

Bimal Barchha,
Viva Property Group Limited,
19 York Road,
Northampton,
NN1 QG

31st January 2024

Our Ref: 5445 24 01 26 Ltr Rpt 08 Rev A TI BB

Dear Bimal,

SITE: 81/81A Whinbush Road, Hitchin, SG5 1PZ
SERVICE: Ground Gas Risk Assessment and Groundwater Monitoring Addendum Letter Report

Introduction

The work covered in this report was undertaken on behalf of Viva Property Group Limited, in accordance with Sevenoaks Environmental Consultancy Ltd's (SEC) proposal dated July 2023 (Ref: 5445 23 07 07 Ltr 01 FPA 01 Rev B KW TSA). This addendum provides comment on the environmental ground gas and groundwater monitoring carried out as part of the previous site investigation and should be read in conjunction with the Geo-Environmental Site Investigation Report (Ref: 5445 23 08 04 Rpt 01 Rev A BD BB) dated August 2023 and Supplementary Geo-Environmental Site Investigation Report (Ref: 5551 24 01 05 Ltr Rpt 07 Rev A TI BM) dated January 2024, which were both produced for the site by SEC Ltd.

The site boundary formed an approximately square shaped plot accessible from Whinbush Road to the west and was situated in a semi-residential semi-commercial setting with residential housing to the North, East and South as well as an active MOT center to the south of the site. At the time of writing, the site comprised an unoccupied residential property in the northwest corner and a disused former vehicle repair garage which occupied the majority of the site area. Associated with the vehicle repair garage on site was a single-story building used as an office and reception along the northern boundary, a forecourt yard area in the center of the site laid to asphalt hard standing and a garage building used for car repairs and storage along the southern boundary. The ground level across the site and locally to the site was noted to be generally flat. The residential property was accessible from Whinbush Road to the west via a small courtyard front garden. The forecourt provided access to the garage, office, and reception buildings (see Appendix A Site Location Plan and Appendix B Existing Layout Plan).

The proposed redevelopment for the site comprises the demolition of the existing garage buildings (excluding the existing residential house which is to be retained) to make way for the construction of a three-story block of flats containing 1no. two-bedroom flat and 7no. one-bedroom flats with associated parking and areas of soft landscaping / gardens. An extension to the existing residential property is also proposed (see Appendix C –

Proposed Development Plan).

As part of the Geo-Environmental Site Investigation referred to above, SEC were instructed to carry out 6 no. environmental ground gas and groundwater monitoring visits. Details of the standpipes installed, and their response zone backfill / materials have been provided in the relevant attached Exploratory Hole Records. Also see Appendix D - Exploratory Hole Location Plan.

Gas Monitoring Results

Based on the rounds of monitoring conducted, concentrations of carbon dioxide were recorded up to 0.6% (WS02) and oxygen was recorded to be depleted slightly down to 12.1% (WS05). Methane and carbon monoxide concentrations were not recorded to be elevated above 0% and 0.0ppm respectively during all monitoring visits. VOCs concentrations were, however, recorded up to 288.8ppm (WS01) on the first monitoring visit only and subsequent results indicated lower VOCs up to 3.6ppm (WS05). Flow rates were negligible and did not exceed 0.0l/hr (see Appendix F Environmental Monitoring data). It is noted that the rounds of monitoring included results recorded during two periods of low atmospheric pressure.

Groundwater Monitoring Results

Based on the rounds of groundwater monitoring conducted groundwater levels were identified between 1.25m bgl (WS05) and 3.95m bgl (WS02). Groundwater samples were recovered from all 3 monitoring wells and were analysed for potential contaminants of concern including ammonia, TPH and VOCs (see Appendix G Chemical Test Reports).

To help establish the environmental setting with respect to the sensitivity of the groundwater, the geology beneath the site is noted to comprise superficial material consisting of Glaciofluvial Deposits (sand and gravel with silt or clay lenses locally), Mid Pleistocene (Sand and Gravel) or Lowestoft Formation (Diamicton) (chalky till with sands, gravels and clay) which are classified as a Secondary Undifferentiated Aquifer over solid geology of West Melbury Marly Chalk Formation which is classified as a Principal Aquifer. No groundwater abstraction boreholes were identified within 1km of the site.

It is also noted that the ground conditions on site consisted of gravelly Clay material proven up to 4.45m bgl which is consistent with the superficial deposits overlying the Chalk at depth. The Chalk bedrock was unproven by the previous boreholes on site, and it is noted that BGS Boreholes (ref; TL12NE50) to the south west of the site did not encounter the Chalk by 10m bgl.

In order to provide an initial screen of the chemical results for the groundwater samples analysed, for indicative purposes the groundwater analysis results have been compared against the available published Drinking Water Standards 2018. However, it is noted that given the environmental setting discussed above these guidance values are likely to be overly conservative.

Concentrations of ammonia were not recorded to be elevated within WS01 and WS05 however a slightly elevated of 942ug/l was identified in WS02 which exceeded the UK Drinking Water Standard of 500ug/l. Concentrations of TPH were recorded to be slightly elevated within all 3 monitoring boreholes up to between 14ug/l (WS05) and 36 (WS02) which exceeded the Drinking Water Standard of 10ug/l. Concentrations of VOCs in WS05 (adjacent to the below ground fuel storage tank) were not elevated above the laboratory detection limits.

The groundwater sample recovered from WS01 was also analysed for zinc given that the near surface Made Ground and natural soils at this location exhibited elevated concentrations of zinc. The concentration of zinc

recorded in the groundwater was 31ug/l. It is noted that there is no maximum permitted concentration provided by the Drinking Water Standards however an EQS Freshwater value ranges between 8-500ug/l and as such the zinc within the groundwater is not considered to be unacceptably elevated.

Discussion and Recommendations

6 no. rounds of environmental ground gas monitoring were carried out between 1st August 2023 and 29th January 2024 which included monitoring during 2 no. periods of low/falling atmospheric pressure to help inform a preliminary ground gas risk assessment given consideration of the potential on site sources of ground gas that have been identified which include the following:

- Made Ground across the site associated with previous phases of development since 1898, identified up to between 0.20m bgl (WS03) and 1.20m bgl (HP01) and typically comprising gravelly Clay, sandy Gravel and gravelly Sand with very slightly elevated concentrations of VOCs up to 3.4ppm (WS05 at 0.05m bgl) and containing fragments of tarmac (WS03 between 0.05 and 0.20m bgl) and clinker (within HP01 between 0.10 – 1.20m bgl) and concentrations of metals including zinc up to 1,200mg/kg (WS01 at 0.2m bgl), lead up to 389mg/kg and mercury up to 26.9mg/kg (both within HP103 at 0.15m bgl), PAHs including benzo(a)pyrene (8.80mg/kg) and dibenz(a,h)anthracene (0.085mg/kg) within HP103 at 0.15) and TPH up to 6,942mg/kg (with HP103 at 0.25m bgl);
- Former site uses including historical use as a builder's yard, lock up garages in the 1980s / early 1990s and the more recent use until early 2023 as a car servicing / repairs garage with potential contaminative features including vehicle repair bays, storage of engine parts, storage of oil and fuel drums in the southwest corner of the site with evidence of leaked / spilt hydrocarbons given oil staining to the hardstanding in this area of the site;
- A below ground fuel storage tank located towards the western corner of the site;

Off-site sources of potential contamination identified included:

- Numerous vehicle repair garages the closest of which was ~7m south of the site;
- 1 No. Gas Works ~80m north-west of the site since 1881;
- 1 No. Electrical Power Station ~220m south-west of the site since 1923;
- 2 No. Depots ~140m and ~160m north of the site since 1964; and
- 1 No. Smithy ~70m north of the site since 1898.

Based upon the findings to date some impact to the groundwater has been identified associated with ammonia and TPH. The ammonia may relate to sewage from leaking foul pipes beneath the site or adjacent to the site and although the maximum concentration recorded exceeded current UK Drinking Water Standards this is not considered to pose an unacceptable risk which would require either more detailed further risk assessment or remedial action. There are no groundwater abstractions for potable supplies within 1km of the site and the clayey superficial deposits (identified to at least 10m depth locally to the site) offer the underlying Chalk Aquifer some protection. Furthermore the new development will result in the replacement of the existing drainage system on site which will help mitigate any further ongoing leaks that may have been occurring previously. It is noted however, that groundworkers involved in the preparatory groundwork may come into contact with groundwater (given that it was recorded to be 1.25m bgl in WS05) and as such standard health and safety and hygiene measures would be necessary to mitigate human health risks to workers.

In relation to the concentrations of TPH identified within the groundwater, they exceed the current UK Drinking

Water Standard of 10ug/l and are indicative of some impact associated with the previous site use having migrated downwards to the groundwater, but the concentrations are not suggestive of a serious hydrocarbon groundwater contamination issue at the site. Risks are likely to be low given that there are no nearby potable groundwater abstractions, that the concentrations recorded are only slightly elevated above the Drinking Water guidance value and no evidence of free product has been identified. The Chalk Aquifer at depth beneath the superficial deposits is also afforded some protection by the Clayey superficial material which adjacent to the south of the site was proven to be at least 10m bgl. Furthermore, the proposed end use for the site will result in the removal of the hydrocarbon sources associated with the previous site use (including particularly the below ground fuel storage tank). It is considered that the relatively low-level hydrocarbon impact identified within the groundwater on site will naturally attenuate.

The results of the environmental ground gas monitoring indicate that a ground gas screening value of 0.0l/hr is applicable to the site associated with the concentrations of methane and carbon dioxide recorded. This corresponds with Characteristic Situation 1 of the current CIRIA C665 guidance and therefore suggests that the ground gas concentrations recorded pose a low risk and that no special ground gas protection measures are required to protect the proposed development from potential ground gas ingress. However, it is noted that VOC concentrations were initially recorded up to 288.8ppm within WS01 (and 68.4ppm within WS05) and that a number of factors require consideration given their potential for residual risk. These factors include that ground gas concentrations / flow rates can vary seasonally and that the exploratory holes conducted to date may have not encountered contamination that remain undetected beneath the site. Additionally, the former site use gives rise to the potential for hydrocarbon contamination to have impacted the ground beneath the site (e.g. associated with the below ground fuel storage tank). There are also a number of nearby off-site sources of potential contamination which could also give rise to ground gas migration beneath site. The potential off-site sources identified by the earlier Desk Study Report included a Gas Works 80m northwest of the site, a vehicle repair garage 7m to the south and a Works ~30m to the west.

Potential risks associated with the offsite sources identified would be likely to be mitigated by the low permeability of the local ground conditions identified in the boreholes on site, which typically encountered shallow Made Ground material underlain by Clay containing chalk fragments (considered to be the Lowestoft Formation superficial deposits). More permeable bedrock Chalk geology (West Melbury Marly Chalk Formation) was indicated to be at depth beneath the Clayey Lowestoft superficial deposits (although this was not encountered within the boreholes advanced on site up to ~4.5m bgl). It was also inferred previously that the local groundwater gradient may be towards the north / west given the position of the nearby River Hiz, which would position many of the offsite sources identified down groundwater gradient.

Based upon the preliminary ground gas monitoring to date and consideration of potential source pathway receptor linkages it would appear that ground gas risks on site are low given consideration of CIRIA C665 guidance and that ground gas concentrations and flow rates have not been recorded to be elevated. As such guidance indicates that special protective measures are not required to the new development or the existing residential house that is to be extended. In addition, we are unaware of any known local issues associated with ground gas problems, the site is not listed on the LPA's Part IIa list and there are no known issues with indoor air quality at the existing house on site. However, given residual risks associated with the former site use and that VOCs have been detected during monitoring it would be prudent to include passive sub-floor ventilation beneath the suspended floor slabs associated with the buildings to help ventilate any vapours that may accumulate.

It is recommended that the existing monitoring boreholes should be protected and retained until this ground gas risk assessment has been approved by the Regulators.

Potential residual risks should be mitigated by the implementation of a Discovery Strategy on site during

the redevelopment works which should include for the immediate reporting of any potential indicators of ground or water contamination (e.g., cement bonded asbestos sheeting fragments, ash/clinker, or hydrocarbon odours) for additional separate assessment by an Environmental Consultant. Additionally, groundworkers should wear appropriate PPE/RPE, work in well-ventilated areas, avoid confined spaces, avoid contact with soil and groundwater, not smoke, adopt high standards of personal hygiene, and operate with due care.

It is also noted that the recommendations made in the SEC's Geo-Environmental Site Investigation Reports remain applicable and should be referred to in relation to the development of the site's remedial strategy.

Please find attached our General Limitations and Exceptions

Kind Regards

Damian Jones

Managing Director

Email; d.jones@sevenoaksenvironmental.co.uk

Enc.

Appendix A - Site Location Plan

Appendix B - Existing Site Layout Plan

Appendix C - Proposed Site Layout

Appendix D - Exploratory Hole Location Plan

Appendix E - Exploratory Hole Records

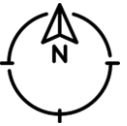
Appendix F - Environmental Monitoring

Appendix G – Chemical Test Reports

Appendix H - General Limitations and Exception

Appendix A

Site Location Plan

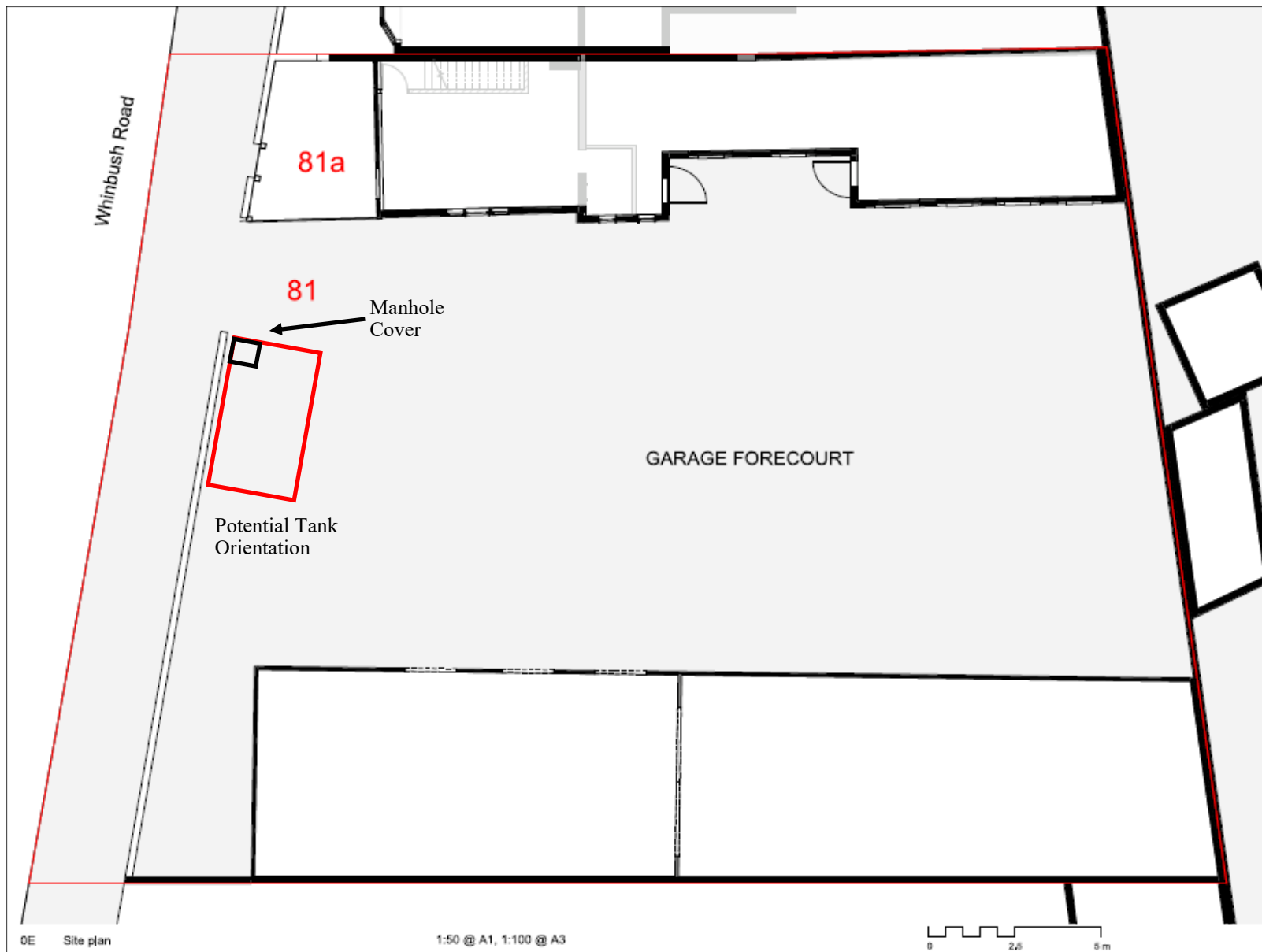


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This map is not to be relied upon for accuracy and is for identification purposes only

SITE: 81/81A Whinbush Road, Hitchin, SG5 1PZ	SCALE: NTS	JOB NO: 5445	 SEVENOAKS ENVIRONMENTAL CONSULTANCY
FIGURE TITLE: Site location Plan	REV: 01	FIGURE NO: 3	

Appendix B

Existing Site Layout Plan



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This map is not to be relied upon for accuracy and is for identification purposes only

SITE: 81/81A Whinbush Road, Hitchin, SG5 1PZ

SCALE: NTS

JOB NO: 5445

FIGURE TITLE: Site Layout Plan

REV: 01

FIGURE NO: 3

 **SEVENOAKS**
ENVIRONMENTAL
CONSULTANCY

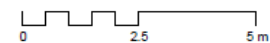
Appendix C

Proposed Site
Layout Plan



P05 Proposed Site Plan

1:50 @ A1, 1:100 @ A3



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This map is not to be relied upon for accuracy and is for identification purposes only

SITE: 81/81A Whinbush Road, Hitchin, SG5 1PZ

SCALE: NTS

JOB NO: 5445

FIGURE TITLE: Proposed Site Layout Plan

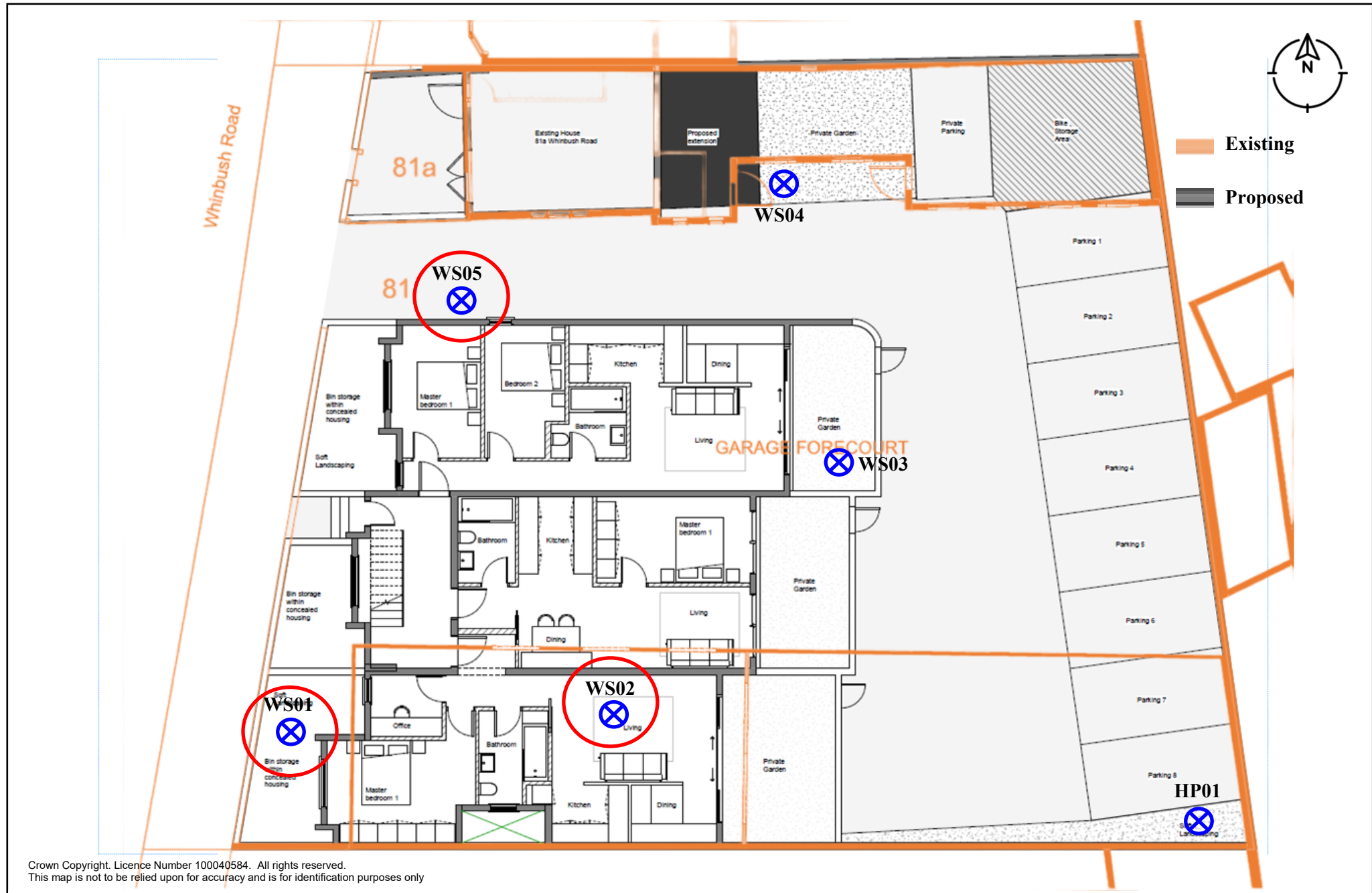
REV: 01

FIGURE NO: 3



Appendix D

Exploratory Hole
Location Plan



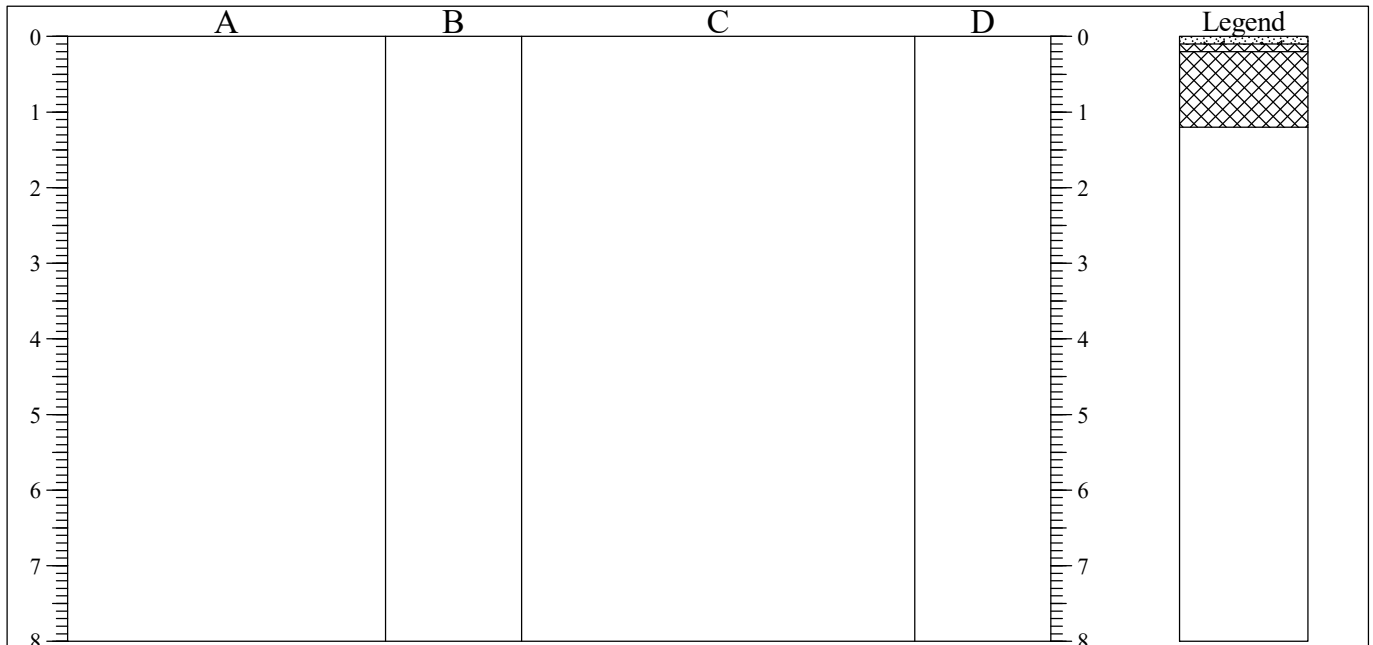
SITE: 81/81A Whinbush Road, Hitchin, SG5 1PZ	SCALE: NTS	JOB NO: 5445	
FIGURE TITLE: Exploratory Hole Layout Plan	REV: 01	FIGURE NO: 4	

Appendix E

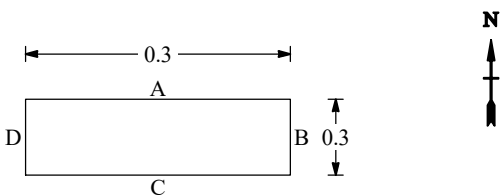
Exploratory Hole Records

TRIAL PIT LOG

Project Geo-Environmental Site Investigation - 81/81a Whinbush Road				TRIAL PIT No HP01
Job No 5445	Date 18-07-23	Ground Level (m)	Co-Ordinates ()	
Contractor Sevenoaks Environmental Consultancy Ltd				Sheet 1 of 1



STRATA				SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests	
0.00-0.10		MADE GROUND: Concrete	0.05	DMG	0.2PPM	
0.10-0.20		MADE GROUND: Soft, light yellowish brown sandy gravelly Clay. Sand is fine to coarse. Gravel comprised fine to coarse, sub-rounded to sub-angular, abundant brick, concrete, flint and clinker fragments.	0.15	DMG	0.6PPM	
0.20-1.20			0.70	DMG	0PPM	
			1.10	DNAT	0PPM	
		MADE GROUND: Stiff brown gravelly Clay. Gravel comprised fine to coarse, sub-rounded to sub-angular, occasional chalk fragments and rare brick, flint and clinker fragments				

Shoring/Support: N/A Stability: Stable		GENERAL REMARKS No groundwater encountered.
		

All dimensions in metres Scale 1:100	Client The Smart Move	Method/ Plant Used Hand Tools & Breaker	Logged By TI
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BOREHOLE LOG

Project Geo-Environmental Site Investigation - 81/81a Whinbush Road				BOREHOLE No WS01
Job No 5445	Date 18-07-23	Ground Level (m)	Co-Ordinates ()	
Contractor Sevenoaks Environmental Consultancy Ltd				Sheet 1 of 1

SAMPLES & TESTS			Water	Reduced Level	Legend	Depth (Thickness)	STRATA DESCRIPTION	Geology	Instrument/ Backfill
Depth	Type No	Test Result							
0.05	D	0PPM				0.10	MADE GROUND: Concrete		
0.20	D	0PPM				0.30	MADE GROUND: Soft reddish brown slightly sandy gravelly Clay. Sand is fine to coarse. Gravel comprised fine to coarse, sub-angular to rounded, occasional flint, chalk and brick fragments with abundant brick cobbles.		
0.70	D	0PPM				(1.00)	Loose brown clayey gravelly SAND. Sand is fine to coarse. Gravel comprised fine to coarse, angular to sub-rounded, occasional chalk and flint fragments with fine rare angular to sub-rounded black possible charcoal fragments.		
1.20		N9				1.30	Loose yellowish brown fine to coarse SAND.		
1.65	D	0PPM				(0.70)			
2.00	D	0PPM				2.00	Firm yellowish brown gravelly CLAY. Gravel comprised fine to coarse, angular to sub-angular abundant flint and chalk fragments.		
2.00		N9				2.30			
2.15	D	0.2PPM				(0.60)	Firm yellow brown slightly gravelly CLAY. Gravel comprised fine to coarse, angular to sub-rounded, occasional chalk fragments and rare chalk cobbles.		
2.60	D	0.1PPM				2.90			
3.00		N10					Stiff dark grey gravelly CLAY. Gravel comprised fine to coarse, angular to sub-rounded abundant chalk fragments.		
3.40	D	0PPM				(1.55)	@4.45m bgl becomes very stiff.		
3.90	D	0PPM							
4.00		N20				4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Depth	Date	Time	Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											No groundwater encountered.
All dimensions in metres Scale 1:50			Client The Smart Move			Method/ Plant Used CDS & Breaker			Logged By TI		

BOREHOLE LOG

Project Geo-Environmental Site Investigation - 81/81a Whinbush Road				BOREHOLE No WS02
Job No 5445	Date 18-07-23	Ground Level (m)	Co-Ordinates ()	
Contractor Sevenoaks Environmental Consultancy Ltd				Sheet 1 of 1

SAMPLES & TESTS			Water	Reduced Level	Legend	Depth (Thickness)	STRATA	Geology	Instrument/Backfill
Depth	Type No	Test Result					DESCRIPTION		
0.05	D	0.4PPM				0.10	MADE GROUND: Concrete		
0.20	D	0PPM				0.30	MADE GROUND: Medium Dense red sandy Gravel. Sand is fine to coarse. Gravel comprised fine to coarse, sub-angular to sub-rounded, abundant brick, concrete and sandstone fragments and cobbles.		
0.50	D	0PPM					VeryStiff yellowish gravelly CLAY. Gravel comprised fine to coarse, angular to sub-rounded, abundant chalk fragments.		
1.00	D	0PPM							
1.20		N15							
1.50	D	0PPM							
2.00		N15				(4.15)			
2.50	D	0PPM							
3.00		N16							
3.50	D	0PPM							
4.00		N17				4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											No groundwater encountered.
All dimensions in metres Scale 1:50			Client The Smart Move			Method/ Plant Used CDS & Breaker			Logged By TI		

BOREHOLE LOG

Project Geo-Environmental Site Investigation - 81/81a Whinbush Road				BOREHOLE No WS03
Job No 5445	Date 18-07-23	Ground Level (m)	Co-Ordinates ()	
Contractor Sevenoaks Environmental Consultancy Ltd				Sheet 1 of 1

SAMPLES & TESTS			Water	Reduced Level	Legend	Depth (Thickness)	STRATA	Geology	Instrument/Backfill
Depth	Type No	Test Result					DESCRIPTION		
0.03	D	OPPM				0.05	MADE GROUND: Tarmac.		
0.20	D	OPPM				0.20	MADE GROUND: Loose grey / light brown sandy Gravel. Sand is fine to coarse. Gravel comprised fine to coarse, sub-rounded to sub-angular, abundant concrete, brick, flint and tarmac fragments with rare concrete cobbles.		
0.50	D	OPPM					Very Stiff yellow gravelly CLAY. Gravel comprised fine to coarse, angular to sub-rounded, abundant chalk fragments.		
1.00	D	OPPM					@ 3.00m bgl becomes brown grey.		
1.20		N13					@4.45m bgl becomes very stiff.		
1.50	D	OPPM							
2.00		N28				(4.25)			
2.50	D	OPPM							
3.00		N16							
3.50	D	OPPM							
4.00		N23				4.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											No groundwater encountered.
All dimensions in metres Scale 1:50			Client The Smart Move			Method/ Plant Used CDS & Breaker			Logged By TI		

BOREHOLE LOG

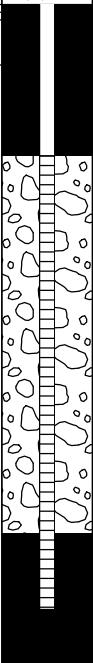
Project Geo-Environmental Site Investigation - 81/81a Whinbush Road				BOREHOLE No WS04
Job No 5445	Date 18-07-23	Ground Level (m)	Co-Ordinates ()	
Contractor Sevenoaks Environmental Consultancy Ltd				Sheet 1 of 1

SAMPLES & TESTS			Water				STRATA	Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.03	D	0.1PPM				0.05	MADE GROUND: Tarmac.		
0.15	D	0PPM				0.20	MADE GROUND: Concrete		
0.50	D	0PPM				(4.25)	Very Stiff yellowish gravelly CLAY. Gravel comprised fine to coarse, angular to sub-rounded, abundant chalk fragments.		
1.00	D	0PPM							
1.20		N17							
1.50	D	0PPM							
2.00		N19							
2.50	D	0PPM							
3.00		N24							
3.50	D	0PPM							
4.00		N25							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Depth	Date	Time	Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											No groundwater encountered.
All dimensions in metres Scale 1:50			Client The Smart Move			Method/ Plant Used CDS & Breaker			Logged By TI		

BOREHOLE LOG

Project Geo-Environmental Site Investigation - 81/81a Whinbush Road				BOREHOLE No WS05
Job No 5445	Date 18-07-23	Ground Level (m)	Co-Ordinates ()	
Contractor Sevenoaks Environmental Consultancy Ltd				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill	
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)			DESCRIPTION
0.05	D	3.4PPM				0.05	MADE GROUND: Tarmac.		
0.07	D	3PPM				0.10			MADE GROUND: Loose brown, very gravelly Sand. Sand is fine to medium, gravel comprised fine to coarse abundant concrete and sandstone fragments and occasional sub-angular to sub-rounded, fine to medium, flint fragments.
0.25	D	0.2PPM				0.40			
0.60	D	0PPM					MADE GROUND: Stiff brown grey slightly sandy gravelly Clay. Sand is fine to coarse, sub-rounded to aub-angular, occassional flint, chalk and brick fragments.		
1.00	D	0PPM					Very Stiff yellow gravelly CLAY. Gravel comprised fine to coarse, angular to sub-rounded, abundant chalk fragments.		
1.20		N13							
1.50	D	0PPM							
2.00		N20							
2.50	D	0PPM				(4.05)			
3.00		N21							
3.50	D	0PPM							
4.00		N23							
					4.45				
				</					

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Depth	Date	Time	Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											No groundwater encountered.
All dimensions in metres Scale 1:50			Client	The Smart Move			Method/ Plant Used	CDS & Breaker		Logged By	TI

Appendix F

Environmental Monitoring



Date: 01/08/2023
Site: Whinbush
Job Ref: 5445
Monitoring Round: 01
Engineer & Log No: TI 114

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	0.4	18.3	-10.0	0.0	288.8	0.0	2	3.86	Located at drum store - No Odour or sheen noticed
WS02	0.0	0.6	19.6	0.0	0.0	7.6	0.0	3.85	3.95	Located in MOT Bay
WS05	0.0	0.0	18.0	0.0	0.0	68.4	0.0	1.25	3.28	Located adjacent to UST

Atmospheric pressure start:	992mb
Atmospheric pressure finish:	993mb
Weather:	Sunny, Breezy



Date: 15/08/2023
Site: Whinbush
Job Ref: 5445
Monitoring Round: 02
Engineer & Log No: TI 114

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	0.3	19.7	0.0	0.0	1.1	0.0	2.28	3.87	Located at drum store - No Odour or sheen noticed
WS02	0.0	0.2	19.4	0.0	0.0	3.2	0.0	Dry	3.95	Located in MOT Bay
WS05	0.0	0.4	19.3	0.0	0.0	3.6	0.0	2.25	3.28	Located adjacent to UST

Atmospheric pressure start:	1006mb
Atmospheric pressure finish:	1006mb
Weather:	Sunny, Breezy



Date: 29/08/2023
Site: Whinbush
Job Ref: 5445
Monitoring Round: 03
Engineer & Log No: TI 114

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	0.0	20.5	0.0	0.0	0.0	0.0	2.35	3.86	Located at drum store - No Odour or sheen noticed
WS02	0.0	0.4	19.8	0.0	0.0	0.2	0.0	Dry	3.95	Located in MOT Bay
WS05	0.0	0.0	17.1	0.0	0.0	0.2	0.0	1.76	3.28	Located adjacent to UST

Atmospheric pressure start:	1003mb
Atmospheric pressure finish:	1003mb
Weather:	Cloudy, Dry



Date: 20/09/2023
Site: Whinbush
Job Ref: 5445
Monitoring Round: 04
Engineer & Log No: AK

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	0.0	20.8	0.0	0.0	0.3	0.0	2.39	3.88	Located at drum store - No Odour or sheen noticed
WS02	0.0	0.0	20.5	0.0	0.0	0.8	0.0	Dry	4.00	Located in MOT Bay
WS05	0.0	0.0	19.1	0.0	0.0	0.4	0.0	1.48	3.27	Located adjacent to UST

Atmospheric pressure start:	988mb
Atmospheric pressure finish:	989mb
Weather:	Cloudy, Dry



Date: 23/01/2024
Site: Whinbush
Job Ref: 5445
Monitoring Round: 05
Engineer & Log No: JH

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	0.1	20.0	0.0	0.0	0.3	0.0	2.29	3.59	-
WS02	0.0	0.4	20.1	0.0	0.0	0.2	0.0	3.17	4.01	-
WS05	0.0	0.0	19.9	0.0	0.0	0.5	0.0	1.23	3.34	-

Atmospheric pressure start:	1011mb
Atmospheric pressure finish:	1010mb
Weather:	Wet, Rain



Date: 29/01/2024
Site: Whinbush
Job Ref: 5445
Monitoring Round: 06
Engineer & Log No: JH

Borehole Ref:	Methane %	Carbon Dioxide %	Oxygen %	Carbon Monoxide (ppm)	H2S %	VOCs (ppm)	Flow l/hr	Dip [m]	Plumb [m]	Comments
WS01	0.0	0.1	20.2	0.0	0.0	1.1	0.0	2.34	3.59	-
WS02	0.0	0.6	19.9	0.0	0.0	1.1	-0.1	2.74	4.01	-
WS05	0.0	0.0	12.1	0.0	0.0	0.7	0.0	1.16	3.34	-

Atmospheric pressure start:	1013mb
Atmospheric pressure finish:	1013mb
Weather:	Dry, cloudy and mild

Appendix G

Chemical Test Reports



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Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 23-10592

Site Reference: Hitchin 5445

Project / Job Ref: 5445

Order No: 5445

Sample Receipt Date: 17/08/2023

Sample Scheduled Date: 17/08/2023

Report Issue Number: 1

Reporting Date: 23/08/2023

Authorised by:



Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

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Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Water Analysis Certificate						
DETS Report No: 23-10592	Date Sampled	15/08/23				
Sevenoaks Environmental Consultancy Ltd	Time Sampled	1500				
Site Reference: Hitchin 5445	TP / BH No	WS01				
Project / Job Ref: 5445	Additional Refs	Post-Purge				
Order No: 5445	Depth (m)	None Supplied				
Reporting Date: 23/08/2023	DETS Sample No	670476				

Determinand	Unit	RL	Accreditation				
Zinc (dissolved)	ug/l	< 2	ISO17025	31			

Subcontracted analysis ^(S)
Insufficient sample ^{I/S}
Unsuitable Sample ^{U/S}



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Water Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 23-10592

Sevenoaks Environmental Consultancy Ltd

Site Reference: Hitchin 5445

Project / Job Ref: 5445

Order No: 5445

Reporting Date: 23/08/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered



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List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym



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Derwentside Environmental Testing Services Ltd
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Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 23-10120

Site Reference: Hitchin 5445

Project / Job Ref: 5445

Order No: 5445

Sample Receipt Date: 07/08/2023

Sample Scheduled Date: 07/08/2023

Report Issue Number: 1

Reporting Date: 11/08/2023

Authorised by:



Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

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Water Analysis Certificate						
DETS Report No: 23-10120	Date Sampled	03/08/23	03/08/23	03/08/23		
Sevenoaks Environmental Consultancy Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Hitchin 5445	TP / BH No	WS01	WS02	WS05		
Project / Job Ref: 5445	Additional Refs	Post-Purge	Post-Purge	Post-Purge		
Order No: 5445	Depth (m)	None Supplied	None Supplied	None Supplied		
Reporting Date: 11/08/2023	DETS Sample No	668541	668542	668543		

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	ISO17025			10.6		
Sulphate as SO ₄	mg/l	< 1	ISO17025			232		
Ammonia as NH ₄	ug/l	< 50	ISO17025	< 50	942	344		

Subcontracted analysis ^(S)

Insufficient sample ^{I/S}

Unsuitable Sample ^{U/S}



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Water Analysis Certificate - EPH Texas Banded						
DETS Report No: 23-10120	Date Sampled	03/08/23	03/08/23	03/08/23		
Sevenoaks Environmental Consultancy Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Hitchin 5445	TP / BH No	WS01	WS02	WS05		
Project / Job Ref: 5445	Additional Refs	Post-Purge	Post-Purge	Post-Purge		
Order No: 5445	Depth (m)	None Supplied	None Supplied	None Supplied		
Reporting Date: 11/08/2023	DETS Sample No	668541	668542	668543		

Determinand	Unit	RL	Accreditation					
EPH Texas (C6 - C8) :	ug/l	< 10	NONE	< 10	< 10	14		
HS 1D MS Total								
EPH Texas (>C8 - C10) :	ug/l	< 10	NONE	< 10	< 10	< 10		
EH 1D Total								
EPH Texas (>C10 - C12) :	ug/l	< 10	NONE	< 10	< 10	< 10		
EH 1D Total								
EPH Texas (>C12 - C16) :	ug/l	< 10	NONE	< 10	23	< 10		
EH 1D Total								
EPH Texas (>C16 - C21) :	ug/l	< 10	NONE	11	13	< 10		
EH 1D Total								
EPH Texas (>C21 - C40) :	ug/l	< 10	NONE	12	< 10	< 10		
EH 1D Total								
EPH Texas (C6 - C40) :	ug/l	< 10	NONE	23	36	14		
HS 1D MS+EH 1D Total								



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Water Analysis Certificate - Volatile Organic Compounds (VOC)						
DETS Report No: 23-10120	Date Sampled	03/08/23				
Sevenoaks Environmental Consultancy Ltd	Time Sampled	None Supplied				
Site Reference: Hitchin 5445	TP / BH No	WS01				
Project / Job Ref: 5445	Additional Refs	Post-Purge				
Order No: 5445	Depth (m)	None Supplied				
Reporting Date: 11/08/2023	DETS Sample No	668541				

Determinand	Unit	RL	Accreditation				
Dichlorodifluoromethane	ug/l	< 5	ISO17025	< 5			
Vinyl Chloride	ug/l	< 5	ISO17025	< 5			
Chloromethane	ug/l	< 5	ISO17025	< 5			
Chloroethane	ug/l	< 5	ISO17025	< 5			
Bromomethane	ug/l	< 5	ISO17025	< 5			
Trichlorofluoromethane	ug/l	< 5	ISO17025	< 5			
1,1-Dichloroethene	ug/l	< 5	ISO17025	< 5			
MTBE	ug/l	< 10	ISO17025	< 10			
trans-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5			
1,1-Dichloroethane	ug/l	< 5	ISO17025	< 5			
cis-1,2-Dichloroethene	ug/l	< 5	ISO17025	< 5			
2,2-Dichloropropane	ug/l	< 5	ISO17025	< 5			
Chloroform	ug/l	< 5	ISO17025	< 5			
Bromochloromethane	ug/l	< 10	ISO17025	< 10			
1,1,1-Trichloroethane	ug/l	< 5	ISO17025	< 5			
1,1-Dichloropropene	ug/l	< 5	ISO17025	< 5			
Carbon Tetrachloride	ug/l	< 5	ISO17025	< 5			
1,2-Dichloroethane	ug/l	< 10	ISO17025	< 10			
Benzene	ug/l	< 1	ISO17025	< 1			
1,2-Dichloropropane	ug/l	< 5	ISO17025	< 5			
Trichloroethene	ug/l	< 5	ISO17025	< 5			
Bromodichloromethane	ug/l	< 5	ISO17025	< 5			
Dibromomethane	ug/l	< 5	ISO17025	< 5			
TAME	ug/l	< 5	ISO17025	< 5			
cis-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5			
Toluene	ug/l	< 5	ISO17025	< 5			
trans-1,3-Dichloropropene	ug/l	< 5	ISO17025	< 5			
1,1,2-Trichloroethane	ug/l	< 10	ISO17025	< 10			
1,3-Dichloropropane	ug/l	< 5	ISO17025	< 5			
Tetrachloroethene	ug/l	< 5	ISO17025	< 5			
Dibromochloromethane	ug/l	< 5	ISO17025	< 5			
1,2-Dibromoethane	ug/l	< 5	ISO17025	< 5			
Chlorobenzene	ug/l	< 5	ISO17025	< 5			
1,1,1,2-Tetrachloroethane	ug/l	< 5	ISO17025	< 5			
Ethyl Benzene	ug/l	< 5	ISO17025	< 5			
m,p-Xylene	ug/l	< 10	ISO17025	< 10			
o-Xylene	ug/l	< 5	ISO17025	< 5			
Styrene	ug/l	< 5	ISO17025	< 5			
Bromoform	ug/l	< 10	ISO17025	< 10			
Isopropylbenzene	ug/l	< 5	ISO17025	< 5			
1,1,2,2-Tetrachloroethane	ug/l	< 10	ISO17025	< 10			
1,2,3-Trichloropropane	ug/l	< 5	ISO17025	< 5			
n-Propylbenzene	ug/l	< 5	ISO17025	< 5			
Bromobenzene	ug/l	< 5	ISO17025	< 5			
2-Chlorotoluene	ug/l	< 5	ISO17025	< 5			
1,3,5-Trimethylbenzene	ug/l	< 5	ISO17025	< 5			
4-Chlorotoluene	ug/l	< 5	ISO17025	< 5			
tert-Butylbenzene	ug/l	< 5	ISO17025	< 5			
1,2,4-Trimethylbenzene	ug/l	< 5	ISO17025	< 5			
sec-Butylbenzene	ug/l	< 5	ISO17025	< 5			
p-Isopropyltoluene	ug/l	< 5	ISO17025	< 5			
1,3-Dichlorobenzene	ug/l	< 5	ISO17025	< 5			
1,4-Dichlorobenzene	ug/l	< 5	ISO17025	< 5			
n-Butylbenzene	ug/l	< 5	ISO17025	< 5			
1,2-Dichlorobenzene	ug/l	< 5	ISO17025	< 5			
1,2-Dibromo-3-chloropropane	ug/l	< 10	ISO17025	< 10			
Hexachlorobutadiene	ug/l	< 5	ISO17025	< 5			



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Water Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 23-10120

Sevenoaks Environmental Consultancy Ltd

Site Reference: Hitchin 5445

Project / Job Ref: 5445

Order No: 5445

Reporting Date: 11/08/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered



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List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym
EPH Texas (C10 - C12) - EH_1D_Total
EPH Texas (C12 - C16) - EH_1D_Total
EPH Texas (C16 - C21) - EH_1D_Total
EPH Texas (C21 - C40) - EH_1D_Total
EPH Texas (C6 - C40) - HS_1D_MS+EH_1D_Total
EPH Texas (C6 - C8) - HS_1D_MS_Total
EPH Texas (C8 - C10) - EH_1D_Total

Appendix H

General Limitations and Exceptions

General Limitations and Exceptions

1. The advice given in this report with respect to contaminated land/pollution is based on the guidelines available at the time of writing.
2. This report does not include for an assessment of above-ground structures on site for the presence of potential asbestos containing materials.
3. The Client is advised that the conditions observed on site by SEC at the time of the investigation or assessment is subject to change. Certain indicators of the presence of hazardous substances may have been latent at the time of the most recent site reconnaissance or investigation and they may subsequently have become observable.
4. Comments made relating to land gas or groundwater conditions are based on observations made at the time of an investigation unless otherwise stated. However, land gas or groundwater conditions may vary as a result of seasonal or other effects. It would be prudent to conduct groundwater monitoring.
5. This assessment may be subject to amendment in light of additional information becoming available.
6. The findings and opinions conveyed in this report are based on information obtained from a variety of sources, including that from chemical testing laboratories, and which SEC has assumed are correct. Nevertheless, SEC cannot and does not guarantee the authenticity or reliability of the information it has relied upon. SEC can accept no responsibility for inaccuracies within the data supplied by other parties.
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17. That this investigation has relied on information from a discrete number of exploratory hole locations and allowances should be made for the variation in ground conditions between these locations and within the site boundary.
18. It should be noted that the Made Ground depth recorded above is that encountered within the trial pits undertaken during the phase of work to which this report pertains. Owing to the variable nature and unknown deposition criteria of Made Ground it is possible that deeper or more extensive areas of Made Ground may exist at this site which have not been revealed by the current work.
19. Should the proposed end use or site layout change then a reassessment of potential risks will be required.