



AT/M4993/11821

17 February 2023

Shurgard UK Ltd
Ground Floor
Egerton House
Baker Street
Weybridge
KT13 8AL

For the attention of Mr David Ross

Dear David

Re: Garman Road, Tottenham-Ground Gas Risk Assessment.

We write to report on the gas monitoring at the above site. The site is currently occupied by a warehouse/factory building, with a vegetated area along the eastern boundary. There is a small yard along the northern boundary of the site.

A Desk Study was initially undertaken by BSL (SRP/M4993/10841) issued in March 2022, which highlighted a moderate risk from ground gas due to the anticipated presence of made ground on-site in addition to Alluvium deposits underlying the made ground.

BSL completed a site investigation between the dates of 21st and 22nd March 2022 to confirm or otherwise the presence and risk of ground gas sources at the site. A Geo-Environmental Assessment report (Ref: SRP/M4993/10981) was issued in May 2022.

Site Investigation

Concrete surfacing was present across the site. This concrete was cored inside the building and was observed from ground level to between 0.14m and 0.21m bgl. Concrete was also observed in the yard and was encountered from ground level to between 0.12m and 0.15m bgl in this area.

General made ground was encountered within all the exploratory holes across the site and was observed from ground level to depths between 0.90m and 1.20m bgl. The base of the made ground was not observed in HP01 as the hole was terminated due to a possible service. The composition of the made ground was fairly consistent across the site. The majority comprised dark brown gravelly clay. The gravel generally consisted of brick, chert, concrete, pottery with occasional coal and rare slate. In WS03, made ground of light brown and grey sandy gravel with medium cobble content was encountered between 0.12m and 0.32m bgl between the concrete and clay made ground.

Two layers of natural superficial strata were encountered beneath the made ground. The first layer encountered was generally a firm clay with varying amounts of sand and gravel as minor constituents. The second layer consists of a sandy gravel of chert and siltstone. In WS02 the gravel strata was recorded as clayey.

Based on the ground conditions encountered, the gas generation potential of the made ground and natural soils is considered to be very low, and the sensitivity of the building is considered to be low.

Ground gas and ground water monitoring standpipes were installed in five boreholes and subsequently three monitoring visits have been undertaken out of three proposed as part of the current scope, in line with the recommendations of CIRIA C665. All gas monitoring was undertaken using GA 5000 infrared gas meter with integral electronic flow analyser and a Photo Ionisation Detector (PID). The Desk Study completed by Brownfield Solutions Ltd (reference SRP/M4993/10841) suggested six monitoring visits were to be carried out in accordance with CIRIA C665 guidance however monitoring may be concluded early if the dataset shows consistent data including across periods of falling pressure.

Flow measurements on each standpipe (l/hr) were taken. Measurements of the percentage volume in air (%v/v) of oxygen (O₂), carbon dioxide (CO₂) and methane (CH₄) were recorded in addition to the percentage Lower Explosive Limit (%LEL) of methane (Note: 100% LEL equates to 5% by volume), the atmospheric pressure (mb) and average temperature during the visit (°C). Total volatile organic compounds (TVOCs) were measured with a Photo Ionisation Detector (PID).

Standpipes were constructed in general accordance with the relevant guidance. A summary of the installation construction is presented in the table below:

Location and Depth	Internal Diameter Pipe	Response Zone (m bgl)	Targeted Strata	Purpose
WS01	35mm PVC	1.00 – 3.00	MADE GROUND, CLAY, and GRAVEL	Ground Gas
WS02	35mm PVC	0.75 – 2.00	MADE GROUND and GRAVEL	Ground Gas
WS03	35mm PVC	0.75 – 2.00	MADE GROUND, CLAY, and GRAVEL	Ground Gas
WS04	35mm PVC	0.60 – 3.00	MADE GROUND, CLAY, and GRAVEL	Ground Gas
WS05	35mm PVC	0.60 – 3.00	MADE GROUND, CLAY, and GRAVEL	Ground Gas

The gas monitoring visits recorded peak and steady state conditions. Peak results are those that occur on opening the valve on the borehole tap. Steady state conditions are those that occur a period of time afterwards when the initial (accumulated) gases have been purged from the borehole.

Ground Gas Results

Three ground gas monitoring visits have been carried out between the dates of 7th April and 17th May 2022. The results are summarised in the table below:

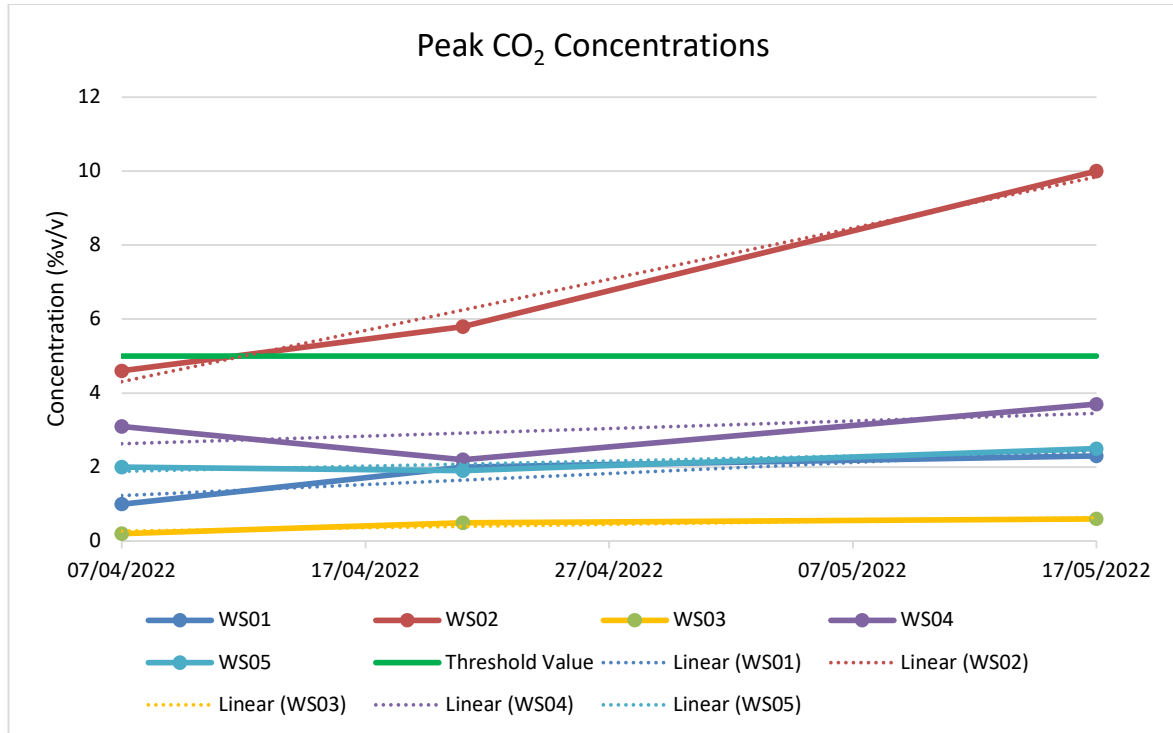
	CH ₄ (%)		CO ₂ (%)		O ₂ (%)		CO (ppm)		H ₂ S (ppm)		TVOC (ppm)		Flow (l/h)	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Peak	0.1	0.1	0.2	10.0	6.2	19.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.1
Steady	0.1	0.1	0.1	10.0	6.0	20.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1

Notes: CH₄ = Methane; CO₂ = Carbon dioxide; O₂ = Oxygen; CO = Carbon Monoxide; H₂S = Hydrogen Sulphide; TVOC (PID) = Total Volatile Organic Compounds (as measured with Photo Ionisation Detector); ppm = Parts Per Million.

Methane was recorded at 0.1%v/v or lower during the monitoring period.

Peak carbon dioxide concentrations ranged between 0.2%v/v and 10.0%v/v and exceeded 5%v/v within one location on two visits. Steady state concentrations ranged between 0.1%v/v and 10.0%v/v. Carbon dioxide concentrations were consistently highest in WS02. A graph of the peak carbon dioxide concentrations over the monitoring period is presented below, which also shows the linear average trend lines.

Figure 1: Graph of peak carbon dioxide concentrations during monitoring period 07/04/22 to 17/05/22 with linear trend lines.



Peak oxygen concentrations ranged between 6.2%v/v and 19.8%v/v, steady state conditions ranged between 6.0%v/v and 20.5%v/v. Depleted oxygen concentrations were observed in all boreholes, primarily WS02 where elevated carbon dioxide was detected.

The recorded flow rates were generally below the limit of detection (0.1l/hr), with one exception being a peak recorded flow of 2.1l/hr within WS04 on the first visit, with the steady state flow returning to the limit of detection value (0.1l/hr). During the following monitoring visits, all locations were less than the limit of detection (0.1l/hr).

The initial peak flow reading in WS04 is not considered to be representative based on the data recorded in other locations on the same date and the fact that no other positive flow rates were detected during subsequent monitoring visits. A pressure differential may have developed in the standpipe following installation which caused the brief spike in flow rate.

Driving Mechanisms

The atmospheric pressure ranged between 981mb and 1018mb over the monitoring period. The gas monitoring visits were undertaken through periods of both rising and falling atmospheric pressure. The gas monitoring data has been collected in conditions that would be representative of worst-case results.

The weather conditions during the monitoring period ranged from cool windy conditions to clear and sunny conditions. No evidence of frost was observed on the ground and none of the areas surrounding the boreholes appeared to be saturated.

The temperatures recorded during the monitoring period ranged between 11 and 19° Celsius.

No groundwater was encountered in WS02 or WS03 on the second and third visits. Where present, groundwater levels on site ranged from 1.91 mbgl and 2.64mbgl and were recorded below the response zone of the monitoring standpipes in all of the holes. The groundwater depths are summarised in the table below:

Location and Response Zone	During Site Works	07/04/22	21/04/22	17/05/22
WS01 1.00-3.00m bgl	NGW	2.09	2.25	2.30
WS02 0.75-2.00m bgl	NGW	1.97	NGW	NGW
WS03 0.75-2.00m bgl	NGW	1.91	NGW	NGW
WS04 0.60-3.00m bgl	2.60	2.10	2.26	2.31
WS05 0.60-3.00m bgl	NGW	2.21	2.34	2.37

Cells highlighted red indicate groundwater recorded above the response zone

Radon

Having assessed the site from information available to date, the site is not in an area requiring radon precaution measures.

Assessment

The development is a five storey commercial self storage unit. Approximately 30% of the building footprint is taken up with under-croft car parking space at grade, such that the upper floors fly over the parking areas.

The desk study and ground investigation have found no significant credible sources of ground gas. The only potential source of ground gas is the made ground which has been identified as gravelly clay up to 1.20m deep and as not described does not contain significant material likely to give rise to ground gases. Therefore ground gas monitoring has been undertaken as a precautionary exercise.

In order to assess the ground gas situation and the requirement for ground gas precautionary measures at the site, guidance was taken from CIRIA C665 'Assessing risks posed by hazardous ground gases to buildings' and BS8485:2015+A1:2019 'Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'.

As the proposed end-use is for a commercial development, CIRIA C665 dictates that the gas monitoring results should be assessed in accordance with the Wilson and Card methodology.

In accordance with CIRIA C665, the Wilson and Card methodology uses the concept of a Gas Screening Value (GSV) which is based on measured data using the following equation: (max gas concentration / 100) x maximum flow.

As the maximum positive flow reading of 2.1l/hr is considered an anomalous result and is not thought to be representative of the gas flow regime at the site, a positive flow of 0.1l/hr has been used to derive the GSVs. The GSV's for the site are presented below.

Gas	Calculated GSV (l/h)	Max Threshold Concentration Exceeded	Classification
Methane	0.0001	No	CS2

Gas	Calculated GSV (l/h)	Max Threshold Concentration Exceeded	Classification
Carbon Dioxide	0.01	Not typically only in one location see below	CS1

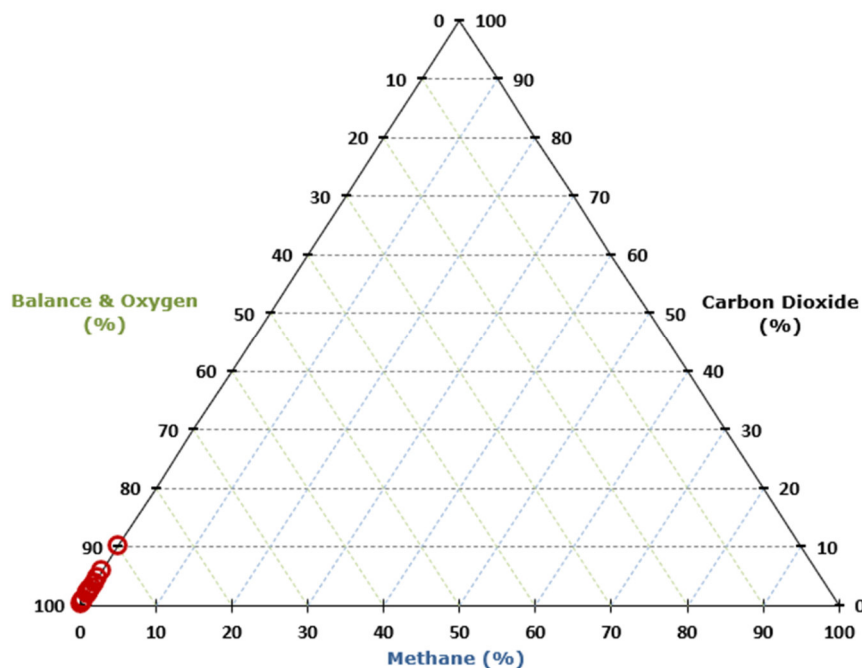
The GSV for carbon dioxide and methane place the site the site into Characteristic Situation 1 (CS1), and although carbon dioxide exceeded 5%v/v in one location, this is not considered typical.

The ground gas monitoring has been reinforced by a lines of evidence approach in order to assess the ground gas risk at the site.

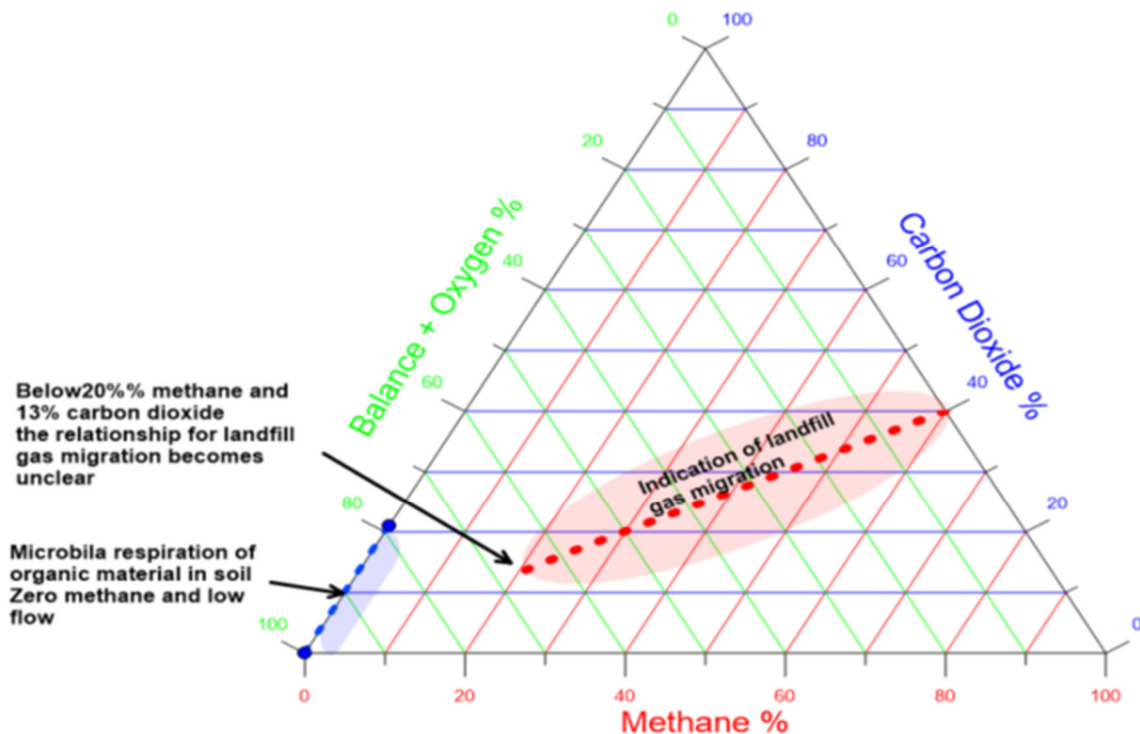
The only location where the 5% threshold value was exceeded was in WS02, which is in the location of a proposed undercroft car park, therefore the structure is not considered to be sensitive to ground gases.

Ternary Plots

In order to increase confidence in this assessment, reference has been made to the 2018 paper by Wilson et al (Ambisence and EPG Ltd) "Using ternary plots for interpretation of ground gas monitoring results". The data for ground gas concentrations has been presented on the ternary plot displayed below, which aims to interpret the likely source of the ground gas.



The dataset falls within the zone attributed to microbial respiration of organic material in soils (see below) and this hypothesis is supported by the low gas flow rates and very low methane concentrations which characterise the gas monitoring data as shown below (extract from Wilson et al 2018).



The monitoring well installation crosses the boundary of the made ground and natural strata, terminating in a clayey gravel, interpreted to be of a river deposit origin such as alluvium or river terrace deposits. As indicated in the paper by Wilson et al, natural soils of river terrace origin can have a carbon dioxide concentration up to 21%. Furthermore, the made ground deposits recorded at the site are predominantly cohesive deposits with no evidence of degradable anthropogenic material being present within the soils.

When monitoring wells are installed in the above materials, the small volumes of organic material are exposed to oxygen which can result in biological respiration or oxidation which results in the production of carbon dioxide. The above process of generating carbon dioxide, occurs very slowly and will not be emitted from the ground surface in quantities or at a rate that will pose a risk to the development. This is supported by the lack of flows recorded on-site, given that the only flow above limit of detection is thought to have been caused directly as a result of the installation of the monitoring well, and it is not characteristic of the ground gas flow regime on the site.

Oxygen concentrations may be depleted but in this scenario oxygen deficient air is not likely to be emitted quickly from the ground and it does not pose a risk.

Based on the qualitative and quantitative lines of evidence, it is appropriate to classify the site as CS1 and gas protection measures are not considered to be necessary in the development.

Pathway Introduction

The proposed development is a five-storey self-storage centre which will utilise piled foundations. Given the source of the carbon dioxide has been assessed to originate from microbial degradation and is a very low gas generation source, it is considered that piled foundations will not create an elevated risk from ground gas ingress by introducing preferential pathways.

Conclusions and Recommendations

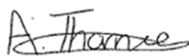
On the basis of the monitoring undertaken, the assessment and guidance, ground gas precautions are not required as the site has been characterised as Characteristic Situation 1 (CS1), and therefore the risk from ground gas is considered to be very low.

Recommendations made within this assessment should be confirmed with the Local Authority prior to any irrevocable action at the site.

We trust the above meets your requirements. If you have any queries then please do not hesitate to contact the undersigned.

Yours sincerely

For Brownfield Solutions Ltd



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Enc Ground Gas Monitoring Results
 Ground Gas Monitor Calibration Certificates
 Borehole Logs
 Exploratory Hole Location Plan



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Ground Gas Monitoring Results



CLIENT:	Date	Operator	Analysar	Weather Observations			Temp (°C)	Pressure Trend	Min Barometric Pressure (mb)	Notes
SHURGARD UK	07/04/2022	PG	GFM	Intermittent cloud	Windy	Cool	11	Falling	981	
JOB NO.	21/04/2022	PG	GFM	Sunny	No wind	Warm	14	Falling	1009	
M4993	17/05/2022	PG	GA5000	Intermittent cloud	No wind	Warm	19	Rising	1018	
SITE:										
GARMAN ROAD TOTTENHAM										

Notes: mb = milibars; CH₄ = methane; LEL = lower explosive limit = 5%v/v; CO₂ = carbon dioxide; O₂ = oxygen; CO=carbon monoxide; H₂S = hydrogen sulphide; TVOC= Total volatile organic compounds; PPM = parts per million. Where the flow is less than the limit of detection of the instrument, the detection limit is reported (Highlighted in green). Gas Screening Values (GSVs) are rounded to 3 decimal places. Calibration Records for analysers used available on request.

Date	Time	Location	Response zone (m)	Pressures (mb)		Gas flows (l/hr)		CH ₄ (%v/v)		CH ₄ (%LEL)		CO ₂ (%v/v)		O ₂ (%v/v)		Other Gases (PPM)			Depth to Water (m)	Well Base (m)	Gas Screening Value (CH ₄) (l/hr)	Gas Screening Value (CO ₂) (l/hr)	Notes
				Atmospheric Pressure	Well Pressure	Initial	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	CO	H ₂ S	TVOC (PID)					
				Summary Statistics																			
Max. values:				1009	0.2	2.1	0.1	0.1	0.1	2.0	2.0	10.0	10.0	20.9	20.5	0.0	0.0	0.0	2.4	21.6	0.000	0.010	
Min. values:				982	-0.1	0.1	0.1	0.1	0.1	2.0	2.0	0.1	0.1	6.2	6.0	0.0	0.0	0.0	1.9	2.0	0.000	0.000	
				Worst-case GSVs based on maximum recorded steady flow and maximum individual peak concentrations:																		0.000	
07/04/2022	AM	Ambient	X.00 - X.00	982				0.1		2.0		0.1		19.7		0.0	0.0	0.0					
		WS03	0.75-2.00	982.00	0.0	0.1	0.1	0.1	0.1	2.0	2.0	0.2	0.1	19.4	19.7	0.0	0.0	0.0	1.91	2.03	0.000	0.000	
		WS02	0.75-2.00	982.00	0.0	0.1	0.1	0.1	0.1	2.0	2.0	4.6	4.6	13.9	13.2	0.0	0.0	0.0	1.97	2.05	0.000	0.005	
		WS01	1.00-3.00	982.00	0.0	0.1	0.1	0.1	0.1	2.0	2.0	1.0	1.1	18.2	18.5	0.0	0.0	0.0	2.09	2.61	0.000	0.001	
		WS04	0.60-3.00	982.00	0.0	2.1	0.1	0.1	0.1	2.0	2.0	3.1	3.3	16.9	17.0	0.0	0.0	0.0	2.10	2.57	0.000	0.003	
		WS05	0.60-3.00	982.00	0.0	0.1	0.1	0.1	0.1	2.0	2.0	2.0	0.2	17.9	19.4	0.0	0.0	0.0	2.21	2.71	0.000	0.002	
07/04/2022	AM	Ambient	X.00 - X.00	981				0.1		2.0		0.1		19.7		0.0	0.0	0.0					
21/04/2022	AM	Ambient	X.00 - X.00	1009		0.1		0.1		2.0		0.1		19.4		0.0	0.0	0.0					
		WS03	0.75-2.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	0.5	0.2	19.3	19.4	0.0	0.0	0.0	NGW	2.08	0.000	0.001	
		WS02	0.75-2.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	5.8	5.8	9.7	9.7	0.0	0.0	0.0	NGW	2.05	0.000	0.006	
		WS01	1.00-3.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	2.0	0.9	17.8	18.9	0.0	0.0	0.0	2.25	2.53	0.000	0.002	
		WS04	0.60-3.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	2.2	1.8	18.0	18.4	0.0	0.0	0.0	2.26	2.60	0.000	0.002	
		WS05	0.60-3.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	1.9	1.9	18.6	18.7	0.0	0.0	0.0	2.34	2.65	0.000	0.002	
21/04/2022	AM	Ambient	X.00 - X.00	1009		0.1		0.1		2.0		0.1		19.4		0.0	0.0	0.0					
17/05/2022	AM	Ambient	X.00 - X.00	1009		0.1		0.1		2.0		0.1		20.9		NA	0.0	0.0					
		WS03	0.75-2.00		0.05	0.1	0.1	0.1	0.1	2.0	2.0	0.6	0.3	19.8	20.5	NA	0.0	0.0	NGW	2.07	0.000	0.001	
		WS02	0.75-2.00		-0.10	0.1	0.1	0.1	0.1	2.0	2.0	10.0	10.0	6.2	6.0	NA	0.0	0.0	NGW	2.04	0.000	0.010	
		WS01	1.00-3.00		0.05	0.1	0.1	0.1	0.1	2.0	2.0	2.3	2.3	17.9	17.9	NA	0.0	0.0	2.30	2.63	0.000	0.002	
		WS04	0.60-3.00		0.19	0.1	0.1	0.1	0.1	2.0	2.0	3.7	4.0	17.4	17.1	NA	0.0	0.0	2.31	21.58	0.000	0.004	
		WS05	0.60-3.00		0.09	0.1	0.1	0.1	0.1	2.0	2.0	2.5	2.6	18.5	18.3	NA	0.0	0.0	2.37	2.65	0.000	0.003	
17/05/2022	AM	Ambient	X.00 - X.00	1009		0.1		0.1		2.0		0.1		20.9		NA	0.0	0.0					

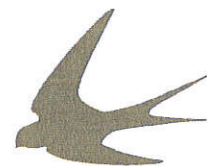
TEST DATE AND CONDITIONS	
Date	25/3/21
Atmospheric Pressure	1004 mB
Ambient Temp	22.6 °C
Enviroics Serial No.	N/A

GAS DATA LTD

Pegasus House
Seven Stars Estate
Wheler Rd.
Coventry
CV3 4LB

Tel: 024 76 303311

Fax: 024 76 307711



8524

GFM436-1 OUTWARD INSPECTION & QUALITY CHECK SHEET

INSTRUMENT DETAILS				
SO Number	Instrument Banner	Instrument Serial Number + SW Version	Job Number(s)	
327853	GFM 436	13233 / 27 - 1P	20589	20721

Calibration Technician *P. D.*

DATE 24-3-21

Inspection Technician *A. D.*

DATE 25/3/21

INSTRUMENT CHECKS		Pass (P), Fail (F) or not applicable(NA)	INSTRUMENT PACKING LIST		Tick if included
Function Tests	Dust Caps Fitted	P	Instrument		✓
	Keyboard Test (All keys)	P	Leather Case		✓
	Backlight Test	P	Instrument Strap		✓
	Clock Set / Running	P	AC Battery Charger (UK)		✓
	Comms Test	P	AC Battery Charger (EURO)		X
	Pump Flow Test (In & Out)	P	AC Battery Charger (US)		X
	Overall Leak Test (30mb)	N/A	AC Battery Charger (AUS)		X
	Battery Charge Test	P	Gas Sample Pipe		✓
	Service Date set to?	20/7/21	Hard Carry Case		✓
Channel Tests	Data Logging Enabled?	P	Spares Pot		X
	Verify CH4/LEL/Hexane/PID	P	Allen Key		X
	Verify CO2	P	Flow Sample Pipe		✓
	Verify O2	P	Temperature Probe		X
	Verify H2S	P	Vane Anemometer		X
	Verify CO	P	USB Cable		✓
	Verify LEL	P	USB Memory Stick		✓
	Verify 1st Option gas	N/A	SM V5 Software	Ver 6.05	✓
	Verify atmospheric pressure	P	Internal Filter Pack	Qty	X
	Verify differential pressure	P	External Filter Pack	Qty	X
	Verify flow	P	Field Guide		X
	Verify temperature probe input	P	Extra Items:		
	Verify vane anemometer input	P			
DataBase Checks	Jobcard(s) completed and signed	P			
	Jobcard(s) booked off database	P			
	Calibration certificate completed	P			
	Complete & print QI record	N/A			
Label Checks	No. of Calibration label fitted	10485	Comments		
	MCERTS label not displayed	P			
	Warranty label fitted	P			
H2S Range	H2S Range from SO	50000 ppm			
	H2S Range from cal cert	50000 ppm			
	Over-range value correct?	P			

CERTIFICATION OF CALIBRATION



Date Of Calibration: 24-Sep-2021

Certificate Number: G502031_1/28922

Issued by: QED Environmental Systems Ltd.

Customer: Brownfield Solutions Ltd

William Smith House 173-183 Witton Street Northwich
Cheshire CW9 5LP UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G502031

UKAS Accredited results:

Results after adjustment :

Methane (CH ₄)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	5.0	0.072
14.9	14.9	0.13
59.7	59.5	0.42

Carbon Dioxide (CO ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.8	0.074
15.1	14.8	0.13
40.3	40.3	0.29

Oxygen (O ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
21.1	21.2	0.25

The inwards assessment was carried out 16-Sep-2021.

The maximum adjustment was less than the specification limit.

Inwards assessment data is available if requested.

All concentrations are molar.

CH₄, CO₂ readings recorded at : 32.0 °C ± 2.5 °C

O₂ readings recorded at : 22.1 °C ± 2.5 °C

Barometric Pressure : 1004 mbar ± 4 mbar

Method of Test : The analyser is calibrated in a temperature controlled chamber using a series of reference gases, in compliance with procedure LP004.

Instrument has passed calibration as the measurement result is within the specification limit. The specification limit takes into account the measurement uncertainty.

The results relate only to the item calibrated

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:112 IGC Instance:112

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www.qedenv.com +44 (0) 333 800 0088 sales@qedenv.co.uk

QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

CERTIFICATION OF CALIBRATION



Date Of Calibration: 24-Sep-2021

Certificate Number: G502031_1/28922

Issued by: QED Environmental Systems Ltd.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Calibrations marked 'Non-UKAS Accredited results' on this certificate have been included for completeness.

Non-UKAS accredited results after adjustment:

Barometer (mbar)	
Reference	Instrument Reading
1004	1005

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
H ₂ S	259	259

Internal Flow	
Applied (l/hr)	Instrument Reading (l/hr)
5.00	5.10
10.00	10.30

Date of Issue : 28-Sep-2021

Approved by Signatory

Laura McBride

Laboratory Inspection

End of Certificate

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:112 IGC Instance:112

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QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

Instrument Service Report

<u>Unit Type:</u> GA5000	<u>Part Number:</u> GA5K00C0-301	<u>Date:</u> 28-Sep-2021	<u>Next Service Due:</u> 05-Jul-2021	<u>Customer Name:</u> Brownfield Solutions Ltd
<u>Serial Number:</u> G502031				
Actions/Investigation Description		Result	Comments	
Serial Number Check		Yes		
Battery Requires Replacing		No		
Internal Flow Calibrated		Yes	Internal flow calibrated – please reference calibration certificate	
Full Automatic Calibration		Pass		
Serial Comms Test (USB)		Pass		
Service history of instrument reviewed		Yes		
Inwards gas check data reviewed		Yes		
Instrument turns on		Pass		
Backlight operates correctly		Yes		
External visual inspection performed		Pass		
Internal visual inspection performed		Pass		
All screws tightened to correct torque		Yes		
All connectors are secure		Pass		
Check diagnostic channels		Pass		
Case compression test		Pass		
Impact and stability test		Pass		
Pressure transducer test(s) as per user operation		Pass		

Instrument Service Report

<u>Unit Type:</u> GA5000	<u>Part Number:</u>	<u>Date:</u>	<u>Next Service Due:</u>	<u>Customer Name:</u>
<u>Serial Number:</u> G502031	GA5K00C0-301	28-Sep-2021	05-Jul-2021	Brownfield Solutions Ltd
Actions/Investigation Description	Result	Comments		
Final visual inspection on instrument	Pass			
Case assembly closed and screws tightened to correct torque	Yes			
PTFE filters replaced	Yes			
Pump flow greater than 550 ml/min	Pass			
Automated instrument pressure system test (leak test)	Pass			
Pump vacuum greater than -400 mb and flow fails	Pass			
GPS function test	Pass			
Temperature probe tested	Pass			
Anemometer tested	Pass			
Chemical gas sensors calibrated – refer to Calibration Certificate	Retest Passed			
Check main PCB and sensor PCB have the latest software	Yes			
Transducers calibrated	Pass			
As Received Chemical Cell Gas Assessment Performed (CAL16)	Yes			
As Received Gas Assessment Performed (CAL01 or CAL02)	Yes			
Chemical sensor(s) replacement over 2yrs UK and 21mths overseas.	Yes	H2S sensor replaced		
O2 sensor replacement over 3yrs UK, 33mths overseas	NA			

Instrument Service Report

Unit Type: GA5000	Part Number:	Date:	Next Service Due:	Customer Name:
Serial Number: G502031	GA5K00C0-301	28-Sep-2021	05-Jul-2021	Brownfield Solutions Ltd

Customer Comments

Returned for full service and calibration

Accessory Test	Result	Comments
Charger	Pass	Charger output is in spec.

General Comments/Feedback

Thank you for returning your gas analyser to the QED Service Centre for full service and calibration.

We are pleased to inform you that the analyser was received and fully assessed by one of our experienced Service Engineers and no significant faults or issues were observed during the assessment.

Our extensive service was carried out, and any necessary components replaced.

The H2S electrochemical sensor has been replaced due it being over 2 years old in accordance with the manufacturer's recommendations, and also as a proactive measure based on our experience of the typical lifetime of this type of sensor.

We have replaced the Differential Pressure Transducer due to a fault.

The analyser has successfully passed all of our rigorous testing and quality checks and has been calibrated using our bespoke, state of the art calibration facility.

For further information about how to get the best use from your instrument please visit our YouTube channel <http://www.youtube.com/GeotechTV> and on our Website <https://qedenv.com>

If you require any further assistance with your instrument please email our Technical Support Team at technical@qedenv.co.uk or call us on +44 (0) 333 800 0088 (Monday to Thursday 08.30 - 17.00 & Friday 08.30 - 15.30) UK time zone.

Service Details: Service Scheme	☒	Service Engineer:	Calibration Engineer:	Approved By:	Signature:
Standard Service	☐	David Edwards	Suk Balrey	<i>Laura McBride</i>	<i>AM.</i>



No.	
HP01	
Sheet 1 of 1	
Hole Type	
BH	
Scale	
1:50	
Prepared	Checked
P	JW

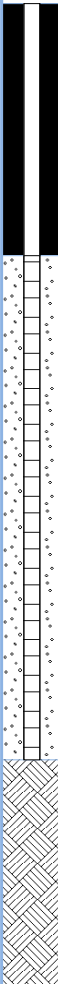
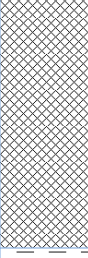
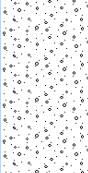
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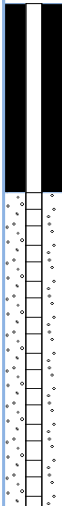
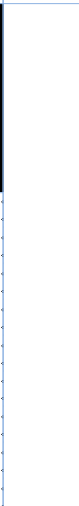
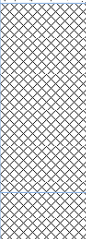
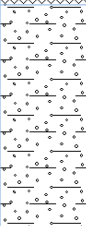
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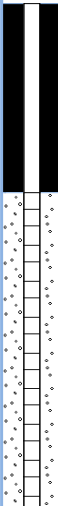
DATES: 21/03/22

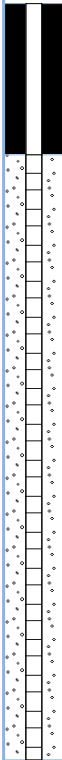
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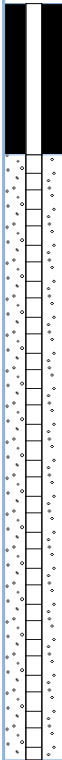
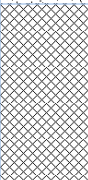
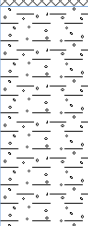
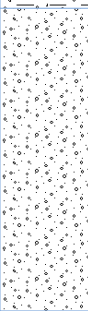
ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD						Borehole Log		Window Sampler No.		
PROJECT NO: M4993						CO-ORDS:		WS01		
								Sheet 1 of 1		
								Hole Type		
PROJECT NAME: GARMAN ROAD, TOTTENHAM						LEVEL:		WS		
								Scale		
								1:30		
CLIENT: SHURGARD UK						DATES: 21/03/22		Logged	Checked	
								SRP	JW	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.21			MADE GROUND: CONCRETE.		
		0.40	ES PID	0.0PPM				MADE GROUND: Firm to stiff dark brown slightly sandy gravelly clay. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse of brick, limestone and chert with occasional pottery and slate.		
		1.00	ES PID	0.0PPM			Occasional coal gravel between 1.10m and 1.20m bgl.			
		1.20	SPT	N=4 (1,1/1,1,1,1)	1.20			Firm brown slightly sandy CLAY. Sand is fine to coarse.		
		1.50	ES PID	0.0PPM						
		2.00	SPT	N=34 (3,4/6,8,10,10)	2.00			Brown slightly clayey sandy GRAVEL. Sand is fine to coarse. Gravel is sub-rounded to rounded fine to medium of chert and siltstone.		
		2.30			2.30			Brown sandy GRAVEL. Sand is medium to coarse. Gravel is sub-angular to rounded fine to coarse of chert.		
		2.60	ES PID	0.0PPM						
		3.00	SPT	N=41 (8,10/11,11,11,8)			Collapse from 3.60m bgl up to 3.00m bgl.			
		3.50	ES PID	0.0PPM			Black slightly clayey gravel with slight hydrocarbon odour between 3.50m and 3.60m bgl.			
		3.60	SPT	N≥50 (25 for 120mm/50 for 165mm)						
					3.90		End of Borehole at 3.90m			
Remarks		1. Location scanned and cleared with CAT and Genny. 2. Hand-dug inspection pit excavated to 1.20m bgl. 3. No groundwater encountered. 4. Borehole installed; GL to 1.00m bgl plain, 1.00m to 3.00m bgl slotted.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane		

 BROWNFIELD SOLUTIONS LTD						Borehole Log		Window Sampler No.		
								WS02		
								Sheet 1 of 1		
PROJECT NO: M4993						CO-ORDS:		Hole Type		
								WS		
PROJECT NAME: GARMAN ROAD, TOTTENHAM						LEVEL:		Scale		
								1:30		
CLIENT: SHURGARD UK						DATES: 21/03/22 - 22/03/22		Logged	Checked	
								SRP	JW	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.15			MADE GROUND: CONCRETE.		
		0.30	ES PID	0.0PPM				MADE GROUND: Firm dark brown gravelly clay. Gravel is angular to sub-angular fine to coarse of concrete, brick, chert and siltstone.		
		1.00	ES PID	0.0PPM	0.90				MADE GROUND: Firm brown gravelly clay. Gravel is sub-angular fine to coarse of brick and chert with rare pottery.	1.0
		1.20	SPT	N=16 (1,1/4,4,4,4)	1.10		Orange and brown clayey GRAVEL. Gravel is sub-angular fine to coarse of chert.			
		1.60	ES PID	0.0PPM						
		2.00	SPT	N≥50 (6,9/50 for 250mm)	2.00			End of Borehole at 2.00m	2.0	
									3.0	
									4.0	
									5.0	
									6.0	
Remarks		1. Location scanned and cleared with CAT and Genny. 2. Hand-dug inspection pit excavated to 1.20m bgl. 3. No groundwater encountered. 4. Borehole installed; GL to 0.75m bgl plain, 0.75m to 2.00m bgl slotted.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane		

BROWNFIELD SOLUTIONS LTD						Borehole Log		Window Sampler No.		
								WS03		
PROJECT NO: M4993						CO-ORDS:		Sheet 1 of 1		
PROJECT NAME: GARMAN ROAD, TOTTENHAM						LEVEL:		Hole Type		
								WS		
CLIENT: SHURGARD UK						DATES: 21/03/22 - 22/03/22		Scale		
								1:30		
								Logged	Checked	
								SRP	JW	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.20	ES PID	0.0PPM	0.12 0.32			MADE GROUND: CONCRETE.		
								MADE GROUND: Light brown and grey sandy gravel with medium cobble content. Gravel is angular to sub-angular fine to coarse of brick, concrete, pottery and chert. Cobble are angular of brick and concrete.		
								MADE GROUND: Firm dark brown gravelly clay. Gravel is sub-angular fine to coarse of brick and chert.		
		0.80	ES PID	0.0PPM	0.95			Firm brown CLAY.	1.0	
		1.20	SPT	N=4 (0,0/1,1,1,1)						
		1.30	ES PID	0.0PPM						
					1.70					
		1.90	ES PID	0.0PPM	2.00			Brown clayey GRAVEL. Gravel is sub-rounded fine to coarse of chert.	2.0	
		2.00	SPT	N≥50 (5,7/50 for 290mm)				End of Borehole at 2.00m		
Remarks								ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane		
1. Location scanned and cleared with CAT and Genny. 2. Hand-dug inspection pit excavated to 1.20m bgl. 3. No groundwater encountered. 4. Borehole installed; GL to 0.75m bgl plain, 0.75m to 2.00m bgl slotted.										

 BROWNFIELD SOLUTIONS LTD						Borehole Log		Window Sampler No.			
								WS04			
								Sheet 1 of 1			
PROJECT NO: M4993						CO-ORDS:		Hole Type			
PROJECT NAME: GARMAN ROAD, TOTTENHAM						LEVEL:		WS			
								Scale			
								1:30			
CLIENT: SHURGARD UK						DATES: 22/03/22		Logged	Checked		
								SRP	JW		
Well 	Water Strikes 	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description			
		Depth (m)	Type	Results							
									MADE GROUND: CONCRETE.		
									MADE GROUND: Firm dark brown gravelly clay. Gravel is sub-angular fine to coarse of brick, pottery and chert.		
		0.60	ES PID	0.0PPM							1.0
		1.20	SPT	N=7 (1,2/2,2,1,2)		1.10			Firm brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is sub-angular fine to medium of chert.		
		1.60	ES PID	0.0PPM		1.70					
2.00	SPT	N=36 (5,7/8,9,9,10)					Orange and brown GRAVEL. Gravel is sub-rounded fine to coarse of chert.		2.0		
							Slow seepage of groundwater below 2.60m bgl.				
2.80	ES PID	0.0PPM									
3.00	SPT	N≥50 (8,11/50 for 215mm)		3.00			End of Borehole at 3.00m		3.0		
											4.0
											5.0
											6.0
Remarks		1. Location scanned and cleared with CAT and Genny. 2. Hand-dug inspection pit excavated to 1.20m bgl. 3. Groundwater encountered at 2.60m bgl. 4. Borehole installed; GL to 1.00m bgl plain, 1.00m to 3.00m bgl slotted.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane			

BROWNFIELD SOLUTIONS LTD						Borehole Log		Window Sampler No.		
								WS05		
PROJECT NO: M4993						CO-ORDS:		Sheet 1 of 1		
PROJECT NAME: GARMAN ROAD, TOTTENHAM						LEVEL:		Hole Type		
								WS		
CLIENT: SHURGARD UK						DATES: 22/03/22		Scale		
								1:30		
								Logged	Checked	
								SRP		
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.18			MADE GROUND: CONCRETE.		
		0.40	ES PID	0.0PPM				MADE GROUND: Firm dark brown gravelly clay. Gravel is angular fine to coarse of chert, siltstone, brick and concrete with occasional pottery.		
					0.90			Firm brown slightly gravelly CLAY. Gravel is sub-angular fine to coarse of chert.	1.0	
		1.20	SPT	N=5 (1,1/1,1,1,2)						
		1.30	ES PID	0.0PPM						
					1.80			Brown sandy GRAVEL. Sand is medium to coarse. Gravel is sub-rounded fine to medium of chert and siltstone.	2.0	
		2.00	SPT	N=25 (7,7/5,5,6,9)						
		2.90	ES PID	0.0PPM						
		3.00	SPT	N≥50 (7,8/50 for 280mm)	3.00			End of Borehole at 3.00m	3.0	
									4.0	
									5.0	
									6.0	
Remarks		1. Location scanned and cleared with CAT and Genny. 2. Hand-dug inspection pit excavated to 1.20m bgl. 3. No groundwater encountered. 4. Borehole installed; GL to 0.60m bgl plain, 0.60m to 3.00m bgl slotted.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane		



KEY

- APPROXIMATE SITE BOUNDARY
- WINDOW SAMPLE BOREHOLE
WSXX
- HAND EXCAVATED TRIAL PIT
HP01
- BOREHOLE INSTALLATION
- BUILDING OUTLINE
- OFFICE AND SHOWROOM
OUTLINE

REV	DATE	DESCRIPTION	BY	CKD



CLIENT
SHURGARD UK

PROJECT TITLE
GARMAN ROAD, TOTTENHAM

DRAWING TITLE
EXPLORATORY HOLE LOCATION PLAN

DRAWING No. M4993/04	REVISION -	SCALE NTS	DATE 23/03/22
DRAWN BY SRP		CHECKED BY JW	