroethene (1,1 DCE)		<1.5	<5.9	<1.5	<1.5	<5.9	<5.9
75-09-2	84.94	#	Methylene Chloride		<14.4	<50	<14.4	<14.4	<50	<50
76-13-1	187.37	#	Trichlorotrifluoroethane		<1.5	<11.5	<1.5	<1.5	<11.5	<11.5
75-15-0	76.14		Carbon Disulfide		11.7	36.4	<1.5	<1.5	<4.7	<4.7
71-23-8	60.09		1-Propanol		<1.5	<3.7	<1.5	<1.5	<3.7	<3.7
78-85-3	70.09		Methylacrolein		<1.5	<4.3	<1.5	<1.5	<4.3	<4.3
75-34-3	98.97	#	1,1-Dichloroethane		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
287-92-3	70.14		Cyclopentane		<1.5	<4.3	<1.5	<1.5	<4.3	<4.3
78-94-4	70.09		Methyl Vinyl Ketone		<1.6	<4.6	<1.6	<1.6	<4.6	<4.6
1634-04-4	88.15		Methyl tertiary butyl ether		<1.5	<5.4	<1.5	<1.5	<5.4	<5.4
108-05-4	86.09		Vinyl Acetate		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
123-72-8	72.11		Butanal		<2	<6	<2	<2	<6	<6
78-93-3	72.1		2-Butanone (MEK)		<2	<6	<2	<2	<6	<6
156-59-2	96.94	#	cis-1,2-Dichloroethene		2	8	<1	<1	<4	<4
110-54-3	86.17		Hexane		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
67-66-3	119.39	#	Chloroform		6.4	31.3	<1.5	<1.5	<7.3	<7.3
107-06-2	98.96	#	1,2-Dichloroethane		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
71-55-6	133.42	#	1,1,1-Trichloroethane		<1.5	<8.2	<1.5	<1.5	<8.2	<8.2
71-36-3	74.12		1-Butanol		<3	<9	<3	<3	<9	<9
71-43-2	78.11	#	Benzene		<1.5	<4.8	<1.5	<1.5	<4.8	<4.8
56-23-5	153.84	#	Carbon Tetrachloride		<1.5	<9.4	<1.5	<1.5	<9.4	<9.4
110-82-7	84.16		Cyclohexane		<2	<7	<2	<2	<7	<7

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: VS661
Depth:
EMT Job No: 21/16235
EMT Sample No: 4
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 1241 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight		Compound	Q*	RESULT ppbv	RESULT ug/m³	RL ppbv	MDL ppbv	RL ug/m³	MDL ug/m³
107-87-9	86.13		2-Pentanone		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
110-62-3	86.13		Pentanal		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
96-22-0	86.13		3-Pentanone		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
78-87-5	112.99	#	1,2-Dichloropropane		<1.5	<6.9	<1.5	<1.5	<6.9	<6.9
75-27-4	163.83		Bromodichloromethane		5.2	34.8	<1.5	<1.5	<10.1	<10.1
123-91-1	88.11		1,4-Dioxane		<2	<7	<2	<2	<7	<7
79-01-6	131.4	#	Trichloroethene (TCE)		34.2	183.8	<1.5	<1.5	<8.1	<8.1
10061-01-5	110.97	#	cis-1,3-Dichloropropene		<1.5	<6.8	<1.5	<1.5	<6.8	<6.8
108-10-1	100.16		4-Methyl-2-pentanone		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
10061-02-6	110.97	#	trans-1,3-Dichloropropene		<1.5	<6.8	<1.5	<1.5	<6.8	<6.8
79-00-5	133.4	#	1,1,2-Trichloroethane		<1.5	<8.2	<1.5	<1.5	<8.2	<8.2
108-88-3	92.13	#	Toluene		<1.5	<5.7	<1.5	<1.5	<5.7	<5.7
589-38-8	100.16		3-Hexanone		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
591-78-6	100.16		2-Hexanone		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
66-25-1	100.16		Hexanal		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
106-93-4	187.86	#	1,2-Dibromoethane		<1.5	<11.5	<1.5	<1.5	<11.5	<11.5
127-18-4	165.85	#	Tetrachloroethene (PCE)		<1.5	<10.2	<1.5	<1.5	<10.2	<10.2
108-90-7	112.56	#	Chlorobenzene		<1.5	<6.9	<1.5	<1.5	<6.9	<6.9
100-41-4	106.16	#	Ethylbenzene		<1.5	<6.5	<1.5	<1.5	<6.5	<6.5
179601-23-1	106.17	#	m/p-Xylene		<1.5	<6.5	<1.5	<1.5	<6.5	<6.5
75-25-2	252.77		Bromoform		<1.5	<15.5	<1.5	<1.5	<15.5	<15.5
100-42-5	104.14	#	Styrene		<1.5	<6.4	<1.5	<1.5	<6.4	<6.4
79-34-5	167.85	#	1,1,2,2-Tetrachloroethane		<1.5	<10.3	<1.5	<1.5	<10.3	<10.3
95-47-6	106.17	#	o-Xylene		<1.5	<6.5	<1.5	<1.5	<6.5	<6.5
108-67-8	120.2	#	1,3,5-Trimethylbenzene		<1.5	<7.4	<1.5	<1.5	<7.4	<7.4
95-63-6	120.19	#	1,2,4-Trimethylbenzene		<1.5	<7.4	<1.5	<1.5	<7.4	<7.4
541-73-1	147.01	#	1,3-Dichlorobenzene		<1.5	<9	<1.5	<1.5	<9	<9
100-44-7	126.58		Benzyl Chloride		<1.5	<7.8	<1.5	<1.5	<7.8	<7.8
106-46-7	147.01	#	1,4-Dichlorobenzene		<1.5	<9	<1.5	<1.5	<9	<9
526-73-8	120.2		1,2,3-Trimethylbenzene		<1.5	<7.4	<1.5	<1.5	<7.4	<7.4
95-50-1	147	#	1,2-Dichlorobenzene		<1.5	<9	<1.5	<1.5	<9	<9
120-82-1	181.46		1,2,4-Trichlorobenzene		<1.5	<11.1	<1.5	<1.5	<11.1	<11.1
91-20-3	128.17		Naphthalene		<0.32	<1.7	<0.32	<0.32	<1.7	<1.7
			Sum of VOC TO15 compounds		84.5	353.3				
460-00-4			4-Bromofluorobenzene Surrogate Recovery		108%		0%	0%		
75-01-4	62.5	#	Vinyl Chloride		<1.5	<3.8	<1.5	<1.5	<3.8	<3.8
	81		Aliphatic >C4-C6		<10	<33	<10	<10	<33	<33
	100		Aliphatic >C6-C8		<10	<41	<10	<10	<41	<41
	130		Aliphatic >C8-C10		<10	<53	<10	<10	<53	<53

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: VS661
Depth:
EMT Job No: 21/16235
EMT Sample No: 4
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 1241 0.55
Sample Train Serial number: -

Q* - Qualifiers

B	Indicates analyte found in associated method blank
++	Indicates value exceeds calibration range

Key

MDL	Method Detection Limit
RL	Reporting Limit
#	ISO 17025 (UKAS) accredited

Cas No	Molecular Weight	Compound	Q*	RESULT ppbv	RESULT ug/m^3	RL ppbv	MDL ppbv	RL ug/m^3	MDL ug/m^3
	160	Aliphatic >C10-C12		**<10**	**<65**	<10	<10	<65	<65
	78.11	Aromatic >C5-EC7 (Benzene)		**<1.5**	**<4.8**	<1.5	<1.5	<4.8	<4.8
	92.13	Aromatic >EC7-EC8 (Toluene)		**<1.5**	**<5.7**	<1.5	<1.5	<5.7	<5.7
	120	Aromatic >EC8-EC10		**<10**	**<49**	<10	<10	<49	<49
	130	Aromatic >EC10-EC12		**<10**	**<53**	<10	<10	<53	<53

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: BH615
Depth:
EMT Job No: 21/16235
EMT Sample No: 5
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 20281 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight	Compound	Q*	RESULT ppbv	RESULT ug/m^3	RL ppbv	MDL ppbv	RL ug/m^3	MDL ug/m^3
75-45-6	86.77	Chlorodifluoromethane (HCFC-22)		<2	<7	<2	<2	<7	<7
75-71-8	120.91	Dichlorodifluoromethane (F-12)		<2.5	<12.4	<2.5	<2.5	<12.4	<12.4
74-87-3	50.49	Chloromethane		<1.5	<3.1	<1.5	<1.5	<3.1	<3.1
76-14-2	170.92	1,2-Dichlorotetrafluoroethane (F-114)		<1.5	<10.5	<1.5	<1.5	<10.5	<10.5
115-11-7	56.12	Isobutene		<1.5	<3.4	<1.5	<1.5	<3.4	<3.4
106-99-0	54.09	1,3-Butadiene		<1.5	<3.3	<1.5	<1.5	<3.3	<3.3
74-83-9	94.95	# Bromomethane		<1.5	<5.8	<1.5	<1.5	<5.8	<5.8
75-00-3	64.52	# Chloroethane		<1.5	<4	<1.5	<1.5	<4	<4
64-17-5	46.07	Ethanol		<100	<188.4	<100	<100	<188.4	<188.4
75-05-8	41.05	Acetonitrile		<1.5	<2.5	<1.5	<1.5	<2.5	<2.5
107-02-8	56.06	Acrolein		<2.5	<5.7	<2.5	<2.5	<5.7	<5.7
	58.08	Acetone + Propanal		8	19	<6	<6	<14	<14
75-69-4	137.36	# Trichlorofluoromethane (F-11)		<1.5	<8.4	<1.5	<1.5	<8.4	<8.4
67-63-0	60.09	2-Propanol		<6	<15	<6	<6	<15	<15
109-66-0	72.15	Pentane		<1.5	<4.4	<1.5	<1.5	<4.4	<4.4
78-79-5	68.12	Isoprene		<2	<6	<2	<2	<6	<6
74-88-4	141.94	Methyl Iodide		<1.5	<8.7	<1.5	<1.5	<8.7	<8.7
75-35-4	96.95	# 1,1-Dichloroethene (1,1 DCE)		<1.5	<5.9	<1.5	<1.5	<5.9	<5.9
75-09-2	84.94	# Methylene Chloride		<14.4	<50	<14.4	<14.4	<50	<50
76-13-1	187.37	# Trichlorotrifluoroethane		<1.5	<11.5	<1.5	<1.5	<11.5	<11.5
75-15-0	76.14	Carbon Disulfide		8.9	27.7	<1.5	<1.5	<4.7	<4.7
71-23-8	60.09	1-Propanol		<1.5	<3.7	<1.5	<1.5	<3.7	<3.7
78-85-3	70.09	Methylacrolein		<1.5	<4.3	<1.5	<1.5	<4.3	<4.3
75-34-3	98.97	# 1,1-Dichloroethane		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
287-92-3	70.14	Cyclopentane		<1.5	<4.3	<1.5	<1.5	<4.3	<4.3
78-94-4	70.09	Methyl Vinyl Ketone		<1.6	<4.6	<1.6	<1.6	<4.6	<4.6
1634-04-4	88.15	Methyl tertiary butyl ether		<1.5	<5.4	<1.5	<1.5	<5.4	<5.4
108-05-4	86.09	Vinyl Acetate		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
123-72-8	72.11	Butanal		<2	<6	<2	<2	<6	<6
78-93-3	72.1	2-Butanone (MEK)		<2	<6	<2	<2	<6	<6
156-59-2	96.94	# cis-1,2-Dichloroethene		46	182	<1	<1	<4	<4
110-54-3	86.17	Hexane		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
67-66-3	119.39	# Chloroform		<1.5	<7.3	<1.5	<1.5	<7.3	<7.3
107-06-2	98.96	# 1,2-Dichloroethane		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
71-55-6	133.42	# 1,1,1-Trichloroethane		<1.5	<8.2	<1.5	<1.5	<8.2	<8.2
71-36-3	74.12	1-Butanol		<3	<9	<3	<3	<9	<9
71-43-2	78.11	# Benzene		<1.5	<4.8	<1.5	<1.5	<4.8	<4.8
56-23-5	153.84	# Carbon Tetrachloride		<1.5	<9.4	<1.5	<1.5	<9.4	<9.4
110-82-7	84.16	Cyclohexane		<2	<7	<2	<2	<7	<7

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: BH615
Depth:
EMT Job No: 21/16235
EMT Sample No: 5
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 20281 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight		Compound	Q*	RESULT	RESULT	RL	MDL	RL	MDL
					ppbv	ug/m^3	ppbv	ppbv	ug/m^3	ug/m^3
107-87-9	86.13		2-Pentanone		**<1.5**	**<5.3**	<1.5	<1.5	<5.3	<5.3
110-62-3	86.13		Pentanal		**<1.5**	**<5.3**	<1.5	<1.5	<5.3	<5.3
96-22-0	86.13		3-Pentanone		**<1.5**	**<5.3**	<1.5	<1.5	<5.3	<5.3
78-87-5	112.99	#	1,2-Dichloropropane		**<1.5**	**<6.9**	<1.5	<1.5	<6.9	<6.9
75-27-4	163.83		Bromodichloromethane		**<1.5**	**<10.1**	<1.5	<1.5	<10.1	<10.1
123-91-1	88.11		1,4-Dioxane		**<2**	**<7**	<2	<2	<7	<7
79-01-6	131.4	#	Trichloroethene (TCE)		**416.9**	**2240.4**	<1.5	<1.5	<8.1	<8.1
10061-01-5	110.97	#	cis-1,3-Dichloropropene		**<1.5**	**<6.8**	<1.5	<1.5	<6.8	<6.8
108-10-1	100.16		4-Methyl-2-pentanone		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
10061-02-6	110.97	#	trans-1,3-Dichloropropene		**<1.5**	**<6.8**	<1.5	<1.5	<6.8	<6.8
79-00-5	133.4	#	1,1,2-Trichloroethane		**<1.5**	**<8.2**	<1.5	<1.5	<8.2	<8.2
108-88-3	92.13	#	Toluene		**<1.5**	**<5.7**	<1.5	<1.5	<5.7	<5.7
589-38-8	100.16		3-Hexanone		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
591-78-6	100.16		2-Hexanone		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
66-25-1	100.16		Hexanal		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
106-93-4	187.86	#	1,2-Dibromoethane		**<1.5**	**<11.5**	<1.5	<1.5	<11.5	<11.5
127-18-4	165.85	#	Tetrachloroethene (PCE)		**<1.5**	**<10.2**	<1.5	<1.5	<10.2	<10.2
108-90-7	112.56	#	Chlorobenzene		**<1.5**	**<6.9**	<1.5	<1.5	<6.9	<6.9
100-41-4	106.16	#	Ethylbenzene		**<1.5**	**<6.5**	<1.5	<1.5	<6.5	<6.5
179601-23-1	106.17	#	m/p-Xylene		**<1.5**	**<6.5**	<1.5	<1.5	<6.5	<6.5
75-25-2	252.77		Bromoform		**<1.5**	**<15.5**	<1.5	<1.5	<15.5	<15.5
100-42-5	104.14	#	Styrene		**<1.5**	**<6.4**	<1.5	<1.5	<6.4	<6.4
79-34-5	167.85	#	1,1,2,2-Tetrachloroethane		**<1.5**	**<10.3**	<1.5	<1.5	<10.3	<10.3
95-47-6	106.17	#	o-Xylene		**<1.5**	**<6.5**	<1.5	<1.5	<6.5	<6.5
108-67-8	120.2	#	1,3,5-Trimethylbenzene		**<1.5**	**<7.4**	<1.5	<1.5	<7.4	<7.4
95-63-6	120.19	#	1,2,4-Trimethylbenzene		**<1.5**	**<7.4**	<1.5	<1.5	<7.4	<7.4
541-73-1	147.01	#	1,3-Dichlorobenzene		**<1.5**	**<9**	<1.5	<1.5	<9	<9
100-44-7	126.58		Benzyl Chloride		**<1.5**	**<7.8**	<1.5	<1.5	<7.8	<7.8
106-46-7	147.01	#	1,4-Dichlorobenzene		**<1.5**	**<9**	<1.5	<1.5	<9	<9
526-73-8	120.2		1,2,3-Trimethylbenzene		**<1.5**	**<7.4**	<1.5	<1.5	<7.4	<7.4
95-50-1	147	#	1,2-Dichlorobenzene		**<1.5**	**<9**	<1.5	<1.5	<9	<9
120-82-1	181.46		1,2,4-Trichlorobenzene		**<1.5**	**<11.1**	<1.5	<1.5	<11.1	<11.1
91-20-3	128.17		Naphthalene		**<0.32**	**<1.7**	<0.32	<0.32	<1.7	<1.7
			Sum of VOC TO15 compounds		**479.8**	**2469.1**				
460-00-4			4-Bromofluorobenzene Surrogate Recovery		**108%**		0%	0%		
75-01-4	62.5	#	Vinyl Chloride		**<1.5**	**<3.8**	<1.5	<1.5	<3.8	<3.8
	81		Aliphatic >C4-C6		**<10**	**<33**	<10	<10	<33	<33
	100		Aliphatic >C6-C8		**<10**	**<41**	<10	<10	<41	<41
	130		Aliphatic >C8-C10		**48**	**255**	<10	<10	<53	<53

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: BH615
Depth:
EMT Job No: 21/16235
EMT Sample No: 5
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 20281 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight	Compound	Q*	RESULT ppbv	RESULT ug/m^3	RL ppbv	MDL ppbv	RL ug/m^3	MDL ug/m^3
	160	Aliphatic >C10-C12		**114**	**746**	<10	<10	<65	<65
	78.11	Aromatic >C5-EC7 (Benzene)		**<1.5**	**<4.8**	<1.5	<1.5	<4.8	<4.8
	92.13	Aromatic >EC7-EC8 (Toluene)		**<1.5**	**<5.7**	<1.5	<1.5	<5.7	<5.7
	120	Aromatic >EC8-EC10		**<10**	**<49**	<10	<10	<49	<49
	130	Aromatic >EC10-EC12		**<10**	**<53**	<10	<10	<53	<53

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: WS604 BH
Depth:
EMT Job No: 21/16235
EMT Sample No: 6
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 20286 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight	Compound	Q*	RESULT ppbv	RESULT ug/m^3	RL ppbv	MDL ppbv	RL ug/m^3	MDL ug/m^3
75-45-6	86.77	Chlorodifluoromethane (HCFC-22)		<2	<7	<2	<2	<7	<7
75-71-8	120.91	Dichlorodifluoromethane (F-12)		<2.5	<12.4	<2.5	<2.5	<12.4	<12.4
74-87-3	50.49	Chloromethane		17.5	36.1	<1.5	<1.5	<3.1	<3.1
76-14-2	170.92	1,2-Dichlorotetrafluoroethane (F-114)		<1.5	<10.5	<1.5	<1.5	<10.5	<10.5
115-11-7	56.12	Isobutene		<1.5	<3.4	<1.5	<1.5	<3.4	<3.4
106-99-0	54.09	1,3-Butadiene		<1.5	<3.3	<1.5	<1.5	<3.3	<3.3
74-83-9	94.95	# Bromomethane		<1.5	<5.8	<1.5	<1.5	<5.8	<5.8
75-00-3	64.52	# Chloroethane		<1.5	<4	<1.5	<1.5	<4	<4
64-17-5	46.07	Ethanol		<100	<188.4	<100	<100	<188.4	<188.4
75-05-8	41.05	Acetonitrile		<1.5	<2.5	<1.5	<1.5	<2.5	<2.5
107-02-8	56.06	Acrolein		<2.5	<5.7	<2.5	<2.5	<5.7	<5.7
	58.08	Acetone + Propanal		232	551	<6	<6	<14	<14
75-69-4	137.36	# Trichlorofluoromethane (F-11)		<1.5	<8.4	<1.5	<1.5	<8.4	<8.4
67-63-0	60.09	2-Propanol		<6	<15	<6	<6	<15	<15
109-66-0	72.15	Pentane		<1.5	<4.4	<1.5	<1.5	<4.4	<4.4
78-79-5	68.12	Isoprene		<2	<6	<2	<2	<6	<6
74-88-4	141.94	Methyl Iodide		<1.5	<8.7	<1.5	<1.5	<8.7	<8.7
75-35-4	96.95	# 1,1-Dichloroethene (1,1 DCE)		<1.5	<5.9	<1.5	<1.5	<5.9	<5.9
75-09-2	84.94	# Methylene Chloride		<14.4	<50	<14.4	<14.4	<50	<50
76-13-1	187.37	# Trichlorotrifluoroethane		<1.5	<11.5	<1.5	<1.5	<11.5	<11.5
75-15-0	76.14	Carbon Disulfide		324.6	1010.8	<1.5	<1.5	<4.7	<4.7
71-23-8	60.09	1-Propanol		<1.5	<3.7	<1.5	<1.5	<3.7	<3.7
78-85-3	70.09	Methylacrolein		<1.5	<4.3	<1.5	<1.5	<4.3	<4.3
75-34-3	98.97	# 1,1-Dichloroethane		11.3	45.7	<1.5	<1.5	<6.1	<6.1
287-92-3	70.14	Cyclopentane		<1.5	<4.3	<1.5	<1.5	<4.3	<4.3
78-94-4	70.09	Methyl Vinyl Ketone		<1.6	<4.6	<1.6	<1.6	<4.6	<4.6
1634-04-4	88.15	Methyl tertiary butyl ether		<1.5	<5.4	<1.5	<1.5	<5.4	<5.4
108-05-4	86.09	Vinyl Acetate		<1.5	<5.3	<1.5	<1.5	<5.3	<5.3
123-72-8	72.11	Butanal		<2	<6	<2	<2	<6	<6
78-93-3	72.1	2-Butanone (MEK)		3	9	<2	<2	<6	<6
156-59-2	96.94	# cis-1,2-Dichloroethene		<1	<4	<1	<1	<4	<4
110-54-3	86.17	Hexane		1.9	6.7	<1.5	<1.5	<5.3	<5.3
67-66-3	119.39	# Chloroform		1.6	7.8	<1.5	<1.5	<7.3	<7.3
107-06-2	98.96	# 1,2-Dichloroethane		<1.5	<6.1	<1.5	<1.5	<6.1	<6.1
71-55-6	133.42	# 1,1,1-Trichloroethane		319.5	1743.4	<1.5	<1.5	<8.2	<8.2
71-36-3	74.12	1-Butanol		<3	<9	<3	<3	<9	<9
71-43-2	78.11	# Benzene		74.8	239	<1.5	<1.5	<4.8	<4.8
56-23-5	153.84	# Carbon Tetrachloride		<1.5	<9.4	<1.5	<1.5	<9.4	<9.4
110-82-7	84.16	Cyclohexane		<2	<7	<2	<2	<7	<7

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: WS604 BH
Depth:
EMT Job No: 21/16235
EMT Sample No: 6
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 20286 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight		Compound	Q*	RESULT	RESULT	RL	MDL	RL	MDL
					ppbv	ug/m^3	ppbv	ppbv	ug/m^3	ug/m^3
107-87-9	86.13		2-Pentanone		**<1.5**	**<5.3**	<1.5	<1.5	<5.3	<5.3
110-62-3	86.13		Pentanal		**<1.5**	**<5.3**	<1.5	<1.5	<5.3	<5.3
96-22-0	86.13		3-Pentanone		**<1.5**	**<5.3**	<1.5	<1.5	<5.3	<5.3
78-87-5	112.99	#	1,2-Dichloropropane		**<1.5**	**<6.9**	<1.5	<1.5	<6.9	<6.9
75-27-4	163.83		Bromodichloromethane		**<1.5**	**<10.1**	<1.5	<1.5	<10.1	<10.1
123-91-1	88.11		1,4-Dioxane		**<2**	**<7**	<2	<2	<7	<7
79-01-6	131.4	#	Trichloroethene (TCE)		**12.2**	**65.6**	<1.5	<1.5	<8.1	<8.1
10061-01-5	110.97	#	cis-1,3-Dichloropropene		**<1.5**	**<6.8**	<1.5	<1.5	<6.8	<6.8
108-10-1	100.16		4-Methyl-2-pentanone		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
10061-02-6	110.97	#	trans-1,3-Dichloropropene		**<1.5**	**<6.8**	<1.5	<1.5	<6.8	<6.8
79-00-5	133.4	#	1,1,2-Trichloroethane		**<1.5**	**<8.2**	<1.5	<1.5	<8.2	<8.2
108-88-3	92.13	#	Toluene		**7.1**	**26.8**	<1.5	<1.5	<5.7	<5.7
589-38-8	100.16		3-Hexanone		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
591-78-6	100.16		2-Hexanone		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
66-25-1	100.16		Hexanal		**<1.5**	**<6.1**	<1.5	<1.5	<6.1	<6.1
106-93-4	187.86	#	1,2-Dibromoethane		**<1.5**	**<11.5**	<1.5	<1.5	<11.5	<11.5
127-18-4	165.85	#	Tetrachloroethene (PCE)		**3.2**	**21.7**	<1.5	<1.5	<10.2	<10.2
108-90-7	112.56	#	Chlorobenzene		**<1.5**	**<6.9**	<1.5	<1.5	<6.9	<6.9
100-41-4	106.16	#	Ethylbenzene		**2.1**	**9.1**	<1.5	<1.5	<6.5	<6.5
179601-23-1	106.17	#	m/p-Xylene		**6.3**	**27.4**	<1.5	<1.5	<6.5	<6.5
75-25-2	252.77		Bromoform		**<1.5**	**<15.5**	<1.5	<1.5	<15.5	<15.5
100-42-5	104.14	#	Styrene		**<1.5**	**<6.4**	<1.5	<1.5	<6.4	<6.4
79-34-5	167.85	#	1,1,2,2-Tetrachloroethane		**<1.5**	**<10.3**	<1.5	<1.5	<10.3	<10.3
95-47-6	106.17	#	o-Xylene		**2.7**	**11.7**	<1.5	<1.5	<6.5	<6.5
108-67-8	120.2	#	1,3,5-Trimethylbenzene		**<1.5**	**<7.4**	<1.5	<1.5	<7.4	<7.4
95-63-6	120.19	#	1,2,4-Trimethylbenzene		**<1.5**	**<7.4**	<1.5	<1.5	<7.4	<7.4
541-73-1	147.01	#	1,3-Dichlorobenzene		**<1.5**	**<9**	<1.5	<1.5	<9	<9
100-44-7	126.58		Benzyl Chloride		**<1.5**	**<7.8**	<1.5	<1.5	<7.8	<7.8
106-46-7	147.01	#	1,4-Dichlorobenzene		**<1.5**	**<9**	<1.5	<1.5	<9	<9
526-73-8	120.2		1,2,3-Trimethylbenzene		**<1.5**	**<7.4**	<1.5	<1.5	<7.4	<7.4
95-50-1	147	#	1,2-Dichlorobenzene		**<1.5**	**<9**	<1.5	<1.5	<9	<9
120-82-1	181.46		1,2,4-Trichlorobenzene		**<1.5**	**<11.1**	<1.5	<1.5	<11.1	<11.1
91-20-3	128.17		Naphthalene		**<0.32**	**<1.7**	<0.32	<0.32	<1.7	<1.7
			Sum of VOC TO15 compounds		**1019.8**	**3811.8**				
460-00-4			4-Bromofluorobenzene Surrogate Recovery		**111%**		0%	0%		
75-01-4	62.5	#	Vinyl Chloride		**<1.5**	**<3.8**	<1.5	<1.5	<3.8	<3.8
	81		Aliphatic >C4-C6		**276**	**914**	<10	<10	<33	<33
	100		Aliphatic >C6-C8		**68**	**278**	<10	<10	<41	<41
	130		Aliphatic >C8-C10		**11**	**58**	<10	<10	<53	<53

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE18542-100
Location: Langley Park, Chippenham
Contact: Paul Latta

Sample Date: 13 Oct 2021
Date of Receipt: 15 Oct 2021
Date Analysed: 1 Nov 2021

Sample ID: WS604 BH
Depth:
EMT Job No: 21/16235
EMT Sample No: 6
Matrix: Air
Method: TM68 VOCs in gases (GC-MS)

Canister Serial number: V 20286 0.55
Sample Train Serial number: -

Q* - Qualifiers

B Indicates analyte found in associated method blank
++ Indicates value exceeds calibration range

Key

MDL Method Detection Limit
RL Reporting Limit
ISO 17025 (UKAS) accredited

Cas No	Molecular Weight	Compound	Q*	RESULT ppbv	RESULT ug/m^3	RL ppbv	MDL ppbv	RL ug/m^3	MDL ug/m^3
	160	Aliphatic >C10-C12		**12**	**79**	<10	<10	<65	<65
	78.11	Aromatic >C5-EC7 (Benzene)		**74.8**	**239**	<1.5	<1.5	<4.8	<4.8
	92.13	Aromatic >EC7-EC8 (Toluene)		**7.1**	**26.8**	<1.5	<1.5	<5.7	<5.7
	120	Aromatic >EC8-EC10		**15**	**74**	<10	<10	<49	<49
	130	Aromatic >EC10-EC12		**<10**	**<53**	<10	<10	<53	<53

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	407VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	BH612	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480512	**Date Analysed:**	09-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	29

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 1	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	-	< 5	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8 *	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	85	Dibromofluoromethane	117
1,4-Difluorobenzene	4.01	87	Toluene-d8	97
Chlorobenzene-d5	5.14	88	Bromofluorobenzene	96
1,4-Dichlorobenzene-d4	5.94	89		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	407VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	BH610	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480513	**Date Analysed:**	09-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	30

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 1	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	-	< 5	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8 *	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	85	Dibromofluoromethane	107
1,4-Difluorobenzene	4.01	86	Toluene-d8	97
Chlorobenzene-d5	5.14	87	Bromofluorobenzene	94
1,4-Dichlorobenzene-d4	5.94	86		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	407VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	BH201	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480514	**Date Analysed:**	09-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	31

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 1	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	-	< 5	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8 *	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	83	Dibromofluoromethane	118
1,4-Difluorobenzene	4.01	85	Toluene-d8	98
Chlorobenzene-d5	5.14	86	Bromofluorobenzene	95
1,4-Dichlorobenzene-d4	5.94	85		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	407VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	BH608 (Deep)	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480515	**Date Analysed:**	09-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	32

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 1	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	-	< 5	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8 *	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	83	Dibromofluoromethane	117
1,4-Difluorobenzene	4.01	85	Toluene-d8	98
Chlorobenzene-d5	5.14	87	Bromofluorobenzene	94
1,4-Dichlorobenzene-d4	5.94	81		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	407VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	BH613 (Deep)	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480516	**Date Analysed:**	09-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	1

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	3.37	11	96
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	4.13	5	99
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8 *	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	84	Dibromofluoromethane	115
1,4-Difluorobenzene	4.01	85	Toluene-d8	98
Chlorobenzene-d5	5.14	87	Bromofluorobenzene	95
1,4-Dichlorobenzene-d4	5.94	84		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	407VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	BH303	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480518	**Date Analysed:**	09-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	2

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	1.04	10	52
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	1.97	22	100
trans 1,2-Dichloroethene	156-60-5	2.64	6	87
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2 D	3.37	1190	87
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 * D	4.13	25300	89
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8 *	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted
"D" denotes that result has been taken from dilution

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	83	Dibromofluoromethane	113
1,4-Difluorobenzene	4.01	85	Toluene-d8	100
Chlorobenzene-d5	5.14	85	Bromofluorobenzene	98
1,4-Dichlorobenzene-d4	5.94	87		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	410VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	WS639	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480519	**Date Analysed:**	11-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	4

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 1	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	4.12	13	98
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7 *	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	81	Dibromofluoromethane	118
1,4-Difluorobenzene	4.01	81	Toluene-d8	98
Chlorobenzene-d5	5.14	84	Bromofluorobenzene	95
1,4-Dichlorobenzene-d4	5.94	80		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	410VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	BH139	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480520	**Date Analysed:**	11-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	5

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	3.37	2	88
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	4.12	12	98
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7 *	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	82	Dibromofluoromethane	103
1,4-Difluorobenzene	4.01	84	Toluene-d8	99
Chlorobenzene-d5	5.15	86	Bromofluorobenzene	94
1,4-Dichlorobenzene-d4	5.94	82		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	407VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	WS650	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480521	**Date Analysed:**	09-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	5

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4 D	1.04	2160	91
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	1.97	87	99
trans 1,2-Dichloroethene	156-60-5	2.64	113	96
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2 D	3.37	38100	96
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	3.82	1	58
1,2-Dichloroethane	107-06-2	3.84	1	M
Trichloroethene	79-01-6 * D	4.12	74600	86
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	4.64	4	89
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	4.79	22	90
Tetrachloroethene	127-18-4	4.85	44	95
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	5.18	8	94
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	5.22	6	96
o-Xylene	95-47-6	5.36	8	96

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8 *	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted
"D" denotes that result has been taken from dilution

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	82	Dibromofluoromethane	111
1,4-Difluorobenzene	4.01	84	Toluene-d8	100
Chlorobenzene-d5	5.14	85	Bromofluorobenzene	99
1,4-Dichlorobenzene-d4	5.94	86		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	407VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	BH401 (Shallow)	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480522	**Date Analysed:**	09-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	6

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	0.84	1	M
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	1.08	179	96
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	1.36	31	M
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	1.97	172	99
trans 1,2-Dichloroethene	156-60-5	2.64	11	90
1,1-Dichloroethane	75-34-3	2.98	371	99
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2 D	3.37	1250	93
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	3.63	343	89
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 * D	4.12	6920	88
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	4.84	7	95
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8 *	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted
"D" denotes that result has been taken from dilution

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	78	Dibromofluoromethane	111
1,4-Difluorobenzene	4.01	81	Toluene-d8	99
Chlorobenzene-d5	5.14	82	Bromofluorobenzene	97
1,4-Dichlorobenzene-d4	5.94	82		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	407VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	BH401 (Deep)	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480523	**Date Analysed:**	09-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	7

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	0.84	1	M
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	1.04	170	99
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	1.35	23	M
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	1.97	203	99
trans 1,2-Dichloroethene	156-60-5	2.64	12	96
1,1-Dichloroethane	75-34-3	2.98	367	99
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2 D	3.37	1210	86
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6 D	3.63	398	M
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 * D	4.12	20600	91
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	4.84	15	94
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8 *	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted
"D" denotes that result has been taken from dilution

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	79	Dibromofluoromethane	109
1,4-Difluorobenzene	4.01	83	Toluene-d8	102
Chlorobenzene-d5	5.14	85	Bromofluorobenzene	96
1,4-Dichlorobenzene-d4	5.94	84		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	410VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	WS642	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480524	**Date Analysed:**	11-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	9

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 1	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	-	< 5	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7 *	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	83	Dibromofluoromethane	116
1,4-Difluorobenzene	4.01	84	Toluene-d8	99
Chlorobenzene-d5	5.14	86	Bromofluorobenzene	95
1,4-Dichlorobenzene-d4	5.94	82		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	410VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	WS647	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480525	**Date Analysed:**	11-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	10

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 1	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	-	< 5	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7 *	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	87	Dibromofluoromethane	115
1,4-Difluorobenzene	4.01	88	Toluene-d8	98
Chlorobenzene-d5	5.14	89	Bromofluorobenzene	96
1,4-Dichlorobenzene-d4	5.94	85		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	410VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	WS648	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480526	**Date Analysed:**	11-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	11

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	3.37	4	86
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	4.13	26	99
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7 *	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	90	Dibromofluoromethane	111
1,4-Difluorobenzene	4.01	90	Toluene-d8	99
Chlorobenzene-d5	5.14	92	Bromofluorobenzene	96
1,4-Dichlorobenzene-d4	5.94	88		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	410VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	WS305	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480527	**Date Analysed:**	11-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	12

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	3.37	1	58
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	-	< 5	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7 *	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	90	Dibromofluoromethane	118
1,4-Difluorobenzene	4.01	90	Toluene-d8	99
Chlorobenzene-d5	5.14	92	Bromofluorobenzene	95
1,4-Dichlorobenzene-d4	5.94	90		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	410VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	WS649	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480528	**Date Analysed:**	11-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	13

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 1	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	-	< 5	-
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7 *	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	87	Dibromofluoromethane	116
1,4-Difluorobenzene	4.01	88	Toluene-d8	98
Chlorobenzene-d5	5.14	89	Bromofluorobenzene	95
1,4-Dichlorobenzene-d4	5.94	87		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	415VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	BH203	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480529	**Date Analysed:**	15-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	31

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	2.64	4	M
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	3.37	46	96
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	4.13	9	98
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	91	Dibromofluoromethane	109
1,4-Difluorobenzene	4.01	90	Toluene-d8	97
Chlorobenzene-d5	5.14	92	Bromofluorobenzene	95
1,4-Dichlorobenzene-d4	5.94	93		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	410VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	BH207	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480530	**Date Analysed:**	11-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	15

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	3.37	3	92
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	4.13	16	94
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7 *	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.66	84	Dibromofluoromethane	118
1,4-Difluorobenzene	4.01	85	Toluene-d8	99
Chlorobenzene-d5	5.14	87	Bromofluorobenzene	94
1,4-Dichlorobenzene-d4	5.94	84		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	410VOC.MS11\ Initial Calibration	**Matrix:**	Water
Sample Details:	WS613	**Date Booked in:**	05-Apr-14	**Method:**	Headspace
LIMS ID Number:	EX1480531	**Date Analysed:**	11-Apr-14	**Multiplier:**	1
Job Number:	W17_5242	**Operator:**	PR	**Position:**	16

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Dichlorodifluoromethane	75-71-8 *	-	< 1	-
Chloromethane	74-87-3	-	< 1	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9 *	-	< 5	-
Chloroethane	75-00-3	-	< 5	-
Trichlorofluoromethane	75-69-4	-	< 1	-
1,1-Dichloroethene	75-35-4	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	2.64	1	66
1,1-Dichloroethane	75-34-3	-	< 1	-
2,2-Dichloropropane	594-20-7 *	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	3.37	13	85
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6 *	4.12	9	98
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5 *	-	< 1	-
Toluene	108-88-3	-	< 1	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 5	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7 *	-	< 1	-
Ethylbenzene	100-41-4	-	< 1	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 1	-
o-Xylene	95-47-6	-	< 1	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/l	% Fit
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 *	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 5	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 5	-
1,2,4-Trichlorobenzene	120-82-1	-	< 5	-
Hexachlorobutadiene	87-68-3	-	< 5	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 5	-

Compounds marked * are not UKAS accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	3.65	79	Dibromofluoromethane	111
1,4-Difluorobenzene	4.01	82	Toluene-d8	96
Chlorobenzene-d5	5.14	81	Bromofluorobenzene	91
1,4-Dichlorobenzene-d4	5.94	70		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 14 days of sampling.

Where individual results are flagged see report notes for status.

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-12985-1
Initial Date of Issue:	25-Apr-2023
Client	Terra Firma
Client Address:	t/a Terra Firma The Slate Barn Lower Lowley Dunsford Devon EX6 7BP
Contact(s):	Info
Project	EX-23-027 Langley Park, Chippenham

Quotation No.:		**Date Received:**	20-Apr-2023
Order No.:	EX-23-027	**Date Instructed:**	20-Apr-2023
No. of Samples:	9		
Turnaround (Wkdays):	7	**Results Due:**	28-Apr-2023
Date Approved:	25-Apr-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Gas

Project: EX-23-027 Langley Park, Chippenham

Client: Terra Firma		**Chemtest Job No.:**			23-12985	23-12985	23-12985	23-12985	23-12985	23-12985	23-12985	23-12985	23-12985
Quotation No.:		**Chemtest Sample ID.:**			1626481	1626482	1626483	1626484	1626485	1626486	1626487	1626488	1626489
		Sample Location:			WS611	VS612	R21/2	WS21/3	WS652	WS21/14	BH610	WS21/4	WS21/5
		Sample Type:			GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS
		Date Sampled:			13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Aliphatic TPH >C5-C6	N	3675	µg/m³	N/A	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	3.0	< 1.00	< 1.00
Aliphatic TPH >C6-C8	N	3675	µg/m³	N/A	< 1.00	< 1.00	< 1.00	4.0	2.0	6.0	< 1.00	< 1.00	3.0
Aliphatic TPH >C8-C10	N	3675	µg/m³	N/A	30	3.0	3.0	2.0	5.0	9.0	20	6.0	10
Aliphatic TPH >C10-C12	N	3675	µg/m³	N/A	3.0	< 1.00	3.0	< 1.00	2.0	6.0	< 1.00	2.0	< 1.00
Aliphatic TPH >C12-C16	N	3675	µg/m³	N/A	15	< 1.00	< 1.00	< 1.00	< 1.00	7.0	< 1.00	< 1.00	< 1.00
Aromatic TPH >C5-C7	N	3675	µg/m³	N/A	1.0	1.0	8.0	1.0	1.0	1.0	1.0	2.0	2.0
Aromatic TPH >C7-C8	N	3675	µg/m³	N/A	1.0	< 1.00	1.0	< 1.00	2.0	1.0	< 1.00	1.0	< 1.00
Aromatic TPH >C8-C10	N	3675	µg/m³	N/A	560	27	1900	8.0	10	27	25	3.0	2.0
Aromatic TPH >C10-C12	N	3675	µg/m³	N/A	310	4.0	830	< 1.00	4.0	< 1.00	8.0	< 1.00	< 1.00
Aromatic TPH >C12-C16	N	3675	µg/m³	N/A	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	4.0	< 1.00	< 1.00
Trichlorofluoromethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Propanone	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1	<1.1	<1.2	<1.1	<1.1	<1.1	<1.1
Diethyl ether	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1	<1.1	<1.2	<1.1	<1.1	<1.1	<1.1
1,1-Dichloroethene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Carbon disulfide	N	3760	µg/m³	N/A	<0.4	<0.4	<0.4	<0.4	<0.5	<0.5	<0.4	<0.4	<0.4
Allyl chloride	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1	<1.1	<1.2	<1.1	<1.1	<1.1	<1.1
trans-1,2-Dichloroethene	N	3760	µg/m³	N/A	<0.6	3.8	<0.6	<0.6	77.8	1.0	<0.6	<0.6	<0.6
Methyl-tertiary-butyl ether	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,1-Dichloroethane	N	3760	µg/m³	N/A	1.0	<0.6	<0.6	<0.6	0.7	<0.6	<0.6	<0.6	<0.6
2-Butanone	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1	<1.1	<1.2	<1.1	<1.1	<1.1	<1.1
cis-1,2-Dichloroethene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	0.8	<0.6	<0.6	<0.6	<0.6
Trichloromethane	N	3760	µg/m³	N/A	<0.4	<0.4	<0.4	<0.4	3.5	2.4	<0.4	<0.4	4.7
Tetrahydrofuran	N	3760	µg/m³	N/A	<11.2	<11.1	<11.1	<11.2	<12.0	<11.5	<11.1	<11.1	<11.1
1,1,1-Trichloroethane	N	3760	µg/m³	N/A	38.2	<0.4	<0.4	<0.4	3.7	1.8	<0.4	<0.4	0.9
1,2-Dichloroethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1-Chlorobutane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,1-Dichloropropene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Benzene	N	3760	µg/m³	N/A	1.1	0.6	8.0	0.9	0.7	0.9	1.1	2.0	2.1
Tetrachloromethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	2.9	<0.6	<0.6	<0.6
2-Nitropropane	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1	<1.1	<1.2	<1.1	<1.1	<1.1	<1.1
Methyl methacrylate	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1	<1.1	<1.2	<1.1	<1.1	<1.1	<1.1
2-Hexanone	N	3760	µg/m³	N/A	<1.7	<1.7	<1.7	<1.7	<1.8	<1.7	<1.7	<1.7	<1.7
4-Methyl-2-pentanone	N	3760	µg/m³	N/A	<2.8	<2.8	<2.8	<2.8	<3.0	<2.9	<2.8	<2.8	<2.8
Trichloroethene	N	3760	µg/m³	N/A	1.9	10.6	<0.6	4.3	151.2	19.6	<0.6	11.0	<0.6
Dibromomethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	1.5
Bromodichloromethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	11.0
trans-1,3-Dichloropropene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
cis-1,3-Dichloropropene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Toluene	N	3760	µg/m³	N/A	0.7	<0.6	0.9	<0.6	1.5	1.4	<0.6	0.6	<0.6
1,1,2-Trichloroethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,3-Dichloropropane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6

Results - Gas

Project: EX-23-027 Langley Park, Chippenham

Client: Terra Firma		**Chemtest Job No.:**			23-12985	23-12985	23-12985	23-12985	23-12985	23-12985	23-12985	23-12985	23-12985
Quotation No.:		**Chemtest Sample ID.:**			1626481	1626482	1626483	1626484	1626485	1626486	1626487	1626488	1626489
		Sample Location:			WS611	VS612	R21/2	WS21/3	WS652	WS21/14	BH610	WS21/4	WS21/5
		Sample Type:			GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS
		Date Sampled:			13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Ethyl methacrylate	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1	<1.1	<1.2	<1.1	<1.1	<1.1	<1.1
Dibromochloromethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	9.4
1,2-Dibromoethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Tetrachloroethene	N	3760	µg/m³	N/A	3.5	1.3	31.8	1.2	4.1	2.4	1.1	1.9	13.6
Chlorobenzene	N	3760	µg/m³	N/A	<0.4	<0.4	<0.4	<0.4	<0.5	<0.5	<0.4	<0.4	<0.4
1,1,1,2-Tetrachloroethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Ethylbenzene	N	3760	µg/m³	N/A	0.5	<0.4	4.6	<0.4	<0.5	<0.5	<0.4	<0.4	<0.4
m- & p-Xylene	N	3760	µg/m³	N/A	2.1	<0.8	15.0	<0.8	<0.9	<0.9	<0.8	<0.8	<0.8
Bromoform	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
o-Xylene	N	3760	µg/m³	N/A	2.4	<0.4	13.6	<0.4	<0.5	<0.5	<0.4	<0.4	<0.4
Styrene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	7.7	<0.6	<0.6	0.9	<0.6
1,1,2,2-Tetrachloroethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,2,3-Trichloropropane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
iso-Propylbenzene	N	3760	µg/m³	N/A	<0.5	<0.5	24.1	<0.5	<0.5	0.5	<0.5	1.9	0.9
trans-1,4-Dichloro-2-butene	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1	<1.1	<1.2	<1.1	<1.1	<1.1	<1.1
Bromobenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
2-Chlorotoluene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
n-Propylbenzene	N	3760	µg/m³	N/A	36.3	1.0	95.6	<0.6	<0.6	0.7	<0.6	<0.6	<0.6
4-Chlorotoluene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,3,5-Trimethylbenzene	N	3760	µg/m³	N/A	85.5	2.7	158.3	0.6	<0.6	1.4	1.5	<0.6	0.6
Pentachloroethane	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1	<1.1	<1.2	<1.1	<1.1	<1.1	<1.1
1,2,4-Trimethylbenzene	N	3760	µg/m³	N/A	201.0	11.6	269.6	2.5	0.8	5.2	6.5	<0.6	0.6
tert-Butylbenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,3-Dichlorobenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
sec-Butylbenzene	N	3760	µg/m³	N/A	5.0	<0.6	12.9	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,4-Dichlorobenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
4-Isopropyltoluene	N	3760	µg/m³	N/A	4.4	<0.6	6.0	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,2-Dichlorobenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
n-Butylbenzene	N	3760	µg/m³	N/A	7.4	<0.5	7.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Hexachloroethane	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1	<1.1	<1.2	<1.1	<1.1	<1.1	<1.1
1,2-Dibromo-3-chloropropane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,2,4-Trichlorobenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,2,3-Trichlorobenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Hexachlorobutadiene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6

Tentatively Identified Compounds													
1,3,5-Cycloheptatriene	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	N/A	1.1	N/A	N/A	N/A
1-Hexanol, 2-ethyl-	N	3760	µg/m³	N/A	N/A	1.8	N/A	2.2	4.1	9.4	N/A	4.8	4.2
2-Ethylacridine	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.0	N/A	N/A
2-Undecanone, 6,10-dimethyl-	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	N/A	4.6	N/A	N/A	N/A

Results - Gas

Project: EX-23-027 Langley Park, Chippenham

Client: Terra Firma		**Chemtest Job No.:**			23-12985	23-12985	23-12985	23-12985	23-12985	23-12985	23-12985	23-12985	23-12985
Quotation No.:		**Chemtest Sample ID.:**			1626481	1626482	1626483	1626484	1626485	1626486	1626487	1626488	1626489
		Sample Location:			WS611	VS612	R21/2	WS21/3	WS652	WS21/14	BH610	WS21/4	WS21/5
		Sample Type:			GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS
		Date Sampled:			13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
3,5-Octadien-2-one	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10.7	N/A	N/A
3-Octen-2-one	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.1	N/A	N/A
3-Propyltoluene	N	3760	µg/m³	N/A	52.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3-Thujene	N	3760	µg/m³	N/A	3.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5-Undecanone, 2-methyl-	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	N/A	2.3	N/A	N/A	N/A
6-Methyl-6-ethylfulvene	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.6
Alpha-Methylstyrene	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	N/A	5.6	N/A	N/A	N/A
Alpha-Pinene	N	3760	µg/m³	N/A	26.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, (1-methoxyethyl)-	N	3760	µg/m³	N/A	N/A	N/A	39.1	N/A	1.8	N/A	N/A	N/A	N/A
Benzene, 1,2,3,5-tetramethyl-	N	3760	µg/m³	N/A	15.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, 1,2,3-trimethyl-	N	3760	µg/m³	N/A	N/A	7.8	N/A	31.0	N/A	7.5	11.5	N/A	N/A
Benzene, 1,2,4,5-tetramethyl-	N	3760	µg/m³	N/A	N/A	N/A	19.2	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, 1,2-diethyl-	N	3760	µg/m³	N/A	2.3	N/A	8.9	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, 1,3-bis(1-methylethyl)-	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	2.1	N/A	N/A	N/A	N/A
Benzene, 1,3-dimethyl-	N	3760	µg/m³	N/A	N/A	N/A	25.0	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, 1,4-bis(1-methylethyl)-	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	1.8	N/A	N/A	N/A	N/A
Benzene, 1,4-diethyl-	N	3760	µg/m³	N/A	97.4	N/A	278.1	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, 1-ethenyl-4-ethyl-	N	3760	µg/m³	N/A	1.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, 1-ethyl-2,3-dimethyl-	N	3760	µg/m³	N/A	6.9	N/A	18.6	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, 1-ethyl-2,4-dimethyl-	N	3760	µg/m³	N/A	38.5	N/A	76.0	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, 1-ethyl-2-methyl-	N	3760	µg/m³	N/A	65.4	N/A	361.7	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, 1-ethyl-3-methyl-	N	3760	µg/m³	N/A	171.1	3.9	919.7	1.7	N/A	6.6	5.9	N/A	N/A
Benzene, 1-methyl-3-(1-methylethyl)-	N	3760	µg/m³	N/A	17.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, 1-methyl-3-propyl-	N	3760	µg/m³	N/A	N/A	N/A	175.0	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, 1-methyl-4-propyl-	N	3760	µg/m³	N/A	15.0	N/A	45.6	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, 2-ethyl-1,3-dimethyl-	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.3	N/A	N/A
Benzene, 2-ethyl-1,4-dimethyl-	N	3760	µg/m³	N/A	49.4	1.3	116.1	N/A	N/A	N/A	N/A	N/A	N/A
Benzene, 4-ethyl-1,2-dimethyl-	N	3760	µg/m³	N/A	N/A	2.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Butane, 2-methyl-	N	3760	µg/m³	N/A	N/A	N/A	16.1	N/A	N/A	N/A	N/A	N/A	N/A
Cyclododecane	N	3760	µg/m³	N/A	N/A	N/A	2.5	N/A	N/A	N/A	N/A	N/A	N/A
Cyclohexanone	N	3760	µg/m³	N/A	N/A	N/A	N/A	4.3	N/A	N/A	N/A	N/A	N/A
Cyclotetradecane	N	3760	µg/m³	N/A	15.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Decane	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	1.4	N/A	N/A	N/A	N/A
D-Limonene	N	3760	µg/m³	N/A	N/A	1.0	N/A	N/A	N/A	N/A	N/A	1.2	2.9
Dodecane	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	1.6	3.5	N/A	N/A	N/A
Furan, 2-ethyl-	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.8	N/A	N/A
Furan, 2-pentyl-	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.4	N/A	N/A
Gamma.-Terpinene	N	3760	µg/m³	N/A	2.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heptane	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	1.6	4.6	N/A	N/A	2.7
Heptane, 2,2,4,6,6-pentamethyl-	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.9	N/A
Octane, 2,6-dimethyl-	N	3760	µg/m³	N/A	N/A	N/A	3.4	N/A	N/A	N/A	N/A	N/A	N/A

Results - Gas

Project: EX-23-027 Langley Park, Chippenham

Client: Terra Firma			**Chemtest Job No.:**		23-12985	23-12985	23-12985	23-12985	23-12985	23-12985	23-12985	23-12985	23-12985
Quotation No.:			**Chemtest Sample ID.:**		1626481	1626482	1626483	1626484	1626485	1626486	1626487	1626488	1626489
			Sample Location:		WS611	VS612	R21/2	WS21/3	WS652	WS21/14	BH610	WS21/4	WS21/5
			Sample Type:		GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS
			Date Sampled:		13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023	13-Apr-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
o-Cymene	N	3760	µg/m³	N/A	N/A	N/A	63.4	N/A	N/A	N/A	N/A	N/A	N/A
Pentane	N	3760	µg/m³	N/A	N/A	N/A	6.1	N/A	N/A	N/A	N/A	N/A	N/A
Tetradecane	N	3760	µg/m³	N/A	N/A	N/A	N/A	N/A	N/A	2.1	N/A	N/A	N/A

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-13617-1
Initial Date of Issue:	28-Apr-2023
Client	Terra Firma
Client Address:	t/a Terra Firma The Slate Barn Lower Lowley Dunsford Devon EX6 7BP
Contact(s):	Info
Project	EX-23-027 Langley Park, Chippenham

Quotation No.:		**Date Received:**	25-Apr-2023
Order No.:	EX-23-027	**Date Instructed:**	25-Apr-2023
No. of Samples:	3		
Turnaround (Wkdays):	7	**Results Due:**	04-May-2023
Date Approved:	28-Apr-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Gas

Project: EX-23-027 Langley Park, Chippenham

Client: Terra Firma		**Chemtest Job No.:**			23-13617	23-13617	23-13617
Quotation No.:		**Chemtest Sample ID.:**			1629270	1629271	1629272
		Sample Location:			WS21/11	WS604	R21/1
		Sample Type:			GAS	GAS	GAS
		Date Sampled:			20-Apr-2023	20-Apr-2023	20-Apr-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Aliphatic TPH >C5-C6	N	3675	µg/m³	N/A	< 1.00	< 1.00	< 1.00
Aliphatic TPH >C6-C8	N	3675	µg/m³	N/A	1.0	10	2.0
Aliphatic TPH >C8-C10	N	3675	µg/m³	N/A	10	56	8.0
Aliphatic TPH >C10-C12	N	3675	µg/m³	N/A	2.0	18	6.0
Aliphatic TPH >C12-C16	N	3675	µg/m³	N/A	< 1.00	3.0	< 1.00
Aromatic TPH >C5-C7	N	3675	µg/m³	N/A	1.0	1.0	1.0
Aromatic TPH >C7-C8	N	3675	µg/m³	N/A	1.0	1.0	1.0
Aromatic TPH >C8-C10	N	3675	µg/m³	N/A	12	1.0	2.0
Aromatic TPH >C10-C12	N	3675	µg/m³	N/A	< 1.00	< 1.00	< 1.00
Aromatic TPH >C12-C16	N	3675	µg/m³	N/A	< 1.00	< 1.00	< 1.00
Trichlorofluoromethane	N	3760	µg/m³	N/A	9.3	<0.6	<0.6
Propanone	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1
Diethyl ether	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1
1,1-Dichloroethene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
Carbon disulfide	N	3760	µg/m³	N/A	<0.4	<0.4	<0.4
Allyl chloride	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1
trans-1,2-Dichloroethene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
Methyl-tertiary-butyl ether	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
1,1-Dichloroethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
2-Butanone	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1
cis-1,2-Dichloroethene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
Trichloromethane	N	3760	µg/m³	N/A	<0.4	<0.4	<0.4
Tetrahydrofuran	N	3760	µg/m³	N/A	<11.0	<11.1	<11.1
1,1,1-Trichloroethane	N	3760	µg/m³	N/A	82.7	9.7	0.5
1,2-Dichloroethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
1-Chlorobutane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
1,1-Dichloropropene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
Benzene	N	3760	µg/m³	N/A	1.1	0.9	1.1
Tetrachloromethane	N	3760	µg/m³	N/A	0.6	<0.6	<0.6
2-Nitropropane	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1
Methyl methacrylate	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1
2-Hexanone	N	3760	µg/m³	N/A	<1.7	<1.7	<1.7
4-Methyl-2-pentanone	N	3760	µg/m³	N/A	<2.8	<2.8	<2.8
Trichloroethene	N	3760	µg/m³	N/A	149.2	<0.6	<0.6
Dibromomethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
Bromodichloromethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
trans-1,3-Dichloropropene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
cis-1,3-Dichloropropene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
Toluene	N	3760	µg/m³	N/A	0.7	1.0	1.0
1,1,2-Trichloroethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
1,3-Dichloropropane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6

Results - Gas

Project: EX-23-027 Langley Park, Chippenham

Client: Terra Firma		**Chemtest Job No.:**			23-13617	23-13617	23-13617
Quotation No.:		**Chemtest Sample ID.:**			1629270	1629271	1629272
		Sample Location:			WS21/11	WS604	R21/1
		Sample Type:			GAS	GAS	GAS
		Date Sampled:			20-Apr-2023	20-Apr-2023	20-Apr-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Ethyl methacrylate	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1
Dibromochloromethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
1,2-Dibromoethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
Tetrachloroethene	N	3760	µg/m³	N/A	6.9	1.7	0.7
Chlorobenzene	N	3760	µg/m³	N/A	<0.4	<0.4	<0.4
1,1,1,2-Tetrachloroethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
Ethylbenzene	N	3760	µg/m³	N/A	<0.4	<0.4	<0.4
m- & p-Xylene	N	3760	µg/m³	N/A	<0.8	<0.8	<0.8
Bromoform	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
o-Xylene	N	3760	µg/m³	N/A	<0.4	<0.4	<0.4
Styrene	N	3760	µg/m³	N/A	0.8	1.0	1.0
1,1,2,2-Tetrachloroethane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
1,2,3-Trichloropropane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
iso-Propylbenzene	N	3760	µg/m³	N/A	<0.5	<0.5	<0.5
trans-1,4-Dichloro-2-butene	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1
Bromobenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
2-Chlorotoluene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
n-Propylbenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
4-Chlorotoluene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
1,3,5-Trimethylbenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
Pentachloroethane	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1
1,2,4-Trimethylbenzene	N	3760	µg/m³	N/A	1.1	<0.6	0.6
tert-Butylbenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
1,3-Dichlorobenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
sec-Butylbenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
1,4-Dichlorobenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
4-Isopropyltoluene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
1,2-Dichlorobenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
n-Butylbenzene	N	3760	µg/m³	N/A	<0.5	<0.5	<0.5
Hexachloroethane	N	3760	µg/m³	N/A	<1.1	<1.1	<1.1
1,2-Dibromo-3-chloropropane	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
1,2,4-Trichlorobenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
Naphthalene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
1,2,3-Trichlorobenzene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6
Hexachlorobutadiene	N	3760	µg/m³	N/A	<0.6	<0.6	<0.6

Tentatively Identified Compounds							
1,3,5,7-Cyclooctatetraene	N	3760	µg/m³	N/A	1.3	N/A	N/A
1-Hexanol, 2-ethyl-	N	3760	µg/m³	N/A	4.1	39.3	N/A
Benzene, (1-methoxyethyl)-	N	3760	µg/m³	N/A	10.7	N/A	N/A
Benzene, 1,2,4-trimethyl-	N	3760	µg/m³	N/A	1.2	N/A	N/A

Results - Gas

Project: EX-23-027 Langley Park, Chippenham

Client: Terra Firma		**Chemtest Job No.:**			23-13617	23-13617	23-13617
Quotation No.:		**Chemtest Sample ID.:**			1629270	1629271	1629272
		Sample Location:			WS21/11	WS604	R21/1
		Sample Type:			GAS	GAS	GAS
		Date Sampled:			20-Apr-2023	20-Apr-2023	20-Apr-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Cyclohexane, 1,4-dimethyl-	N	3760	µg/m³	N/A	N/A	1.0	N/A
Cyclohexane, methyl-	N	3760	µg/m³	N/A	N/A	2.7	1.1
Decane	N	3760	µg/m³	N/A	N/A	3.7	N/A
D-Limonene	N	3760	µg/m³	N/A	5.2	7.1	6.0
Dodecane	N	3760	µg/m³	N/A	1.7	3.8	N/A
Gamma.-Terpinene	N	3760	µg/m³	N/A	N/A	2.0	N/A
Heptane	N	3760	µg/m³	N/A	N/A	4.8	1.2
Heptane, 2,2,4,6,6-pentamethyl-	N	3760	µg/m³	N/A	N/A	6.2	6.4
Heptane, 2-methyl-	N	3760	µg/m³	N/A	N/A	1.0	N/A
Heptane, 3-methylene-	N	3760	µg/m³	N/A	N/A	N/A	2.2
Nonane	N	3760	µg/m³	N/A	N/A	1.4	N/A
Octane, 3,5-dimethyl-	N	3760	µg/m³	N/A	N/A	4.7	N/A
Octane, 4-methyl-	N	3760	µg/m³	N/A	N/A	1.5	N/A
Pentane	N	3760	µg/m³	N/A	N/A	1.3	N/A
Tetradecane	N	3760	µg/m³	N/A	N/A	2.5	N/A
Undecane, 3-methyl-	N	3760	µg/m³	N/A	N/A	4.2	N/A

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Table 1: SVOC/VOC Concentrations in Soils (all samples)

Location	BH601	BH602	BH606	BH606	BH606	BH610	BH614	BH614	BH615	BH615	BH625	BH625	BH625	WS610	WS610	WS610	WS610	WS611	WS611	WS624	WS629	WS629	WS630	WS631	WS633	WS652	WS653	WS654	WS661	WS661
Depth	0.5-0.8	1.5	0.5	1.0	3.4	0.3	0.3	0.3	0.6	0.6	0.5	1.0	5.0	0.5	1.0	0.5	1.0	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.6	1.5
Contaminant (ug/kg)																														
1,1-Dichloroethane	<1	23	<1	<1	<1	<1	13	15	13	15	<1	<1	<1	<1	<1	<1	<1	11	12	29	763	1290	28	256	26	11	5	14	<1	<6
cis 1,2-Dichloroethene	<6	15	<6	13	16	<6	13	15	7	8	<6	<6	<6	<5	<5	<7	<6	11	12	25	364	545	13	91	13	9	9	18	<7	<6
1,1,1-Trichloroethane	<1	46	<1	<1	<1	<1	28	33	22	26	<1	<1	<1	<1	2	<1	2	12	13	26	855	26800	18	125	158	7	2	5	13	18
Benzene	5	8	<1	<1	<1	<1	11	13	7	8	3	<1	2	<1	<1	<1	<1	<1	<1	5	2	5	3	23	2	<1	5	3	<1	<1
Trichloroethene	<1	42	<1	665	792	2	812	946	24	28	3	<1	<1	24	2	31	2	75	84	36	432	5510	35	85	10	15	14	18	59	40
Toluene	8	9	<6	<6	<1	<6	8	9	6	7	6	<6	10	<5	<5	<7	<6	<5	<6	<6	26	<6	5	28	<6	<5	<6	<5	<7	<6
Tetrachloroethene	<4	6	<4	<4	<3	<3	4	5	<3	<4	<3	<3	<4	<3	<3	<4	<4	8	9	7	234	4450	3	8	5	<3	<4	<3	<4	<4
Ethylbenzene	<2	3	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	19	<2	<2	<3	<2	<2	<2	2	43	<2	<2	22	<2	<2	7	<2	<3	<1
m and p-Xylene	<5	9	<5	<5	<5	<4	7	8	<4	<5	6	<5	52	<4	<4	<5	<5	<4	<4	7	116	<5	5	69	<5	<4	<5	5	<5	<5
o-Xylene	<2	3	<2	<2	<2	<2	3	3	<2	<2	<2	<2	27	<2	<2	<3	<2	<2	<2	2	67	<2	<2	22	<2	<2	<2	<2	<3	<2
1,3,5-Trimethylbenzene	<1	1	<1	<1	<1	<1	3	3	<1	<1	2	<1	19	<1	<1	<1	<1	<1	<1	1	62	<1	<1	13	2	<1	<1	1	<1	<1
1,2,4-Trimethylbenzene	4	3	<1	<1	<1	<1	5	6	2	2	2	<1	63	<1	<1	<1	<1	2	2	4	90	2	2	34	<3	1	1	2	<1	<1
1,4-Dichlorobenzene	<1	3	<1	<1	<1	<1	<1	<1	4	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	88	35	<1	16	<1	2	<1	1	<1	<1
Naphthalene	23	19	<6	<6	<6	21	96	112	18	21	10	<6	5470	<3	<5	<7	<6	12	13	13	112	20	<5	259	96	<5	373	8	9	<6

Environmental Scientifics Group

UKAS TESTING
1015

OCCUPATIONAL HYGIENE & ENVIRONMENTAL MONITORING LABORATORY

TEST REPORT

RESULTS OF ANALYSIS
Landfill Gas Trace Components

Waterman Energy, Environment & Design
Site: Langley Park, Chippenham

Client:

Mr M Amos
Senior Land Quality Consultant
Waterman Energy, Environment & Design
Merchants House
Wapping Road
Bristol
BS1 4RW

Job Number: OHEM 12834
Report Number: OHEM/12834/CA/0001, Rev 0

Date Received: 07 April 2014
Date Analysis Completed: 11 April 2014
Issue Date: 28 April 2014

Environmental Scientifics Group Limited - Environmental Safety Compliance Division does not accept responsibility for the sampling associated with the results included within this report.

Authorised By:

.....

N J Fenwick, Technical Manager
Occupational Hygiene & Environmental Monitoring
Direct Dial: 01 283 554487

Report Contents

Analytical Techniques:

- Landfill Gas VOC Compounds

Sample information & results tables:

- VS655 (073800)
- BH128 (073801)
- VS658 (073802)
- VS656 (073803)
- VS641 (073804)
- VS610 (073805)
- VS645 (073806)
- VS660 (073807)
- VS612 (073808)
- VS657 (073809)
- BH401 Shallow (073810) : No results – sorbent lost
- VS661 (073811)

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Landfill Gas Trace Component Volatile Organic Compounds

Substance	Landfill Gas Trace Component VOC's
Analytical Method	ATD-GC-MS
Sample Media	Dual Bed Sulfinert (Tenax TA/Spherocarb) ATD Tube
Analysis Preparation	1.5 litre dry nitrogen purge
Instrument Calibration	5 level calibration for all compounds reported
Analytical Instrument(s)	Perkin Elmer Turbo Matrix ATD/Agilent 6890/5973N GC-MS (Scan Mode)
Reference Method(s)	In house method ASC/SOP/210
Analysis Laboratory	ESG Specialist Chemistry, Bretby
Accreditation	UKAS for mass of compounds described below
Analysis Report Reference	ASC/14323

This analysis is UKAS accredited for the following compounds:

UKAS Accredited Compound List	
Acetone	n-Octane
Propan-2-ol	Tetrachloroethene
Dichloromethane	Chlorobenzene
trans-1,2-Dichloroethene	EthylBenzene
n-Hexane	m-Xylene + p-Xylene
Propyl Mercaptan	n-Nonane
Chloroform	Styrene
Tetrachloromethane	o-Xylene
Benzene	n-Decane
Butan-1-ol	1,2,4-TrimethylBenzene
n-Heptane	1,2-DichloroBenzene
Trichloroethene	Ethyl Acetate
1,2-Dichloropropane	1,4-Dichlorobenzene
Toluene	1,2-Dichloroethane

Any reported result exceeding 1000ng is outside of the normal calibration range, carries a higher level of uncertainty and is not covered by UKAS accreditation.

Nomenclature

Substance (as reported)	IUPAC name	CAS Number
Butyl Mercaptan	1-Butanethiol	109-79-5
Propyl Mercaptan	1-Propanethiol	107-03-9
Ethyl Mercaptan	Ethanethiol	75-08-1
Methyl Mercaptan	Methanethiol	74-93-1
Formaldehyde	Methanal	50-00-0
Acetaldehyde	Ethanal	75-07-0

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Site: Langley Park, Chippenham Sample Location: VS655			Date: 04 April 2014 (10:24-10:34 hr.) Pump: 2601133			
Media	**Analytes**	**Tube Number**	**Sample Identity Number**	**Duration (min)**	**Flow Rate ($ml.min^{-1}$)**	**Sample Volume (m^3)**
Dual Bed Sulfinert Automated Thermal Desorption (ATD) tube	VOC's EALGTC	Mi 091219	OHEM 073800	10	19.82	0.0001982

Compound	ng on tube	Concentration ($\mu g.m^{-3}$)	Compound	ng on tube	Concentration ($\mu g.m^{-3}$)
Dichlorodifluoromethane	<40	<200	Methylisobutylketone	<5	<30
Chloromethane	180	930	Dimethyldisulfide	<10	<50
Chloroethene	<30	<200	Toluene	<10	<50
Bromoethane	<20	<90	Butyric Acid	<40	<200
Chloroethane	<10	<60	n-Octane	<10	<50
Trichlorofluoromethane	<5	<30	Ethyl Butyrate	<9	<50
1-Pentene	<20	<80	Butyl Acetate	<8	<40
Acetone	910	4600	Tetrachloroethene	30	150
Furan	<7	<40	EthylCyclohexane	<4	<20
Propan-2-ol	430	2200	Chlorobenzene	<10	<50
Ethyl Mercaptan	<30	<200	EthylBenzene	<10	<50
1,1-Dichloroethene	340	1700	m-Xylene + p-Xylene	<20	<100
Methylsulfide	<10	<60	n-Nonane	<10	<50
Dichloromethane	*1400*	6900	Styrene	<10	<50
Carbon Disulfide	<10	<50	o-Xylene	<10	<50
trans-1,2-Dichloroethene	480	2400	2-ButoxyEthanol	<20	<100
1,1-Dichloroethane	<6	<30	1,1,2,2-Tetrachloroethane	<4	<20
n-Hexane	<10	<50	n-PropylBenzene	<10	<50
Methylethylketone	8.2	41	p-EthylToluene	<4	<20
cis-1,2-Dichloroethene	*48000*	240000	n-Decane	<10	<50
Propyl Mercaptan	<20	<100	1,2,4-TrimethylBenzene	<10	<50
Chloroform	<10	<50	Limonene	<5	<30
Tetrachloromethane	<10	<50	1,2-DichloroBenzene	<20	<100
Benzene	20	99	Tetramethylbenzene	<4	<20
Butan-1-ol	43	220	Dichlorofluoromethane	<5	<30
n-Heptane	<10	<50	Ethyl Acetate	<10	<50
Trichloroethene	*1100*	5400	Methyl Mercaptan	<100	<500
1,2-Dichloropropane	<10	<50	1,4-Dichlorobenzene	<20	<100
Diethylsulfide	<8	<40	1,3-Butadiene	<7	<40
Butyl Mercaptan	<30	<200	1,2-Dichloroethane	<10	<50
Methylcyclohexane	<6	<30	**Estimation of Total VOC's present = 6900 ng**		

Mass of compound is UKAS Accredited, except where result exceeds 1000 ng.

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Site: Langley Park, Chippenham Sample Location: BH128				Date: 04 April 2014 (11:08-11:18 hr.) Pump: 2101872		
Media	**Analytes**	**Tube Number**	**Sample Identity Number**	**Duration (min)**	**Flow Rate ($ml.min^{-1}$)**	**Sample Volume (m^3)**
Dual Bed Sulfinert Automated Thermal Desorption (ATD) tube	VOC's EALGTC	Mi 091300	OHEM 073801	10	24.10	0.0002410

Compound	ng on tube	Concentration ($\mu g.m^{-3}$)	Compound	ng on tube	Concentration ($\mu g.m^{-3}$)
Dichlorodifluoromethane	<40	<200	Methylisobutylketone	<5	<20
Chloromethane	<30	<100	Dimethyldisulfide	<10	<40
Chloroethene	<30	<100	Toluene	<10	<40
Bromoethane	<20	<70	Butyric Acid	<40	<200
Chloroethane	<10	<50	n-Octane	<10	<40
Trichlorofluoromethane	<5	<20	Ethyl Butyrate	<9	<40
1-Pentene	<20	<70	Butyl Acetate	<8	<30
Acetone	730	3000	Tetrachloroethene	52	210
Furan	<7	<30	EthylCyclohexane	<4	<20
Propan-2-ol	200	820	Chlorobenzene	<10	<40
Ethyl Mercaptan	<30	<100	EthylBenzene	<10	<40
1,1-Dichloroethene	*6000*	25000	m-Xylene + p-Xylene	<20	<80
Methylsulfide	<10	<50	n-Nonane	<10	<40
Dichloromethane	570	2400	Styrene	<10	<40
Carbon Disulfide	99	410	o-Xylene	<10	<40
trans-1,2-Dichloroethene	*4100*	17000	2-ButoxyEthanol	<20	<80
1,1-Dichloroethane	<6	<20	1,1,2,2-Tetrachloroethane	<4	<20
n-Hexane	39	160	n-PropylBenzene	<10	<40
Methylethylketone	<7	<30	p-EthylToluene	<4	<20
cis-1,2-Dichloroethene	*39000*	160000	n-Decane	<10	<40
Propyl Mercaptan	<20	<80	1,2,4-TrimethylBenzene	<10	<40
Chloroform	<10	<40	Limonene	<5	<20
Tetrachloromethane	<10	<40	1,2-DichloroBenzene	<20	<80
Benzene	31	130	Tetramethylbenzene	<4	<20
Butan-1-ol	27	110	Dichlorofluoromethane	<5	<20
n-Heptane	<10	<40	Ethyl Acetate	<10	<40
Trichloroethene	*130000*	540000	Methyl Mercaptan	<100	<400
1,2-Dichloropropane	<10	<40	1,4-Dichlorobenzene	<20	<80
Diethylsulfide	<8	<30	1,3-Butadiene	<7	<30
Butyl Mercaptan	<30	<100	1,2-Dichloroethane	<10	<40
Methylcyclohexane	<6	<20	**Estimation of Total VOC's present = 7300 ng**		

Mass of compound is UKAS Accredited, except where result exceeds 1000 ng.

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Site: Langley Park, Chippenham Sample Location: VS658				Date: 04 April 2014 (08:50-09:00 hr.) Pump: 0978774		
Media	**Analytes**	**Tube Number**	**Sample Identity Number**	**Duration (min)**	**Flow Rate ($ml.min^{-1}$)**	**Sample Volume (m^3)**
Dual Bed Sulfinert Automated Thermal Desorption (ATD) tube	VOC's EALGTC	Mi 091212	OHEM 073802	10	20.11	0.0002011

Compound	ng on tube	Concentration ($\mu g.m^{-3}$)	Compound	ng on tube	Concentration ($\mu g.m^{-3}$)
Dichlorodifluoromethane	<40	<200	Methylisobutylketone	<5	<20
Chloromethane	<30	<100	Dimethyldisulfide	<10	<50
Chloroethene	<30	<100	Toluene	<10	<50
Bromoethane	<20	<80	Butyric Acid	<40	<200
Chloroethane	<10	<60	n-Octane	<10	<50
Trichlorofluoromethane	<5	<20	Ethyl Butyrate	<9	<40
1-Pentene	<20	<80	Butyl Acetate	<8	<40
Acetone	750	3800	Tetrachloroethene	19	94
Furan	<7	<30	EthylCyclohexane	<4	<20
Propan-2-ol	340	1700	Chlorobenzene	<10	<50
Ethyl Mercaptan	<30	<100	EthylBenzene	<10	<50
1,1-Dichloroethene	44	220	m-Xylene + p-Xylene	<20	<100
Methylsulfide	<10	<50	n-Nonane	<10	<50
Dichloromethane	*1200*	5700	Styrene	<10	<50
Carbon Disulfide	35	170	o-Xylene	<10	<50
trans-1,2-Dichloroethene	<10	<50	2-ButoxyEthanol	<20	<100
1,1-Dichloroethane	160	770	1,1,2,2-Tetrachloroethane	<4	<20
n-Hexane	35	170	n-PropylBenzene	<10	<50
Methylethylketone	<7	<30	p-EthylToluene	<4	<20
cis-1,2-Dichloroethene	440	2200	n-Decane	<10	<50
Propyl Mercaptan	<20	<100	1,2,4-TrimethylBenzene	<10	<50
Chloroform	<10	<50	Limonene	<5	<20
Tetrachloromethane	<10	<50	1,2-DichloroBenzene	<20	<100
Benzene	13	63	Tetramethylbenzene	<4	<20
Butan-1-ol	28	140	Dichlorofluoromethane	<5	<20
n-Heptane	<10	<50	Ethyl Acetate	<10	<50
Trichloroethene	120	590	Methyl Mercaptan	<100	<500
1,2-Dichloropropane	<10	<50	1,4-Dichlorobenzene	<20	<100
Diethylsulfide	<8	<40	1,3-Butadiene	<7	<30
Butyl Mercaptan	<30	<100	1,2-Dichloroethane	<10	<50
Methylcyclohexane	<6	<30	**Estimation of Total VOC's present = 2000 ng**		

Mass of compound is UKAS Accredited, except where result exceeds 1000 ng.

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Site: Langley Park, Chippenham Sample Location: VS656				Date: 04 April 2014 (10:38-10:48 hr.) Pump: 0978812		
Media	**Analytes**	**Tube Number**	**Sample Identity Number**	**Duration (min)**	**Flow Rate ($ml.min^{-1}$)**	**Sample Volume (m^3)**
Dual Bed Sulfinert Automated Thermal Desorption (ATD) tube	VOC's EALGTC	Mi 142575	OHEM 073803	10	21.75	0.0002175

Compound	ng on tube	Concentration ($\mu g.m^{-3}$)	Compound	ng on tube	Concentration ($\mu g.m^{-3}$)
Dichlorodifluoromethane	<40	<200	Methylisobutylketone	<5	<20
Chloromethane	<30	<100	Dimethyldisulfide	<10	<50
Chloroethene	<30	<100	Toluene	<10	<50
Bromoethane	<20	<80	Butyric Acid	<40	<200
Chloroethane	<10	<60	n-Octane	<10	<50
Trichlorofluoromethane	<5	<20	Ethyl Butyrate	<9	<40
1-Pentene	<20	<70	Butyl Acetate	<8	<40
Acetone	100	470	Tetrachloroethene	90	410
Furan	<7	<30	EthylCyclohexane	<4	<20
Propan-2-ol	48	220	Chlorobenzene	<10	<50
Ethyl Mercaptan	<30	<100	EthylBenzene	<10	<50
1,1-Dichloroethene	<9	<40	m-Xylene + p-Xylene	<20	<90
Methylsulfide	<10	<50	n-Nonane	<10	<50
Dichloromethane	190	870	Styrene	<10	<50
Carbon Disulfide	<10	<50	o-Xylene	<10	<50
trans-1,2-Dichloroethene	42	190	2-ButoxyEthanol	<20	<90
1,1-Dichloroethane	<6	<30	1,1,2,2-Tetrachloroethane	<4	<20
n-Hexane	<10	<50	n-PropylBenzene	<10	<50
Methylethylketone	32	150	p-EthylToluene	<4	<20
cis-1,2-Dichloroethene	*1600*	7200	n-Decane	970	4400
Propyl Mercaptan	<20	<90	1,2,4-TrimethylBenzene	<10	<50
Chloroform	<10	<50	Limonene	44	200
Tetrachloromethane	<10	<50	1,2-DichloroBenzene	<20	<90
Benzene	<10	<50	Tetramethylbenzene	<4	<20
Butan-1-ol	17	78	Dichlorofluoromethane	<5	<20
n-Heptane	<10	<50	Ethyl Acetate	<10	<50
Trichloroethene	370	1700	Methyl Mercaptan	<100	<500
1,2-Dichloropropane	<10	<50	1,4-Dichlorobenzene	<20	<90
Diethylsulfide	<8	<40	1,3-Butadiene	<7	<30
Butyl Mercaptan	<30	<100	1,2-Dichloroethane	<10	<50
Methylcyclohexane	<6	<30	**Estimation of Total VOC's present = 4200 ng**		

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Site: Langley Park, Chippenham Sample Location: VS641				Date: 04 April 2014 (08:50-09:00 hr.) Pump: 0978888		
Media	**Analytes**	**Tube Number**	**Sample Identity Number**	**Duration (min)**	**Flow Rate ($ml.min^{-1}$)**	**Sample Volume (m^3)**
Dual Bed Sulfinert Automated Thermal Desorption (ATD) tube	VOC's EALGTC	Mi 091214	OHEM 073804	10	20.84	0.0002084

Compound	ng on tube	Concentration ($\mu g.m^{-3}$)	Compound	ng on tube	Concentration ($\mu g.m^{-3}$)
Dichlorodifluoromethane	<40	<200	Methylisobutylketone	<5	<20
Chloromethane	<30	<100	Dimethyldisulfide	<10	<50
Chloroethene	<30	<100	Toluene	16	76
Bromoethane	<20	<80	Butyric Acid	<40	<200
Chloroethane	<10	<60	n-Octane	<10	<50
Trichlorofluoromethane	<5	<20	Ethyl Butyrate	<9	<40
1-Pentene	<20	<80	Butyl Acetate	<8	<40
Acetone	*1000*	4900	Tetrachloroethene	57	270
Furan	<7	<30	EthylCyclohexane	<4	<20
Propan-2-ol	730	3500	Chlorobenzene	<10	<50
Ethyl Mercaptan	<30	<100	EthylBenzene	<10	<50
1,1-Dichloroethene	18	88	m-Xylene + p-Xylene	<20	<100
Methylsulfide	<10	<50	n-Nonane	<10	<50
Dichloromethane	980	4700	Styrene	<10	<50
Carbon Disulfide	<10	<50	o-Xylene	<10	<50
trans-1,2-Dichloroethene	<10	<50	2-ButoxyEthanol	<20	<100
1,1-Dichloroethane	<6	<30	1,1,2,2-Tetrachloroethane	<4	<20
n-Hexane	96	460	n-PropylBenzene	<10	<50
Methylethylketone	11	53	p-EthylToluene	<4	<20
cis-1,2-Dichloroethene	*8300*	40000	n-Decane	<10	<50
Propyl Mercaptan	<20	<100	1,2,4-TrimethylBenzene	<10	<50
Chloroform	<10	<50	Limonene	<5	<20
Tetrachloromethane	<10	<50	1,2-DichloroBenzene	<20	<100
Benzene	17	83	Tetramethylbenzene	<4	<20
Butan-1-ol	53	250	Dichlorofluoromethane	<5	<20
n-Heptane	<10	<50	Ethyl Acetate	<10	<50
Trichloroethene	110	530	Methyl Mercaptan	<100	<500
1,2-Dichloropropane	<10	<50	1,4-Dichlorobenzene	<20	<100
Diethylsulfide	<8	<40	1,3-Butadiene	<7	<30
Butyl Mercaptan	<30	<100	1,2-Dichloroethane	<10	<50
Methylcyclohexane	<6	<30	**Estimation of Total VOC's present = 3800 ng**		

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Site: Langley Park, Chippenham Sample Location: VS610				Date: 04 April 2014 (11:34-11:44 hr.) Pump: 1181634		
Media	**Analytes**	**Tube Number**	**Sample Identity Number**	**Duration (min)**	**Flow Rate ($ml.min^{-1}$)**	**Sample Volume (m^3)**
Dual Bed Sulfinert Automated Thermal Desorption (ATD) tube	VOC's EALGTC	Mi 023139	OHEM 073805	10	23.63	0.0002363

Compound	ng on tube	Concentration ($\mu g.m^{-3}$)	Compound	ng on tube	Concentration ($\mu g.m^{-3}$)
Dichlorodifluoromethane	<40	<200	Methylisobutylketone	<5	<20
Chloromethane	520	2200	Dimethyldisulfide	<10	<40
Chloroethene	<30	<100	Toluene	<10	<40
Bromoethane	<20	<70	Butyric Acid	<40	<200
Chloroethane	<10	<50	n-Octane	13	56
Trichlorofluoromethane	<5	<20	Ethyl Butyrate	<9	<40
1-Pentene	<20	<70	Butyl Acetate	<8	<30
Acetone	*3300*	14000	Tetrachloroethene	58	250
Furan	<7	<30	EthylCyclohexane	<4	<20
Propan-2-ol	870	3700	Chlorobenzene	<10	<40
Ethyl Mercaptan	<30	<100	EthylBenzene	<10	<40
1,1-Dichloroethene	<9	<40	m-Xylene + p-Xylene	<20	<80
Methylsulfide	<10	<50	n-Nonane	<10	<40
Dichloromethane	*2000*	8400	Styrene	<10	<40
Carbon Disulfide	130	530	o-Xylene	<10	<40
trans-1,2-Dichloroethene	*1700*	7400	2-ButoxyEthanol	<20	<80
1,1-Dichloroethane	<6	<30	1,1,2,2-Tetrachloroethane	<4	<20
n-Hexane	44	190	n-PropylBenzene	<10	<40
Methylethylketone	16	69	p-EthylToluene	<4	<20
cis-1,2-Dichloroethene	*6600*	28000	n-Decane	<10	<40
Propyl Mercaptan	<20	<80	1,2,4-TrimethylBenzene	<10	<40
Chloroform	<10	<40	Limonene	<5	<20
Tetrachloromethane	<10	<40	1,2-DichloroBenzene	<20	<80
Benzene	13	54	Tetramethylbenzene	<4	<20
Butan-1-ol	110	460	Dichlorofluoromethane	<5	<20
n-Heptane	<10	<40	Ethyl Acetate	<10	<40
Trichloroethene	*81000*	340000	Methyl Mercaptan	<100	<400
1,2-Dichloropropane	<10	<40	1,4-Dichlorobenzene	<20	<80
Diethylsulfide	<8	<30	1,3-Butadiene	<7	<30
Butyl Mercaptan	<30	<100	1,2-Dichloroethane	<10	<40
Methylcyclohexane	<6	<30	**Estimation of Total VOC's present = 43000 ng**		

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Site: Langley Park, Chippenham Sample Location: VS645				Date: 04 April 2014 (10:10-10:20 hr.) Pump: 1181631		
Media	**Analytes**	**Tube Number**	**Sample Identity Number**	**Duration (min)**	**Flow Rate ($ml.min^{-1}$)**	**Sample Volume (m^3)**
Dual Bed Sulfinert Automated Thermal Desorption (ATD) tube	VOC's EALGTC	Mi 058879	OHEM 073806	10	21.42	0.0002142

Compound	ng on tube	Concentration ($\mu g.m^{-3}$)	Compound	ng on tube	Concentration ($\mu g.m^{-3}$)
Dichlorodifluoromethane	<40	<200	Methylisobutylketone	<5	<20
Chloromethane	220	1000	Dimethyldisulfide	<10	<50
Chloroethene	<30	<100	Toluene	26	120
Bromoethane	27	120	Butyric Acid	<40	<200
Chloroethane	<10	<60	n-Octane	<10	<50
Trichlorofluoromethane	<5	<20	Ethyl Butyrate	<9	<40
1-Pentene	<20	<70	Butyl Acetate	<8	<40
Acetone	280	1300	Tetrachloroethene	110	530
Furan	<7	<30	EthylCyclohexane	<4	<20
Propan-2-ol	120	580	Chlorobenzene	<10	<50
Ethyl Mercaptan	<30	<100	EthylBenzene	<10	<50
1,1-Dichloroethene	<9	<40	m-Xylene + p-Xylene	<20	<90
Methylsulfide	<10	<50	n-Nonane	<10	<50
Dichloromethane	250	1200	Styrene	<10	<50
Carbon Disulfide	26	120	o-Xylene	<10	<50
trans-1,2-Dichloroethene	<10	<50	2-ButoxyEthanol	<20	<90
1,1-Dichloroethane	13	59	1,1,2,2-Tetrachloroethane	<4	<20
n-Hexane	20	91	n-PropylBenzene	<10	<50
Methylethylketone	35	160	p-EthylToluene	<4	<20
cis-1,2-Dichloroethene	140	660	n-Decane	<10	<50
Propyl Mercaptan	<20	<90	1,2,4-TrimethylBenzene	<10	<50
Chloroform	<10	<50	Limonene	120	570
Tetrachloromethane	<10	<50	1,2-DichloroBenzene	<20	<90
Benzene	<10	<50	Tetramethylbenzene	<4	<20
Butan-1-ol	24	110	Dichlorofluoromethane	<5	<20
n-Heptane	<10	<50	Ethyl Acetate	<10	<50
Trichloroethene	30	140	Methyl Mercaptan	<100	<500
1,2-Dichloropropane	<10	<50	1,4-Dichlorobenzene	<20	<90
Diethylsulfide	<8	<40	1,3-Butadiene	<7	<30
Butyl Mercaptan	<30	<100	1,2-Dichloroethane	<10	<50
Methylcyclohexane	<6	<30	**Estimation of Total VOC's present = 6400 ng**		

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Site: Langley Park, Chippenham Sample Location: VS660				Date: 04 April 2014 (11:10-11:20 hr.) Pump: 1181638		
Media	**Analytes**	**Tube Number**	**Sample Identity Number**	**Duration (min)**	**Flow Rate ($ml.min^{-1}$)**	**Sample Volume (m^3)**
Dual Bed Sulfinert Automated Thermal Desorption (ATD) tube	VOC's EALGTC	Mi 091299	OHEM 073807	10	22.17	0.0002217

Compound	ng on tube	Concentration ($\mu g.m^{-3}$)	Compound	ng on tube	Concentration ($\mu g.m^{-3}$)
Dichlorodifluoromethane	<40	<200	Methylisobutylketone	<5	<20
Chloromethane	110	510	Dimethyldisulfide	<10	<50
Chloroethene	<30	<100	Toluene	<10	<50
Bromoethane	<20	<80	Butyric Acid	<40	<200
Chloroethane	<10	<50	n-Octane	<10	<50
Trichlorofluoromethane	<5	<20	Ethyl Butyrate	<9	<40
1-Pentene	<20	<70	Butyl Acetate	<8	<40
Acetone	450	2000	Tetrachloroethene	27	120
Furan	<7	<30	EthylCyclohexane	<4	<20
Propan-2-ol	270	1200	Chlorobenzene	<10	<50
Ethyl Mercaptan	<30	<100	EthylBenzene	<10	<50
1,1-Dichloroethene	<9	<40	m-Xylene + p-Xylene	<20	<90
Methylsulfide	<10	<50	n-Nonane	<10	<50
Dichloromethane	330	1500	Styrene	<10	<50
Carbon Disulfide	11	51	o-Xylene	<10	<50
trans-1,2-Dichloroethene	<10	<50	2-ButoxyEthanol	<20	<90
1,1-Dichloroethane	<6	<30	1,1,2,2-Tetrachloroethane	<4	<20
n-Hexane	21	94	n-PropylBenzene	<10	<50
Methylethylketone	11	50	p-EthylToluene	<4	<20
cis-1,2-Dichloroethene	91	410	n-Decane	<10	<50
Propyl Mercaptan	<20	<90	1,2,4-TrimethylBenzene	<10	<50
Chloroform	<10	<50	Limonene	<5	<20
Tetrachloromethane	<10	<50	1,2-DichloroBenzene	<20	<90
Benzene	<10	<50	Tetramethylbenzene	<4	<20
Butan-1-ol	16	74	Dichlorofluoromethane	<5	<20
n-Heptane	<10	<50	Ethyl Acetate	<10	<50
Trichloroethene	35	160	Methyl Mercaptan	<100	<500
1,2-Dichloropropane	<10	<50	1,4-Dichlorobenzene	<20	<90
Diethylsulfide	<8	<40	1,3-Butadiene	<7	<30
Butyl Mercaptan	<30	<100	1,2-Dichloroethane	<10	<50
Methylcyclohexane	<6	<30	**Estimation of Total VOC's present = 1300 ng**		

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Site: Langley Park, Chippenham Sample Location: VS612				Date: 04 April 2014 (11:12-11:22 hr.) Pump: 0978789		
Media	**Analytes**	**Tube Number**	**Sample Identity Number**	**Duration (min)**	**Flow Rate ($ml.min^{-1}$)**	**Sample Volume (m^3)**
Dual Bed Sulfinert Automated Thermal Desorption (ATD) tube	VOC's EALGTC	Mi 116511	OHEM 073808	10	24.29	0.0002429

Compound	ng on tube	Concentration ($\mu g.m^{-3}$)	Compound	ng on tube	Concentration ($\mu g.m^{-3}$)
Dichlorodifluoromethane	<40	<200	Methylisobutylketone	<5	<20
Chloromethane	<30	<100	Dimethyldisulfide	<10	<40
Chloroethene	<30	<100	Toluene	<10	<40
Bromoethane	<20	<70	Butyric Acid	<40	<200
Chloroethane	<10	<50	n-Octane	<10	<40
Trichlorofluoromethane	<5	<20	Ethyl Butyrate	<9	<40
1-Pentene	<20	<70	Butyl Acetate	<8	<30
Acetone	92	380	Tetrachloroethene	61	250
Furan	<7	<30	EthylCyclohexane	<4	<20
Propan-2-ol	64	260	Chlorobenzene	<10	<40
Ethyl Mercaptan	<30	<100	EthylBenzene	<10	<40
1,1-Dichloroethene	<9	<40	m-Xylene + p-Xylene	<20	<80
Methylsulfide	<10	<50	n-Nonane	<10	<40
Dichloromethane	210	860	Styrene	<10	<40
Carbon Disulfide	19	79	o-Xylene	<10	<40
trans-1,2-Dichloroethene	<10	<40	2-ButoxyEthanol	<20	<80
1,1-Dichloroethane	<6	<20	1,1,2,2-Tetrachloroethane	<4	<20
n-Hexane	<10	<40	n-PropylBenzene	<10	<40
Methylethylketone	29	120	p-EthylToluene	<4	<20
cis-1,2-Dichloroethene	480	2000	n-Decane	<10	<40
Propyl Mercaptan	<20	<80	1,2,4-TrimethylBenzene	<10	<40
Chloroform	<10	<40	Limonene	66	270
Tetrachloromethane	<10	<40	1,2-DichloroBenzene	<20	<80
Benzene	<10	<40	Tetramethylbenzene	<4	<20
Butan-1-ol	15	63	Dichlorofluoromethane	<5	<20
n-Heptane	<10	<40	Ethyl Acetate	<10	<40
Trichloroethene	270	1100	Methyl Mercaptan	<100	<400
1,2-Dichloropropane	<10	<40	1,4-Dichlorobenzene	<20	<80
Diethylsulfide	58	240	1,3-Butadiene	<7	<30
Butyl Mercaptan	<30	<100	1,2-Dichloroethane	<10	<40
Methylcyclohexane	<6	<20	**Estimation of Total VOC's present = 1300 ng**		

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Site: Langley Park, Chippenham Sample Location: VS657				Date: 04 April 2014 (10:40-10:50 hr.) Pump: 0978891		
Media	**Analytes**	**Tube Number**	**Sample Identity Number**	**Duration (min)**	**Flow Rate ($ml.min^{-1}$)**	**Sample Volume (m^3)**
Dual Bed Sulfinert Automated Thermal Desorption (ATD) tube	VOC's EALGTC	Mi 130968	OHEM 073809	10	24.15	0.0002415

Compound	ng on tube	Concentration ($\mu g.m^{-3}$)	Compound	ng on tube	Concentration ($\mu g.m^{-3}$)
Dichlorodifluoromethane	<40	<200	Methylisobutylketone	<5	<20
Chloromethane	<30	<100	Dimethyldisulfide	<10	<40
Chloroethene	<30	<100	Toluene	35	150
Bromoethane	<20	<70	Butyric Acid	<40	<200
Chloroethane	<10	<50	n-Octane	11	47
Trichlorofluoromethane	<5	<20	Ethyl Butyrate	<9	<40
1-Pentene	<20	<70	Butyl Acetate	<8	<30
Acetone	190	770	Tetrachloroethene	63	260
Furan	<7	<30	EthylCyclohexane	<4	<20
Propan-2-ol	120	490	Chlorobenzene	<10	<40
Ethyl Mercaptan	<30	<100	EthylBenzene	<10	<40
1,1-Dichloroethene	<9	<40	m-Xylene + p-Xylene	<20	<80
Methylsulfide	<10	<50	n-Nonane	<10	<40
Dichloromethane	180	750	Styrene	<10	<40
Carbon Disulfide	45	180	o-Xylene	<10	<40
trans-1,2-Dichloroethene	<10	<40	2-ButoxyEthanol	<20	<80
1,1-Dichloroethane	<6	<20	1,1,2,2-Tetrachloroethane	<4	<20
n-Hexane	17	69	n-PropylBenzene	<10	<40
Methylethylketone	38	160	p-EthylToluene	<4	<20
cis-1,2-Dichloroethene	100	430	n-Decane	<10	<40
Propyl Mercaptan	<20	<80	1,2,4-TrimethylBenzene	<10	<40
Chloroform	<10	<40	Limonene	68	280
Tetrachloromethane	<10	<40	1,2-DichloroBenzene	<20	<80
Benzene	<10	<40	Tetramethylbenzene	<4	<20
Butan-1-ol	26	110	Dichlorofluoromethane	<5	<20
n-Heptane	<10	<40	Ethyl Acetate	<10	<40
Trichloroethene	50	210	Methyl Mercaptan	<100	<400
1,2-Dichloropropane	<10	<40	1,4-Dichlorobenzene	<20	<80
Diethylsulfide	10	42	1,3-Butadiene	<7	<30
Butyl Mercaptan	<30	<100	1,2-Dichloroethane	<10	<40
Methylcyclohexane	<6	<20	**Estimation of Total VOC's present = 5000 ng**		

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Site: Langley Park, Chippenham Sample Location: BH401 shallow			Date: 04 April 2014 (hr.) Pump: 0978802			
Media	**Analytes**	**Tube Number**	**Sample Identity Number**	**Duration (min)**	**Flow Rate ($ml.min^{-1}$)**	**Sample Volume (m^3)**
Dual Bed Sulfinert Automated Thermal Desorption (ATD) tube	VOC's EALGTC	Mi 024092	OHEM 073810	10	24.17	0.0002417

Compound	ng on tube	Concentration ($\mu g.m^{-3}$)	Compound	ng on tube	Concentration ($\mu g.m^{-3}$)
Dichlorodifluoromethane			Methylisobutylketone		
Chloromethane			Dimethyldisulfide		
Chloroethene			Toluene		
Bromoethane			Butyric Acid		
Chloroethane			n-Octane		
Trichlorofluoromethane			Ethyl Butyrate		
1-Pentene			Butyl Acetate		
Acetone			Tetrachloroethene		
Furan			EthylCyclohexane		
Propan-2-ol			Chlorobenzene		
Ethyl Mercaptan			EthylBenzene		
1,1-Dichloroethene			m-Xylene + p-Xylene		
Methylsulfide			n-Nonane		
Dichloromethane			Styrene		
Carbon Disulfide			o-Xylene		
trans-1,2-Dichloroethene			2-ButoxyEthanol		
1,1-Dichloroethane			1,1,2,2-Tetrachloroethane		
n-Hexane			n-PropylBenzene		
Methylethylketone			p-EthylToluene		
cis-1,2-Dichloroethene			n-Decane		
Propyl Mercaptan			1,2,4-TrimethylBenzene		
Chloroform			Limonene		
Tetrachloromethane			1,2-DichloroBenzene		
Benzene			Tetramethylbenzene		
Butan-1-ol			Dichlorofluoromethane		
n-Heptane			Ethyl Acetate		
Trichloroethene			Methyl Mercaptan		
1,2-Dichloropropane			1,4-Dichlorobenzene		
Diethylsulfide			1,3-Butadiene		
Butyl Mercaptan			1,2-Dichloroethane		
Methylcyclohexane			**Estimation of Total VOC's present = ng**		

No Results Lost Sorebent

No Results Lost Sorebent

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Site: Langley Park, Chippenham Sample Location: VS661				Date: 04 April 2014 (-hr.) Pump: 1181640		
Media	**Analytes**	**Tube Number**	**Sample Identity Number**	**Duration (min)**	**Flow Rate ($ml.min^{-1}$)**	**Sample Volume (m^3)**
Dual Bed Sulfinert Automated Thermal Desorption (ATD) tube	VOC's EALGTC	Mi 142590	OHEM 073811	10	22.92	0.0002292

Compound	ng on tube	Concentration ($\mu g.m^{-3}$)	Compound	ng on tube	Concentration ($\mu g.m^{-3}$)
Dichlorodifluoromethane	<40	<200	Methylisobutylketone	<5	<20
Chloromethane	<30	<100	Dimethyldisulfide	<10	<40
Chloroethene	<30	<100	Toluene	11	49
Bromoethane	<20	<70	Butyric Acid	<40	<200
Chloroethane	<10	<50	n-Octane	10	45
Trichlorofluoromethane	<5	<20	Ethyl Butyrate	<9	<40
1-Pentene	<20	<70	Butyl Acetate	<8	<30
Acetone	200	850	Tetrachloroethene	100	440
Furan	<7	<30	EthylCyclohexane	<4	<20
Propan-2-ol	250	1100	Chlorobenzene	<10	<40
Ethyl Mercaptan	<30	<100	EthylBenzene	<10	<40
1,1-Dichloroethene	<9	<40	m-Xylene + p-Xylene	<20	<90
Methylsulfide	<10	<50	n-Nonane	<10	<40
Dichloromethane	270	1200	Styrene	<10	<40
Carbon Disulfide	49	210	o-Xylene	<10	<40
trans-1,2-Dichloroethene	<10	<40	2-ButoxyEthanol	<20	<90
1,1-Dichloroethane	<6	<30	1,1,2,2-Tetrachloroethane	<4	<20
n-Hexane	12	53	n-PropylBenzene	<10	<40
Methylethylketone	30	130	p-EthylToluene	<4	<20
cis-1,2-Dichloroethene	7.1	31	n-Decane	<10	<40
Propyl Mercaptan	<20	<90	1,2,4-TrimethylBenzene	<10	<40
Chloroform	<10	<40	Limonene	71	310
Tetrachloromethane	<10	<40	1,2-DichloroBenzene	<20	<90
Benzene	<10	<40	Tetramethylbenzene	<4	<20
Butan-1-ol	20	88	Dichlorofluoromethane	<5	<20
n-Heptane	<10	<40	Ethyl Acetate	<10	<40
Trichloroethene	44	190	Methyl Mercaptan	<100	<400
1,2-Dichloropropane	<10	<40	1,4-Dichlorobenzene	<20	<90
Diethylsulfide	8.6	37	1,3-Butadiene	<7	<30
Butyl Mercaptan	<30	<100	1,2-Dichloroethane	<10	<40
Methylcyclohexane	<6	<20	**Estimation of Total VOC's present = 3800 ng**		

Mass of compound is UKAS Accredited, except where result exceeds 1000 ng

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Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH602 1.50
LIMS ID Number: CL1406774
Job Number: S14_1632M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 20-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 15

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	3.27	1	M	UM
1,1-Dichloroethane	75-34-3	3.56	23	53	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	15	50	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	4.12	46	74	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	8	58	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.57	42	93	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.05	9	89	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	5.27	6	M	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	5.58	3	57	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.62	9	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.76	3	M	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.06	1	M	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	3	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	6.36	3	M	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	7.23	19	M	N
1,2,3-Trichlorobenzene	87-61-6 **	-	< 3	-	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %
Pentafluorobenzene	4.11	79
1,4-Difluorobenzene	4.45	77
Chlorobenzene-d5	5.56	59
Bromofluorobenzene	5.96	43
1,4-Dichlorobenzene-d4	6.35	31
Naphthalene-d8	7.22	13

Surrogates	% Rec
Dibromofluoromethane	109
Toluene-d8	97

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS624 0.50
LIMS ID Number: CL1406780
Job Number: S14_1632M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 20-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 16

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	3.56	29	53	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	25	52	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	4.12	26	58	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	5	58	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.57	36	94	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	5.27	7	M	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	5.58	2	57	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.62	7	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.76	2	M	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.05	1	M	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	4	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	6.36	2	M	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	7.23	13	M	N
1,2,3-Trichlorobenzene	87-61-6 **	-	< 4	-	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %
Pentafluorobenzene	4.11	78
1,4-Difluorobenzene	4.45	77
Chlorobenzene-d5	5.56	55
Bromofluorobenzene	5.96	37
1,4-Dichlorobenzene-d4	6.36	26
Naphthalene-d8	7.22	5

Surrogates	% Rec
Dibromofluoromethane	113
Toluene-d8	95

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS633 0.50
LIMS ID Number: CL1406783
Job Number: S14_1632M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 20-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 17

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	1.70	6	M	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	3.56	26	53	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	13	M	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	4.12	158	99	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	2	M	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.57	10	M	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	5.27	5	M	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.06	2	M	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	2	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	7.23	96	68	N
1,2,3-Trichlorobenzene	87-61-6 **	-	< 3	-	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	82	Dibromofluoromethane	107
1,4-Difluorobenzene	4.45	80	Toluene-d8	94
Chlorobenzene-d5	5.56	64		
Bromofluorobenzene	5.96	50		
1,4-Dichlorobenzene-d4	6.35	38		
Naphthalene-d8	7.22	17		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS629 0.50
LIMS ID Number: CL1406784
Job Number: S14_1632M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 20-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 18

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	1.41	12	M	UM
Bromomethane	74-83-9	1.65	5	M	UM
Chloroethane	75-00-3	1.87	5	M	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	2.64	16	M	N
trans 1,2-Dichloroethene	156-60-5	3.27	68	63	UM
1,1-Dichloroethane	75-34-3 D	3.56	763	M	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2 D	3.89	364	M	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6 D	4.12	855	M	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	2	M	UM
1,2-Dichloroethane	107-06-2	4.31	43	78	UM
Trichloroethene	79-01-6	4.57	432	92	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.05	26	90	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	5.27	234	89	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	5.57	12	M	UM
Ethylbenzene	100-41-4	5.58	43	81	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.62	116	94	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.76	67	88	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	5.88	9	58	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.06	62	79	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	90	88	UM
sec-Butylbenzene	135-98-8	6.25	28	M	UM
p-Isopropyltoluene	99-87-6	6.29	28	54	UM
1,3-Dichlorobenzene	541-73-1	6.33	38	M	UM
1,4-Dichlorobenzene	106-46-7	6.36	88	M	UM
n-Butylbenzene	104-51-8 *	6.43	32	77	N
1,2-Dichlorobenzene	95-50-1	6.50	379	91	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	7.23	112	M	N
1,2,3-Trichlorobenzene	87-61-6 **	-	< 3	-	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %
Pentafluorobenzene	4.11	75
1,4-Difluorobenzene	4.45	67
Chlorobenzene-d5	5.56	32
Bromofluorobenzene	5.96	20
1,4-Dichlorobenzene-d4	6.36	11
Naphthalene-d8	7.22	3

Surrogates	% Rec
Dibromofluoromethane	103
Toluene-d8	73

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS629 1.00
LIMS ID Number: CL1406785
Job Number: S14_1632M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 20-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 19

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	2.62	7	M	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3 D	3.57	1290	53	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	545	80	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	4.04	1	M	UM
1,1,1-Trichloroethane	71-55-6 D	4.12	26800	99	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	5	58	UM
1,2-Dichloroethane	107-06-2	4.31	52	95	UM
Trichloroethene	79-01-6 D	4.57	5510	93	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4 D	5.27	4450	90	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	5.57	2	M	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	2	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	6.33	12	M	UM
1,4-Dichlorobenzene	106-46-7	6.36	35	M	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	6.50	71	63	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	7.23	20	M	N
1,2,3-Trichlorobenzene	87-61-6 **	-	< 3	-	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	74	Dibromofluoromethane	127
1,4-Difluorobenzene	4.45	78	Toluene-d8	92
Chlorobenzene-d5	5.56	52		
Bromofluorobenzene	5.96	33		
1,4-Dichlorobenzene-d4	6.36	22		
Naphthalene-d8	7.22	5		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	320VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS653 0.50	**Date Booked in:**	17-Mar-14	**Method:**	Headspace
LIMS ID Number:	CL1406787	**Date Analysed:**	20-Mar-14	**Multiplier:**	1
Job Number:	S14_1632M	**Operator:**	TP	**Position:**	21

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	3.27	25	M	UM
1,1-Dichloroethane	75-34-3	3.57	5	M	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	9	M	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	4.13	2	M	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	5	58	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.57	14	72	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	5.58	7	57	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	5.76	5	M	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	5.87	1	M	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	1	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	7.23	373	99	N
1,2,3-Trichlorobenzene	87-61-6 **	-	< 4	-	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	92	Dibromofluoromethane	104
1,4-Difluorobenzene	4.45	90	Toluene-d8	99
Chlorobenzene-d5	5.56	85		
Bromofluorobenzene	5.96	77		
1,4-Dichlorobenzene-d4	6.35	68		
Naphthalene-d8	7.22	41		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS630 0.50
LIMS ID Number: CL1406792
Job Number: S14_1632M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 20-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 24

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	3.56	28	53	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	13	M	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	4.13	18	M	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	3	58	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.57	35	89	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.05	5	91	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	5.27	3	M	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.62	5	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	2	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	-	< 5	-	N
1,2,3-Trichlorobenzene	87-61-6 **	-	< 3	-	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	92	Dibromofluoromethane	98
1,4-Difluorobenzene	4.45	93	Toluene-d8	96
Chlorobenzene-d5	5.56	84		
Bromofluorobenzene	5.96	72		
1,4-Dichlorobenzene-d4	6.35	59		
Naphthalene-d8	7.22	30		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS631 0.50
LIMS ID Number: CL1406793
Job Number: S14_1632M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 20-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 25

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	2.65	3	M	N
trans 1,2-Dichloroethene	156-60-5	3.27	5	M	UM
1,1-Dichloroethane	75-34-3	3.56	256	85	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	91	79	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	4.13	125	91	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	23	58	UM
1,2-Dichloroethane	107-06-2	4.31	3	M	UM
Trichloroethene	79-01-6	4.57	85	93	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.05	28	90	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	5.27	8	M	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	5.58	22	57	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.62	69	82	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.76	22	M	UM
Styrene	100-42-5	5.76	2	M	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	5.88	2	M	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.06	13	M	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	34	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	6.36	16	M	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 **	7.23	259	68	N
1,2,3-Trichlorobenzene	87-61-6 **	-	< 3	-	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	47	Dibromofluoromethane	113
1,4-Difluorobenzene	4.45	44	Toluene-d8	79
Chlorobenzene-d5	5.56	19		
Bromofluorobenzene	5.96	10		
1,4-Dichlorobenzene-d4	6.36	6		
Naphthalene-d8	7.22	2		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	320VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS611 0.50	**Date Booked in:**	17-Mar-14	**Method:**	Headspace
LIMS ID Number:	CL1406796	**Date Analysed:**	21-Mar-14	**Multiplier:**	1
Job Number:	S14_1633	**Operator:**	TP	**Position:**	2

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4 **	-	< 1	-
1,1-Dichloroethene	75-35-48 **	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	3.56	11	M
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	3.89	11	M
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	4.04	1	M
1,1,1-Trichloroethane	71-55-6	4.12	12	M
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6	4.57	75	91
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	-	< 5	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	5.27	8	M
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 **	6.20	2	M
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6 **	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	7.23	12	M
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	69	Dibromofluoromethane	4
1,4-Difluorobenzene	4.45	70	Toluene-d8	96
Chlorobenzene-d5	5.56	60		
Bromofluorobenzene	5.96	48		
1,4-Dichlorobenzene-d4	6.35	37		
Naphthalene-d8	7.22	19		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	320VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS654 0.50	**Date Booked in:**	17-Mar-14	**Method:**	Headspace
LIMS ID Number:	CL1406797	**Date Analysed:**	21-Mar-14	**Multiplier:**	1
Job Number:	S14_1633	**Operator:**	TP	**Position:**	3

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4 **	-	< 1	-
1,1-Dichloroethene	75-35-48 **	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	3.56	14	53
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	3.89	18	54
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	4.13	5	M
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	4.29	3	M
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6	4.57	18	73
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	-	< 5	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	5.62	5	M

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	6.05	1	M
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 **	6.20	2	M
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6 **	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	6.36	1	M
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	7.23	8	M
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited

Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	74	Dibromofluoromethane	110
1,4-Difluorobenzene	4.45	72	Toluene-d8	94
Chlorobenzene-d5	5.56	54		
Bromofluorobenzene	5.96	41		
1,4-Dichlorobenzene-d4	6.35	30		
Naphthalene-d8	7.22	12		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	320VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	BH615 0.60	**Date Booked in:**	17-Mar-14	**Method:**	Headspace
LIMS ID Number:	CL1406798	**Date Analysed:**	21-Mar-14	**Multiplier:**	1
Job Number:	S14_1633	**Operator:**	TP	**Position:**	4

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4 **	-	< 1	-
1,1-Dichloroethene	75-35-48 **	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	3.56	13	M
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	3.89	7	M
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	4.13	22	53
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	4.29	7	58
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6	4.57	24	92
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	5.05	6	M
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 **	6.20	2	M
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6 **	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	6.36	4	M
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	7.23	18	M
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited

Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	57	Dibromofluoromethane	138
1,4-Difluorobenzene	4.45	55	Toluene-d8	101
Chlorobenzene-d5	5.56	43		
Bromofluorobenzene	5.96	30		
1,4-Dichlorobenzene-d4	6.35	22		
Naphthalene-d8	7.22	7		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	320VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	BH614 0.30	**Date Booked in:**	17-Mar-14	**Method:**	Headspace
LIMS ID Number:	CL1406799	**Date Analysed:**	21-Mar-14	**Multiplier:**	1
Job Number:	S14_1633	**Operator:**	TP	**Position:**	5

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4 **	-	< 1	-
1,1-Dichloroethene	75-35-48 **	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	3.27	5	M
1,1-Dichloroethane	75-34-3	3.56	13	M
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	3.89	13	M
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	4.04	4	M
1,1,1-Trichloroethane	71-55-6	4.12	28	58
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	4.29	11	58
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6	4.56	812	93
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	5.05	8	90
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	5.27	4	M
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	5.62	7	M

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	5.76	3	M
Styrene	100-42-5	5.76	3	M
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	6.01	3	60
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	6.05	3	M
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 **	6.20	5	M
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6 **	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	6.44	2	M
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	7.23	96	68
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	73	Dibromofluoromethane	111
1,4-Difluorobenzene	4.45	72	Toluene-d8	96
Chlorobenzene-d5	5.56	60		
Bromofluorobenzene	5.96	48		
1,4-Dichlorobenzene-d4	6.35	37		
Naphthalene-d8	7.22	19		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	320VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS610 0.50	**Date Booked in:**	17-Mar-14	**Method:**	Headspace
LIMS ID Number:	CL1406800	**Date Analysed:**	21-Mar-14	**Multiplier:**	1
Job Number:	S14_1633	**Operator:**	TP	**Position:**	6

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4 **	-	< 1	-
1,1-Dichloroethene	75-35-48 **	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	-	< 1	-
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6	4.56	24	95
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	-	< 5	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 **	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6 **	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited

Compounds marked ** are not UKAS or Mcerts accredited

"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	80	Dibromofluoromethane	110
1,4-Difluorobenzene	4.45	80	Toluene-d8	97
Chlorobenzene-d5	5.56	72		
Bromofluorobenzene	5.96	61		
1,4-Dichlorobenzene-d4	6.35	51		
Naphthalene-d8	7.22	23		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	320VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS610 1.00	**Date Booked in:**	17-Mar-14	**Method:**	Headspace
LIMS ID Number:	CL1406801	**Date Analysed:**	21-Mar-14	**Multiplier:**	1
Job Number:	S14_1633	**Operator:**	TP	**Position:**	7

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4 **	-	< 1	-
1,1-Dichloroethene	75-35-48 **	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	4.13	2	M
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6	4.56	2	M
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	-	< 5	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 **	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6 **	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	85	Dibromofluoromethane	112
1,4-Difluorobenzene	4.45	87	Toluene-d8	99
Chlorobenzene-d5	5.56	87		
Bromofluorobenzene	5.96	80		
1,4-Dichlorobenzene-d4	6.35	74		
Naphthalene-d8	7.22	58		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	320VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS661 0.60	**Date Booked in:**	17-Mar-14	**Method:**	Headspace
LIMS ID Number:	CL1406802	**Date Analysed:**	21-Mar-14	**Multiplier:**	1
Job Number:	S14_1633	**Operator:**	TP	**Position:**	8

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4 **	-	< 1	-
1,1-Dichloroethene	75-35-48 **	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 1	-
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	4.12	10	M
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6	4.57	44	94
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	-	< 5	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 **	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6 **	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	7.23	7	M
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	83	Dibromofluoromethane	113
1,4-Difluorobenzene	4.45	85	Toluene-d8	98
Chlorobenzene-d5	5.56	79		
Bromofluorobenzene	5.96	70		
1,4-Dichlorobenzene-d4	6.35	59		
Naphthalene-d8	7.22	31		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

UKAS accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	320VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	WS661 1.50	**Date Booked in:**	17-Mar-14	**Method:**	Headspace
LIMS ID Number:	CL1406803	**Date Analysed:**	21-Mar-14	**Multiplier:**	1
Job Number:	S14_1633	**Operator:**	TP	**Position:**	9

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
Dichlorodifluoromethane	75-71-8 **	-	< 1	-
Chloromethane	74-87-3 *	-	< 3	-
Vinyl Chloride	75-01-4	-	< 1	-
Bromomethane	74-83-9	-	< 1	-
Chloroethane	75-00-3	-	< 2	-
Trichlorofluoromethane	75-69-4 **	-	< 1	-
1,1-Dichloroethene	75-35-48 **	-	< 1	-
trans 1,2-Dichloroethene	156-60-5	-	< 1	-
1,1-Dichloroethane	75-34-3	-	< 5	-
MTBE	1634-04-4	-	< 1	-
2,2-Dichloropropane	594-20-7	-	< 1	-
cis 1,2-Dichloroethene	156-59-2	-	< 5	-
Bromochloromethane	74-97-5	-	< 1	-
Chloroform	67-66-3	-	< 1	-
1,1,1-Trichloroethane	71-55-6	4.12	15	M
Carbon Tetrachloride	56-23-5	-	< 1	-
1,1-Dichloropropene	563-58-6	-	< 1	-
Benzene	71-43-2	-	< 1	-
1,2-Dichloroethane	107-06-2	-	< 1	-
Trichloroethene	79-01-6	4.57	33	91
1,2-Dichloropropane	78-87-5	-	< 1	-
Dibromomethane	74-95-3	-	< 1	-
Bromodichloromethane	75-27-4	-	< 1	-
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-
Toluene	108-88-3	-	< 5	-
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-
1,1,2-Trichloroethane	79-00-5	-	< 1	-
Tetrachloroethene	127-18-4	-	< 3	-
1,3-Dichloropropane	142-28-9	-	< 1	-
Dibromochloromethane	124-48-1	-	< 1	-
1,2-Dibromoethane	106-93-4	-	< 1	-
Chlorobenzene	108-90-7	-	< 1	-
Ethylbenzene	100-41-4	-	< 2	-
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-
m and p-Xylene	108-38-3/106-42-3	-	< 4	-

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit
o-Xylene	95-47-6	-	< 2	-
Styrene	100-42-5	-	< 1	-
Bromoform	75-25-2	-	< 1	-
iso-Propylbenzene	98-82-8	-	< 1	-
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-
Propylbenzene	103-65-1	-	< 1	-
Bromobenzene	108-86-1	-	< 1	-
1,2,3-Trichloropropane	96-18-4	-	< 1	-
2-Chlorotoluene	95-49-8	-	< 1	-
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-
4-Chlorotoluene	106-43-4	-	< 1	-
tert-Butylbenzene	98-06-6	-	< 1	-
1,2,4-Trimethylbenzene	95-63-6 **	-	< 1	-
sec-Butylbenzene	135-98-8	-	< 1	-
p-Isopropyltoluene	99-87-6 **	-	< 1	-
1,3-Dichlorobenzene	541-73-1	-	< 1	-
1,4-Dichlorobenzene	106-46-7	-	< 1	-
n-Butylbenzene	104-51-8 *	-	< 1	-
1,2-Dichlorobenzene	95-50-1	-	< 1	-
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-
Hexachlorobutadiene	87-68-3 **	-	< 2	-
Naphthalene	91-20-3	-	< 5	-
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-

Compounds marked * are not MCERTS accredited
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	81	Dibromofluoromethane	111
1,4-Difluorobenzene	4.45	82	Toluene-d8	97
Chlorobenzene-d5	5.56	76		
Bromofluorobenzene	5.96	66		
1,4-Dichlorobenzene-d4	6.35	57		
Naphthalene-d8	7.22	29		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS611 0.50
LIMS ID Number: CL1406796
Job Number: S14_1633M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 21-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 2

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	3.56	12	M	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	12	M	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	4.04	1	M	UM
1,1,1-Trichloroethane	71-55-6	4.12	13	M	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.57	84	91	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	5.27	9	M	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 4	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6 **	6.20	2	M	N
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6 **	-	< 1	-	N
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	7.23	13	M	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	69	Dibromofluoromethane	4
1,4-Difluorobenzene	4.45	70	Toluene-d8	96
Chlorobenzene-d5	5.56	60		
Bromofluorobenzene	5.96	48		
1,4-Dichlorobenzene-d4	6.35	37		
Naphthalene-d8	7.22	19		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS654 0.50 (NVM)
LIMS ID Number: CL1406797
Job Number: S14_1633M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 21-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 3

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	-	< 1	-	U
Bromomethane	74-83-9	-	< 1	-	U
Chloroethane	75-00-3	-	< 2	-	U
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	U
1,1-Dichloroethane	75-34-3	3.56	14	53	U
MTBE	1634-04-4	-	< 1	-	U
2,2-Dichloropropane	594-20-7	-	< 1	-	U
cis 1,2-Dichloroethene	156-59-2	3.89	18	54	U
Bromochloromethane	74-97-5	-	< 1	-	U
Chloroform	67-66-3	-	< 1	-	U
1,1,1-Trichloroethane	71-55-6	4.13	5	M	U
Carbon Tetrachloride	56-23-5	-	< 1	-	U
1,1-Dichloropropene	563-58-6	-	< 1	-	U
Benzene	71-43-2	4.29	3	M	U
1,2-Dichloroethane	107-06-2	-	< 1	-	U
Trichloroethene	79-01-6	4.57	18	73	U
1,2-Dichloropropane	78-87-5	-	< 1	-	U
Dibromomethane	74-95-3	-	< 1	-	U
Bromodichloromethane	75-27-4	-	< 1	-	U
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	U
Toluene	108-88-3	-	< 5	-	U
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	U
1,1,2-Trichloroethane	79-00-5	-	< 1	-	U
Tetrachloroethene	127-18-4	-	< 3	-	U
1,3-Dichloropropane	142-28-9	-	< 1	-	U
Dibromochloromethane	124-48-1	-	< 1	-	U
1,2-Dibromoethane	106-93-4	-	< 1	-	U
Chlorobenzene	108-90-7	-	< 1	-	U
Ethylbenzene	100-41-4	-	< 2	-	U
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	U
m and p-Xylene	108-38-3/106-42-3	5.62	5	M	U

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	U
Styrene	100-42-5	-	< 1	-	U
Bromoform	75-25-2	-	< 1	-	U
iso-Propylbenzene	98-82-8	-	< 1	-	U
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	U
Bromobenzene	108-86-1	-	< 1	-	U
1,2,3-Trichloropropane	96-18-4	-	< 1	-	U
2-Chlorotoluene	95-49-8	-	< 1	-	U
1,3,5-Trimethylbenzene	108-67-8	6.05	1	M	U
4-Chlorotoluene	106-43-4	-	< 1	-	U
tert-Butylbenzene	98-06-6	-	< 1	-	U
1,2,4-Trimethylbenzene	95-63-6 **	6.20	2	M	N
sec-Butylbenzene	135-98-8	-	< 1	-	U
p-Isopropyltoluene	99-87-6 **	-	< 1	-	N
1,3-Dichlorobenzene	541-73-1	-	< 1	-	U
1,4-Dichlorobenzene	106-46-7	6.36	1	M	U
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	U
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	U
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	7.23	8	M	U
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-	U

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	74	Dibromofluoromethane	110
1,4-Difluorobenzene	4.45	72	Toluene-d8	94
Chlorobenzene-d5	5.56	54		
Bromofluorobenzene	5.96	41		
1,4-Dichlorobenzene-d4	6.35	30		
Naphthalene-d8	7.22	12		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH615 0.60
LIMS ID Number: CL1406798
Job Number: S14_1633M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 21-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 4

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	3.56	15	M	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	8	M	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	4.13	26	53	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	8	58	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.57	28	92	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.05	7	M	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6 **	6.20	2	M	N
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6 **	-	< 1	-	N
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	6.36	5	M	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	7.23	21	M	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	57	Dibromofluoromethane	138
1,4-Difluorobenzene	4.45	55	Toluene-d8	101
Chlorobenzene-d5	5.56	43		
Bromofluorobenzene	5.96	30		
1,4-Dichlorobenzene-d4	6.35	22		
Naphthalene-d8	7.22	7		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH614 0.30
LIMS ID Number: CL1406799
Job Number: S14_1633M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 21-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 5

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	3.27	6	M	UM
1,1-Dichloroethane	75-34-3	3.56	15	M	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	15	M	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	4.04	5	M	UM
1,1,1-Trichloroethane	71-55-6	4.12	33	58	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	13	58	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.56	946	93	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.05	9	90	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	5.27	5	M	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.62	8	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.76	3	M	UM
Styrene	100-42-5	5.76	3	M	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	6.01	3	60	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.05	3	M	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6 **	6.20	6	M	N
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6 **	-	< 1	-	N
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	6.44	2	M	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	7.23	112	68	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	73	Dibromofluoromethane	111
1,4-Difluorobenzene	4.45	72	Toluene-d8	96
Chlorobenzene-d5	5.56	60		
Bromofluorobenzene	5.96	48		
1,4-Dichlorobenzene-d4	6.35	37		
Naphthalene-d8	7.22	19		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS610 0.50
LIMS ID Number: CL1406800
Job Number: S14_1633M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 21-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 6

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 3	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 7	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.56	31	95	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 7	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 3	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 3	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6 **	-	< 1	-	N
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6 **	-	< 1	-	N
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 3	-	N
Naphthalene	91-20-3	-	< 7	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	80	Dibromofluoromethane	110
1,4-Difluorobenzene	4.45	80	Toluene-d8	97
Chlorobenzene-d5	5.56	72		
Bromofluorobenzene	5.96	61		
1,4-Dichlorobenzene-d4	6.35	51		
Naphthalene-d8	7.22	23		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS610 1.00
LIMS ID Number: CL1406801
Job Number: S14_1633M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 21-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 7

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	4.13	2	M	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.56	2	M	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6 **	-	< 1	-	N
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6 **	-	< 1	-	N
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	-	< 6	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	85	Dibromofluoromethane	112
1,4-Difluorobenzene	4.45	87	Toluene-d8	99
Chlorobenzene-d5	5.56	87		
Bromofluorobenzene	5.96	80		
1,4-Dichlorobenzene-d4	6.35	74		
Naphthalene-d8	7.22	58		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS661 0.60
LIMS ID Number: CL1406802
Job Number: S14_1633M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 21-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 8

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 3	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 7	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	4.12	13	M	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.57	59	94	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 7	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 3	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 3	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6 **	-	< 1	-	N
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6 **	-	< 1	-	N
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 3	-	N
Naphthalene	91-20-3	7.23	9	M	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	83	Dibromofluoromethane	113
1,4-Difluorobenzene	4.45	85	Toluene-d8	98
Chlorobenzene-d5	5.56	79		
Bromofluorobenzene	5.96	70		
1,4-Dichlorobenzene-d4	6.35	59		
Naphthalene-d8	7.22	31		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS661 1.50
LIMS ID Number: CL1406803
Job Number: S14_1633M

Directory/Quant file: 320VOC_MS19\ Initial Calibration
Date Booked in: 17-Mar-14
Date Analysed: 21-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 9

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4 **	-	< 1	-	N
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 6	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	4.12	18	M	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.57	40	91	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6 **	-	< 1	-	N
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6 **	-	< 1	-	N
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	-	< 6	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	81	Dibromofluoromethane	111
1,4-Difluorobenzene	4.45	82	Toluene-d8	97
Chlorobenzene-d5	5.56	76		
Bromofluorobenzene	5.96	66		
1,4-Dichlorobenzene-d4	6.35	57		
Naphthalene-d8	7.22	29		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH601 0.5-0.8
LIMS ID Number: CL1407197
Job Number: S14_1727M

Directory/Quant file: 324VOC_MS19\ Initial Calibration
Date Booked in: 20-Mar-14
Date Analysed: 25-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 25

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7 **	-	< 1	-	N
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	5	M	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	-	< 1	-	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.05	8	M	UM
trans 1,3-Dichloropropene	10061-02-6 **	-	< 1	-	N
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	4	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	7.23	23	M	UM
1,2,3-Trichlorobenzene	87-61-6 **	-	< 4	-	N

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	50	Dibromofluoromethane	113
1,4-Difluorobenzene	4.45	48	Toluene-d8	84
Chlorobenzene-d5	5.56	25		
Bromofluorobenzene	5.96	14		
1,4-Dichlorobenzene-d4	6.35	8		
Naphthalene-d8	7.22	2		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS660 0.5
LIMS ID Number: CL1407616
Job Number: S14_1803M

Directory/Quant file: 326VOC_MS19\ Initial Calibration
Date Booked in: 24-Mar-14
Date Analysed: 27-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 14

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	1.44	5	M	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 **	2.63	2	M	N
trans 1,2-Dichloroethene	156-60-5	3.27	105	72	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	268	81	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.57	191	93	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1 *	-	< 1	-	N
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8 *	-	< 1	-	N
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	1	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	-	< 6	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	90	Dibromofluoromethane	105
1,4-Difluorobenzene	4.45	86	Toluene-d8	95
Chlorobenzene-d5	5.56	77		
Bromofluorobenzene	5.96	64		
1,4-Dichlorobenzene-d4	6.35	50		
Naphthalene-d8	7.22	20		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS660 1.5
LIMS ID Number: CL1407617
Job Number: S14_1803M

Directory/Quant file: 326VOC_MS19\ Initial Calibration
Date Booked in: 24-Mar-14
Date Analysed: 27-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 15

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 3	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	3.27	1	M	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	17	M	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.57	263	93	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 7	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1 *	-	< 1	-	N
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 3	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 3	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8 *	-	< 1	-	N
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 3	-	N
Naphthalene	91-20-3	-	< 7	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	84	Dibromofluoromethane	110
1,4-Difluorobenzene	4.45	84	Toluene-d8	98
Chlorobenzene-d5	5.56	84		
Bromofluorobenzene	5.96	79		
1,4-Dichlorobenzene-d4	6.35	78		
Naphthalene-d8	7.22	63		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS612 0.35
LIMS ID Number: CL1407618
Job Number: S14_1803M

Directory/Quant file: 326VOC_MS19\ Initial Calibration
Date Booked in: 24-Mar-14
Date Analysed: 27-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 16

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 3	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	3.28	1	M	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	4.04	1	M	UM
1,1,1-Trichloroethane	71-55-6	4.12	1	M	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	22	58	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.57	763	93	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.05	34	91	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	5.27	6	M	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1 *	-	< 1	-	N
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	5.58	7	57	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.62	17	M	UM
o-Xylene	95-47-6	5.76	7	M	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8 *	5.88	2	M	N
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.06	5	M	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	8	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	7.23	21	M	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	64	Dibromofluoromethane	8
1,4-Difluorobenzene	4.45	63	Toluene-d8	89
Chlorobenzene-d5	5.56	42		
Bromofluorobenzene	5.96	27		
1,4-Dichlorobenzene-d4	6.35	18		
Naphthalene-d8	7.22	5		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: WS612 1.0
LIMS ID Number: CL1407619
Job Number: S14_1803M

Directory/Quant file: 326VOC_MS19\ Initial Calibration
Date Booked in: 24-Mar-14
Date Analysed: 27-Mar-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 17

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 *	-	< 4	-	N
Vinyl Chloride	75-01-4	-	< 1	-	UM
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 **	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.57	1	M	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1 *	-	< 1	-	N
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8 *	-	< 1	-	N
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	-	< 6	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	91	Dibromofluoromethane	108
1,4-Difluorobenzene	4.45	91	Toluene-d8	97
Chlorobenzene-d5	5.56	90		
Bromofluorobenzene	5.96	86		
1,4-Dichlorobenzene-d4	6.35	82		
Naphthalene-d8	7.22	65		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH625 0.5
LIMS ID Number: CL1408310
Job Number: S14_1970M

Directory/Quant file: 407VOC_MS19\ Initial Calibration
Date Booked in: 31-Mar-14
Date Analysed: 07-Apr-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 15

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 3	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	4.04	1	M	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	3	M	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.56	3	M	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.05	6	M	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 3	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.62	6	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.06	2	M	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	2	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	7.23	10	M	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	68	Dibromofluoromethane	117
1,4-Difluorobenzene	4.45	63	Toluene-d8	87
Chlorobenzene-d5	5.56	32		
Bromofluorobenzene	5.96	17		
1,4-Dichlorobenzene-d4	6.35	11		
Naphthalene-d8	7.22	2		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH625 1.0
LIMS ID Number: CL1408311
Job Number: S14_1970M

Directory/Quant file: 407VOC_MS19\ Initial Calibration
Date Booked in: 31-Mar-14
Date Analysed: 07-Apr-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 16

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 3	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	-	< 1	-	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 3	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	-	< 6	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	97	Dibromofluoromethane	104
1,4-Difluorobenzene	4.45	95	Toluene-d8	94
Chlorobenzene-d5	5.56	82		
Bromofluorobenzene	5.96	65		
1,4-Dichlorobenzene-d4	6.35	52		
Naphthalene-d8	7.22	15		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH625 5.0
LIMS ID Number: CL1408312
Job Number: S14_1970M

Directory/Quant file: 407VOC_MS19\ Initial Calibration
Date Booked in: 31-Mar-14
Date Analysed: 07-Apr-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 17

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 4	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	2	M	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	-	< 1	-	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.05	10	88	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	5.58	19	81	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.62	52	89	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.76	27	93	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	5.88	4	M	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.06	19	80	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	63	96	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	6.29	2	54	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	6.44	19	35	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 D	7.23	5470	100	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	102	Dibromofluoromethane	103
1,4-Difluorobenzene	4.45	100	Toluene-d8	99
Chlorobenzene-d5	5.56	96		
Bromofluorobenzene	5.96	89		
1,4-Dichlorobenzene-d4	6.35	82		
Naphthalene-d8	7.22	52		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH610 0.3 (NVM)
LIMS ID Number: CL1408313
Job Number: S14_1970M

Directory/Quant file: 407VOC_MS19\ Initial Calibration
Date Booked in: 31-Mar-14
Date Analysed: 07-Apr-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 18

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 3	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	U
Chloroethane	75-00-3	-	< 2	-	U
Trichlorofluoromethane	75-69-4	-	< 1	-	U
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	U
1,1-Dichloroethane	75-34-3	-	< 1	-	U
MTBE	1634-04-4	-	< 1	-	U
2,2-Dichloropropane	594-20-7	-	< 1	-	U
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	U
Bromochloromethane	74-97-5	-	< 1	-	U
Chloroform	67-66-3	-	< 1	-	U
1,1,1-Trichloroethane	71-55-6	-	< 1	-	U
Carbon Tetrachloride	56-23-5	-	< 1	-	U
1,1-Dichloropropene	563-58-6	-	< 1	-	U
Benzene	71-43-2	-	< 1	-	U
1,2-Dichloroethane	107-06-2	-	< 1	-	U
Trichloroethene	79-01-6	4.57	2	M	U
1,2-Dichloropropane	78-87-5	-	< 1	-	U
Dibromomethane	74-95-3	-	< 1	-	U
Bromodichloromethane	75-27-4	-	< 1	-	U
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	U
Toluene	108-88-3	-	< 6	-	U
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	U
1,1,2-Trichloroethane	79-00-5	-	< 1	-	U
Tetrachloroethene	127-18-4	-	< 3	-	U
1,3-Dichloropropane	142-28-9	-	< 1	-	U
Dibromochloromethane	124-48-1	-	< 1	-	U
1,2-Dibromoethane	106-93-4	-	< 1	-	U
Chlorobenzene	108-90-7	-	< 1	-	U
Ethylbenzene	100-41-4	-	< 2	-	U
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	U
m and p-Xylene	108-38-3/106-42-3	-	< 4	-	U

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	U
Styrene	100-42-5	-	< 1	-	U
Bromoform	75-25-2	-	< 1	-	U
iso-Propylbenzene	98-82-8	-	< 1	-	U
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	U
Bromobenzene	108-86-1	-	< 1	-	U
1,2,3-Trichloropropane	96-18-4	-	< 1	-	U
2-Chlorotoluene	95-49-8	-	< 1	-	U
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	U
4-Chlorotoluene	106-43-4	-	< 1	-	U
tert-Butylbenzene	98-06-6	-	< 1	-	U
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	U
sec-Butylbenzene	135-98-8	-	< 1	-	U
p-Isopropyltoluene	99-87-6	-	< 1	-	U
1,3-Dichlorobenzene	541-73-1	-	< 1	-	U
1,4-Dichlorobenzene	106-46-7	-	< 1	-	U
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	U
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	U
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	7.23	21	68	U
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-	U

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	99	Dibromofluoromethane	15
1,4-Difluorobenzene	4.45	96	Toluene-d8	96
Chlorobenzene-d5	5.56	89		
Bromofluorobenzene	5.96	79		
1,4-Dichlorobenzene-d4	6.35	69		
Naphthalene-d8	7.22	37		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH606 0.5
LIMS ID Number: CL1408314
Job Number: S14_1970M

Directory/Quant file: 407VOC_MS19\ Initial Calibration
Date Booked in: 31-Mar-14
Date Analysed: 07-Apr-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 19

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 4	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	-	< 1	-	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	-	< 6	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	101	Dibromofluoromethane	106
1,4-Difluorobenzene	4.45	101	Toluene-d8	98
Chlorobenzene-d5	5.56	99		
Bromofluorobenzene	5.96	96		
1,4-Dichlorobenzene-d4	6.35	97		
Naphthalene-d8	7.22	93		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH606 1.0
LIMS ID Number: CL1408315
Job Number: S14_1970M

Directory/Quant file: 407VOC_MS19\ Initial Calibration
Date Booked in: 31-Mar-14
Date Analysed: 07-Apr-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 20

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 4	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	13	M	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.56	665	91	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	-	< 6	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	99	Dibromofluoromethane	103
1,4-Difluorobenzene	4.45	98	Toluene-d8	97
Chlorobenzene-d5	5.56	87		
Bromofluorobenzene	5.96	73		
1,4-Dichlorobenzene-d4	6.35	61		
Naphthalene-d8	7.22	20		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH606 3.4
LIMS ID Number: CL1408316
Job Number: S14_1970M

Directory/Quant file: 407VOC_MS19\ Initial Calibration
Date Booked in: 31-Mar-14
Date Analysed: 07-Apr-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 21

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 3	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	16	M	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.56	792	92	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 3	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	-	< 6	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	74	Dibromofluoromethane	105
1,4-Difluorobenzene	4.45	72	Toluene-d8	96
Chlorobenzene-d5	5.56	64		
Bromofluorobenzene	5.96	52		
1,4-Dichlorobenzene-d4	6.35	42		
Naphthalene-d8	7.22	12		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH625 0.5
LIMS ID Number: CL1408310
Job Number: S14_1970M

Directory/Quant file: 407VOC_MS19\ Initial Calibration
Date Booked in: 31-Mar-14
Date Analysed: 07-Apr-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 15

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 3	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	4.04	1	M	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	3	M	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.56	3	M	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.05	6	M	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 3	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.62	6	M	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.06	2	M	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	2	M	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	7.23	10	M	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	68	Dibromofluoromethane	117
1,4-Difluorobenzene	4.45	63	Toluene-d8	87
Chlorobenzene-d5	5.56	32		
Bromofluorobenzene	5.96	17		
1,4-Dichlorobenzene-d4	6.35	11		
Naphthalene-d8	7.22	2		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH625 1.0
LIMS ID Number: CL1408311
Job Number: S14_1970M

Directory/Quant file: 407VOC_MS19\ Initial Calibration
Date Booked in: 31-Mar-14
Date Analysed: 07-Apr-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 16

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 3	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	-	< 1	-	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 3	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	-	< 6	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	97	Dibromofluoromethane	104
1,4-Difluorobenzene	4.45	95	Toluene-d8	94
Chlorobenzene-d5	5.56	82		
Bromofluorobenzene	5.96	65		
1,4-Dichlorobenzene-d4	6.35	52		
Naphthalene-d8	7.22	15		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH625 5.0
LIMS ID Number: CL1408312
Job Number: S14_1970M

Directory/Quant file: 407VOC_MS19\ Initial Calibration
Date Booked in: 31-Mar-14
Date Analysed: 07-Apr-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 17

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 4	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	4.29	2	M	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	-	< 1	-	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	5.05	10	88	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	5.58	19	81	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	5.62	52	89	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	5.76	27	93	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	5.88	4	M	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	6.06	19	80	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	6.20	63	96	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	6.29	2	54	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	6.44	19	35	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3 D	7.23	5470	100	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	102	Dibromofluoromethane	103
1,4-Difluorobenzene	4.45	100	Toluene-d8	99
Chlorobenzene-d5	5.56	96		
Bromofluorobenzene	5.96	89		
1,4-Dichlorobenzene-d4	6.35	82		
Naphthalene-d8	7.22	52		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH610 0.3 (NVM)
LIMS ID Number: CL1408313
Job Number: S14_1970M

Directory/Quant file: 407VOC_MS19\ Initial Calibration
Date Booked in: 31-Mar-14
Date Analysed: 07-Apr-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 18

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 3	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	U
Chloroethane	75-00-3	-	< 2	-	U
Trichlorofluoromethane	75-69-4	-	< 1	-	U
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	U
1,1-Dichloroethane	75-34-3	-	< 1	-	U
MTBE	1634-04-4	-	< 1	-	U
2,2-Dichloropropane	594-20-7	-	< 1	-	U
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	U
Bromochloromethane	74-97-5	-	< 1	-	U
Chloroform	67-66-3	-	< 1	-	U
1,1,1-Trichloroethane	71-55-6	-	< 1	-	U
Carbon Tetrachloride	56-23-5	-	< 1	-	U
1,1-Dichloropropene	563-58-6	-	< 1	-	U
Benzene	71-43-2	-	< 1	-	U
1,2-Dichloroethane	107-06-2	-	< 1	-	U
Trichloroethene	79-01-6	4.57	2	M	U
1,2-Dichloropropane	78-87-5	-	< 1	-	U
Dibromomethane	74-95-3	-	< 1	-	U
Bromodichloromethane	75-27-4	-	< 1	-	U
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	U
Toluene	108-88-3	-	< 6	-	U
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	U
1,1,2-Trichloroethane	79-00-5	-	< 1	-	U
Tetrachloroethene	127-18-4	-	< 3	-	U
1,3-Dichloropropane	142-28-9	-	< 1	-	U
Dibromochloromethane	124-48-1	-	< 1	-	U
1,2-Dibromoethane	106-93-4	-	< 1	-	U
Chlorobenzene	108-90-7	-	< 1	-	U
Ethylbenzene	100-41-4	-	< 2	-	U
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	U
m and p-Xylene	108-38-3/106-42-3	-	< 4	-	U

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	U
Styrene	100-42-5	-	< 1	-	U
Bromoform	75-25-2	-	< 1	-	U
iso-Propylbenzene	98-82-8	-	< 1	-	U
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	U
Bromobenzene	108-86-1	-	< 1	-	U
1,2,3-Trichloropropane	96-18-4	-	< 1	-	U
2-Chlorotoluene	95-49-8	-	< 1	-	U
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	U
4-Chlorotoluene	106-43-4	-	< 1	-	U
tert-Butylbenzene	98-06-6	-	< 1	-	U
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	U
sec-Butylbenzene	135-98-8	-	< 1	-	U
p-Isopropyltoluene	99-87-6	-	< 1	-	U
1,3-Dichlorobenzene	541-73-1	-	< 1	-	U
1,4-Dichlorobenzene	106-46-7	-	< 1	-	U
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	U
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	U
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	7.23	21	68	U
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-	U

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	99	Dibromofluoromethane	15
1,4-Difluorobenzene	4.45	96	Toluene-d8	96
Chlorobenzene-d5	5.56	89		
Bromofluorobenzene	5.96	79		
1,4-Dichlorobenzene-d4	6.35	69		
Naphthalene-d8	7.22	37		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH606 0.5
LIMS ID Number: CL1408314
Job Number: S14_1970M

Directory/Quant file: 407VOC_MS19\ Initial Calibration
Date Booked in: 31-Mar-14
Date Analysed: 07-Apr-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 19

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 4	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	-	< 6	-	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	-	< 1	-	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	-	< 6	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	101	Dibromofluoromethane	106
1,4-Difluorobenzene	4.45	101	Toluene-d8	98
Chlorobenzene-d5	5.56	99		
Bromofluorobenzene	5.96	96		
1,4-Dichlorobenzene-d4	6.35	97		
Naphthalene-d8	7.22	93		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details: Waterman EED: Langley Park
Sample Details: BH606 1.0
LIMS ID Number: CL1408315
Job Number: S14_1970M

Directory/Quant file: 407VOC_MS19\ Initial Calibration
Date Booked in: 31-Mar-14
Date Analysed: 07-Apr-14
Operator: TP

Matrix: Soil
Method: Headspace
Multiplier: 1
Position: 20

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 4	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	13	M	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.56	665	91	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 4	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 4	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	-	< 6	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 4	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	99	Dibromofluoromethane	103
1,4-Difluorobenzene	4.45	98	Toluene-d8	97
Chlorobenzene-d5	5.56	87		
Bromofluorobenzene	5.96	73		
1,4-Dichlorobenzene-d4	6.35	61		
Naphthalene-d8	7.22	20		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Volatile Organic Compounds by HSA-GCMS

Accredited?: Yes

Customer and Site Details:	Waterman EED: Langley Park	**Directory/Quant file:**	407VOC_MS19\ Initial Calibration	**Matrix:**	Soil
Sample Details:	BH606 3.4	**Date Booked in:**	31-Mar-14	**Method:**	Headspace
LIMS ID Number:	CL1408316	**Date Analysed:**	07-Apr-14	**Multiplier:**	1
Job Number:	S14_1970M	**Operator:**	TP	**Position:**	21

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
Dichlorodifluoromethane	75-71-8 **	-	< 1	-	N
Chloromethane	74-87-3 **	-	< 3	-	N
Vinyl Chloride	75-01-4 **	-	< 1	-	N
Bromomethane	74-83-9	-	< 1	-	UM
Chloroethane	75-00-3	-	< 2	-	UM
Trichlorofluoromethane	75-69-4	-	< 1	-	UM
1,1-Dichloroethene	75-35-48 *	-	< 1	-	N
trans 1,2-Dichloroethene	156-60-5	-	< 1	-	UM
1,1-Dichloroethane	75-34-3	-	< 1	-	UM
MTBE	1634-04-4	-	< 1	-	UM
2,2-Dichloropropane	594-20-7	-	< 1	-	UM
cis 1,2-Dichloroethene	156-59-2	3.89	16	M	UM
Bromochloromethane	74-97-5	-	< 1	-	UM
Chloroform	67-66-3	-	< 1	-	UM
1,1,1-Trichloroethane	71-55-6	-	< 1	-	UM
Carbon Tetrachloride	56-23-5	-	< 1	-	UM
1,1-Dichloropropene	563-58-6	-	< 1	-	UM
Benzene	71-43-2	-	< 1	-	UM
1,2-Dichloroethane	107-06-2	-	< 1	-	UM
Trichloroethene	79-01-6	4.56	792	92	UM
1,2-Dichloropropane	78-87-5	-	< 1	-	UM
Dibromomethane	74-95-3	-	< 1	-	UM
Bromodichloromethane	75-27-4	-	< 1	-	UM
cis 1,3-Dichloropropene	10061-01-5	-	< 1	-	UM
Toluene	108-88-3	-	< 6	-	UM
trans 1,3-Dichloropropene	10061-02-6	-	< 1	-	UM
1,1,2-Trichloroethane	79-00-5	-	< 1	-	UM
Tetrachloroethene	127-18-4	-	< 3	-	UM
1,3-Dichloropropane	142-28-9	-	< 1	-	UM
Dibromochloromethane	124-48-1	-	< 1	-	UM
1,2-Dibromoethane	106-93-4	-	< 1	-	UM
Chlorobenzene	108-90-7	-	< 1	-	UM
Ethylbenzene	100-41-4	-	< 2	-	UM
1,1,1,2-Tetrachloroethane	630-20-6	-	< 1	-	UM
m and p-Xylene	108-38-3/106-42-3	-	< 5	-	UM

Target Compounds	CAS #	R.T. (min.)	Concentration µg/kg	% Fit	Accr. code
o-Xylene	95-47-6	-	< 2	-	UM
Styrene	100-42-5	-	< 1	-	UM
Bromoform	75-25-2	-	< 1	-	UM
iso-Propylbenzene	98-82-8	-	< 1	-	UM
1,1,2,2-Tetrachloroethane	79-34-5 **	-	< 1	-	N
Propylbenzene	103-65-1	-	< 1	-	UM
Bromobenzene	108-86-1	-	< 1	-	UM
1,2,3-Trichloropropane	96-18-4	-	< 1	-	UM
2-Chlorotoluene	95-49-8	-	< 1	-	UM
1,3,5-Trimethylbenzene	108-67-8	-	< 1	-	UM
4-Chlorotoluene	106-43-4	-	< 1	-	UM
tert-Butylbenzene	98-06-6	-	< 1	-	UM
1,2,4-Trimethylbenzene	95-63-6	-	< 1	-	UM
sec-Butylbenzene	135-98-8	-	< 1	-	UM
p-Isopropyltoluene	99-87-6	-	< 1	-	UM
1,3-Dichlorobenzene	541-73-1	-	< 1	-	UM
1,4-Dichlorobenzene	106-46-7	-	< 1	-	UM
n-Butylbenzene	104-51-8 *	-	< 1	-	N
1,2-Dichlorobenzene	95-50-1	-	< 1	-	UM
1,2-Dibromo-3-chloropropane	96-12-8	-	< 1	-	UM
1,2,4-Trichlorobenzene	120-82-1 *	-	< 3	-	N
Hexachlorobutadiene	87-68-3 **	-	< 2	-	N
Naphthalene	91-20-3	-	< 6	-	UM
1,2,3-Trichlorobenzene	87-61-6	-	< 3	-	UM

Concentrations are reported on a dry weight basis
Compounds marked ** are not UKAS or Mcerts accredited
"M" denotes that % fit has been manually interpreted
This analysis was conducted on an 'As Recieved' basis.

Internal standards	R.T.	Area %	Surrogates	% Rec
Pentafluorobenzene	4.11	74	Dibromofluoromethane	105
1,4-Difluorobenzene	4.45	72	Toluene-d8	96
Chlorobenzene-d5	5.56	64		
Bromofluorobenzene	5.96	52		
1,4-Dichlorobenzene-d4	6.35	42		
Naphthalene-d8	7.22	12		

Note: Volatile compounds degrade with time, and this may affect the integrity of the data depending on the timescale between sampling and analysis. It is recommended that analysis takes place within 7 days of sampling.

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105℃ where appropriate, in accordance with the MCERTS standard.

Annex 3 – Gas Monitoring Records

In Situ Gas Monitoring Pro Forma

Site:	Langley Park Chippenham						
Job No:	EX-23-027						
Date/Time of Visit:	06/04/2023						
Atmospheric Pressure (mb):	**1007**	Trend	Start	Finish	- 24 Hrs	- 48 Hrs	- 72 Hrs
		Steady	1007	1007			
Weather Conditions:	Wet Cloudy						
Ground Conditions:	Wet						
Technician:	KB						
Instrument:	Geotechnical Instruments Gas Analyser (GA5000) – Serial No. GS01105						

BH / WS No.	**Flow** l/hr		**Methane (CH_4)** % V/V			**Carbon Dioxide (CO_2)** % V/V			**Oxygen (O_2)** % V/V			**Water Level** (mbgl)	**Well Depth** (mbgl)	**Other Gases (ppm)**		
			Peak	**Steady (mins)**		**Peak**	**Steady (mins)**		**Min**	**Steady (mins)**				**H2S**	**CO**	**VOC**
WS21/14	1	0	0	1	0	0.3	1	0	18	1	18			N/A	N/A	N/A
	2	0		2	0		2	0		2	19					
	3	0		3	0		3	0.3		3	20					
	10	0		10			10			10						
WS21/2	1	0	0	1	0	0	1	0	20	1	20			N/A	N/A	N/A
	2	0		2	0		2	0		2	20.1					
	3	0		3	0		3	0		3	20.4					
	10	0		10			10			10						
WS21/3	1	0	1.6	1	0.8	0.1	1	0.1	18	1	18			N/A	N/A	N/A
	2	0		2	1.2		2	0.1		2	18.4					
	3	0		3	1.6		3	0.1		3	18.2					
	10	0		10			10			10						
WS627	1	0	0	1	0	0	1	0	19.9	1	19.9			N/A	N/A	N/A
	2	0		2	0		2	0		2	20.4					
	3	0		3	0		3	0		3	20.4					
	10	0		10			10			10						
WS21/5	1	0	0	1	0	0	1	0	19.9	1	19.9	**0**	**1.52**	N/A	N/A	N/A
	2	0		2	0		2	0		2	20.2					
	3	0		3	0		3	0		3	20.3					
	10	0		10			10			10						
BH13	1	0	0	1	0	1.1	1	0.8	18	1	18			N/A	N/A	N/A
	2	0		2	0		2	1.1		2	18.4					
	3	0		3	0		3	1.1		3	18.2					
	10	0		10			10			10						
BH305	1	0	0	1	0	1.5	1	0.8	18	1	18			N/A	N/A	N/A
	2	0		2	0		2	1.5		2	18.6					
	3	0		3	0		3	1.5		3	18.6					
	10	0		10			10			10						
BH118	1	0	0	1	0	0	1	0	20	1	20			N/A	N/A	N/A
	2	0		2	0		2	0		2	20.2					
	3	0		3	0		3	0		3	20.2					
	10	0		10			10			10						
VS610	1	0	0	1	0	1	1	0.8	18.5	1	18.5			N/A	N/A	N/A
	2	0		2	0		2	1		2	18.9					
	3	0		3	0		3	1		3	18.9					
	10	0		10			10			10						

Notes:

In Situ Gas Monitoring Pro Forma

Site:	Langley Park Chippenham						
Job No:	EX-23-027						
Date/Time of Visit:	13/04/2023						
Atmospheric Pressure (mb):	**1009**	Trend	Start	Finish	- 24 Hrs	- 48 Hrs	- 72 Hrs
		Steady	1009	1009			
Weather Conditions:	Dry Sunny						
Ground Conditions:	Dry						
Technician:	KB						
Instrument:	Geotechnical Instruments Gas Analyser (GA5000) – Serial No. GS01105						

BH / WS No.	**Flow** l/hr		**Methane (CH_4)** % V/V			**Carbon Dioxide (CO_2)** % V/V			**Oxygen (O_2)** % V/V			**Water Level** (mbgl)	**Well Depth** (mbgl)	**Other Gases (ppm)**		
			Peak	**Steady (mins)**		**Peak**	**Steady (mins)**		**Min**	**Steady (mins)**				**H2S**	**CO**	**VOC**
ws611	1	0	0	1	0	0	1	0	20.1	1	20.1	**2.71**	**3.9**			
	2	0		2	0		2	0		2	20.1					
	3	0		3	0		3	0		3	20.1					
	10	0		10	0		10			10						
vs612	1	0	0	1	0	1.2	1	0.8	13.2	1	14	**0**	**3.3**			
	2	0		2	0		2	1.2		2	13.2					
	3	0		3	0		3	1.2		3	13.2					
	10	0		10	0		10			10						
r21/2	1	0	0	1	0	0.1	1	0	20.6	1	20.6	**0**	**0.9**			
	2	0		2	0		2	0		2	20.6					
	3	0		3	0		3	0.1		3	20.6					
	10	0		10	0		10			10						
ws21/3	1	0	0	1	0	0	1	0	20.9	1	20.9	**2.22**	**6.1**			
	2	0		2	0		2	0		2	20.9					
	3	0		3	0		3	0		3	20.9					
	10	0		10	0		10			10						
ws652	1	0	0	1	0	0	1	0	20.2	1	20.2	**2.78**	**3.89**			
	2	0		2	0		2	0		2	20.2					
	3	0		3	0		3	0		3	20.2					
	10	0		10	0		10			10						
ws21/14	1	0	0	1	0	0.3	1	0	20.4	1	20.4	**2.77**	**3**			
	2	0		2	0		2	0.2		2	20.4					
	3	0		3	0		3	0.3		3	20.4					
	10	0		10	0		10			10						
bh610	1	0	0	1	0	0	1	0	20.7	1	20.7	**n/a**	**n/a**			
	2	0		2	0		2	0		2	20.7					
	3	0		3	0		3	0		3	20.7					
	10	0		10	0		10			10						
ws21/4	1	0	0	1	0	0.6	1	0.2	18.8	1	19.3	**2**	**2.5**			
	2	0		2	0		2	0.6		2	18.8					
	3	0		3	0		3	0.6		3	18.8					
	10	0		10	0		10			10						
ws21/5	1	0	0	1	0	2.2	1	1.1	15.6	1	16	**0**	**1.52**			
	2	0		2	0		2	2.1		2	15.6					
	3	0		3	0		3	2.2		3	15.6					
	10	0		10			10			10						

Notes:

In Situ Gas Monitoring Pro Forma

Site:	Langley Park Chippenham						
Job No:	EX-23-027						
Date/Time of Visit:	20/04/2023 00:00						
Atmospheric Pressure (mb):		Trend	Start	Finish	- 24 Hrs	- 48 Hrs	- 72 Hrs
		Falling	1024	1020	1027	1029	1028
Weather Conditions:	Dry						
Ground Conditions:	Dry						
Technician:	KB						
Instrument:	Geotechnical Instruments Gas Analyser (GA5000) – Serial No. GS01105						

BH / WS No.	Flow l/hr		Methane (CH_4) % V/V			Carbon Dioxide (CO_2) % V/V			Oxygen (O_2) % V/V			Water Level (mbgl)	Well Depth (mbgl)	Other Gases (ppm)		
			Peak	Steady (mins)		Peak	Steady (mins)		Min	Steady (mins)				H2S	CO	VOC
ws611	1	0	0	1	0	0	1	0	20.1	1		**2.71**	**3.9**			
	2	0		2	0		2	0		2						
	3	0		3	0		3	0		3						
	10	0		10	0		10			10						
vs612	1	0	0	1	0	1.1	1	0.9	13.2	1		**0**	**3.3**			
	2	0		2	0		2	1.1		2						
	3	0		3	0		3	1.1		3						
	10	0		10	0		10			10						
r21/2	1	0	0	1	0	0.2	1	0	20.6	1		**0**	**0.9**			
	2	0		2	0		2	0.2		2						
	3	0		3	0		3	0.2		3						
	10	0		10	0		10			10						
ws21/3	1	0	0	1	0	0	1	0	20.9	1		**2.16**	**6.1**			
	2	0		2	0		2	0		2						
	3	0		3	0		3	0		3						
	10	0		10	0		10			10						
ws652	1	0	0	1	0	0	1	0	20.2	1		**2.8**	**3.89**			
	2	0		2	0		2	0		2						
	3	0		3	0		3	0		3						
	10	0		10	0		10			10						
ws21/14	1	0	0	1	0	0.3	1	0	20.4	1		**2.77**	**3**			
	2	0		2	0		2	0.3		2						
	3	0		3	0		3	0/3		3						
	10	0		10	0		10			10						
bh610	1	0	0	1	0	0	1	0	20.5	1		**n/a**	**n/a**			
	2	0		2	0		2	0		2						
	3	0		3	0		3	0		3						
	10	0		10	0		10			10						
ws21/4	1	0	0	1	0	0.6	1	0.5	18.5	1		**1.98**	**2.5**			
	2	0		2	0		2	0.6		2						
	3	0		3	0		3	0.6		3						
	10	0		10	0		10			10						
ws21/5	1	0	0	1	0	2.2	1	2	13	1		**0**	**1.52**			
	2	0		2	0		2	2.2		2						
	3	0		3	0		3	2.2		3						
	10	0		10	0		10			10						
ws21/11	1		0	1	0	1.5	1	1.3	18.2	1		**0**	**2.06**			
	2			2	0		2	1.5		2						
	3			3	0		3	1.5		3						
	10			10	0		10			10						
ws604	1		0.1	1	0	1.9	1	1.9	14.8	1		**0**	**1**			
	2			2	0		2	1.9		2						
	3			3	0		3	1.8		3						
	10			10	0		10			10						
r21/1	1		0	1	0	1.5	1	1.5	20	1		**0.5**	**3.84**			
	2			2	0		2	1.5		2						
	3			3	0		3	1.5		3						
	10			10	0		10			10						
	1			1			1			1						
	2			2			2			2						
	3			3			3			3						
	10			10			10			10						

Notes:

In Situ Gas Monitoring Pro Forma

Site:	Langley Park Chippenham						
Job No:	EX-23-027						
Date/Time of Visit:	26/05/2023 10:00						
Atmospheric Pressure (mb):	**1032**	Trend	Start	Finish	- 24 Hrs	- 48 Hrs	- 72 Hrs
		Rising	1031	1032	1031	1025	1027
Weather Conditions:	Dry						
Ground Conditions:	Dry						
Technician:	KB						
Instrument:	Geotechnical Instruments Gas Analyser (GA5000) – Serial No. GS01105						

BH / WS No.	**Flow** l/hr		**Methane (CH_4)** % V/V			**Carbon Dioxide (CO_2)** % V/V			**Oxygen (O_2)** % V/V			**Water Level** (mbgl)	**Well Depth** (mbgl)	**Other Gases (ppm)**		
			Peak	**Steady (mins)**		**Peak**	**Steady (mins)**		**Min**	**Steady (mins)**				**H2S**	**CO**	**VOC**
ws611	1	0	0	1	0	0	1	0	20.1	1	20.6	**2.71**	**3.9**			
	2	0		2	0		2	0		2	20.1					
	3	0		3	0		3	0		3	20.1					
	10	0		10			10			10						
vs612	1	0	0	1	0	1.1	1	0.9	13.2	1	13.2	**0**	**3.3**			
	2	0		2	0		2	1.1		2	13.2					
	3	0		3	0		3	1		3	13.2					
	10	0		10			10			10						
r21/2	1	0	0	1	0	0.2	1	0.2	20.6	1	20.6	**0**	**0.9**			
	2	0		2	0		2	0.2		2	20.6					
	3	0		3	0		3	0.2		3	20.6					
	10	0		10	0		10			10						
ws21/3	1	0	0	1	0	0	1	0	20.9	1	20.9	**2.26**	**6.1**			
	2	0		2	0		2	0		2	20.9					
	3	0		3	0		3	0		3	20.9					
	10	0		10	0		10			10						
ws652	1	0	0	1	0	0	1	0	21	1	21	**2.78**	**3.89**			
	2	0		2	0		2	0		2	21					
	3	0		3	0		3	0		3	21					
	10	0		10	0		10			10						
ws21/14	1	0	0	1	0	0.4	1	0.4	20.4	1	20.4	**2.77**	**3**			
	2	0		2	0		2	0.4		2	204					
	3	0		3	0		3	0.3		3	20.4					
	10	0		10	0		10			10						
bh610	1	0	0	1	0	0	1	0	20.6	1	20;6	**n/a**	**n/a**			
	2	0		2	0		2	0		2	20.6					
	3	0		3	0		3	0		3	20.6					
	10	0		10	0		10			10						
ws21/4	1	0	0	1	0	0.7	1		18	1	18.7	**2**	**2.5**			
	2	0		2	0		2	0.7		2	18.1					
	3	0		3	0		3	0.7		3	198					
	10	0		10	0		10	0.5		10						
ws21/5	1	0	0	1	0	2	1	1.8	14.2	1	14.2	**0**	**1.52**			
	2	0		2	0		2	2		2	15.1					
	3	0		3	0		3	2		3	15.1					
	10	0		10	0		10			10						
ws21/11	1		0	1		2	1	1.2	16.9	1	17.2	**0**	**2.06**			
	2			2	0		2	2		2	16.3					
	3			3	0		3	1.8		3	16.3					
	10			10	0		10			10						
ws604	1		0	1	0	2.4	1	2.2	12.8	1	13	**0**	**1**			
	2			2	0		2	2.4		2	12.8					
	3			3	0		3	2.3		3	12.8					
	10			10	0		10			10						
r21/1	1		0	1	0	1.3	1	1.3	20.1	1	20.2	**0.46**	**3.84**			
	2			2	0		2	1.3		2	20.1					
	3			3	0		3	1.3		3	20.1					
	10			10			10			10						

Notes:

PERMANENT GROUND GAS MONITORING FORM

GROUNDTECH CONSULTING

SITE NAME:	*LANGLEY PARK, CHIPPENHAM*	***ENGINEER:***	*Jack Perkins*
CLIENT:	*LANGLEY PROPERTIES LIMITED*	***DATE:***	*22/09/2021*
JOB NO:	*GRO-21222*		

Pressure Trend:	*Steady*	***Weather:***	*Overcast*	***Equipment:***	*GFM 436*

Ambient:	O_2 (%v/v)	CH_4 (%v/v)	CO_2 (%v/v)	LEL	H_2S (ppm)	CO (ppm)
Start	20.7	0.0	0.0	0.0	0.0	0.0
Finish	21.1	0.0	0.0	0.0	0.0	0.0

BH Ref.	Gas Flow Rate (l/hr)		Borehole Pressure (mb)	Methane (%v/v)			Carbon Dioxide (%v/v)		Oxygen (%v/v)		Hydrogen Sulphide (ppm)		Carbon Monoxide (ppm)		Q_{hg} CO_2 (l/hr)	Q_{hg} CH_4 (l/hr)	Atmos Press (mb)	PID (ppm)	Sheen (Y/N)	Depth to Water (m bgl)
	Peak	Steady		Peak	Steady	LEL	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady						
R21/1	0.0	0.0	0.00	15.5	14.2	284.0	17.9	14.9	5.9	7.9	0.0	0.0	0.0	0.0	0.0179	0.0155	1014	-	N	NGW
R21/2	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	19.6	20.3	0.0	0.0	0.0	0.0	0.0000	0.0000	1016	-	N	1.40
R21/3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
R21/4	0.0	0.0	0.00	0.0	0.0	0.0	0.5	0.5	0.7	0.7	0.0	0.0	0.0	0.0	0.0005	0.0000	1016	-	N	0.87
R21/5	0.0	0.0	0.00	0.0	0.0	0.0	1.8	1.4	18.9	19.1	0.0	0.0	0.0	0.0	0.0018	0.0000	1013	-	N	0.91
WS21/1	0.0	0.0	0.00	0.0	0.0	0.0	1.6	1.0	19.2	19.8	0.0	0.0	0.0	0.0	0.0016	0.0000	1013	-	N	NGW
WS21/2	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	20.7	20.5	0.0	0.0	0.0	0.0	0.0000	0.0000	1014	-	N	NGW
WS21/3	0.0	0.0	0.00	0.0	0.0	0.0	0.1	0.0	16.9	21.1	0.0	0.0	0.0	0.0	0.0001	0.0000	1016	-	N	NGW
WS21/5	0.0	0.0	0.00	0.0	0.0	0.0	1.5	0.0	18.9	21.1	0.0	0.0	0.0	0.0	0.0015	0.0000	1016	-	N	NGW
WS21/10	0.0	0.0	0.00	0.0	0.0	0.0	1.5	1.5	19.1	19.1	0.0	0.0	0.0	0.0	0.0015	0.0000	1015	-	N	NGW
WS21/11	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	20.5	20.8	0.0	0.0	0.0	0.0	0.0000	0.0000	1016	-	N	NGW
WS21/12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0000	0.0000	1016	-	N	NGW
WS21/14	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	18.5	18.9	0.0	0.0	0.0	0.0	0.0000	0.0000	1015	-	N	NGW

Notes: R21/1, R21/5, WS21/2, WS21/10, WS21/11 peaks affected due to open valve. Initial ground gas monitoring recorded until the peak state was obtained the steady state conditions were recorded by allowing the gas monitor to run for a minimum of 3 minutes.

PERMANENT GROUND GAS MONITORING FORM

GROUNDTECH CONSULTING

SITE NAME:	*LANGLEY PARK, CHIPPENHAM*	***ENGINEER:***	*Jack Perkins*
CLIENT:	*LANGLEY PROPERTIES LIMITED*	***DATE:***	*07/10/2021*
JOB NO:	*GRO-21222*		

Pressure Trend:	*Rising*	***Weather:***	*Overcast*	***Equipment:***	*GFM 436*

Ambient:	O_2 (%v/v)	CH_4 (%v/v)	CO_2 (%v/v)	LEL	H_2S (ppm)	CO (ppm)
Start	20.9	0.0	0.0	0.0	0.0	0.0
Finish	20.9	0.0	0.0	0.0	0.0	0.0

BH Ref.	Gas Flow Rate (l/hr)		Borehole Pressure (mb)	Methane (%v/v)			Carbon Dioxide (%v/v)		Oxygen (%v/v)		Hydrogen Sulphide (ppm)		Carbon Monoxide (ppm)		Q_{hg} CO_2 (l/hr)	Q_{hg} CH_4 (l/hr)	Atmos Press (mb)	PID (ppm)	Sheen (Y/N)	Depth to Water (m bgl)
	Peak	Steady		Peak	Steady	LEL	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady						
R21/1	0.0	0.0	0.00	8.1	0.0	162.0	31.4	0.0	0.0	19.8	0.0	0.0	0.0	0.0	0.0314	0.0081	1013	-	N	NGW
R21/2	0.0	0.0	0.00	0.0	0.0	0.0	0.8	0.7	17.2	16.2	0.0	0.0	0.0	0.0	0.0008	0.0000	1014	-	N	0.80
R21/3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
R21/4	0.0	0.0	0.00	0.0	0.0	0.0	0.5	0.5	0.8	0.7	0.0	0.0	0.0	0.0	0.0005	0.0000	1015	-	N	0.94
R21/5	0.0	0.0	0.00	0.0	0.0	0.0	1.8	1.4	18.9	19.1	0.0	0.0	0.0	0.0	0.0018	0.0000	1013	-	N	0.99
WS21/1	0.0	0.0	0.00	0.0	0.0	0.0	2.0	1.9	18.0	18.5	0.0	0.0	0.0	0.0	0.0020	0.0000	1013	-	N	NGW
WS21/2	0.0	0.0	0.00	0.0	0.0	0.0	0.9	0.8	13.9	14.3	0.0	0.0	0.0	0.0	0.0009	0.0000	1014	-	N	NGW
WS21/3	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	20.6	20.6	0.0	0.0	0.0	0.0	0.0000	0.0000	1014	-	N	0.45
WS21/5	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	20.6	20.6	0.0	0.0	0.0	0.0	0.0000	0.0000	1014		N	NGW
WS21/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS21/11	0.0	0.0	0.00	0.0	0.0	0.0	1.7	1.5	18.9	18.8	0.0	0.0	0.0	0.0	0.0	0.0	1014.0	-	N	NGW
WS21/12	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	20.9	20.9	0.0	0.0	0.0	0.0	0.0	0.0	1015.0	-	N	NGW
WS21/14	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	20.4	20.4	0.0	0.0	0.0	0.0	0.0	0.0	1014.0	-	N	NGW
BH615	0.0	0.0	0.00	0.0	0.0	0.0	0.9	0.3	19.9	20.1	0.0	0.0	0.0	0.0	0.0	0.0	1015.0	-	N	NGW
WS609BH	0.0	0.0	0.00	0.0	0.0	0.0	0.4	0.0	20.1	20.0	0.0	0.0	0.0	0.0	0.0	0.0	1015.0	-	N	NGW

Notes: R21/3 & WS09 inaccessible due to being unable to remove cover. WS21/10 hole blocked by sediment. Initial ground gas monitoring recorded until the peak state was obtained the steady state conditions were recorded by allowing the gas monitor to run for a minimum of 3 minutes. Groundwater samples were unable to be taken due to groundwater not rechacrging.

PERMANENT GROUND GAS MONITORING FORM

GROUNDTECH CONSULTING

SITE NAME:	*LANGLEY PARK, CHIPPENHAM*	***ENGINEER:***	*Joshua Turton*
CLIENT:	*LANGLEY PROPERTIES LIMITED*	***DATE:***	*27/10/2021*
JOB NO:	*GRO-21222*		

Pressure Trend:	*Steady*	***Weather:***	*Overcast*	***Equipment:***	*GFM 436*

Ambient:	O_2 (%v/v)	CH_4 (%v/v)	CO_2 (%v/v)	LEL	H_2S (ppm)	CO (ppm)
Start	20.5	0.0	0.0		0.0	0.0
Finish	20.3	0.0	0.0		0.0	0.0

BH Ref.	Gas Flow Rate (l/hr)		Borehole Pressure (mb)	Methane (%v/v)			Carbon Dioxide (%v/v)		Oxygen (%v/v)		Hydrogen Sulphide (ppm)		Carbon Monoxide (ppm)		Q_{hg} CO_2 (l/hr)	Q_{hg} CH_4 (l/hr)	Atmos Press (mb)	PID (ppm)	Sheen (Y/N)	Depth to Water (m bgl)
	Peak	Steady		Peak	Steady	LEL	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady						
R21/1	0.0	0.0	0.00	8.8	3.9	176.0	26.0	14.6	0.8	10.6	0.0	0.0	0.0	0.0	0.0260	0.0088	1006	-	N	5.89
R21/2	0.0	0.0	0.00	0.0	0.0	0.0	0.4	0.3	18.8	19.2	0.0	0.0	0.0	0.0	0.0004	0.0000	1006	-	N	NGW
R21/3	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	16.8	17.7	0.0	0.0	0.0	0.0	0.0000	0.0000	1005	-	N	NGW
R21/4	0.0	0.0	0.00	0.0	0.0	0.0	9.5	8.5	3.4	2.9	0.0	0.0	0.0	0.0	0.0095	0.0000	1005	-	N	NGW
R21/5	0.0	0.0	0.00	0.0	0.0	0.0	0.7	0.7	1.1	3.5	0.0	0.0	0.0	0.0	0.0007	0.0000	1005	-	N	NGW
WS21/1	0.0	0.0	0.00	0.0	0.0	0.0	2.5	1.3	16.5	18.6	0.0	0.0	0.0	0.0	0.0025	0.0000	1006	-	N	NGW
WS21/2	0.0	0.0	0.00	0.0	0.0	0.0	1.4	0.9	16.8	15.6	0.0	0.0	0.0	0.0	0.0014	0.0000	1006	-	N	NGW
WS21/3	0.0	0.0	0.00	2.1	2.1	42.0	0.2	0.2	6.4	6.7	0.0	0.0	0.0	0.0	0.0002	0.0021	1006	-	N	NGW
WS21/5	0.0	0.0	0.00	0.0	0.0	0.0	1.3	0.6	17.5	19.8	0.0	0.0	0.0	0.0	0.0013	0.0000	1006	-	N	NGW
WS21/10	0.0	0.0	0.00	0.0	0.0	0.0	0.1	0.0	20.1	20.2	0.0	0.0	0.0	0.0	0.0001	0.0000	1005	-	N	NGW
WS21/11	0.0	0.0	0.00	0.0	0.0	0.0	1.6	0.0	18.5	20.3	0.0	0.0	0.0	0.0	0.0016	0.0000	1005	-	N	NGW
WS21/12	0.0	0.0	0.00	0.0	0.0	0.0	5.3	3.0	7.6	15.2	0.0	0.0	0.0	0.0	0.0053	0.0000	1005	-	N	NGW
WS21/14	0.0	0.0	0.00	0.0	0.0	0.0	0.2	0.1	19.7	19.8	0.0	0.0	0.0	0.0	0.0002	0.0000	1005	-	N	NGW
BH615	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	16.8	17.7	0.0	0.0	0.0	0.0	0.0000	0.0000	1005	-	N	NGW
WS609BH	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	20.2	20.2	0.0	0.0	0.0	0.0	0.0000	0.0000	1005	-	N	NGW

Notes: Initial ground gas monitoring recorded until the peak state was obtained the steady state conditions were recorded by allowing the gas monitor to run for a minimum of 3 minutes.

Annex 4 – Johnson and Ettinger RA Outputs

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

Source Characteristics:	Units	Symbol	Trichloroethylene Value
Source medium		Source	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	19.6
Depth below grade to soil gas sample	(m)	Ls	0.50
Average vadose zone temperature	(°C)	Ts	10
Calc: Source vapor concentration	(ug/m3)	Cs	20
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%
Chemical:	**Units**	**Symbol**	**Value**
Chemical Name		Chem	Trichloroethylene
CAS No.		CAS	79-01-6
Toxicity Factors			
Unit risk factor	$(ug/m^3)^{-1}$	IUR	see note
Mutagenic compound		Mut	Yes
Reference concentration	(ug/m^3)	RfC	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**
Pure component water solubility	(mg/L)	S	1.28E+03
Henry's Law Constant @ 25°C	($atm\text{-}m^3/mol$)	Hc	9.85E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.97E-01
Diffusivity in air	(cm2/s)	Dair	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**
Building setting		Bldg_Setting	Residential
Foundation type		Found_Type	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15
Foundation thickness	(m)	Lf	0.15
Fraction of foundation area with cracks	(-)	eta	0.002
Enclosed space floor area	(m2)	Ab	92.00
Enclosed space mixing height	(m)	Hb	4.80
Indoor air exchange rate	(1/hr)	ach	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66

Vadose zone characteristics:	Units	Symbol	Value
Stratum A (Top of soil profile):			
Stratum A SCS soil type		SCS_A	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00
Stratum A total porosity	(-)	nSA	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180
Stratum B (Soil layer below Stratum A):			
Stratum B SCS soil type		SCS_B	Not Present
Stratum B thickness	(m)	hSB	0.00
Stratum B total porosity	(-)	nSB	
Stratum B water-filled porosity	(-)	nwSB	
Stratum B bulk density	(g/cm^3)	rhoSB	
Stratum C (Soil layer below Stratum B):			
Stratum C SCS soil type		SCS_C	Not Present
Stratum C thickness	(m)	hSC	0.00
Stratum C total porosity	(-)	nSC	
Stratum C water-filled porosity	(-)	nwSC	
Stratum C bulk density	(g/cm^3)	rhoSC	
Stratum containing soil gas sample			
Stratum A, B, or C		src_soil	Stratum A

Exposure Parameters:	Units	Symbol	Value
Target risk for carcinogens	(-)	Target_CR	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1
Exposure Scenario		Scenario	Residential
Averaging time for carcinogens	(yrs)	ATc	70
Averaging time for non-carcinogens	(yrs)	ATnc	26
Exposure duration	(yrs)	ED	26
Exposure frequency	(days/yr)	EF	350
Exposure time	(hrs/24 hrs)	ET	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72

Source to Indoor Air Attenuation Factor	Units	Symbol	Value
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**5.9E-02**
		Range	2.0E-03 - 9.8E-01
	(ppbv)	**Cia**	**1.1E-02**
		Range	3.6E-04 - 1.8E-01
Predicted Vapor Concentration Beneath the Foundation			**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**2.0E+01**
		Range	2.0E+01 - 2.0E+01
	(ppbv)	**Css**	**3.6E+00**
		Range	3.6E+00 - 3.6E+00
Diffusive Transport Upward Through Vadose Zone			**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	1.9E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB	
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC	
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	1.9E-04
Critical Parameters			**Value**
α for diffusive transport from source to building with	(-)	A_Param	8.5E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	7.6E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03

Interpretation

Advection is the dominant mechanism across the foundation.
Diffusion through soil is the overall rate limiting process.

Critical Parameters

Hb, Ls, DeffT, ach

Non-Critical Parameters

Qsoil_Qb, Lf, DeffA, eta

Risk Calculations	Units	Symbol	Value
Risk-Based Target Screening Levels			
Target risk for carcinogens	(-)	Target_CR	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**4.78E-01**
	(ppbv)	**Target_IA**	**8.91E-02**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.59E+02**
Incremental Risk Estimates			
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**1.23E-07**
		Range	4.1E-09 - 2.0E-06
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.028191781**
		Range	9.4E-04 - 4.7E-01

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

Source Characteristics:	Units	Symbol	Benzene Value	Dichloroethylene, 1,2-cis Value	Trichloroethylene Value
Source medium		Source	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	4.8	182	2240
Depth below grade to soil gas sample	(m)	Ls	0.50	0.50	0.50
Average vadose zone temperature	(°C)	Ts	10	10	10
Calc: Source vapor concentration	(ug/m3)	Cs	5	182	2240
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%	0.000%	0.000%
Chemical:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Chemical Name		Chem	Benzene	Dichloroethylene, 1,2-cis	Trichloroethylene
CAS No.		CAS	71-43-2	156-59-2	79-01-6
Toxicity Factors					
Unit risk factor	$(ug/m^3)^{-1}$	IUR	7.80E-06	Not Available	see note
Mutagenic compound		Mut	No	No	Yes
Reference concentration	(ug/m^3)	RfC	3.00E-02	Not Available	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Pure component water solubility	(mg/L)	S	1.79E+03	6.41E+03	1.28E+03
Henry's Law Constant @ 25°C	($atm\text{-}m^3/mol$)	Hc	5.55E-03	4.08E-03	9.85E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	2.27E-01	1.67E-01	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.16E-01	8.85E-02	1.97E-01
Diffusivity in air	(cm2/s)	Dair	8.95E-02	8.84E-02	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.03E-05	1.13E-05	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Building setting		Bldg_Setting	Residential	Residential	Residential
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15	0.15	0.15
Foundation thickness	(m)	Lf	0.15	0.15	0.15
Fraction of foundation area with cracks	(-)	eta	0.002	0.002	0.002
Enclosed space floor area	(m2)	Ab	92.00	92.00	92.00
Enclosed space mixing height	(m)	Hb	4.80	4.80	4.80
Indoor air exchange rate	(1/hr)	ach	0.50	0.50	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80	220.80	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66	0.66	0.66
Vadose zone characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Stratum A (Top of soil profile):					
Stratum A SCS soil type		SCS_A	Sandy Clay	Sandy Clay	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00	3.00	3.00
Stratum A total porosity	(-)	nSA	0.295	0.295	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214	0.214	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180	2.180	2.180
Stratum B (Soil layer below Stratum A):					
Stratum B SCS soil type		SCS_B	Not Present	Not Present	Not Present
Stratum B thickness	(m)	hSB	0.00	0.00	0.00
Stratum B total porosity	(-)	nSB			
Stratum B water-filled porosity	(-)	nwSB			
Stratum B bulk density	(g/cm^3)	rhoSB			
Stratum C (Soil layer below Stratum B):					
Stratum C SCS soil type		SCS_C	Not Present	Not Present	Not Present
Stratum C thickness	(m)	hSC	0.00	0.00	0.00
Stratum C total porosity	(-)	nSC			
Stratum C water-filled porosity	(-)	nwSC			
Stratum C bulk density	(g/cm^3)	rhoSC			
Stratum containing soil gas sample					
Stratum A, B, or C		src_soil	Stratum A	Stratum A	Stratum A
Exposure Parameters:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1	1
Exposure Scenario		Scenario	Residential	Residential	Residential
Averaging time for carcinogens	(yrs)	ATc	70	70	70
Averaging time for non-carcinogens	(yrs)	ATnc	26	26	26
Exposure duration	(yrs)	ED	26	26	26
Exposure frequency	(days/yr)	EF	350	350	350
Exposure time	(hrs/24 hrs)	ET	24	24	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72	72
Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**	**Value**	**Value**
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**	**3.0E-03**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**	**Value**	**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**1.4E-02**	**5.5E-01**	**6.7E+00**
		Range	4.8E-04 - 2.4E-01	1.8E-02 - 9.1E+00	2.2E-01 - 1.1E+02
	(ppbv)	**Cia**	**4.5E-03**	**1.4E-01**	**1.3E+00**
		Range	1.5E-04 - 7.5E-02	4.6E-03 - 2.3E+00	4.2E-02 - 2.1E+01
Predicted Vapor Concentration Beneath the Foundation			**Value**	**Value**	**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**4.8E+00**	**1.8E+02**	**2.2E+03**
		Range	4.8E+00 - 4.8E+00	1.8E+02 - 1.8E+02	2.2E+03 - 2.2E+03
	(ppbv)	**Css**	**1.5E+00**	**4.6E+01**	**4.2E+02**
		Range	1.5E+00 - 1.5E+00	4.6E+01 - 4.6E+01	4.2E+02 - 4.2E+02
Diffusive Transport Upward Through Vadose Zone			**Value**	**Value**	**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	2.4E-04	2.4E-04	1.9E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB			
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC			
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	2.4E-04	2.4E-04	1.9E-04
Critical Parameters			**Value**	**Value**	**Value**
α for diffusive transport from source to building with	(-)	A_Param	1.1E-04	1.1E-04	8.5E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	5.8E+03	5.8E+03	7.6E+03
α for convective transport from subslab to buildina	(-)	C_Param	3.0E-03	3.0E-03	3.0E-03
Interpretation					
			Advection is the dominc	Advection is the domi	Advection is the dominant mechanism acros
			Diffusion through soil is tl	Diffusion through soil i:	Diffusion through soil is the overall rate limiting
Critical Parameters					
			Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach
Non-Critical Parameters					
			Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, et	Qsoil_Qb, Lf, DeffA, eta
Risk Calculations	**Units**	**Symbol**	**Value**	**Value**	**Value**
Risk-Based Target Screening Levels					
Target risk for carcinogens	(-)	Target_CR	1E-06	1E-06	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	1	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**3.60E-01**	**No tox data available**	**4.78E-01**
	(ppbv)	**Target_IA**	**1.13E-01**	**No tox data available**	**8.91E-02**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.20E+02**	**No tox data available**	**1.59E+02**
Incremental Risk Estimates					
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**4.00E-08**	**No IUR**	**1.40E-05**
		Range	1.3E-09 - 6.7E-07	-	4.7E-07 - 2.3E-04
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.000460274**	**No RfC Available**	**3.221917808**
		Range	1.5E-05 - 7.7E-03	fC Available - No RfC Ava	1.1E-01 - 5.4E+01

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

Source Characteristics:	Units	Symbol	Benzene Value	Trimethylbenzene, 1,2,4- Value
Source medium		Source	Sub-slab Soil Gas	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	8	269.6
Depth below grade to soil gas sample	(m)	Ls	0.50	0.50
Average vadose zone temperature	(°C)	Ts	10	10
Calc: Source vapor concentration	(ug/m3)	Cs	8	270
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%	0.002%
Chemical:	**Units**	**Symbol**	**Value**	**Value**
Chemical Name		Chem	Benzene	Trimethylbenzene, 1,2,4-
CAS No.		CAS	71-43-2	95-63-6
Toxicity Factors				
Unit risk factor	$(ug/m^3)^{-1}$	IUR	7.80E-06	Not Available
Mutagenic compound		Mut	No	No
Reference concentration	(ug/m^3)	RfC	3.00E-02	6.00E-02
Chemical Properties:	**Units**	**Symbol**	**Value**	**Value**
Pure component water solubility	(mg/L)	S	1.79E+03	5.70E+01
Henry's Law Constant @ 25°C	($atm\text{-}m^3/mol$)	Hc	5.55E-03	6.16E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	2.27E-01	2.52E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.16E-01	9.31E-02
Diffusivity in air	(cm2/s)	Dair	8.95E-02	6.07E-02
Diffusivity in water	(cm2/s)	Dwater	1.03E-05	7.92E-06
Building Characteristics:	**Units**	**Symbol**	**Value**	**Value**
Building setting		Bldg_Setting	Residential	Residential
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15	0.15
Foundation thickness	(m)	Lf	0.15	0.15
Fraction of foundation area with cracks	(-)	eta	0.002	0.002
Enclosed space floor area	(m2)	Ab	92.00	92.00
Enclosed space mixing height	(m)	Hb	4.80	4.80
Indoor air exchange rate	(1/hr)	ach	0.50	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66	0.66
Vadose zone characteristics:	**Units**	**Symbol**	**Value**	**Value**
Stratum A (Top of soil profile):				
Stratum A SCS soil type		SCS_A	Sandy Clay	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00	3.00
Stratum A total porosity	(-)	nSA	0.295	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180	2.180
Stratum B (Soil layer below Stratum A):				
Stratum B SCS soil type		SCS_B	Not Present	Not Present
Stratum B thickness	(m)	hSB	0.00	0.00
Stratum B total porosity	(-)	nSB		
Stratum B water-filled porosity	(-)	nwSB		
Stratum B bulk density	(g/cm^3)	rhoSB		
Stratum C (Soil layer below Stratum B):				
Stratum C SCS soil type		SCS_C	Not Present	Not Present
Stratum C thickness	(m)	hSC	0.00	0.00
Stratum C total porosity	(-)	nSC		
Stratum C water-filled porosity	(-)	nwSC		
Stratum C bulk density	(g/cm^3)	rhoSC		
Stratum containing soil gas sample				
Stratum A, B, or C		src_soil	Stratum A	Stratum A
Exposure Parameters:	**Units**	**Symbol**	**Value**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1
Exposure Scenario		Scenario	Residential	Residential
Averaging time for carcinogens	(yrs)	ATc	70	70
Averaging time for non-carcinogens	(yrs)	ATnc	26	26
Exposure duration	(yrs)	ED	26	26
Exposure frequency	(days/yr)	EF	350	350
Exposure time	(hrs/24 hrs)	ET	24	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72
Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**	**Value**
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**	**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**2.4E-02**	**8.1E-01**
		Range	8.0E-04 - 4.0E-01	2.7E-02 - 1.3E+01
	(ppbv)	**Cia**	**7.5E-03**	**1.6E-01**
		Range	2.5E-04 - 1.3E-01	5.5E-03 - 2.7E+00
Predicted Vapor Concentration Beneath the Foundation			**Value**	**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**8.0E+00**	**2.7E+02**
		Range	8.0E+00 - 8.0E+00	2.7E+02 - 2.7E+02
	(ppbv)	**Css**	**2.5E+00**	**5.5E+01**
		Range	2.5E+00 - 2.5E+00	5.5E+01 - 5.5E+01
Diffusive Transport Upward Through Vadose Zone			**Value**	**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	2.4E-04	1.7E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB		
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC		
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	2.4E-04	1.7E-04
Critical Parameters			**Value**	**Value**
α for diffusive transport from source to building with	(-)	A_Param	1.1E-04	7.6E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	5.8E+03	8.4E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03	3.0E-03
Interpretation				
			Advection is the dominc Advection is the dominant mechanism across the foundation. Diffusion through soil is th Diffusion through soil is the overall rate limiting process.	
Critical Parameters				
			Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach
Non-Critical Parameters				
			Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta
Risk Calculations	**Units**	**Symbol**	**Value**	**Value**
Risk-Based Target Screening Levels				
Target risk for carcinogens	(-)	Target_CR	1E-06	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**3.60E-01**	**6.26E+01**
	(ppbv)	**Target_IA**	**1.13E-01**	**1.27E+01**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.20E+02**	**2.09E+04**
Incremental Risk Estimates				
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**6.67E-08**	**No IUR**
		Range	2.2E-09 - 1.1E-06	-
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.000767123**	**0.012926027**
		Range	2.6E-05 - 1.3E-02	4.3E-04 - 2.2E-01

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

			Benzene	Dichloroethylene, 1,1-	Dichloroethylene, 1,2-cis	Tetrachloroethylene
Source Characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**
Source medium		Source	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	54	30	28000	250
Depth below grade to soil gas sample	(m)	Ls	0.50	0.50	0.50	0.50
Average vadose zone temperature	(°C)	Ts	10	10	10	10
Calc: Source vapor concentration	(ug/m3)	Cs	54	30	28000	250
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%	0.000%	0.003%	0.000%
Chemical:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**
Chemical Name		Chem	Benzene	Dichloroethylene, 1,1-	Dichloroethylene, 1,2-cis-	Tetrachloroethylene
CAS No.		CAS	71-43-2	75-35-4	156-59-2	127-18-4
Toxicity Factors						
Unit risk factor	$(ug/m^3)^{-1}$	IUR	7.80E-06	Not Available	Not Available	2.60E-07
Mutagenic compound		Mut	No	No	No	No
Reference concentration	(ug/m^3)	RfC	3.00E-02	2.00E-01	Not Available	4.00E-02
Chemical Properties:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**
Pure component water solubility	(mg/L)	S	1.79E+03	2.42E+03	6.41E+03	2.06E+02
Henry's Law Constant @ 25°C	($atm\text{-}m^3/mol$)	Hc	5.55E-03	2.61E-02	4.08E-03	1.77E-02
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	2.27E-01	1.07E+00	1.67E-01	7.24E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.16E-01	6.34E-01	8.85E-02	3.24E-01
Diffusivity in air	(cm2/s)	Dair	8.95E-02	8.63E-02	8.84E-02	5.05E-02
Diffusivity in water	(cm2/s)	Dwater	1.03E-05	1.10E-05	1.13E-05	9.46E-06
Building Characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**
Building setting		Bldg_Setting	Residential	Residential	Residential	Residential
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade	Slab-on-grade	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15	0.15	0.15	0.15
Foundation thickness	(m)	Lf	0.15	0.15	0.15	0.15
Fraction of foundation area with cracks	(-)	eta	0.002	0.002	0.002	0.002
Enclosed space floor area	(m2)	Ab	92.00	92.00	92.00	92.00
Enclosed space mixing height	(m)	Hb	4.80	4.80	4.80	4.80
Indoor air exchange rate	(1/hr)	ach	0.50	0.50	0.50	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030	0.0030	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80	220.80	220.80	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66	0.66	0.66	0.66
Vadose zone characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**
Stratum A (Top of soil profile):						
Stratum A SCS soil type		SCS_A	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00	3.00	3.00	3.00
Stratum A total porosity	(-)	nSA	0.295	0.295	0.295	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214	0.214	0.214	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180	2.180	2.180	2.180
Stratum B (Soil layer below Stratum A):						
Stratum B SCS soil type		SCS_B	Not Present	Not Present	Not Present	Not Present
Stratum B thickness	(m)	hSB	0.00	0.00	0.00	0.00
Stratum B total porosity	(-)	nSB				
Stratum B water-filled porosity	(-)	nwSB				
Stratum B bulk density	(g/cm^3)	rhoSB				
Stratum C (Soil layer below Stratum B):						
Stratum C SCS soil type		SCS_C	Not Present	Not Present	Not Present	Not Present
Stratum C thickness	(m)	hSC	0.00	0.00	0.00	0.00
Stratum C total porosity	(-)	nSC				
Stratum C water-filled porosity	(-)	nwSC				
Stratum C bulk density	(g/cm^3)	rhoSC				
Stratum containing soil gas sample						
Stratum A, B, or C		src_soil	Stratum A	Stratum A	Stratum A	Stratum A
Exposure Parameters:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06	1.00E-06	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1	1	1
Exposure Scenario		Scenario	Residential	Residential	Residential	Residential
Averaging time for carcinogens	(yrs)	ATc	70	70	70	70
Averaging time for non-carcinogens	(yrs)	ATnc	26	26	26	26
Exposure duration	(yrs)	ED	26	26	26	26
Exposure frequency	(days/yr)	EF	350	350	350	350
Exposure time	(hrs/24 hrs)	ET	24	24	24	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72	72	72
Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**	**3.0E-03**	**3.0E-03**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**	**Value**	**Value**	**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**1.6E-01**	**9.0E-02**	**8.4E+01**	**7.5E-01**
		Range	5.4E-03 - 2.7E+00	3.0E-03 - 1.5E+00	2.8E+00 - 1.4E+03	2.5E-02 - 1.3E+01
	(ppbv)	**Cia**	**5.1E-02**	**2.3E-02**	**2.1E+01**	**1.1E-01**
		Range	1.7E-03 - 8.5E-01	7.6E-04 - 3.8E-01	7.1E-01 - 3.5E+02	3.7E-03 - 1.8E+00
Predicted Vapor Concentration Beneath the Foundation			**Value**	**Value**	**Value**	**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**5.4E+01**	**3.0E+01**	**2.8E+04**	**2.5E+02**
		Range	5.4E+01 - 5.4E+01	3.0E+01 - 3.0E+01	2.8E+04 - 2.8E+04	2.5E+02 - 2.5E+02
	(ppbv)	**Css**	**1.7E+01**	**7.6E+00**	**7.1E+03**	**3.7E+01**
		Range	1.7E+01 - 1.7E+01	7.6E+00 - 7.6E+00	7.1E+03 - 7.1E+03	3.7E+01 - 3.7E+01
Diffusive Transport Upward Through Vadose Zone			**Value**	**Value**	**Value**	**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	2.4E-04	2.3E-04	2.4E-04	1.4E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB				
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC				
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	2.4E-04	2.3E-04	2.4E-04	1.4E-04
Critical Parameters			**Value**	**Value**	**Value**	**Value**
α for diffusive transport from source to building with	(-)	A_Param	1.1E-04	1.1E-04	1.1E-04	6.2E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	5.8E+03	6.1E+03	5.8E+03	1.0E+04
α for convective transport from subslab to buildina	(-)	C_Param	3.0E-03	3.0E-03	3.0E-03	3.0E-03
			5.8E+03	6.1E+03	5.8E+03	1.0E+04
Interpretation						
			Advection is the dominc	Advection is the domi	Advection is the dom	Advection is the domi
			Diffusion through soil is th	Diffusion through soil is	Diffusion through soil is	Diffusion through soil is
Critical Parameters						
			Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach
Non-Critical Parameters						
			Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, et	Qsoil_Qb, Lf, DeffA, et	Qsoil_Qb, Lf, DeffA, et
Risk Calculations	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**
Risk-Based Target Screening Levels						
Target risk for carcinogens	(-)	Target_CR	1E-06	1E-06	1E-06	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	1	1	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**3.60E-01**	**2.09E+02**	**No tox data available**	**1.08E+01**
	(ppbv)	**Target_IA**	**1.13E-01**	**5.26E+01**	**No tox data available**	**1.59E+00**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.20E+02**	**6.95E+04**	**No tox data available**	**3.60E+03**
Incremental Risk Estimates						
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**4.50E-07**	**No IUR**	**No IUR**	**6.95E-08**
		Range	1.5E-08 - 7.5E-06	-	-	2.3E-09 - 1.2E-06
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.005178082**	**0.000431507**	**No RfC Available**	**0.017979452**
		Range	1.7E-04 - 8.6E-02	1.4E-05 - 7.2E-03	Available - No RfC Av	6.0E-04 - 3.0E-01
			1.3E-04 - 6.4E-02	1.4E-05 - 7.2E-03	Available - No RfC Av	1.1E-03 - 5.3E-01

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

			Benzene	Trichloroethylene
Source Characteristics:	**Units**	**Symbol**	**Value**	**Value**
Source medium		Source	Sub-slab Soil Gas	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	8	176.3
Depth below grade to soil gas sample	(m)	Ls	0.50	0.50
Average vadose zone temperature	(°C)	Ts	10	10
Calc: Source vapor concentration	(ug/m3)	Cs	8	176
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%	0.000%
Chemical:	**Units**	**Symbol**	**Value**	**Value**
Chemical Name		Chem	Benzene	Trichloroethylene
CAS No.		CAS	71-43-2	79-01-6
Toxicity Factors				
Unit risk factor	$(ug/m^3)^{-1}$	IUR	7.80E-06	see note
Mutagenic compound		Mut	No	Yes
Reference concentration	(ug/m^3)	RfC	3.00E-02	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**	**Value**
Pure component water solubility	(mg/L)	S	1.79E+03	1.28E+03
Henry's Law Constant @ 25°C	($atm\text{-}m^3/mol$)	Hc	5.55E-03	9.85E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	2.27E-01	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.16E-01	1.97E-01
Diffusivity in air	(cm2/s)	Dair	8.95E-02	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.03E-05	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**	**Value**
Building setting		Bldg_Setting	Residential	Residential
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15	0.15
Foundation thickness	(m)	Lf	0.15	0.15
Fraction of foundation area with cracks	(-)	eta	0.002	0.002
Enclosed space floor area	(m2)	Ab	92.00	92.00
Enclosed space mixing height	(m)	Hb	4.80	4.80
Indoor air exchange rate	(1/hr)	ach	0.50	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66	0.66
Vadose zone characteristics:	**Units**	**Symbol**	**Value**	**Value**
Stratum A (Top of soil profile):				
Stratum A SCS soil type		SCS_A	Sandy Clay	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00	3.00
Stratum A total porosity	(-)	nSA	0.295	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180	2.180
Stratum B (Soil layer below Stratum A):				
Stratum B SCS soil type		SCS_B	Not Present	Not Present
Stratum B thickness	(m)	hSB	0.00	0.00
Stratum B total porosity	(-)	nSB		
Stratum B water-filled porosity	(-)	nwSB		
Stratum B bulk density	(g/cm^3)	rhoSB		
Stratum C (Soil layer below Stratum B):				
Stratum C SCS soil type		SCS_C	Not Present	Not Present
Stratum C thickness	(m)	hSC	0.00	0.00
Stratum C total porosity	(-)	nSC		
Stratum C water-filled porosity	(-)	nwSC		
Stratum C bulk density	(g/cm^3)	rhoSC		
Stratum containing soil gas sample				
Stratum A, B, or C		src_soil	Stratum A	Stratum A
Exposure Parameters:	**Units**	**Symbol**	**Value**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1
Exposure Scenario		Scenario	Residential	Residential
Averaging time for carcinogens	(yrs)	ATc	70	70
Averaging time for non-carcinogens	(yrs)	ATnc	26	26
Exposure duration	(yrs)	ED	26	26
Exposure frequency	(days/yr)	EF	350	350
Exposure time	(hrs/24 hrs)	ET	24	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72
Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**	**Value**
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**	**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**2.4E-02**	**5.3E-01**
		Range	8.0E-04 - 4.0E-01	1.8E-02 - 8.8E+00
	(ppbv)	**Cia**	**7.5E-03**	**9.8E-02**
		Range	2.5E-04 - 1.3E-01	3.3E-03 - 1.6E+00
Predicted Vapor Concentration Beneath the Foundation			**Value**	**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**8.0E+00**	**1.8E+02**
		Range	8.0E+00 - 8.0E+00	1.8E+02 - 1.8E+02
	(ppbv)	**Css**	**2.5E+00**	**3.3E+01**
		Range	2.5E+00 - 2.5E+00	3.3E+01 - 3.3E+01
Diffusive Transport Upward Through Vadose Zone			**Value**	**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	2.4E-04	1.9E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB		
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC		
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	2.4E-04	1.9E-04
Critical Parameters			**Value**	**Value**
α for diffusive transport from source to building with	(-)	A_Param	1.1E-04	8.5E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	5.8E+03	7.6E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03	3.0E-03
Interpretation				
			Advection is the dominc Advection is the dominant mechanism across the foundation. Diffusion through soil is th Diffusion through soil is the overall rate limiting process.	
Critical Parameters				
			Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach
Non-Critical Parameters				
			Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta
Risk Calculations	**Units**	**Symbol**	**Value**	**Value**
Risk-Based Target Screening Levels				
Target risk for carcinogens	(-)	Target_CR	1E-06	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**3.60E-01**	**4.78E-01**
	(ppbv)	**Target_IA**	**1.13E-01**	**8.91E-02**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.20E+02**	**1.59E+02**
Incremental Risk Estimates				
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**6.67E-08**	**1.11E-06**
		Range	2.2E-09 - 1.1E-06	3.7E-08 - 1.8E-05
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.000767123**	**0.253582192**
		Range	2.6E-05 - 1.3E-02	8.5E-03 - 4.2E+00

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

Source Characteristics:	Units	Symbol	Benzene	Dichloroethylene, 1,1-	Dichloroethylene, 1,2-cis	Tetrachloroethylene	Trichloroethylene
Source medium		Source	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	40	20	2000	250	1100
Depth below grade to soil gas sample	(m)	Ls	0.50	0.50	0.50	0.50	0.50
Average vadose zone temperature	(°C)	Ts	10	10	10	10	10
Calc: Source vapor concentration	(ug/m3)	Cs	40	20	2000	250	1100
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%	0.000%	0.000%	0.000%	0.000%
Chemical:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Chemical Name		Chem	Benzene	Dichloroethylene, 1,1-	Dichloroethylene, 1,2-cis	Tetrachloroethylene	Trichloroethylene
CAS No.		CAS	71-43-2	75-35-4	156-59-2	127-18-4	79-01-6
Toxicity Factors							
Unit risk factor	$(ug/m^3)^{-1}$	IUR	7.80E-06	Not Available	Not Available	2.60E-07	see note
Mutagenic compound		Mut	No	No	No	No	Yes
Reference concentration	(ug/m^3)	RfC	3.00E-02	2.00E-01	Not Available	4.00E-02	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Pure component water solubility	(mg/L)	S	1.79E+03	2.42E+03	6.41E+03	2.06E+02	1.28E+03
Henry's Law Constant @ 25°C	($atm-m^3/mol$)	Hc	5.55E-03	2.61E-02	4.08E-03	1.77E-02	9.85E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	2.27E-01	1.07E+00	1.67E-01	7.24E-01	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.16E-01	6.34E-01	8.85E-02	3.24E-01	1.97E-01
Diffusivity in air	(cm2/s)	Dair	8.95E-02	8.63E-02	8.84E-02	5.05E-02	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.03E-05	1.10E-05	1.13E-05	9.46E-06	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Building setting		Bldg_Setting	Residential	Residential	Residential	Residential	Residential
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade	Slab-on-grade	Slab-on-grade	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15	0.15	0.15	0.15	0.15
Foundation thickness	(m)	Lf	0.15	0.15	0.15	0.15	0.15
Fraction of foundation area with cracks	(-)	eta	0.002	0.002	0.002	0.002	0.002
Enclosed space floor area	(m2)	Ab	92.00	92.00	92.00	92.00	92.00
Enclosed space mixing height	(m)	Hb	4.80	4.80	4.80	4.80	4.80
Indoor air exchange rate	(1/hr)	ach	0.50	0.50	0.50	0.50	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030	0.0030	0.0030	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80	220.80	220.80	220.80	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66	0.66	0.66	0.66	0.66
Vadose zone characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Stratum A (Top of soil profile):							
Stratum A SCS soil type		SCS_A	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00	3.00	3.00	3.00	3.00
Stratum A total porosity	(-)	nSA	0.295	0.295	0.295	0.295	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214	0.214	0.214	0.214	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180	2.180	2.180	2.180	2.180
Stratum B (Soil layer below Stratum A):							
Stratum B SCS soil type		SCS_B	Not Present	Not Present	Not Present	Not Present	Not Present
Stratum B thickness	(m)	hSB	0.00	0.00	0.00	0.00	0.00
Stratum B total porosity	(-)	nSB					
Stratum B water-filled porosity	(-)	nwSB					
Stratum B bulk density	(g/cm^3)	rhoSB					
Stratum C (Soil layer below Stratum B):							
Stratum C SCS soil type		SCS_C	Not Present	Not Present	Not Present	Not Present	Not Present
Stratum C thickness	(m)	hSC	0.00	0.00	0.00	0.00	0.00
Stratum C total porosity	(-)	nSC					
Stratum C water-filled porosity	(-)	nwSC					
Stratum C bulk density	(g/cm^3)	rhoSC					
Stratum containing soil gas sample							
Stratum A, B, or C		src_soil	Stratum A	Stratum A	Stratum A	Stratum A	Stratum A
Exposure Parameters:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1	1	1	1
Exposure Scenario		Scenario	Residential	Residential	Residential	Residential	Residential
Averaging time for carcinogens	(yrs)	ATc	70	70	70	70	70
Averaging time for non-carcinogens	(yrs)	ATnc	26	26	26	26	26
Exposure duration	(yrs)	ED	26	26	26	26	26
Exposure frequency	(days/yr)	EF	350	350	350	350	350
Exposure time	(hrs/24 hrs)	ET	24	24	24	24	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72	72	72	72
Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**	**3.0E-03**	**3.0E-03**	**3.0E-03**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**	**Value**	**Value**	**Value**	**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**1.2E-01**	**6.0E-02**	**6.0E+00**	**7.5E-01**	**3.3E+00**
		Range	4.0E-03 - 2.0E+00	2.0E-03 - 1.0E+00	2.0E-01 - 1.0E+02	2.5E-02 - 1.3E+01	1.1E-01 - 5.5E+01
	(ppbv)	**Cia**	**3.8E-02**	**1.5E-02**	**1.5E+00**	**1.1E-01**	**6.1E-01**
		Range	1.3E-03 - 6.3E-01	5.0E-04 - 2.5E-01	5.0E-02 - 2.5E+01	3.7E-03 - 1.8E+00	2.0E-02 - 1.0E+01
Predicted Vapor Concentration Beneath the Foundation			**Value**	**Value**	**Value**	**Value**	**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**4.0E+01**	**2.0E+01**	**2.0E+03**	**2.5E+02**	**1.1E+03**
		Range	4.0E+01 - 4.0E+01	2.0E+01 - 2.0E+01	2.0E+03 - 2.0E+03	2.5E+02 - 2.5E+02	1.1E+03 - 1.1E+03
	(ppbv)	**Css**	**1.3E+01**	**5.0E+00**	**5.0E+02**	**3.7E+01**	**2.0E+02**
		Range	1.3E+01 - 1.3E+01	5.0E+00 - 5.0E+00	5.0E+02 - 5.0E+02	3.7E+01 - 3.7E+01	2.0E+02 - 2.0E+02
Diffusive Transport Upward Through Vadose Zone			**Value**	**Value**	**Value**	**Value**	**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	2.4E-04	2.3E-04	2.4E-04	1.4E-04	1.9E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB					
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC					
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	2.4E-04	2.3E-04	2.4E-04	1.4E-04	1.9E-04
Critical Parameters			**Value**	**Value**	**Value**	**Value**	**Value**
α for diffusive transport from source to building with	(-)	A_Param	1.1E-04	1.1E-04	1.1E-04	6.2E-05	8.5E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	5.8E+03	6.1E+03	5.8E+03	1.0E+04	7.6E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03
			5.8E+03	6.1E+03	5.8E+03	1.0E+04	7.6E+03
Interpretation							
			Advection is the dominc Diffusion through soil is th	Advection is the domi Diffusion through soil is	Advection is the domi Diffusion through soil is	Advection is the domi Diffusion through soil is	Advection is the domin Diffusion through soil is t
Critical Parameters							
			Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach
Non-Critical Parameters							
			Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta
Risk Calculations	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Risk-Based Target Screening Levels							
Target risk for carcinogens	(-)	Target_CR	1E-06	1E-06	1E-06	1E-06	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	1	1	1	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**3.60E-01**	**2.09E+02**	**No tox data available**	**1.08E+01**	**4.78E-01**
	(ppbv)	**Target_IA**	**1.13E-01**	**5.26E+01**	**No tox data available**	**1.59E+00**	**8.91E-02**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.20E+02**	**6.95E+04**	**No tox data available**	**3.60E+03**	**1.59E+02**
Incremental Risk Estimates							
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**3.33E-07**	**No IUR**	**No IUR**	**6.95E-08**	**6.90E-06**
		Range	1.1E-08 - 5.6E-06	-	-	2.3E-09 - 1.2E-06	2.3E-07 - 1.1E-04
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.003835616**	**0.000287671**	**No RfC Available**	**0.017979452**	**1.582191781**
		Range	1.3E-04 - 6.4E-02	9.6E-06 - 4.8E-03	; Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01
			1.3E-04 - 6.4E-02	9.6E-06 - 4.8E-03	; Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01
			1.3E-04 - 6.4E-02	9.6E-06 - 4.8E-03	; Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01
			1.3E-04 - 6.4E-02	; Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01	
			2.6E-05 - 1.3E-02	4.3E-04 - 2.2E-01			
			9.1E-05 - 4.6E-02				
			9.1E-05 - 4.6E-02				

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

Source Characteristics:	Units	Symbol	Benzene	Dichloroethylene, 1,1-	Dichloroethylene, 1,2-cis	Tetrachloroethylene	Trichloroethylene
Source medium		Source	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	75.7	8.9	75	345.7	249.4
Depth below grade to soil gas sample	(m)	Ls	0.50	0.50	0.50	0.50	0.50
Average vadose zone temperature	(°C)	Ts	10	10	10	10	10
Calc: Source vapor concentration	(ug/m3)	Cs	76	9	75	346	249
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%	0.000%	0.000%	0.000%	0.000%
Chemical:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Chemical Name		Chem	Benzene	Dichloroethylene, 1,1-	Dichloroethylene, 1,2-cis-	Tetrachloroethylene	Trichloroethylene
CAS No.		CAS	71-43-2	75-35-4	156-59-2	127-18-4	79-01-6
Toxicity Factors							
Unit risk factor	$(ug/m^3)^{-1}$	IUR	7.80E-06	Not Available	Not Available	2.60E-07	see note
Mutagenic compound		Mut	No	No	No	No	Yes
Reference concentration	(ug/m^3)	RfC	3.00E-02	2.00E-01	Not Available	4.00E-02	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Pure component water solubility	(mg/L)	S	1.79E+03	2.42E+03	6.41E+03	2.06E+02	1.28E+03
Henry's Law Constant @ 25°C	($atm\text{-}m^3/mol$)	Hc	5.55E-03	2.61E-02	4.08E-03	1.77E-02	9.85E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	2.27E-01	1.07E+00	1.67E-01	7.24E-01	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.16E-01	6.34E-01	8.85E-02	3.24E-01	1.97E-01
Diffusivity in air	(cm2/s)	Dair	8.95E-02	8.63E-02	8.84E-02	5.05E-02	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.03E-05	1.10E-05	1.13E-05	9.46E-06	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Building setting		Bldg_Setting	Residential	Residential	Residential	Residential	Residential
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade	Slab-on-grade	Slab-on-grade	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15	0.15	0.15	0.15	0.15
Foundation thickness	(m)	Lf	0.15	0.15	0.15	0.15	0.15
Fraction of foundation area with cracks	(-)	eta	0.002	0.002	0.002	0.002	0.002
Enclosed space floor area	(m2)	Ab	92.00	92.00	92.00	92.00	92.00
Enclosed space mixing height	(m)	Hb	4.80	4.80	4.80	4.80	4.80
Indoor air exchange rate	(1/hr)	ach	0.50	0.50	0.50	0.50	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030	0.0030	0.0030	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80	220.80	220.80	220.80	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66	0.66	0.66	0.66	0.66
Vadose zone characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Stratum A (Top of soil profile):							
Stratum A SCS soil type		SCS_A	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00	3.00	3.00	3.00	3.00
Stratum A total porosity	(-)	nSA	0.295	0.295	0.295	0.295	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214	0.214	0.214	0.214	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180	2.180	2.180	2.180	2.180
Stratum B (Soil layer below Stratum A):							
Stratum B SCS soil type		SCS_B	Not Present	Not Present	Not Present	Not Present	Not Present
Stratum B thickness	(m)	hSB	0.00	0.00	0.00	0.00	0.00
Stratum B total porosity	(-)	nSB					
Stratum B water-filled porosity	(-)	nwSB					
Stratum B bulk density	(g/cm^3)	rhoSB					
Stratum C (Soil layer below Stratum B):							
Stratum C SCS soil type		SCS_C	Not Present	Not Present	Not Present	Not Present	Not Present
Stratum C thickness	(m)	hSC	0.00	0.00	0.00	0.00	0.00
Stratum C total porosity	(-)	nSC					
Stratum C water-filled porosity	(-)	nwSC					
Stratum C bulk density	(g/cm^3)	rhoSC					
Stratum containing soil gas sample							
Stratum A, B, or C		src_soil	Stratum A	Stratum A	Stratum A	Stratum A	Stratum A
Exposure Parameters:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1	1	1	1
Exposure Scenario		Scenario	Residential	Residential	Residential	Residential	Residential
Averaging time for carcinogens	(yrs)	ATc	70	70	70	70	70
Averaging time for non-carcinogens	(yrs)	ATnc	26	26	26	26	26
Exposure duration	(yrs)	ED	26	26	26	26	26
Exposure frequency	(days/yr)	EF	350	350	350	350	350
Exposure time	(hrs/24 hrs)	ET	24	24	24	24	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72	72	72	72
Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**	**3.0E-03**	**3.0E-03**	**3.0E-03**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**	**Value**	**Value**	**Value**	**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**2.3E-01**	**2.7E-02**	**2.3E-01**	**1.0E+00**	**7.5E-01**
		Range	7.6E-03 - 3.8E+00	8.9E-04 - 4.5E-01	7.5E-03 - 3.8E+00	3.5E-02 - 1.7E+01	2.5E-02 - 1.2E+01
	(ppbv)	**Cia**	**7.1E-02**	**6.7E-03**	**5.7E-02**	**1.5E-01**	**1.4E-01**
		Range	2.4E-03 - 1.2E+00	2.2E-04 - 1.1E-01	1.9E-03 - 9.5E-01	5.1E-03 - 2.5E+00	4.6E-03 - 2.3E+00
Predicted Vapor Concentration Beneath the Foundation			**Value**	**Value**	**Value**	**Value**	**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**7.6E+01**	**8.9E+00**	**7.5E+01**	**3.5E+02**	**2.5E+02**
		Range	7.6E+01 - 7.6E+01	8.9E+00 - 8.9E+00	7.5E+01 - 7.5E+01	3.5E+02 - 3.5E+02	2.5E+02 - 2.5E+02
	(ppbv)	**Css**	**2.4E+01**	**2.2E+00**	**1.9E+01**	**5.1E+01**	**4.6E+01**
		Range	2.4E+01 - 2.4E+01	2.2E+00 - 2.2E+00	1.9E+01 - 1.9E+01	5.1E+01 - 5.1E+01	4.6E+01 - 4.6E+01
Diffusive Transport Upward Through Vadose Zone			**Value**	**Value**	**Value**	**Value**	**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	2.4E-04	2.3E-04	2.4E-04	1.4E-04	1.9E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB					
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC					
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	2.4E-04	2.3E-04	2.4E-04	1.4E-04	1.9E-04
Critical Parameters			**Value**	**Value**	**Value**	**Value**	**Value**
α for diffusive transport from source to building with	(-)	A_Param	1.1E-04	1.1E-04	1.1E-04	6.2E-05	8.5E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	5.8E+03	6.1E+03	5.8E+03	1.0E+04	7.6E+03
α for convective transport from subslab to buildina	(-)	C_Param	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03
Interpretation							
			Advection is the dominc	Advection is the domi	Advection is the dom	Advection is the domi	Advection is the domin
			Diffusion through soil is tl	Diffusion through soil i:	Diffusion through soil i	Diffusion through soil i:	Diffusion through soil is t
Critical Parameters							
			Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach
Non-Critical Parameters							
			Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, et	Qsoil_Qb, Lf, DeffA, et	Qsoil_Qb, Lf, DeffA, et	Qsoil_Qb, Lf, DeffA, eta
Risk Calculations	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Risk-Based Target Screening Levels							
Target risk for carcinogens	(-)	Target_CR	1E-06	1E-06	1E-06	1E-06	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	1	1	1	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**3.60E-01**	**2.09E+02**	**No tox data available**	**1.08E+01**	**4.78E-01**
	(ppbv)	**Target_IA**	**1.13E-01**	**5.26E+01**	**No tox data available**	**1.59E+00**	**8.91E-02**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.20E+02**	**6.95E+04**	**No tox data available**	**3.60E+03**	**1.59E+02**
Incremental Risk Estimates							
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**6.31E-07**	**No IUR**	**No IUR**	**9.60E-08**	**1.56E-06**
		Range	2.1E-08 - 1.1E-05	-	-	3.2E-09 - 1.6E-06	5.2E-08 - 2.6E-05
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.007258904**	**0.000128014**	**No RfC Available**	**0.024861986**	**0.358726027**
		Range	2.4E-04 - 1.2E-01	4.3E-06 - 2.1E-03	'C Available - No RfC Avi	8.3E-04 - 4.1E-01	1.2E-02 - 6.0E+00

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

Source Characteristics:	Units	Symbol	Benzene Value	Trimethylbenzene, 1,2,4- Value
Source medium		Source	Sub-slab Soil Gas	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	8	269.6
Depth below grade to soil gas sample	(m)	Ls	0.50	0.50
Average vadose zone temperature	(°C)	Ts	10	10
Calc: Source vapor concentration	(ug/m3)	Cs	8	270
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%	0.002%
Chemical:	**Units**	**Symbol**	**Value**	**Value**
Chemical Name		Chem	Benzene	Trimethylbenzene, 1,2,4-
CAS No.		CAS	71-43-2	95-63-6
Toxicity Factors				
Unit risk factor	$(ug/m^3)^{-1}$	IUR	7.80E-06	Not Available
Mutagenic compound		Mut	No	No
Reference concentration	(ug/m^3)	RfC	3.00E-02	6.00E-02
Chemical Properties:	**Units**	**Symbol**	**Value**	**Value**
Pure component water solubility	(mg/L)	S	1.79E+03	5.70E+01
Henry's Law Constant @ 25°C	($atm\text{-}m^3/mol$)	Hc	5.55E-03	6.16E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	2.27E-01	2.52E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.16E-01	9.31E-02
Diffusivity in air	(cm2/s)	Dair	8.95E-02	6.07E-02
Diffusivity in water	(cm2/s)	Dwater	1.03E-05	7.92E-06
Building Characteristics:	**Units**	**Symbol**	**Value**	**Value**
Building setting		Bldg_Setting	Residential	Residential
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15	0.15
Foundation thickness	(m)	Lf	0.15	0.15
Fraction of foundation area with cracks	(-)	eta	0.002	0.002
Enclosed space floor area	(m2)	Ab	92.00	92.00
Enclosed space mixing height	(m)	Hb	4.80	4.80
Indoor air exchange rate	(1/hr)	ach	0.50	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66	0.66
Vadose zone characteristics:	**Units**	**Symbol**	**Value**	**Value**
Stratum A (Top of soil profile):				
Stratum A SCS soil type		SCS_A	Sandy Clay	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00	3.00
Stratum A total porosity	(-)	nSA	0.295	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180	2.180
Stratum B (Soil layer below Stratum A):				
Stratum B SCS soil type		SCS_B	Not Present	Not Present
Stratum B thickness	(m)	hSB	0.00	0.00
Stratum B total porosity	(-)	nSB		
Stratum B water-filled porosity	(-)	nwSB		
Stratum B bulk density	(g/cm^3)	rhoSB		
Stratum C (Soil layer below Stratum B):				
Stratum C SCS soil type		SCS_C	Not Present	Not Present
Stratum C thickness	(m)	hSC	0.00	0.00
Stratum C total porosity	(-)	nSC		
Stratum C water-filled porosity	(-)	nwSC		
Stratum C bulk density	(g/cm^3)	rhoSC		
Stratum containing soil gas sample				
Stratum A, B, or C		src_soil	Stratum A	Stratum A
Exposure Parameters:	**Units**	**Symbol**	**Value**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1
Exposure Scenario		Scenario	Residential	Residential
Averaging time for carcinogens	(yrs)	ATc	70	70
Averaging time for non-carcinogens	(yrs)	ATnc	26	26
Exposure duration	(yrs)	ED	26	26
Exposure frequency	(days/yr)	EF	350	350
Exposure time	(hrs/24 hrs)	ET	24	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72
Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**	**Value**
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**	**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**2.4E-02**	**8.1E-01**
		Range	8.0E-04 - 4.0E-01	2.7E-02 - 1.3E+01
	(ppbv)	**Cia**	**7.5E-03**	**1.6E-01**
		Range	2.5E-04 - 1.3E-01	5.5E-03 - 2.7E+00
Predicted Vapor Concentration Beneath the Foundation			**Value**	**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**8.0E+00**	**2.7E+02**
		Range	8.0E+00 - 8.0E+00	2.7E+02 - 2.7E+02
	(ppbv)	**Css**	**2.5E+00**	**5.5E+01**
		Range	2.5E+00 - 2.5E+00	5.5E+01 - 5.5E+01
Diffusive Transport Upward Through Vadose Zone			**Value**	**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	2.4E-04	1.7E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB		
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC		
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	2.4E-04	1.7E-04
Critical Parameters			**Value**	**Value**
α for diffusive transport from source to building with	(-)	A_Param	1.1E-04	7.6E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	5.8E+03	8.4E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03	3.0E-03
			1.5E+02	
Interpretation				
			Advection is the dominc Advection is the dominant mechanism across the foundation. Diffusion through soil is th Diffusion through soil is the overall rate limiting process.	
Critical Parameters				
			Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach
Non-Critical Parameters				
			Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta
Risk Calculations	**Units**	**Symbol**	**Value**	**Value**
Risk-Based Target Screening Levels				
Target risk for carcinogens	(-)	Target_CR	1E-06	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**3.60E-01**	**6.26E+01**
	(ppbv)	**Target_IA**	**1.13E-01**	**1.27E+01**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.20E+02**	**2.09E+04**
Incremental Risk Estimates				
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**6.67E-08**	**No IUR**
		Range	2.2E-09 - 1.1E-06	-
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.000767123**	**0.012926027**
		Range	2.6E-05 - 1.3E-02	4.3E-04 - 2.2E-01
			9.1E-05 - 4.6E-02	

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

Source Characteristics:	Units	Symbol	Benzene	Dichloroethylene, 1,1-	Dichloroethylene, 1,2-cis	Tetrachloroethylene	Trichloroethylene
Source medium		Source	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	50	30	410	120	160
Depth below grade to soil gas sample	(m)	Ls	0.50	0.50	0.50	0.50	0.50
Average vadose zone temperature	(°C)	Ts	10	10	10	10	10
Calc: Source vapor concentration	(ug/m3)	Cs	50	30	410	120	160
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%	0.000%	0.000%	0.000%	0.000%
Chemical:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Chemical Name		Chem	Benzene	Dichloroethylene, 1,1-	Dichloroethylene, 1,2-cis	Tetrachloroethylene	Trichloroethylene
CAS No.		CAS	71-43-2	75-35-4	156-59-2	127-18-4	79-01-6
Toxicity Factors							
Unit risk factor	$(ug/m^3)^{-1}$	IUR	7.80E-06	Not Available	Not Available	2.60E-07	see note
Mutagenic compound		Mut	No	No	No	No	Yes
Reference concentration	(ug/m^3)	RfC	3.00E-02	2.00E-01	Not Available	4.00E-02	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Pure component water solubility	(mg/L)	S	1.79E+03	2.42E+03	6.41E+03	2.06E+02	1.28E+03
Henry's Law Constant @ 25°C	($atm-m^3/mol$)	Hc	5.55E-03	2.61E-02	4.08E-03	1.77E-02	9.85E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	2.27E-01	1.07E+00	1.67E-01	7.24E-01	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.16E-01	6.34E-01	8.85E-02	3.24E-01	1.97E-01
Diffusivity in air	(cm2/s)	Dair	8.95E-02	8.63E-02	8.84E-02	5.05E-02	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.03E-05	1.10E-05	1.13E-05	9.46E-06	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Building setting		Bldg_Setting	Residential	Residential	Residential	Residential	Residential
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade	Slab-on-grade	Slab-on-grade	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15	0.15	0.15	0.15	0.15
Foundation thickness	(m)	Lf	0.15	0.15	0.15	0.15	0.15
Fraction of foundation area with cracks	(-)	eta	0.002	0.002	0.002	0.002	0.002
Enclosed space floor area	(m2)	Ab	92.00	92.00	92.00	92.00	92.00
Enclosed space mixing height	(m)	Hb	4.80	4.80	4.80	4.80	4.80
Indoor air exchange rate	(1/hr)	ach	0.50	0.50	0.50	0.50	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030	0.0030	0.0030	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80	220.80	220.80	220.80	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66	0.66	0.66	0.66	0.66
Vadose zone characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Stratum A (Top of soil profile):							
Stratum A SCS soil type		SCS_A	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00	3.00	3.00	3.00	3.00
Stratum A total porosity	(-)	nSA	0.295	0.295	0.295	0.295	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214	0.214	0.214	0.214	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180	2.180	2.180	2.180	2.180
Stratum B (Soil layer below Stratum A):							
Stratum B SCS soil type		SCS_B	Not Present	Not Present	Not Present	Not Present	Not Present
Stratum B thickness	(m)	hSB	0.00	0.00	0.00	0.00	0.00
Stratum B total porosity	(-)	nSB					
Stratum B water-filled porosity	(-)	nwSB					
Stratum B bulk density	(g/cm^3)	rhoSB					
Stratum C (Soil layer below Stratum B):							
Stratum C SCS soil type		SCS_C	Not Present	Not Present	Not Present	Not Present	Not Present
Stratum C thickness	(m)	hSC	0.00	0.00	0.00	0.00	0.00
Stratum C total porosity	(-)	nSC					
Stratum C water-filled porosity	(-)	nwSC					
Stratum C bulk density	(g/cm^3)	rhoSC					
Stratum containing soil gas sample							
Stratum A, B, or C		src_soil	Stratum A	Stratum A	Stratum A	Stratum A	Stratum A
Exposure Parameters:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1	1	1	1
Exposure Scenario		Scenario	Residential	Residential	Residential	Residential	Residential
Averaging time for carcinogens	(yrs)	ATc	70	70	70	70	70
Averaging time for non-carcinogens	(yrs)	ATnc	26	26	26	26	26
Exposure duration	(yrs)	ED	26	26	26	26	26
Exposure frequency	(days/yr)	EF	350	350	350	350	350
Exposure time	(hrs/24 hrs)	ET	24	24	24	24	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72	72	72	72
Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**	**3.0E-03**	**3.0E-03**	**3.0E-03**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**	**Value**	**Value**	**Value**	**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**1.5E-01**	**9.0E-02**	**1.2E+00**	**3.6E-01**	**4.8E-01**
		Range	5.0E-03 - 2.5E+00	3.0E-03 - 1.5E+00	4.1E-02 - 2.1E+01	1.2E-02 - 6.0E+00	1.6E-02 - 8.0E+00
	(ppbv)	**Cia**	**4.7E-02**	**2.3E-02**	**3.1E-01**	**5.3E-02**	**8.9E-02**
		Range	1.6E-03 - 7.8E-01	7.6E-04 - 3.8E-01	1.0E-02 - 5.2E+00	1.8E-03 - 8.9E-01	3.0E-03 - 1.5E+00
Predicted Vapor Concentration Beneath the Foundation			**Value**	**Value**	**Value**	**Value**	**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**5.0E+01**	**3.0E+01**	**4.1E+02**	**1.2E+02**	**1.6E+02**
		Range	5.0E+01 - 5.0E+01	3.0E+01 - 3.0E+01	4.1E+02 - 4.1E+02	1.2E+02 - 1.2E+02	1.6E+02 - 1.6E+02
	(ppbv)	**Css**	**1.6E+01**	**7.6E+00**	**1.0E+02**	**1.8E+01**	**3.0E+01**
		Range	1.6E+01 - 1.6E+01	7.6E+00 - 7.6E+00	1.0E+02 - 1.0E+02	1.8E+01 - 1.8E+01	3.0E+01 - 3.0E+01
Diffusive Transport Upward Through Vadose Zone			**Value**	**Value**	**Value**	**Value**	**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	2.4E-04	2.3E-04	2.4E-04	1.4E-04	1.9E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB					
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC					
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	2.4E-04	2.3E-04	2.4E-04	1.4E-04	1.9E-04
Critical Parameters			**Value**	**Value**	**Value**	**Value**	**Value**
α for diffusive transport from source to building with	(-)	A_Param	1.1E-04	1.1E-04	1.1E-04	6.2E-05	8.5E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	5.8E+03	6.1E+03	5.8E+03	1.0E+04	7.6E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03
			5.8E+03	6.1E+03	5.8E+03	1.0E+04	7.6E+03
Interpretation							
			Advection is the dominc Diffusion through soil is th	Advection is the domi Diffusion through soil is	Advection is the domi Diffusion through soil is	Advection is the domi Diffusion through soil is	Advection is the domin Diffusion through soil is t
Critical Parameters							
			Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach
Non-Critical Parameters							
			Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta
Risk Calculations	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Risk-Based Target Screening Levels							
Target risk for carcinogens	(-)	Target_CR	1E-06	1E-06	1E-06	1E-06	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	1	1	1	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**3.60E-01**	**2.09E+02**	**No tox data available**	**1.08E+01**	**4.78E-01**
	(ppbv)	**Target_IA**	**1.13E-01**	**5.26E+01**	**No tox data available**	**1.59E+00**	**8.91E-02**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.20E+02**	**6.95E+04**	**No tox data available**	**3.60E+03**	**1.59E+02**
Incremental Risk Estimates							
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**4.17E-07**	**No IUR**	**No IUR**	**3.33E-08**	**1.00E-06**
		Range	1.4E-08 - 6.9E-06	-	-	1.1E-09 - 5.6E-07	3.3E-08 - 1.7E-05
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.004794521**	**0.000431507**	**No RfC Available**	**0.008630137**	**0.230136986**
		Range	1.6E-04 - 8.0E-02	1.4E-05 - 7.2E-03	; Available - No RfC Av	2.9E-04 - 1.4E-01	7.7E-03 - 3.8E+00
			1.3E-04 - 6.4E-02	9.6E-06 - 4.8E-03	; Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01
			1.3E-04 - 6.4E-02	9.6E-06 - 4.8E-03	; Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01
			1.3E-04 - 6.4E-02	9.6E-06 - 4.8E-03	; Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01
			1.3E-04 - 6.4E-02	; Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01	
			2.6E-05 - 1.3E-02	4.3E-04 - 2.2E-01			
			9.1E-05 - 4.6E-02				

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

Source Characteristics:	Units	Symbol	Benzene	Dichloroethylene, 1,1-	Dichloroethylene, 1,2-cis	Tetrachloroethylene	Trichloroethylene
Source medium		Source	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	50	30	410	120	160
Depth below grade to soil gas sample	(m)	Ls	0.50	0.50	0.50	0.50	0.50
Average vadose zone temperature	(°C)	Ts	10	10	10	10	10
Calc: Source vapor concentration	(ug/m3)	Cs	50	30	410	120	160
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%	0.000%	0.000%	0.000%	0.000%
Chemical:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Chemical Name		Chem	Benzene	Dichloroethylene, 1,1-	Dichloroethylene, 1,2-cis	Tetrachloroethylene	Trichloroethylene
CAS No.		CAS	71-43-2	75-35-4	156-59-2	127-18-4	79-01-6
Toxicity Factors							
Unit risk factor	$(ug/m^3)^{-1}$	IUR	7.80E-06	Not Available	Not Available	2.60E-07	see note
Mutagenic compound		Mut	No	No	No	No	Yes
Reference concentration	(ug/m^3)	RfC	3.00E-02	2.00E-01	Not Available	4.00E-02	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Pure component water solubility	(mg/L)	S	1.79E+03	2.42E+03	6.41E+03	2.06E+02	1.28E+03
Henry's Law Constant @ 25°C	($atm-m^3/mol$)	Hc	5.55E-03	2.61E-02	4.08E-03	1.77E-02	9.85E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	2.27E-01	1.07E+00	1.67E-01	7.24E-01	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.16E-01	6.34E-01	8.85E-02	3.24E-01	1.97E-01
Diffusivity in air	(cm2/s)	Dair	8.95E-02	8.63E-02	8.84E-02	5.05E-02	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.03E-05	1.10E-05	1.13E-05	9.46E-06	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Building setting		Bldg_Setting	Residential	Residential	Residential	Residential	Residential
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade	Slab-on-grade	Slab-on-grade	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15	0.15	0.15	0.15	0.15
Foundation thickness	(m)	Lf	0.15	0.15	0.15	0.15	0.15
Fraction of foundation area with cracks	(-)	eta	0.002	0.002	0.002	0.002	0.002
Enclosed space floor area	(m2)	Ab	92.00	92.00	92.00	92.00	92.00
Enclosed space mixing height	(m)	Hb	4.80	4.80	4.80	4.80	4.80
Indoor air exchange rate	(1/hr)	ach	0.50	0.50	0.50	0.50	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030	0.0030	0.0030	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80	220.80	220.80	220.80	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66	0.66	0.66	0.66	0.66
Vadose zone characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Stratum A (Top of soil profile):							
Stratum A SCS soil type		SCS_A	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00	3.00	3.00	3.00	3.00
Stratum A total porosity	(-)	nSA	0.295	0.295	0.295	0.295	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214	0.214	0.214	0.214	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180	2.180	2.180	2.180	2.180
Stratum B (Soil layer below Stratum A):							
Stratum B SCS soil type		SCS_B	Not Present	Not Present	Not Present	Not Present	Not Present
Stratum B thickness	(m)	hSB	0.00	0.00	0.00	0.00	0.00
Stratum B total porosity	(-)	nSB					
Stratum B water-filled porosity	(-)	nwSB					
Stratum B bulk density	(g/cm^3)	rhoSB					
Stratum C (Soil layer below Stratum B):							
Stratum C SCS soil type		SCS_C	Not Present	Not Present	Not Present	Not Present	Not Present
Stratum C thickness	(m)	hSC	0.00	0.00	0.00	0.00	0.00
Stratum C total porosity	(-)	nSC					
Stratum C water-filled porosity	(-)	nwSC					
Stratum C bulk density	(g/cm^3)	rhoSC					
Stratum containing soil gas sample							
Stratum A, B, or C		src_soil	Stratum A	Stratum A	Stratum A	Stratum A	Stratum A
Exposure Parameters:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1	1	1	1
Exposure Scenario		Scenario	Residential	Residential	Residential	Residential	Residential
Averaging time for carcinogens	(yrs)	ATc	70	70	70	70	70
Averaging time for non-carcinogens	(yrs)	ATnc	26	26	26	26	26
Exposure duration	(yrs)	ED	26	26	26	26	26
Exposure frequency	(days/yr)	EF	350	350	350	350	350
Exposure time	(hrs/24 hrs)	ET	24	24	24	24	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72	72	72	72
Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**	**3.0E-03**	**3.0E-03**	**3.0E-03**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**	**Value**	**Value**	**Value**	**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**1.5E-01**	**9.0E-02**	**1.2E+00**	**3.6E-01**	**4.8E-01**
		Range	5.0E-03 - 2.5E+00	3.0E-03 - 1.5E+00	4.1E-02 - 2.1E+01	1.2E-02 - 6.0E+00	1.6E-02 - 8.0E+00
	(ppbv)	**Cia**	**4.7E-02**	**2.3E-02**	**3.1E-01**	**5.3E-02**	**8.9E-02**
		Range	1.6E-03 - 7.8E-01	7.6E-04 - 3.8E-01	1.0E-02 - 5.2E+00	1.8E-03 - 8.9E-01	3.0E-03 - 1.5E+00
Predicted Vapor Concentration Beneath the Foundation			**Value**	**Value**	**Value**	**Value**	**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**5.0E+01**	**3.0E+01**	**4.1E+02**	**1.2E+02**	**1.6E+02**
		Range	5.0E+01 - 5.0E+01	3.0E+01 - 3.0E+01	4.1E+02 - 4.1E+02	1.2E+02 - 1.2E+02	1.6E+02 - 1.6E+02
	(ppbv)	**Css**	**1.6E+01**	**7.6E+00**	**1.0E+02**	**1.8E+01**	**3.0E+01**
		Range	1.6E+01 - 1.6E+01	7.6E+00 - 7.6E+00	1.0E+02 - 1.0E+02	1.8E+01 - 1.8E+01	3.0E+01 - 3.0E+01
Diffusive Transport Upward Through Vadose Zone			**Value**	**Value**	**Value**	**Value**	**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	2.4E-04	2.3E-04	2.4E-04	1.4E-04	1.9E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB					
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC					
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	2.4E-04	2.3E-04	2.4E-04	1.4E-04	1.9E-04
Critical Parameters			**Value**	**Value**	**Value**	**Value**	**Value**
α for diffusive transport from source to building with	(-)	A_Param	1.1E-04	1.1E-04	1.1E-04	6.2E-05	8.5E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	5.8E+03	6.1E+03	5.8E+03	1.0E+04	7.6E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03
			5.8E+03	6.1E+03	5.8E+03	1.0E+04	7.6E+03
Interpretation							
			Advection is the dominc Diffusion through soil is th	Advection is the domi Diffusion through soil is	Advection is the domi Diffusion through soil is	Advection is the domi Diffusion through soil is	Advection is the domin Diffusion through soil is t
Critical Parameters							
			Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach
Non-Critical Parameters							
			Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, eta
Risk Calculations	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**
Risk-Based Target Screening Levels							
Target risk for carcinogens	(-)	Target_CR	1E-06	1E-06	1E-06	1E-06	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	1	1	1	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**3.60E-01**	**2.09E+02**	**No tox data available**	**1.08E+01**	**4.78E-01**
	(ppbv)	**Target_IA**	**1.13E-01**	**5.26E+01**	**No tox data available**	**1.59E+00**	**8.91E-02**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.20E+02**	**6.95E+04**	**No tox data available**	**3.60E+03**	**1.59E+02**
Incremental Risk Estimates							
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**4.17E-07**	**No IUR**	**No IUR**	**3.33E-08**	**1.00E-06**
		Range	1.4E-08 - 6.9E-06	-	-	1.1E-09 - 5.6E-07	3.3E-08 - 1.7E-05
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.004794521**	**0.000431507**	**No RfC Available**	**0.008630137**	**0.230136986**
		Range	1.6E-04 - 8.0E-02	1.4E-05 - 7.2E-03	; Available - No RfC Av	2.9E-04 - 1.4E-01	7.7E-03 - 3.8E+00
			1.3E-04 - 6.4E-02	9.6E-06 - 4.8E-03	; Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01
			1.3E-04 - 6.4E-02	9.6E-06 - 4.8E-03	; Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01
			1.3E-04 - 6.4E-02	9.6E-06 - 4.8E-03	; Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01
			1.3E-04 - 6.4E-02	; Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01	
			2.6E-05 - 1.3E-02	4.3E-04 - 2.2E-01			
			9.1E-05 - 4.6E-02				

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

Source Characteristics:	Units	Symbol	Benzene Value	Dichloroethylene, 1,2-cis Value	Trichloroethylene Value
Source medium		Source	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	4.8	8	183.8
Depth below grade to soil gas sample	(m)	Ls	0.50	0.50	0.50
Average vadose zone temperature	(°C)	Ts	10	10	10
Calc: Source vapor concentration	(ug/m3)	Cs	5	8	184
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%	0.000%	0.000%
Chemical:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Chemical Name		Chem	Benzene	Dichloroethylene, 1,2-cis	Trichloroethylene
CAS No.		CAS	71-43-2	156-59-2	79-01-6
Toxicity Factors					
Unit risk factor	$(ug/m^3)^{-1}$	IUR	7.80E-06	Not Available	see note
Mutagenic compound		Mut	No	No	Yes
Reference concentration	(ug/m^3)	RfC	3.00E-02	Not Available	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Pure component water solubility	(mg/L)	S	1.79E+03	6.41E+03	1.28E+03
Henry's Law Constant @ 25°C	($atm\text{-}m^3/mol$)	Hc	5.55E-03	4.08E-03	9.85E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	2.27E-01	1.67E-01	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.16E-01	8.85E-02	1.97E-01
Diffusivity in air	(cm2/s)	Dair	8.95E-02	8.84E-02	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.03E-05	1.13E-05	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Building setting		Bldg_Setting	Residential	Residential	Residential
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15	0.15	0.15
Foundation thickness	(m)	Lf	0.15	0.15	0.15
Fraction of foundation area with cracks	(-)	eta	0.002	0.002	0.002
Enclosed space floor area	(m2)	Ab	92.00	92.00	92.00
Enclosed space mixing height	(m)	Hb	4.80	4.80	4.80
Indoor air exchange rate	(1/hr)	ach	0.50	0.50	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80	220.80	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66	0.66	0.66
Vadose zone characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Stratum A (Top of soil profile):					
Stratum A SCS soil type		SCS_A	Sandy Clay	Sandy Clay	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00	3.00	3.00
Stratum A total porosity	(-)	nSA	0.295	0.295	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214	0.214	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180	2.180	2.180
Stratum B (Soil layer below Stratum A):					
Stratum B SCS soil type		SCS_B	Not Present	Not Present	Not Present
Stratum B thickness	(m)	hSB	0.00	0.00	0.00
Stratum B total porosity	(-)	nSB			
Stratum B water-filled porosity	(-)	nwSB			
Stratum B bulk density	(g/cm^3)	rhoSB			
Stratum C (Soil layer below Stratum B):					
Stratum C SCS soil type		SCS_C	Not Present	Not Present	Not Present
Stratum C thickness	(m)	hSC	0.00	0.00	0.00
Stratum C total porosity	(-)	nSC			
Stratum C water-filled porosity	(-)	nwSC			
Stratum C bulk density	(g/cm^3)	rhoSC			
Stratum containing soil gas sample					
Stratum A, B, or C		src_soil	Stratum A	Stratum A	Stratum A
Exposure Parameters:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1	1
Exposure Scenario		Scenario	Residential	Residential	Residential
Averaging time for carcinogens	(yrs)	ATc	70	70	70
Averaging time for non-carcinogens	(yrs)	ATnc	26	26	26
Exposure duration	(yrs)	ED	26	26	26
Exposure frequency	(days/yr)	EF	350	350	350
Exposure time	(hrs/24 hrs)	ET	24	24	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72	72
Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**	**Value**	**Value**
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**	**3.0E-03**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**	**Value**	**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**1.4E-02**	**2.4E-02**	**5.5E-01**
		Range	4.8E-04 - 2.4E-01	8.0E-04 - 4.0E-01	1.8E-02 - 9.2E+00
	(ppbv)	**Cia**	**4.5E-03**	**6.1E-03**	**1.0E-01**
		Range	1.5E-04 - 7.5E-02	2.0E-04 - 1.0E-01	3.4E-03 - 1.7E+00
Predicted Vapor Concentration Beneath the Foundation			**Value**	**Value**	**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**4.8E+00**	**8.0E+00**	**1.8E+02**
		Range	4.8E+00 - 4.8E+00	8.0E+00 - 8.0E+00	1.8E+02 - 1.8E+02
	(ppbv)	**Css**	**1.5E+00**	**2.0E+00**	**3.4E+01**
		Range	1.5E+00 - 1.5E+00	2.0E+00 - 2.0E+00	3.4E+01 - 3.4E+01
Diffusive Transport Upward Through Vadose Zone			**Value**	**Value**	**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	2.4E-04	2.4E-04	1.9E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB			
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC			
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	2.4E-04	2.4E-04	1.9E-04
Critical Parameters			**Value**	**Value**	**Value**
α for diffusive transport from source to building with	(-)	A_Param	1.1E-04	1.1E-04	8.5E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	5.8E+03	5.8E+03	7.6E+03
α for convective transport from subslab to buildina	(-)	C_Param	3.0E-03	3.0E-03	3.0E-03
Interpretation					
			Advection is the dominc	Advection is the domi	Advection is the dominant mechanism acros
			Diffusion through soil is tl	Diffusion through soil i:	Diffusion through soil is the overall rate limiting
Critical Parameters					
			Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach
Non-Critical Parameters					
			Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, et	Qsoil_Qb, Lf, DeffA, eta
Risk Calculations	**Units**	**Symbol**	**Value**	**Value**	**Value**
Risk-Based Target Screening Levels					
Target risk for carcinogens	(-)	Target_CR	1E-06	1E-06	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	1	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**3.60E-01**	**No tox data available**	**4.78E-01**
	(ppbv)	**Target_IA**	**1.13E-01**	**No tox data available**	**8.91E-02**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.20E+02**	**No tox data available**	**1.59E+02**
Incremental Risk Estimates					
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**4.00E-08**	**No IUR**	**1.15E-06**
		Range	1.3E-09 - 6.7E-07	-	3.8E-08 - 1.9E-05
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.000460274**	**No RfC Available**	**0.264369863**
		Range	1.5E-05 - 7.7E-03	fC Available - No RfC Ava	8.8E-03 - 4.4E+00

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

Source Characteristics:	Units	Symbol	Value
			Trichloroethylene
Source medium		Source	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	4.3
Depth below grade to soil gas sample	(m)	Ls	0.50
Average vadose zone temperature	(°C)	Ts	10
Calc: Source vapor concentration	(ug/m3)	Cs	4
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%
Chemical:	**Units**	**Symbol**	**Value**
Chemical Name		Chem	Trichloroethylene
CAS No.		CAS	79-01-6
Toxicity Factors			
Unit risk factor	$(ug/m^3)^{-1}$	IUR	see note
Mutagenic compound		Mut	Yes
Reference concentration	(ug/m^3)	RfC	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**
Pure component water solubility	(mg/L)	S	1.28E+03
Henry's Law Constant @ 25°C	($atm\text{-}m^3/mol$)	Hc	9.85E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.97E-01
Diffusivity in air	(cm2/s)	Dair	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**
Building setting		Bldg_Setting	Residential
Foundation type		Found_Type	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15
Foundation thickness	(m)	Lf	0.15
Fraction of foundation area with cracks	(-)	eta	0.002
Enclosed space floor area	(m2)	Ab	92.00
Enclosed space mixing height	(m)	Hb	4.80
Indoor air exchange rate	(1/hr)	ach	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66

Vadose zone characteristics:	Units	Symbol	Value
Stratum A (Top of soil profile):			
Stratum A SCS soil type		SCS_A	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00
Stratum A total porosity	(-)	nSA	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180
Stratum B (Soil layer below Stratum A):			
Stratum B SCS soil type		SCS_B	Not Present
Stratum B thickness	(m)	hSB	0.00
Stratum B total porosity	(-)	nSB	
Stratum B water-filled porosity	(-)	nwSB	
Stratum B bulk density	(g/cm^3)	rhoSB	
Stratum C (Soil layer below Stratum B):			
Stratum C SCS soil type		SCS_C	Not Present
Stratum C thickness	(m)	hSC	0.00
Stratum C total porosity	(-)	nSC	
Stratum C water-filled porosity	(-)	nwSC	
Stratum C bulk density	(g/cm^3)	rhoSC	
Stratum containing soil gas sample			
Stratum A, B, or C		src_soil	Stratum A

Exposure Parameters:	Units	Symbol	Value
Target risk for carcinogens	(-)	Target_CR	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1
Exposure Scenario		Scenario	Residential
Averaging time for carcinogens	(yrs)	ATc	70
Averaging time for non-carcinogens	(yrs)	ATnc	26
Exposure duration	(yrs)	ED	26
Exposure frequency	(days/yr)	EF	350
Exposure time	(hrs/24 hrs)	ET	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72

Source to Indoor Air Attenuation Factor	Units	Symbol	Value
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**1.3E-02**
		Range	4.3E-04 - 2.2E-01
	(ppbv)	**Cia**	**2.4E-03**
		Range	8.0E-05 - 4.0E-02
Predicted Vapor Concentration Beneath the Foundation			**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**4.3E+00**
		Range	4.3E+00 - 4.3E+00
	(ppbv)	**Css**	**8.0E-01**
		Range	8.0E-01 - 8.0E-01
Diffusive Transport Upward Through Vadose Zone			**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	1.9E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB	
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC	
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	1.9E-04
Critical Parameters			**Value**
α for diffusive transport from source to building with	(-)	A_Param	8.5E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	7.6E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03

Interpretation

Advection is the dominant mechanism across the foundation.
Diffusion through soil is the overall rate limiting process.

Critical Parameters

Hb, Ls, DeffT, ach

Non-Critical Parameters

Qsoil_Qb, Lf, DeffA, eta

Risk Calculations	Units	Symbol	Value
Risk-Based Target Screening Levels			
Target risk for carcinogens	(-)	Target_CR	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**4.78E-01**
	(ppbv)	**Target_IA**	**8.91E-02**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.59E+02**
Incremental Risk Estimates			
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**2.70E-08**
		Range	9.0E-10 - 4.5E-07
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.006184932**
		Range	2.1E-04 - 1.0E-01

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

Source Characteristics:	Units	Symbol	Trichloroethylene Value
Source medium		Source	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	19.6
Depth below grade to soil gas sample	(m)	Ls	0.50
Average vadose zone temperature	(°C)	Ts	10
Calc: Source vapor concentration	(ug/m3)	Cs	20
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%
Chemical:	**Units**	**Symbol**	**Value**
Chemical Name		Chem	Trichloroethylene
CAS No.		CAS	79-01-6
Toxicity Factors			
Unit risk factor	$(ug/m^3)^{-1}$	IUR	see note
Mutagenic compound		Mut	Yes
Reference concentration	(ug/m^3)	RfC	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**
Pure component water solubility	(mg/L)	S	1.28E+03
Henry's Law Constant @ 25°C	($atm\text{-}m^3/mol$)	Hc	9.85E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.97E-01
Diffusivity in air	(cm2/s)	Dair	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**
Building setting		Bldg_Setting	Residential
Foundation type		Found_Type	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15
Foundation thickness	(m)	Lf	0.15
Fraction of foundation area with cracks	(-)	eta	0.002
Enclosed space floor area	(m2)	Ab	92.00
Enclosed space mixing height	(m)	Hb	4.80
Indoor air exchange rate	(1/hr)	ach	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66

Vadose zone characteristics:	Units	Symbol	Value
Stratum A (Top of soil profile):			
Stratum A SCS soil type		SCS_A	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00
Stratum A total porosity	(-)	nSA	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180
Stratum B (Soil layer below Stratum A):			
Stratum B SCS soil type		SCS_B	Not Present
Stratum B thickness	(m)	hSB	0.00
Stratum B total porosity	(-)	nSB	
Stratum B water-filled porosity	(-)	nwSB	
Stratum B bulk density	(g/cm^3)	rhoSB	
Stratum C (Soil layer below Stratum B):			
Stratum C SCS soil type		SCS_C	Not Present
Stratum C thickness	(m)	hSC	0.00
Stratum C total porosity	(-)	nSC	
Stratum C water-filled porosity	(-)	nwSC	
Stratum C bulk density	(g/cm^3)	rhoSC	
Stratum containing soil gas sample			
Stratum A, B, or C		src_soil	Stratum A

Exposure Parameters:	Units	Symbol	Value
Target risk for carcinogens	(-)	Target_CR	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1
Exposure Scenario		Scenario	Residential
Averaging time for carcinogens	(yrs)	ATc	70
Averaging time for non-carcinogens	(yrs)	ATnc	26
Exposure duration	(yrs)	ED	26
Exposure frequency	(days/yr)	EF	350
Exposure time	(hrs/24 hrs)	ET	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72

Source to Indoor Air Attenuation Factor	Units	Symbol	Value
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**5.9E-02**
		Range	2.0E-03 - 9.8E-01
	(ppbv)	**Cia**	**1.1E-02**
		Range	3.6E-04 - 1.8E-01
Predicted Vapor Concentration Beneath the Foundation			**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**2.0E+01**
		Range	2.0E+01 - 2.0E+01
	(ppbv)	**Css**	**3.6E+00**
		Range	3.6E+00 - 3.6E+00
Diffusive Transport Upward Through Vadose Zone			**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	1.9E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB	
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC	
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	1.9E-04
Critical Parameters			**Value**
α for diffusive transport from source to building with	(-)	A_Param	8.5E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	7.6E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03

Interpretation

Advection is the dominant mechanism across the foundation.
Diffusion through soil is the overall rate limiting process.

Critical Parameters

Hb, Ls, DeffT, ach

Non-Critical Parameters

Qsoil_Qb, Lf, DeffA, eta

Risk Calculations	Units	Symbol	Value
Risk-Based Target Screening Levels			
Target risk for carcinogens	(-)	Target_CR	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**4.78E-01**
	(ppbv)	**Target_IA**	**8.91E-02**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.59E+02**
Incremental Risk Estimates			
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**1.23E-07**
		Range	4.1E-09 - 2.0E-06
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.028191781**
		Range	9.4E-04 - 4.7E-01

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

	Units	Symbol	Benzene	Dichloroethylene, 1,1-	Dichloroethylene, 1,2-ci	Tetrachloroethylene	Trichloroethane, 1,1,1-	Trichloroethylene
Source Characteristics:			**Value**	**Value**	**Value**	**Value**	**Value**	**Value**
Source medium		Source	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	239	45.7	4	1010.8	1743.4	65.6
Depth below grade to soil gas sample	(m)	Ls	0.50	0.50	0.50	0.50	0.50	0.50
Average vadose zone temperature	(°C)	Ts	10	10	10	10	10	10
Calc: Source vapor concentration	(ug/m3)	Cs	239	46	4	1011	1743	66
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%	0.000%	0.000%	0.001%	0.000%	0.000%
Chemical:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**	**Value**
Chemical Name		Chem	Benzene	Dichloroethylene, 1,1-	Dichloroethylene, 1,2-cis-	Tetrachloroethylene	Trichloroethane, 1,1,1-	Trichloroethylene
CAS No.		CAS	71-43-2	75-35-4	156-59-2	127-18-4	71-55-6	79-01-6
Toxicity Factors								
Unit risk factor	$(ug/m^3)^{-1}$	IUR	7.80E-06	Not Available	Not Available	2.60E-07	Not Available	see note
Mutagenic compound		Mut	No	No	No	No	No	Yes
Reference concentration	(ug/m^3)	RfC	3.00E-02	2.00E-01	Not Available	4.00E-02	5.00E+00	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**	**Value**
Pure component water solubility	(mg/L)	S	1.79E+03	2.42E+03	6.41E+03	2.06E+02	1.29E+03	1.28E+03
Henry's Law Constant @ 25°C	$(atm-m^3/mol)$	Hc	5.55E-03	2.61E-02	4.08E-03	1.77E-02	1.72E-02	9.85E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	2.27E-01	1.07E+00	1.67E-01	7.24E-01	7.03E-01	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.16E-01	6.34E-01	8.85E-02	3.24E-01	3.66E-01	1.97E-01
Diffusivity in air	(cm2/s)	Dair	8.95E-02	8.63E-02	8.84E-02	5.05E-02	6.48E-02	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.03E-05	1.10E-05	1.13E-05	9.46E-06	9.60E-06	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**	**Value**
Building setting		Bldg_Setting	Residential	Residential	Residential	Residential	Residential	Residential
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade	Slab-on-grade	Slab-on-grade	Slab-on-grade	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15	0.15	0.15	0.15	0.15	0.15
Foundation thickness	(m)	Lf	0.15	0.15	0.15	0.15	0.15	0.15
Fraction of foundation area with cracks	(-)	eta	0.002	0.002	0.002	0.002	0.002	0.002
Enclosed space floor area	(m2)	Ab	92.00	92.00	92.00	92.00	92.00	92.00
Enclosed space mixing height	(m)	Hb	4.80	4.80	4.80	4.80	4.80	4.80
Indoor air exchange rate	(1/hr)	ach	0.50	0.50	0.50	0.50	0.50	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80	220.80	220.80	220.80	220.80	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66	0.66	0.66	0.66	0.66	0.66
Vadose zone characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**	**Value**
Stratum A (Top of soil profile):								
Stratum A SCS soil type		SCS_A	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00	3.00	3.00	3.00	3.00	3.00
Stratum A total porosity	(-)	nSA	0.295	0.295	0.295	0.295	0.295	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214	0.214	0.214	0.214	0.214	0.214
Stratum A bulk density	(a/cm^3)	rhoSA	2.180	2.180	2.180	2.180	2.180	2.180
Stratum B (Soil layer below Stratum A):								
Stratum B SCS soil type		SCS_B	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present
Stratum B thickness	(m)	hSB	0.00	0.00	0.00	0.00	0.00	0.00
Stratum B total porosity	(-)	nSB						
Stratum B water-filled porosity	(-)	nwSB						
Stratum B bulk density	(a/cm^3)	rhoSB						
Stratum C (Soil layer below Stratum B):								
Stratum C SCS soil type		SCS_C	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present
Stratum C thickness	(m)	hSC	0.00	0.00	0.00	0.00	0.00	0.00
Stratum C total porosity	(-)	nSC						
Stratum C water-filled porosity	(-)	nwSC						
Stratum C bulk density	(a/cm^3)	rhoSC						
Stratum containing soil gas sample								
Stratum A, B, or C		src_soil	Stratum A	Stratum A	Stratum A	Stratum A	Stratum A	Stratum A
Exposure Parameters:	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1	1	1	1	1
Exposure Scenario		Scenario	Residential	Residential	Residential	Residential	Residential	Residential
Averaging time for carcinogens	(yrs)	ATc	70	70	70	70	70	70
Averaging time for non-carcinogens	(yrs)	ATnc	26	26	26	26	26	26
Exposure duration	(yrs)	ED	26	26	26	26	26	26
Exposure frequency	(days/yr)	EF	350	350	350	350	350	350
Exposure time	(hrs/24 hrs)	ET	24	24	24	24	24	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72	72	72	72	72
Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**	**Value**
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**	**3.0E-03**	**3.0E-03**	**3.0E-03**	**3.0E-03**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**	**Value**	**Value**	**Value**	**Value**	**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**7.2E-01**	**1.4E-01**	**1.2E-02**	**3.0E+00**	**5.2E+00**	**2.0E-01**
		Range	2.4E-02 - 1.2E+01	4.6E-03 - 2.3E+00	4.0E-04 - 2.0E-01	1.0E-01 - 5.1E+01	1.7E-01 - 8.7E+01	6.6E-03 -
	(ppbv)	**Cia**	**2.2E-01**	**3.5E-02**	**3.0E-03**	**4.5E-01**	**9.6E-01**	**3.7E-02**
		Range	7.5E-03 - 3.7E+00	1.2E-03 - 5.8E-01	1.0E-04 - 5.0E-02	1.5E-02 - 7.5E+00	3.2E-02 - 1.6E+01	1.2E-03 - 6.1E-01
Predicted Vapor Concentration Beneath the Foundation			**Value**	**Value**	**Value**	**Value**	**Value**	**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**2.4E+02**	**4.6E+01**	**4.0E+00**	**1.0E+03**	**1.7E+03**	**6.6E+01**
		Range	2.4E+02 - 2.4E+02	4.6E+01 - 4.6E+01	4.0E+00 - 4.0E+00	1.0E+03 - 1.0E+03	1.7E+03 - 1.7E+03	6.6E+01 - 6.6E+01
	(ppbv)	**Css**	**7.5E+01**	**1.2E+01**	**1.0E+00**	**1.5E+02**	**3.2E+02**	**1.2E+01**
		Range	7.5E+01 - 7.5E+01	1.2E+01 - 1.2E+01	1.0E+00 - 1.0E+00	1.5E+02 - 1.5E+02	3.2E+02 - 3.2E+02	1.2E+01 - 1.2E+01
Diffusive Transport Upward Through Vadose Zone			**Value**	**Value**	**Value**	**Value**	**Value**	**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	2.4E-04	2.3E-04	2.4E-04	1.4E-04	1.7E-04	1.9E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB						
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC						
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	2.4E-04	2.3E-04	2.4E-04	1.4E-04	1.7E-04	1.9E-04
Critical Parameters			**Value**	**Value**	**Value**	**Value**	**Value**	**Value**
α for diffusive transport from source to building with	(-)	A_Param	1.1E-04	1.1E-04	1.1E-04	6.2E-05	7.9E-05	8.5E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	5.8E+03	6.1E+03	5.8E+03	1.0E+04	8.1E+03	7.6E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03	3.0E-03
			5.8E+03	6.1E+03	5.8E+03	1.0E+04	7.6E+03	
Interpretation								
			Advection is the domin	Advection is the domi	Advection is the dom	Advection is the domi	Advection is the domir	Advection is the dor
			Diffusion through soil is tl	Diffusion through soil i	Diffusion through soil i	Diffusion through soil i	Diffusion through soil is	Diffusion through soi
Critical Parameters								
			Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach
Non-Critical Parameters								
			Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, et	Qsoil_Qb, Lf, DeffA, et	Qsoil_Qb, Lf, DeffA, et	Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, e
Risk Calculations	**Units**	**Symbol**	**Value**	**Value**	**Value**	**Value**	**Value**	**Value**
Risk-Based Target Screening Levels								
Target risk for carcinogens	(-)	Target_CR	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	1	1	1	1	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**3.6E-01**	**2.9E+02**	**No tox data available**	**1.0E+01**	**5.2E+03**	**4.7E-01**
	(ppbv)	**Target_IA**	**1.1E-01**	**5.2E+01**	**No tox data available**	**1.5E+00**	**9.5E+02**	**8.9E-02**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.2E+02**	**6.9E+04**	**No tox data available**	**3.6E+03**	**1.7E+06**	**1.5E+02**
Incremental Risk Estimates								
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**1.9E-06**	**No IUR**	**No IUR**	**2.8E-07**	**No IUR**	**4.1E-07**
		Range	6.6E-08 - 3.3E-05	-	-	9.4E-09 - 4.7E-06	-	1.4E-08 - 6.9E-06
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.022917808**	**0.000657329**	**No RfC Available**	**0.072694521**	**0.001003052**	**0.094356164**
		Range	7.6E-04 - 3.8E-01	2.2E-05 - 1.1E-02	Available - No RfC Av	2.4E-03 - 1.2E+00	3.3E-05 - 1.7E-02	3.1E-03 - 1.6E+00
			1.7E-04 - 8.6E-02	1.4E-05 - 7.2E-03	Available - No RfC Av	6.0E-04 - 3.0E-01	1.6E+01 - 8.2E+03	
			1.3E-04 - 6.4E-02	1.4E-05 - 7.2E-03	Available - No RfC Av	1.1E-03 - 5.3E-01	9.1E-03 - 4.6E+00	
			1.6E-04 - 8.0E-02	1.4E-05 - 7.2E-03	Available - No RfC Av	2.9E-04 - 1.4E-01	7.7E-03 - 3.8E+00	
			1.3E-04 - 6.4E-02	9.6E-06 - 4.8E-03	Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01	
			1.3E-04 - 6.4E-02	9.6E-06 - 4.8E-03	Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01	
			1.3E-04 - 6.4E-02	9.6E-06 - 4.8E-03	Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01	
			1.3E-04 - 6.4E-02	Available - No RfC Av	6.0E-04 - 3.0E-01	5.3E-02 - 2.6E+01		
			2.6E-05 - 1.3E-02	4.3E-04 - 2.2E-01				
			9.1E-05 - 4.6E-02					

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

Source Characteristics:	Units	Symbol	Trichloroethylene Value
Source medium		Source	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	1.9
Depth below grade to soil gas sample	(m)	Ls	0.50
Average vadose zone temperature	(°C)	Ts	25
Calc: Source vapor concentration	(ug/m3)	Cs	2
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%
Chemical:	**Units**	**Symbol**	**Value**
Chemical Name		Chem	Trichloroethylene
CAS No.		CAS	79-01-6
Toxicity Factors			
Unit risk factor	$(ug/m^3)^{-1}$	IUR	see note
Mutagenic compound		Mut	Yes
Reference concentration	(ug/m^3)	RfC	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**
Pure component water solubility	(mg/L)	S	1.28E+03
Henry's Law Constant @ 25°C	($atm\text{-}m^3/mol$)	Hc	9.85E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	4.03E-01
Diffusivity in air	(cm2/s)	Dair	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**
Building setting		Bldg_Setting	Residential
Foundation type		Found_Type	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15
Foundation thickness	(m)	Lf	0.15
Fraction of foundation area with cracks	(-)	eta	0.100
Enclosed space floor area	(m2)	Ab	92.00
Enclosed space mixing height	(m)	Hb	4.80
Indoor air exchange rate	(1/hr)	ach	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66

Vadose zone characteristics:	Units	Symbol	Value
Stratum A (Top of soil profile):			
Stratum A SCS soil type		SCS_A	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00
Stratum A total porosity	(-)	nSA	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180
Stratum B (Soil layer below Stratum A):			
Stratum B SCS soil type		SCS_B	Not Present
Stratum B thickness	(m)	hSB	0.00
Stratum B total porosity	(-)	nSB	
Stratum B water-filled porosity	(-)	nwSB	
Stratum B bulk density	(g/cm^3)	rhoSB	
Stratum C (Soil layer below Stratum B):			
Stratum C SCS soil type		SCS_C	Not Present
Stratum C thickness	(m)	hSC	0.00
Stratum C total porosity	(-)	nSC	
Stratum C water-filled porosity	(-)	nwSC	
Stratum C bulk density	(g/cm^3)	rhoSC	
Stratum containing soil gas sample			
Stratum A, B, or C		src_soil	Stratum A

Exposure Parameters:	Units	Symbol	Value
Target risk for carcinogens	(-)	Target_CR	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1
Exposure Scenario		Scenario	Residential
Averaging time for carcinogens	(yrs)	ATc	70
Averaging time for non-carcinogens	(yrs)	ATnc	26
Exposure duration	(yrs)	ED	26
Exposure frequency	(days/yr)	EF	350
Exposure time	(hrs/24 hrs)	ET	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72

Source to Indoor Air Attenuation Factor	Units	Symbol	Value
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**5.7E-03**
		Range	1.9E-04 - 9.5E-02
	(ppbv)	**Cia**	**1.1E-03**
		Range	3.5E-05 - 1.8E-02
Predicted Vapor Concentration Beneath the Foundation			**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**1.9E+00**
		Range	1.9E+00 - 1.9E+00
	(ppbv)	**Css**	**3.5E-01**
		Range	3.5E-01 - 3.5E-01
Diffusive Transport Upward Through Vadose Zone			**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	1.8E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB	
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC	
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	1.8E-04
Critical Parameters			**Value**
α for diffusive transport from source to building with	(-)	A_Param	8.4E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	1.5E+02
α for convective transport from subslab to building	(-)	C_Param	3.0E-03
			7.5E+04

Interpretation

Advection is the dominant mechanism across the foundation.
Diffusion through soil is the overall rate limiting process.

Critical Parameters

Hb, Ls, DeffT, ach

Non-Critical Parameters

Qsoil_Qb, Lf, DeffA, eta

Risk Calculations	Units	Symbol	Value
Risk-Based Target Screening Levels			
Target risk for carcinogens	(-)	Target_CR	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**4.78E-01**
	(ppbv)	**Target_IA**	**8.91E-02**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.59E+02**
Incremental Risk Estimates			
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**1.19E-08**
		Range	4.0E-10 - 2.0E-07
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.002732877**
		Range	9.1E-05 - 4.6E-02
			9.1E-05 - 4.6E-02

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

Source Characteristics:	Units	Symbol	Trichloroethylene Value
Source medium		Source	Sub-slab Soil Gas
Soil gas concentration	(ug/m3)	Cmedium	151.2
Depth below grade to soil gas sample	(m)	Ls	0.50
Average vadose zone temperature	(°C)	Ts	10
Calc: Source vapor concentration	(ug/m3)	Cs	151
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%
Chemical:	**Units**	**Symbol**	**Value**
Chemical Name		Chem	Trichloroethylene
CAS No.		CAS	79-01-6
Toxicity Factors			
Unit risk factor	$(ug/m^3)^{-1}$	IUR	see note
Mutagenic compound		Mut	Yes
Reference concentration	(ug/m^3)	RfC	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**
Pure component water solubility	(mg/L)	S	1.28E+03
Henry's Law Constant @ 25°C	($atm\text{-}m^3/mol$)	Hc	9.85E-03
Calc: Henry's Law Constant @ 25°C	(dimensionless)	Hr	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.97E-01
Diffusivity in air	(cm2/s)	Dair	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**
Building setting		Bldg_Setting	Residential
Foundation type		Found_Type	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15
Foundation thickness	(m)	Lf	0.15
Fraction of foundation area with cracks	(-)	eta	0.002
Enclosed space floor area	(m2)	Ab	92.00
Enclosed space mixing height	(m)	Hb	4.80
Indoor air exchange rate	(1/hr)	ach	0.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	220.80
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	0.66

Vadose zone characteristics:	Units	Symbol	Value
Stratum A (Top of soil profile):			
Stratum A SCS soil type		SCS_A	Sandy Clay
Stratum A thickness (from surface)	(m)	hSA	3.00
Stratum A total porosity	(-)	nSA	0.295
Stratum A water-filled porosity	(-)	nwSA	0.214
Stratum A bulk density	(g/cm^3)	rhoSA	2.180
Stratum B (Soil layer below Stratum A):			
Stratum B SCS soil type		SCS_B	Not Present
Stratum B thickness	(m)	hSB	0.00
Stratum B total porosity	(-)	nSB	
Stratum B water-filled porosity	(-)	nwSB	
Stratum B bulk density	(g/cm^3)	rhoSB	
Stratum C (Soil layer below Stratum B):			
Stratum C SCS soil type		SCS_C	Not Present
Stratum C thickness	(m)	hSC	0.00
Stratum C total porosity	(-)	nSC	
Stratum C water-filled porosity	(-)	nwSC	
Stratum C bulk density	(g/cm^3)	rhoSC	
Stratum containing soil gas sample			
Stratum A, B, or C		src_soil	Stratum A

Exposure Parameters:	Units	Symbol	Value
Target risk for carcinogens	(-)	Target_CR	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1
Exposure Scenario		Scenario	Residential
Averaging time for carcinogens	(yrs)	ATc	70
Averaging time for non-carcinogens	(yrs)	ATnc	26
Exposure duration	(yrs)	ED	26
Exposure frequency	(days/yr)	EF	350
Exposure time	(hrs/24 hrs)	ET	24
Mutagenic mode-of-action factor	(yrs)	MMOAF	72

Source to Indoor Air Attenuation Factor	Units	Symbol	Value
Soil gas to indoor air attenuation coefficient	**(-)**	**alpha**	**3.0E-03**
		Range	1.0E-04 - 5.0E-02
Predicted Indoor Air Concentration			**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**4.5E-01**
		Range	1.5E-02 - 7.6E+00
	(ppbv)	**Cia**	**8.4E-02**
		Range	2.8E-03 - 1.4E+00
Predicted Vapor Concentration Beneath the Foundation			**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**1.5E+02**
		Range	1.5E+02 - 1.5E+02
	(ppbv)	**Css**	**2.8E+01**
		Range	2.8E+01 - 2.8E+01
Diffusive Transport Upward Through Vadose Zone			**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	1.9E-04
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB	
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC	
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	1.9E-04
Critical Parameters			**Value**
α for diffusive transport from source to building with	(-)	A_Param	8.5E-05
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	7.6E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03

Interpretation

Advection is the dominant mechanism across the foundation.
Diffusion through soil is the overall rate limiting process.

Critical Parameters

Hb, Ls, DeffT, ach

Non-Critical Parameters

Qsoil_Qb, Lf, DeffA, eta

Risk Calculations	Units	Symbol	Value
Risk-Based Target Screening Levels			
Target risk for carcinogens	(-)	Target_CR	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**4.78E-01**
	(ppbv)	**Target_IA**	**8.91E-02**
Target soil gas concentration	**(ug/m3)**	**Target_SV**	**1.59E+02**
Incremental Risk Estimates			
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**9.48E-07**
		Range	3.2E-08 - 1.6E-05
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.217479452**
		Range	7.2E-03 - 3.6E+00

Annex 5 – Radon Report