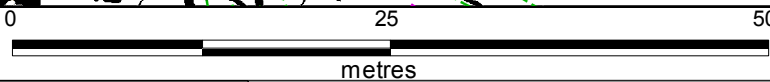


0929
3.398ha
8.40

10

17
2.06
5.



Dig Sites Area:  Line: 

The quality and accuracy of any print will depend on your printer, your computer and its print settings. Measurements scaled from this plan may not match measurements between the same points on the ground.



ALWAYS LOOK UP
BEFORE
YOU START WORK
Refer to HSE
guidance note GS6

IF IN DOUBT - ASK!
PHONE 0800 056 5866
EMERGENCY - If you
damage a cable or line
Phone 0800 783 8838
(24hrs) URGENTLY

Maps produced at 1:2500 scale are Geo-Schematics which show LV mains cables and overhead lines (in some cases all voltages). Prior to carrying out excavations you must refer to the 1:500 records to determine the location of all known underground plant and equipment.

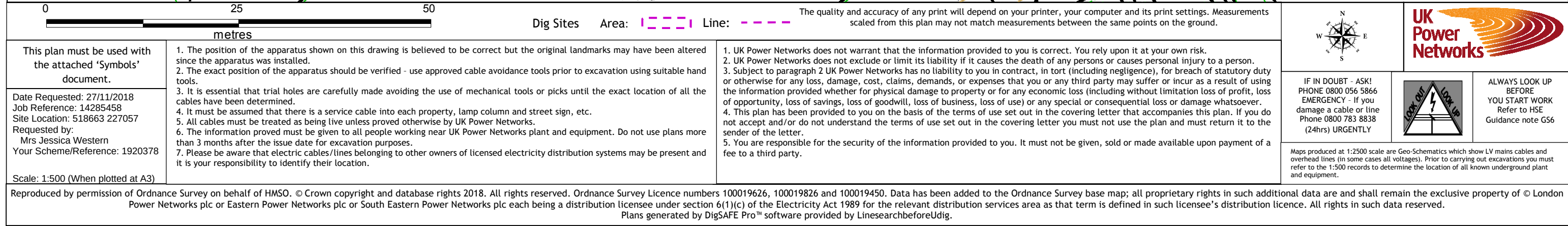
1. The position of the apparatus shown on this drawing is believed to be correct but the original landmarks may have been altered since the apparatus was installed.
2. The exact position of the apparatus should be verified - use approved cable avoidance tools prior to excavation using suitable hand tools.
3. It is essential that trial holes are carefully made avoiding the use of mechanical tools or picks until the exact location of all the cables have been determined.
4. It must be assumed that there is a service cable into each property, lamp column and street sign, etc.
5. All cables must be treated as being live unless proved otherwise by UK Power Networks.
6. The information proved must be given to all people working near UK Power Networks plant and equipment. Do not use plans more than 3 months after the issue date for excavation purposes.
7. Please be aware that electric cables/lines belonging to other owners of licensed electricity distribution systems may be present and it is your responsibility to identify their location.

1. UK Power Networks does not warrant that the information provided to you is correct. You rely upon it at your own risk.
2. UK Power Networks does not exclude or limit its liability if it causes the death of any persons or causes personal injury to a person.
3. Subject to paragraph 2 UK Power Networks has no liability to you in contract, in tort (including negligence), for breach of statutory duty or otherwise for any loss, damage, cost, claims, demands, or expenses that you or any third party may suffer or incur as a result of using the information provided whether for physical damage to property or for any economic loss (including without limitation loss of profit, loss of opportunity, loss of savings, loss of goodwill, loss of business, loss of use) or any special or consequential loss or damage whatsoever.
4. This plan has been provided to you on the basis of the terms of use set out in the covering letter that accompanies this plan. If you do not accept and/or do not understand the terms of use set out in the covering letter you must not use the plan and must return it to the sender of the letter.
5. You are responsible for the security of the information provided to you. It must not be given, sold or made available upon payment of a fee to a third party.

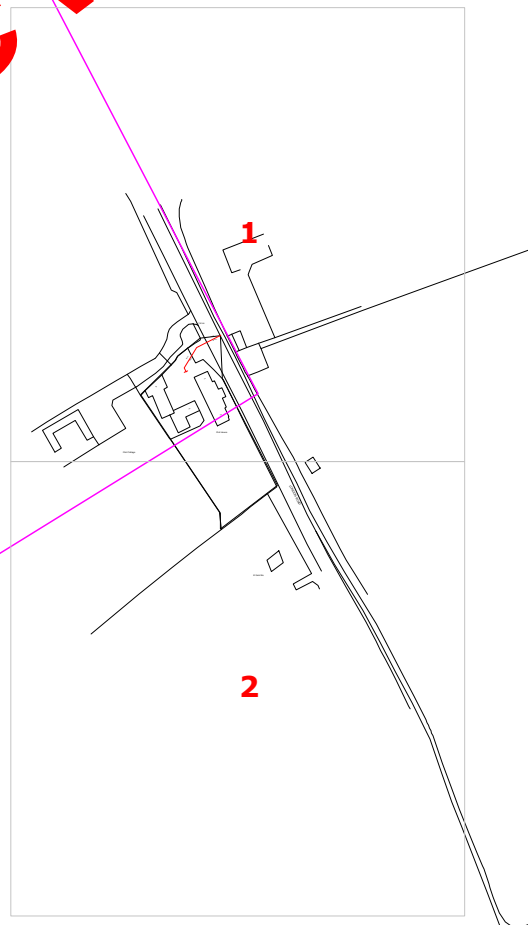
This plan must be used with
the attached 'Symbols'
document.

Date Requested: 27/11/2018
Job Reference: 14285458
Site Location: 518663 227057
Requested by:
Mrs Jessica Western
Your Scheme/Reference: 1920378

Scale: 1:500 (When plotted at A3)



Overview



Date Requested: 27/11/2018

Requested by: Jessica Western

Job Reference: 14285458

Company: RSK Environment Ltd

Your Scheme/Reference: 1920378

Key for Mains & Service Pipework



Existing LP mains or services operating up to 75 millibar gauge



Existing MP mains or services operating between 75 millibar and 2 bar gauge



Existing IP mains or services operating between 2 bar and 7 bar gauge

Whilst ESP Utilities Group Ltd (ESP) try to ensure the asset information we provide is accurate, the information is provided Without Prejudice and ESP accept no liability for claims arising from any inaccuracy, omissions or errors contained in this response. The actual position of underground services must be verified and established on site before any mechanical plant is used. Authorities and contractors will be held liable for the full cost of repairs to ESP apparatus and all claims made against them by Third parties as a result of any interference or damage.

REPRODUCED FROM THE ORDNANCE SURVEY MAP WITH THE SANCTION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE © CROWN COPYRIGHT RESERVED.

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UTILITIES GROUP

ESP Utilities Group Ltd
Bluebird House
Mole Business Park
Leatherhead
Surrey
KT22 7BA

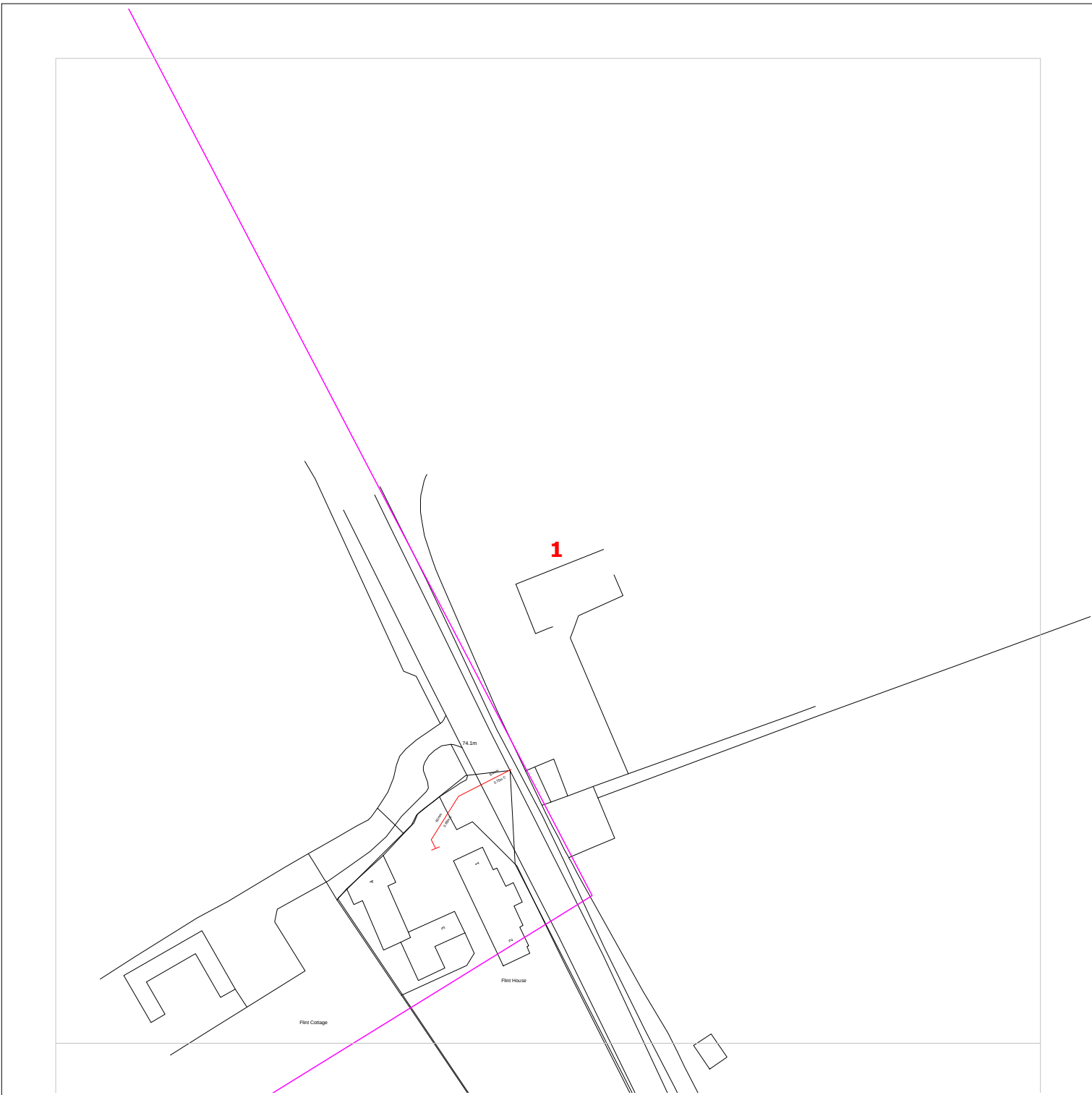
Phone: 01372 587500

Email: info@espug.com

Dig Sites:

Area  Line 

Approx scale on A4 paper: 1:1000
(excluding Overview map)



Date Requested: 27/11/2018
Requested by: Jessica Western
Job Reference: 14285458

Company: RSK Environment Ltd
Your Scheme/Reference: 1920378

Key for Mains & Service Pipework

- | | |
|--|---|
|  | Existing LP mains or services operating up to 75 millibar gauge |
|  | Existing MP mains or services operating between 75 millibar and 2 bar gauge |
|  | Existing IP mains or services operating between 2 bar and 7 bar gauge |

Whilst ESP Utilities Group Ltd (ESP) try to ensure the asset information we provide is accurate, the information is provided Without Prejudice and ESP accept no liability for claims arising from any inaccuracy, omissions or errors contained in this response. The actual position of underground services must be verified and established on site before any mechanical plant is used. Authorities and contractors will be held liable for the full cost of repairs to ESP apparatus and all claims made against them by Third parties as a result of any interference or damage.

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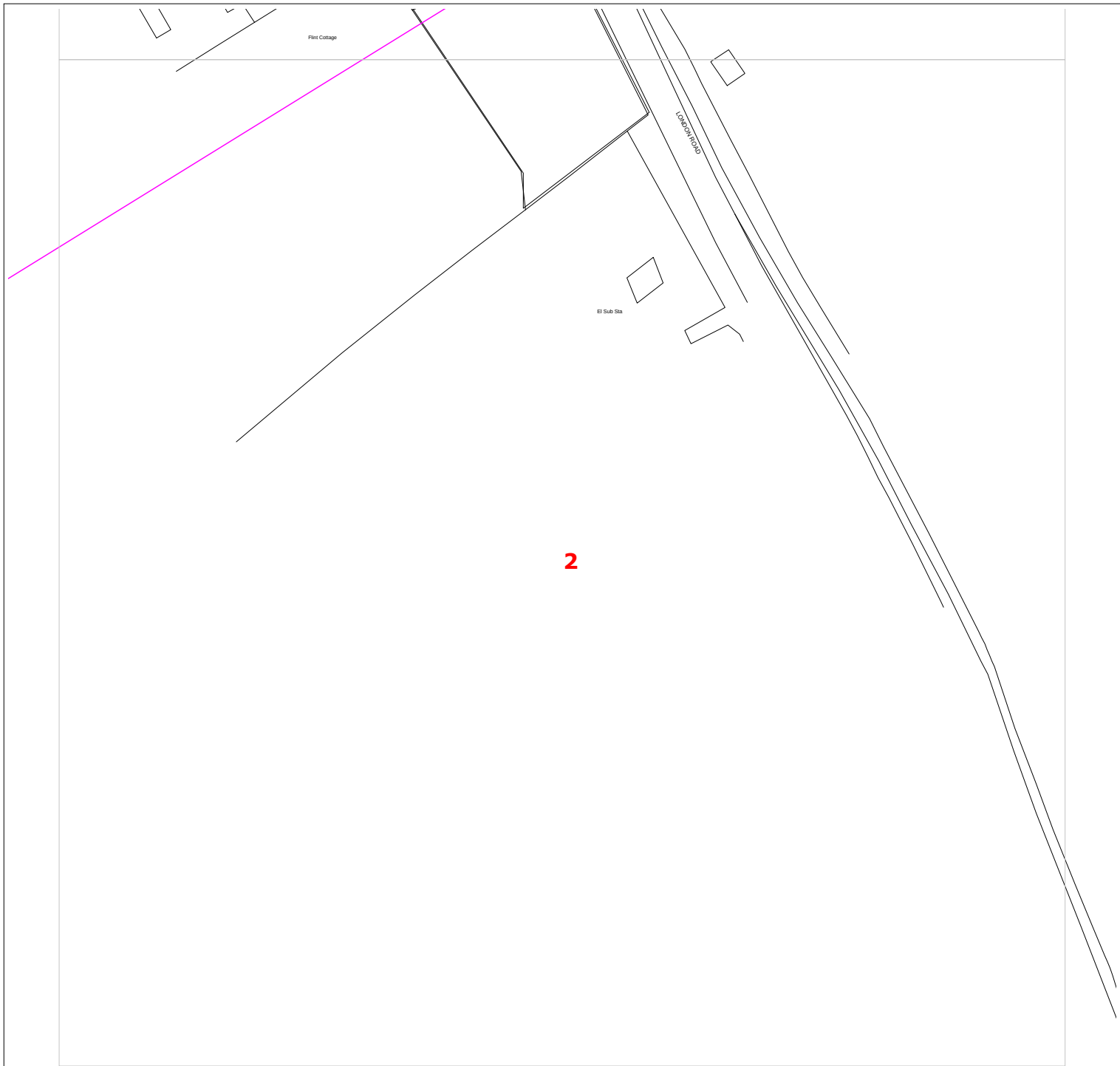


UTILITIES GROUP

ESP Utilities Group Ltd
Bluebird House
Mole Business Park
Leatherhead
Surrey
KT22 7BA
Phone: 01372 587500
Email: info@espug.com

Dig Sites:

Area  Line 
Approx scale on A4 paper: 1:1000
(excluding Overview map)



Date Requested: 27/11/2018

Requested by: Jessica Western

Job Reference: 14285458

Company: RSK Environment Ltd

Your Scheme/Reference: 1920378

Key for Mains & Service Pipework



Existing LP mains or services operating up to 75 millibar gauge



Existing MP mains or services operating between 75 millibar and 2 bar gauge



Existing IP mains or services operating between 2 bar and 7 bar gauge

Whilst ESP Utilities Group Ltd (ESP) try to ensure the asset information we provide is accurate, the information is provided Without Prejudice and ESP accept no liability for claims arising from any inaccuracy, omissions or errors contained in this response. The actual position of underground services must be verified and established on site before any mechanical plant is used. Authorities and contractors will be held liable for the full cost of repairs to ESP apparatus and all claims made against them by Third parties as a result of any interference or damage.

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UTILITIES GROUP

ESP Utilities Group Ltd
Bluebird House
Mole Business Park
Leatherhead
Surrey
KT22 7BA
Phone: 01372 587500
Email: info@espug.com

Dig Sites:

Area  Line 

Approx scale on A4 paper: 1:1000
(excluding Overview map)

PRECAUTIONS TO BE TAKEN WHEN CARRYING OUT WORK IN THE VICINITY OF UNDERGROUND GAS PIPES

ADVICE TO SITE PERSONNEL

MANAGEMENT NOTE

Please ensure that a copy of this note is read by your site management and to your site operatives.

Early consultation with ESP Utilities Group prior to excavation is recommended to obtain the location of plant and precautions to be taken when working nearby.

This Guidance Note should be read in conjunction with the Health and Safety Executive guidance HSG47 "Avoiding danger from underground services".

Introduction

Damage to ESP Utilities Group's plant can result in uncontrolled gas escapes which may be dangerous. In addition these occurrences can cause expense, disruption of work and inconvenience to the public.

Various materials are used for gas mains and services. Cast Iron, Ductile Iron, Steel and Plastic pipes are the most widely found. Modern Plastic pipes are either bright yellow or orange in colour.

Cast Iron and Ductile Iron water pipes are very similar in appearance to Cast Iron and Ductile Iron gas pipes and if any Cast Iron or Ductile Iron pipe is uncovered, it should be treated as a gas pipe. ESP Utilities Group do not own any metallic gas pipes but their gas network infrastructures may be connected to Cast Iron, Ductile Iron or Steel pipes owned by Distribution Network Operators.

The following general precautions apply to Intermediate Pressure (2-7barg MOP), Medium Pressure (75mbarg-2barg MOP), Low Pressure (up to 75mbarg MOP) and other gas mains and services likely to be encountered in general site works and are referred to within this document as '**pipes**'.

Locating Gas Pipes

It should be assumed when working in urban and residential areas that gas mains and services are likely to be present. On request, ESP Utilities Group will give approximate locations of pipes derived from their records. The records do not normally show the position of service pipes but their probable line can be deducted from the gas meter position. ESP Utilities Group's staff will be pleased to assist in the location of gas plant and provide advice on any precautions that may be required. The records and advice are given in good faith but cannot be guaranteed until hand excavation has taken place. Proprietary pipe and cable locators are available although generally these will not locate plastic pipes.

Safe working Practices

To achieve safe working conditions adjacent to gas plant the following must be observed:

Observe any specific request made by ESP Utilities Group's staff.

Gas pipes must be located by hand digging before mechanical excavation. Once a gas pipe has been located, mechanical excavation must proceed **with care**. A mechanical excavator must not in any case be used within 0.5 metre of a gas pipe and greater safety distances may be advised by ESP Utilities Group depending on the mains maximum operating pressure (MOP).

Where heavy plant may have to cross the line of a gas pipe during construction work, the number of crossing points should be kept to a minimum. Crossing points should be clearly indicated and crossings at other places along the line of the pipe should be prevented.

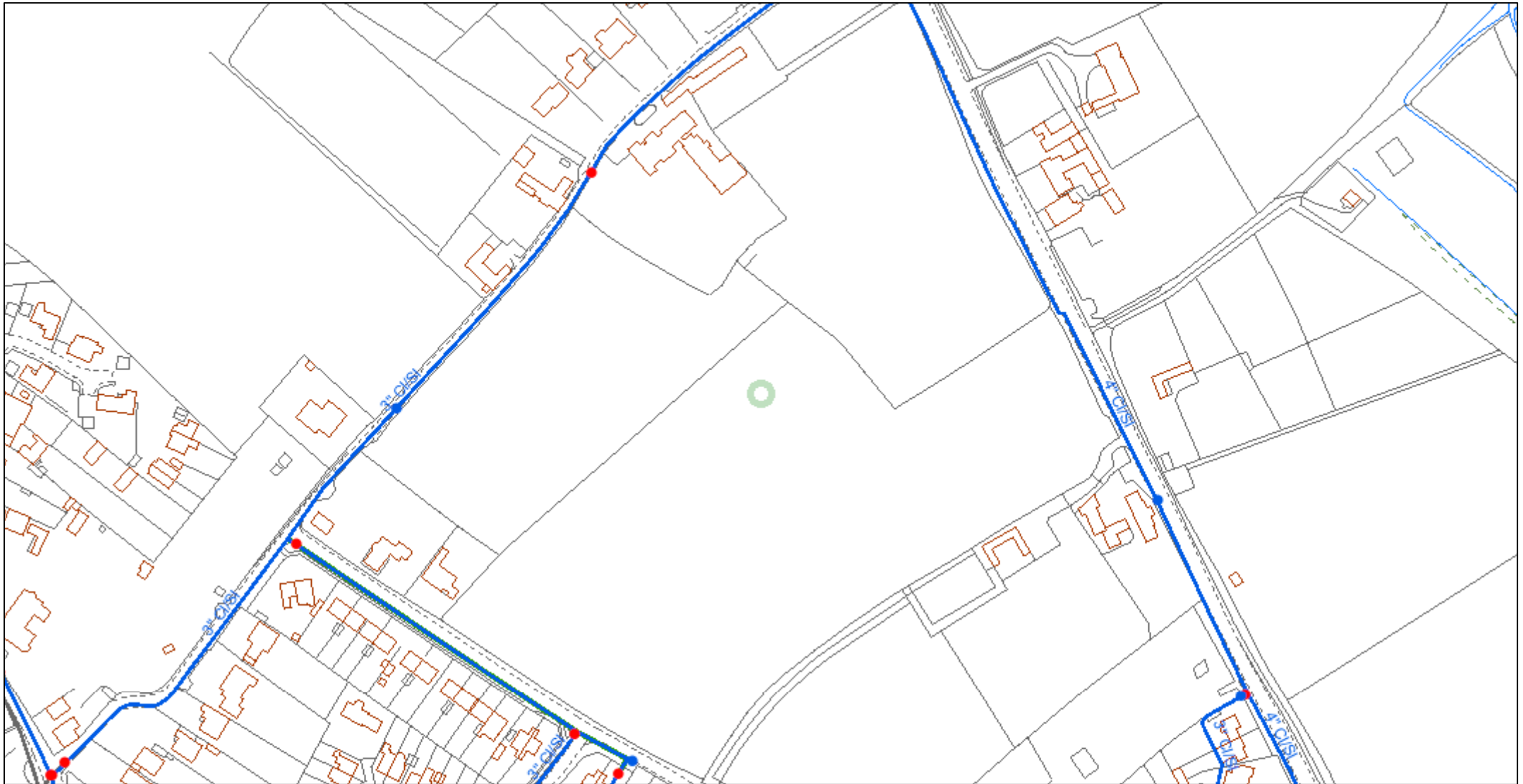
Where the pipe is not adequately protected by an existing road, crossing points should be suitably reinforced with sleepers, steel plates or a specially constructed reinforced concrete raft as necessary. ESP Utilities Group staff will advise on the type of reinforcement necessary.

No explosives should be used within 30 metres of any gas pipe without prior consultation with ESP Utilities Group.

ESP Utilities Group must be consulted prior to carrying out excavation work within 10 metres of any above ground gas installation.

Where it is proposed to carry out piling or boring within 15 metres of any gas pipe, ESP Utilities Group should be consulted prior to the commencement of the works.

Access to gas plant must be maintained at all times during on site works.

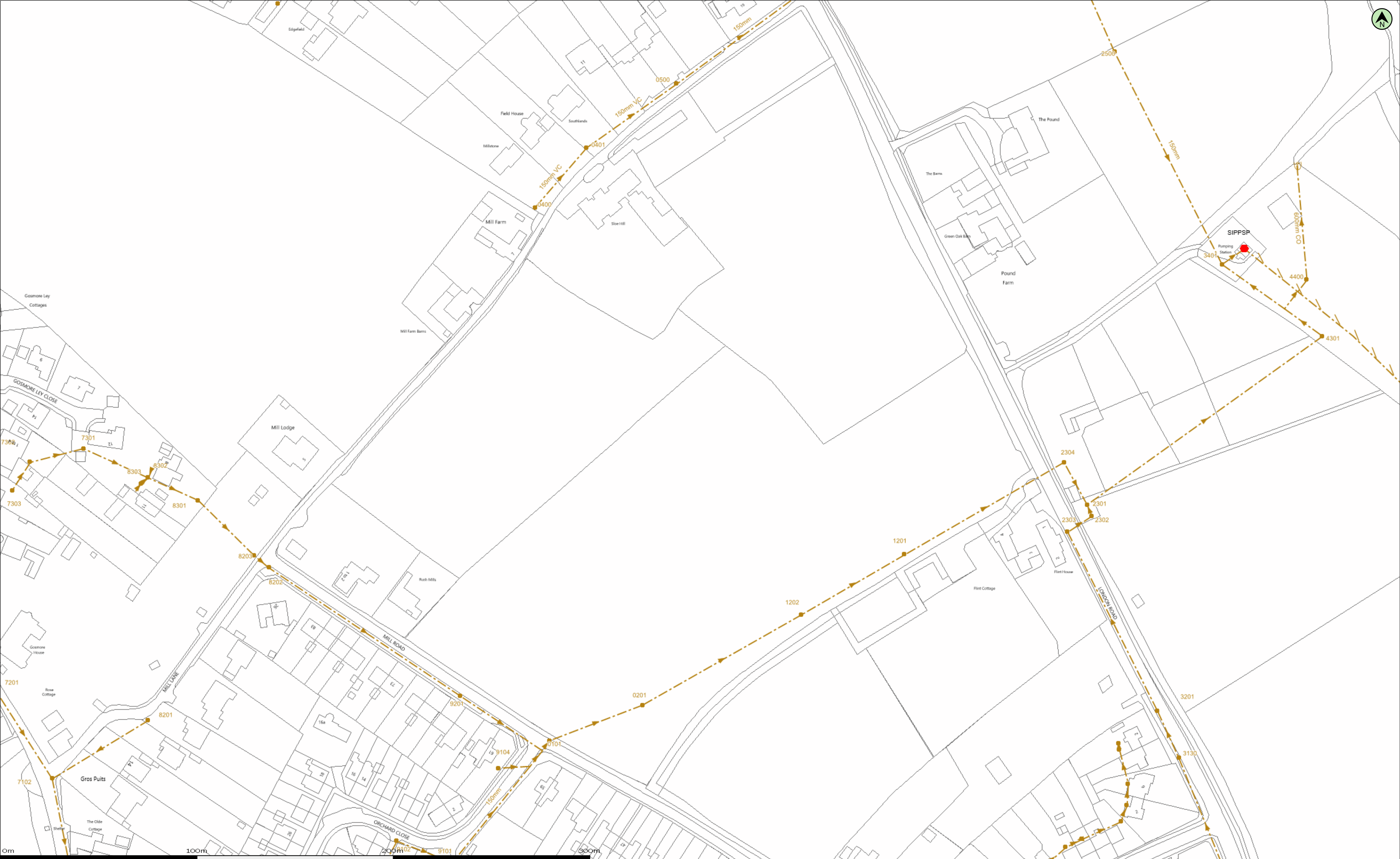


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1:2,500

	Distribution Main		Hydrant
	Asbestos Distribution Main		Fitting
	Abandoned Main		Easement
	Asbestos Abandoned Main		Company Boundary
	Adit / Tunnel		
	Cable		
	Searched Location		



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Date: 27/11/18

Scale: 1:1250

Map Centre: 519085,227351

Data updated: 04/09/18

Our Ref: 289634 - 1

Wastewater Plan A2

This plan is provided by Anglian Water pursuant its obligations under the Water Industry Act 1991 sections 198 or 199. It must be used in conjunction with any search results attached. The information on this plan is based on data currently recorded but position must be regarded as approximate. Service pipes, private sewers and drains are generally not shown. Users of this map are strongly advised to commission their own survey of the area shown on the plan before carrying out any works. The actual position of all apparatus MUST be established by trial holes. No liability whatsoever, including liability for negligence, is accepted by Anglian Water for any error or inaccuracy or omission, including the failure to accurately record, or record at all, the location of any water main, discharge pipe, sewer or disposal main or any item of apparatus. This information is valid for the date printed. This plan is produced by Anglian Water Services Limited (c) Crown copyright and database rights 2018 Ordnance Survey 100022432. This map is to be used for the purposes of viewing the location of Anglian Water plant only. Any other uses of the map data or further copies is not permitted. This notice is not intended to exclude or restrict liability for death or personal injury resulting from negligence.

Foul Sewer		
Surface Sewer		Outfall*
Combined Sewer		
Final Effluent		Inlet*
Rising Main*		
Private Sewer*		Manhole*
Decommissioned Sewer*		

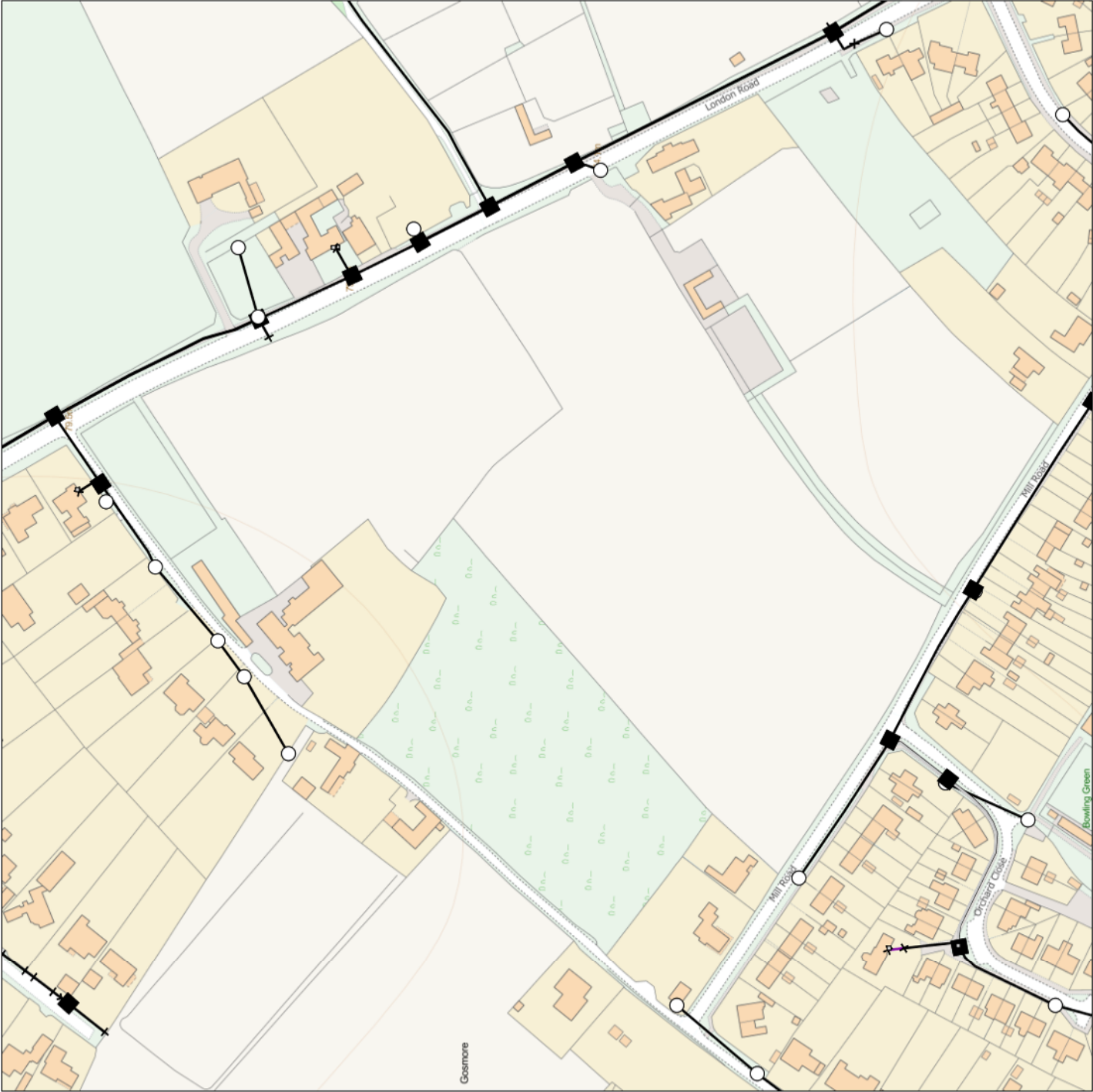
	Sewage Treatment Works	
	Public Pumping Station	
	Decommissioned Pumping Station	

*(Colour denotes effluent type)

jwestern@rsk.co.uk
1920378



Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.



openreach

CLICK BEFORE YOU DIG

FOR PROFESSIONAL FREE ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS INCLUDING LOCATE AND MARKING SERVICE

email cbvd@openreach.co.uk

ADVANCE NOTICE REQUIRED
(Office hours: Monday - Friday 08.00 to 17.00)
www.openreach.co.uk/cbvd

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KEY TO BT SYMBOLS

	Planned	Live	Change Of State	Hatchings
PCP			Split Coupling	Built
Pole			Duct Tee	Planned
Box			Building	Inferred
Manhole			Kiosk	Duct
Cabinet				

Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

Pending Add	In Place	Pending Remove	Not In Use
Power Cable			
Power Duct			N/A

BT Ref : XSP12325T

Map Reference : (centre) TL1908527351
Easting/Northing : (centre) 519085,227351

Issued : 27 / 11 / 2018 12:32:57

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk

Jessica Western

From: cschighways@hertfordshire.gov.uk
Sent: 29 November 2018 07:48
To: Jessica Western
Subject: 1920378 Mill Lane/ London Road, Hitchin SG4 7NF
Attachments: image001.png; image008.jpg; image009.jpg; image010.jpg; Site.docx

Dear Jessica Western,

Thank you for contacting Herts County Council with your request for plant information.

We hold no plans showing the position of underground apparatus maintained by Hertfordshire County Council at this location.

Please be aware there is a **highways drainage system, street lighting and associated power cables** located in the streets for which you have requested information.

Traffic signal and traffic counter loops can be identified from a surface inspection and may also be present at this location.

For information on special engineering difficulty structures in this location please contact our structures team on, highway.structure@hertfordshire.gov.uk.

Kind Regards,

Brandon

Highways Support Team

Hertfordshire County Council
www.hertfordshire.gov.uk/highways

How do you rate the service provided in this email? Please click on one of the faces and tell us why the service was Good, Average or Poor.



[Good](#) [Average](#) [Poor](#)



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Hertfordshire - County of Opportunity

-----Original Message-----

From: JWestern@rsk.co.uk

Sent: Nov 27, 2018 12:30:59 PM

To: plantenquiries@instalcom.co.uk; asset.team@cityfibre.com; plantenquiries@catelecomuk.com; plantenquiries@energetics-uk.com; nrswa@cofely-gdfsuez.com; CSCHighways@hertfordshire.gov.uk; interoute.enquiries@plancast.co.uk; kpn.plantenquiries@instalcom.co.uk; mbnl.plant.enquiries@turntown.com; nrswa@sky.uk; SOTA.plantenquiries@instalcom.co.uk; assetrecords@utilityassets.co.uk; osp-team@uk.verizonbusiness.com; PlantEnquiriesTeam@virginmedia.co.uk; OSM.enquiries@atkinsglobal.com

Subject: 1920378 Mill Lane/ London Road, Hitchin SG4 7NF

/* Font Definitions */

@font-face

{font-family:"Cambria Math";
panose-1:2 4 5 3 5 4 6 3 2 4;}

@font-face

{font-family:Calibri;
panose-1:2 15 5 2 2 2 4 3 2 4;}

/* Style Definitions */

p.MsoNormal, li.MsoNormal, div.MsoNormal

{margin:0cm;

margin-bottom:.0001pt;

font-size:11.0pt;

font-family:"Calibri",sans-serif;

mso-fareast-language:EN-US;}

a:link, span.MsoHyperlink

{mso-style-priority:99;

color:blue;

text-decoration:underline;}

a:visited, span.MsoHyperlinkFollowed

{mso-style-priority:99;

color:purple;

text-decoration:underline;}

span.EmailStyle17

{mso-style-type:personal-compose;

font-family:"Calibri",sans-serif;

color:windowtext;}

.MsoChpDefault

{mso-style-type:export-only;

font-family:"Calibri",sans-serif;

mso-fareast-language:EN-US;}

@page WordSection1

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margin:72.0pt 72.0pt 72.0pt 72.0pt;}

div.WordSection1

{page:WordSection1;}

-->

Good Afternoon,

Our company is currently undertaking an intrusive site investigation of the area detailed below.

Our reference: 1920378

Location of works:

Mill Lane/ London Road, Hitchin

O.S. Grid Ref.:

519085, 227351

Address/Nearest Postcode:

SG4 7NF

Expected Start Date:

Expected Completion Date:

A plan of the site has been enclosed, please cover the entire area shown within the boundary on the attached map.

In order that all reasonable precautions may be taken to avoid the risk to health and safety through contacts with any of your existing apparatus during execution of the

proposed works, please indicate the position and depth of all main statutory services and wayleaves on site and in the adjoining roads where applicable. In addition, please highlight any likely special problems that could arise in connection with your apparatus as a result of the proposed works.

We therefore request that you supply us with relevant plan information or written confirmation to declare that no apparatus is affected at your earliest convenience.

Should you encounter any problems or require any further information, please contact me on the above address or by telephoning 01442 416626, any costs will be accepted with approval first.

Many Thanks,

Jessica Western

Utility Report Co-ordinator

I work part-time Mondays (until 3.00pm), Tuesdays (all day), Wednesdays (until 3.00pm), Thursdays (all day) Friday (until 3.00pm) I will respond to your e mail as soon as I am back in the office.

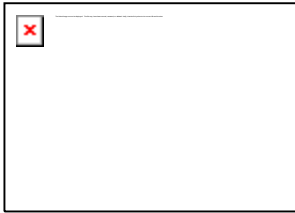
RSK

18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT, UK

Switchboard: +44 (0)1442 437500 · Fax: +44 (0)1442 437550 · Direct dial: +44 01442 416626 (0) · Mobile: +44 (0) 7471 354 928 jwestern@rsk.co.uk

<http://www.rsk.co.uk> |
RSK Geophysics
Download Geophysics
Guide  Follow
@RSK_Geophysics





RSK Environment Ltd is registered in Scotland at 65 Sussex Street, Glasgow, Scotland, G41 1DX, UK

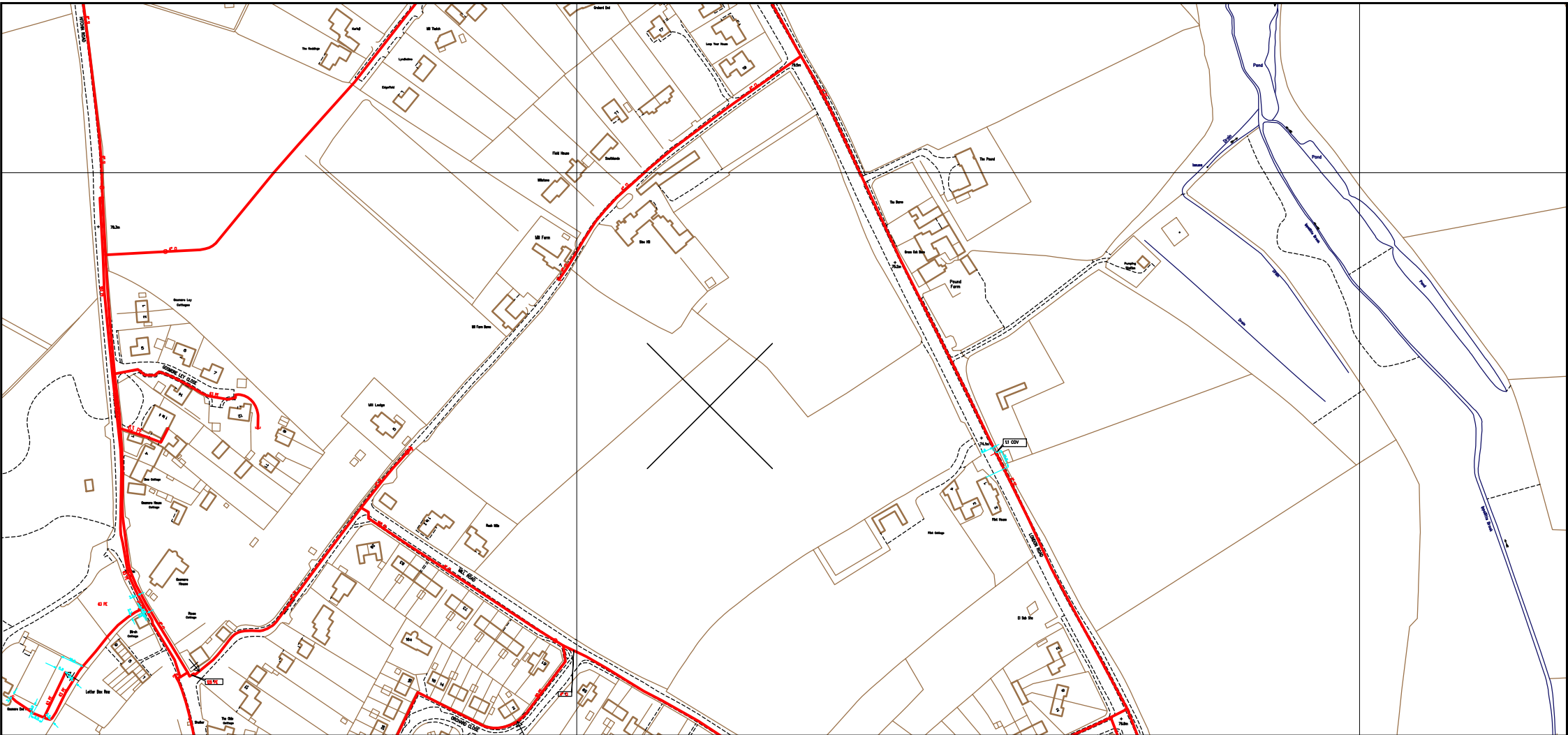
Registered number: 115530

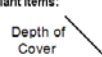
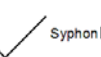
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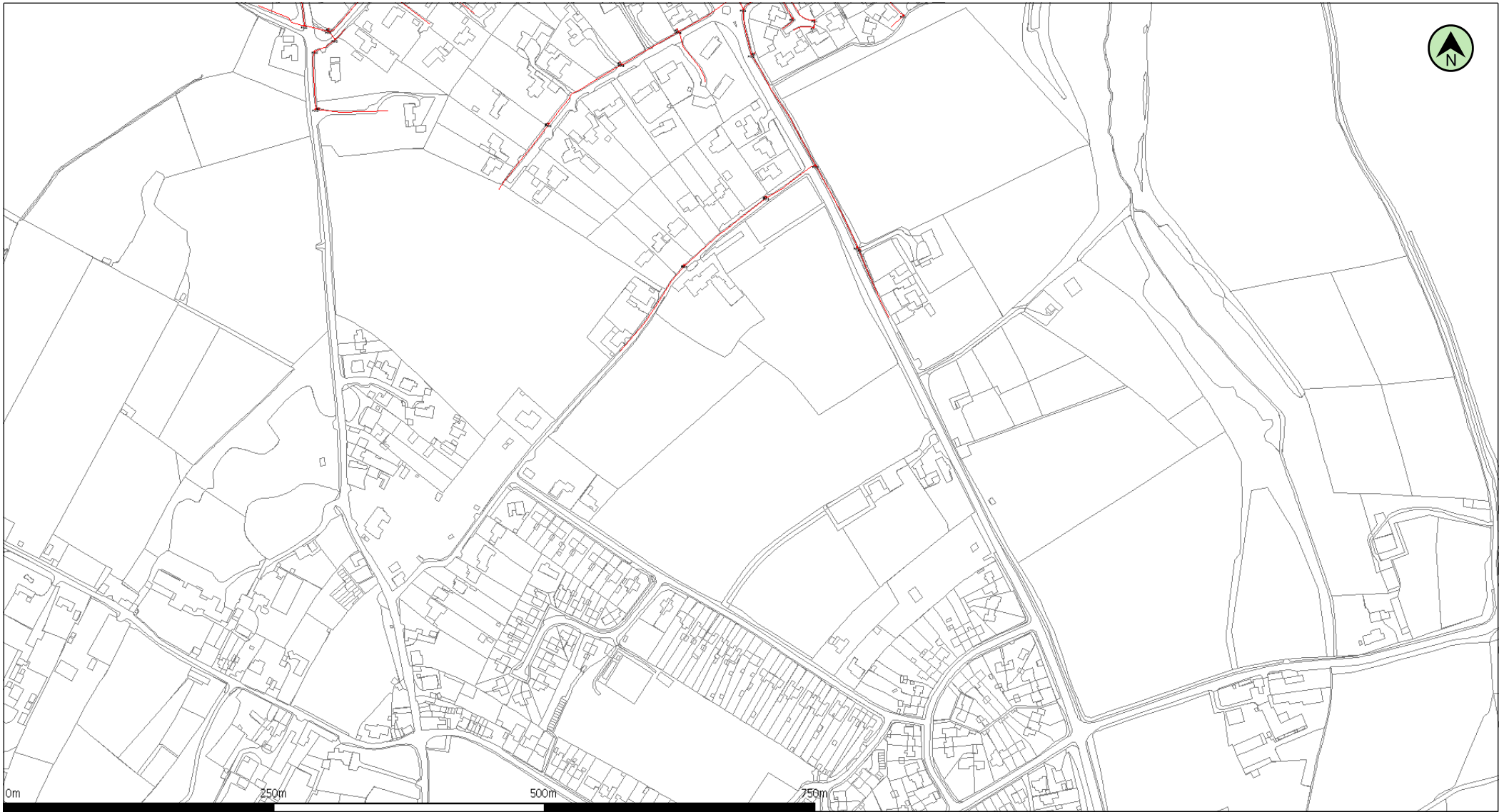
Before printing think
about your responsibility and commitment to the **ENVIRONMENT!**

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SCALE: Not to scale		This plan shows those pipes owned by Cadent Gas Ltd in their role as a Licensed Gas Transporter (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area. Information with regard to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Ltd or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue. Further information on all DR4s can be determined by calling the DR4 hotline on 01455 892426 (9am-5pm) A DR4 is where a potential error has been identified within the asset record and a process is currently underway to investigate and resolve the error as appropriate.	MAPS Viewer Version 5.8.0.1		
USER ID: JWestern			Local Machine		
DATE: 27/11/2018					
EXTRACT DATE: 31/08/2018					
MAP REF: TL1927					
CENTRE: 519132, 227374		This plan is reproduced from or based on the OS map by Cadent Gas Ltd, with the sanction of the controller of HM Stationery Office. Crown Copyright Reserved.			
Some examples of Plant Items:					
					



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Important Information - please read The purpose of this plan is to identify Virgin Media apparatus. We have tried to make it as accurate as possible but we cannot warrant its accuracy. In addition, we caution that within Virgin Media apparatus there may be instances where mains voltage power cables have been placed inside green, rather than black ducting. Further details can be found using the "Affected Postcodes.pdf", which can be downloaded from this website. Therefore, you must not rely solely on this plan if you are carrying out any excavation or other works in the vicinity of Virgin Media apparatus. The actual position of any underground service must be verified by cable detection equipment, etc. and established on site before any mechanical plant is used. Accordingly, unless it is due to the negligence of Virgin Media, its employees or agents, Virgin Media will not have any liability for any omissions or inaccuracies in the plan or for any loss or damage caused or arising from the use of and/or any reliance on this plan. This plan is produced by Virgin Media Limited (c) Crown copyright and database rights 2018 Ordnance Survey 100019209.

Duct, Trench



Chamber



Cabinet



roohi.zama@virginmedia.co.uk

VM.1122126



Proximity of Other Plant

A minimum clearance of 300 millimetres (mm) should be allowed between any plant being installed and an existing gas main to facilitate repair, whether the adjacent plant be parallel to or crossing the gas pipe. No apparatus should be laid over and along the line of a gas pipe irrespective of clearance.

No manhole or chambers shall be built over or around a gas pipe and no work should be carried out which results in a reduction of cover or protection over a pipe, without consultation with ESP Utilities Group.

Support and Backfill

Where excavation of trenches adjacent to any pipe affects its support, the pipe must be supported to the satisfaction of ESP Utilities Group and must not be used as an anchor or support in any way. In some cases, it may be necessary to divert the gas pipe before work commences.

Where a trench is excavated crossing or parallel to the line of the gas pipe, the backfill should be adequately compacted, particularly beneath the pipe, to prevent any settlement which could subsequently cause damage to the pipe.

In special cases it may be necessary to provide permanent support to the gas pipe, before backfilling and reinstatement is carried out. Backfill material adjacent to gas plant must be selected fine material or sand, containing no stones, bricks or lumps of concrete, etc., placed to a minimum depth of 150mm around the pipes and well compacted by hand. No power compaction should take place until 300mm of selected fine fill has been suitably compacted.

If the road construction is in close proximity to the top of the gas pipe, a "cushion" of selected fine material such as sand must be used to prevent the traffic shock being transmitted to the gas pipe. The road construction depth must not be reduced without permission from the local Highway Authority.

No concrete or other hard material must be placed or left under or adjacent to any Cast Iron pipe as this may cause fracture of the pipe at a later date.

Concrete backfill should not be used closer than 300 mm to the pipe.

Damage to Coating

Where a gas pipe is coated with special wrapping and this is damaged, even to a minor extent ESP Utilities Group must be notified so that repairs can be made to prevent future corrosion and subsequent leakage.

Welding or "Hot Works"

When welding or other "hot works" involving naked flames are to be carried out in close proximity to gas plant and the presence of gas is suspected, ESP Utilities Group must be contacted before work commences to check the atmosphere. Even when a gas free atmosphere exists care must be taken when carrying out hot works in close proximity to gas plant in order to ensure that no damage occurs.

Particular care must be taken to avoid damage by heat or naked flame to plastic gas pipes or to the protective coating on other gas pipes.

Leakage from Gas Mains or Services

If damage or leakage is caused or an escape of gas is smelt or suspected the following action should be taken at once:

- ❖ Remove all personnel from the immediate vicinity of the escape;
- ❖ Contact the National Gas Emergency Service on: **0800 111 999**;
- ❖ Prevent any approach by the public, prohibit smoking, extinguish all naked flames or other source of ignition for at least 15 metres from the leakage;
- ❖ Assist gas personnel, Police or Fire Service as requested.

REMEMBER - IF IN DOUBT; SEEK ADVICE FROM ESP UTILITIES GROUP.

ESP Utilities Group can be contacted at:

Office Address: Bluebird House, Mole Business Park, Leatherhead, Surrey, KT22 7BA

Office Tel: 01372 587 500; **Fax:** 01372 377 996

APPENDIX D

EXPLORATORY HOLE RECORDS

TRIAL PIT LOG

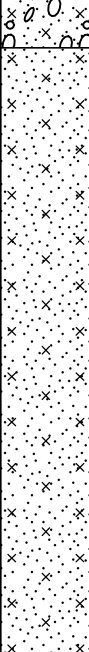
Contract: Hitchin, London Rd			Client: Martin Grant Homes		Trial Pit: TP1
Contract Ref: 1920378	Start: 03.12.18 End: 03.12.18	Ground Level: 77.84	National Grid Co-ordinate: E:519040.1 N:227372.9		Sheet: 1 of 1

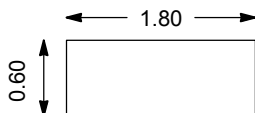
Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES				Soft dark brown very sandy CLAY. Sand is fine to coarse. With rootlets. (TOPSOIL)	(0.30) 0.30	
0.50	2	ES				Soft orangish brown sandy CLAY. Sand is fine to medium. (GLACIOFLUVIAL DEPOSITS)	(0.35) 0.65	
1.50	3	D				Medium dense yellowish brown silty SAND. Sand is fine to medium. (GLACIOFLUVIAL DEPOSITS)	(1.75) 2.40	
						Medium dense slightly gravelly SAND. Sand is fine to coarse. Gravel is angular to rounded. Very gravelly in places. (GLACIOFLUVIAL DEPOSITS)	(1.10) 3.50	
						Trial pit terminated at 3.5m depth		

Plan (Not to Scale)		General Remarks			
		1. Permit to dig approved 2. No groundwater was encountered 3. Trial pit remained stable during excavation 4. Trial pit was backfilled with arisings on completion			
		All dimensions in metres		Scale:	1:25
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: ???	Checked By:		

TRIAL PIT LOG

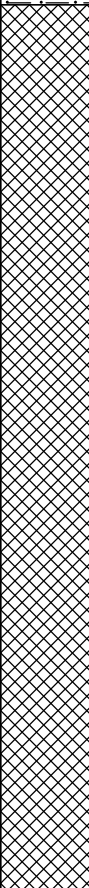
Contract: Hitchin, London Rd		Client: Martin Grant Homes		Trial Pit: TP2
Contract Ref: 1920378	Start: 03.12.18 End: 03.12.18	Ground Level: 78.87	National Grid Co-ordinate: E:518983.6 N:227355.6	Sheet: 1 of 1

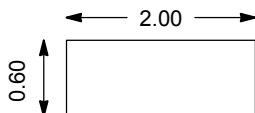
Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES				Soft dark brown very sandy CLAY. Sand is fine to coarse. With rootlets. With rare cobbles of fragmented bricks (TOPSOIL)	(0.35)	
0.50	2	ES				Reddish brown silty SAND. Sand is fine to coarse. With variable content of gravel. Gravel is angular to rounded fine to coarse flints with occasional cobbles of gravel (GLACIOFLUVIAL DEPOSITS)	(0.30)	
						Yellow silty SAND. Sand is fine to medium. With rootlets. (GLACIOFLUVIAL DEPOSITS)	(2.05)	
						at 2.1m with partings of sandy silt. Sand is fine.	2.70	
						Trial pit terminated at 2.7m depth.		

Plan (Not to Scale) 		General Remarks 1. Permit to dig approved 2. No groundwater was encountered 3. Trial pit remained stable during excavation 4. Trial pit was backfilled with arisings on completion	
Method Used: Machine dug		Plant Used: JCB-3CX	
Logged By: ???		Checked By: ???	
All dimensions in metres		Scale: 1:25	

TRIAL PIT LOG

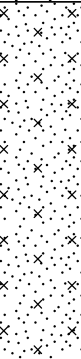
Contract: Hitchin, London Rd			Client: Martin Grant Homes		Trial Pit: TP3
Contract Ref: 1920378	Start: 03.12.18 End: 03.12.18	Ground Level: 79.08	National Grid Co-ordinate: E:518971.8 N:227360.3		Sheet: 1 of 1

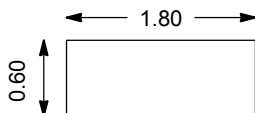
Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.50 0.50	1	ES PID	<0.1ppm			Soft dark brown very sandy CLAY. Sand is fine to coarse. With rootlets. (TOPSOIL) Orangish brown very sandy very gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flints with a significant proportion of anthropogenic material: fragments of bricks, concrete, bituminous material, charcoal, ceramic, structured chalk with rare glass. with cobbles of concrete, bricks and bituminous material. With clayey very sandy gravel in places (MADE GROUND)	0.25	
1.50	2	ES				at 1.3m with partings of ash	(2.95)	
						Trial pit terminated at 3.2m depth	3.20	

Plan (Not to Scale)		General Remarks			
		1. Permit to dig approved 2. No groundwater was encountered 3. Trial pit remained stable during excavation 4. Trial pit was backfilled with arisings on completion			
		All dimensions in metres		Scale:	1:25
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: ???	Checked By:		

TRIAL PIT LOG

Contract: Hitchin, London Rd		Client: Martin Grant Homes		Trial Pit: TP4
Contract Ref: 1920378	Start: 03.12.18 End: 03.12.18	Ground Level: 77.89	National Grid Co-ordinate: E:518957.7 N:227344.2	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES				Soft dark brown very sandy CLAY. Sand is fine to coarse. With rootlets. (TOPSOIL)	(0.30)	
						Reddish brown becoming yellowish brown silty SAND. Sand is fine (GLACIOFLUVIAL DEPOSITS)	0.30	
							(1.20)	
						Trial pit terminated at 1.5m depth	1.50	

Plan (Not to Scale)		General Remarks		
		1. Permit to dig approved 2. No groundwater was encountered 3. Trial pit remained stable during excavation 4. Trial pit was backfilled with arisings on completion		
		All dimensions in metres	Scale:	1:25
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: ???	Checked By:	

TRIAL PIT LOG

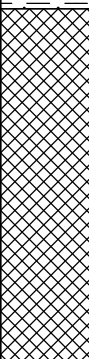
Contract: Hitchin, London Rd		Client: Martin Grant Homes		Trial Pit: TP5
Contract Ref: 1920378	Start: 03.12.18 End: 03.12.18	Ground Level: 78.46	National Grid Co-ordinate: E:518952.3 N:227355.9	Sheet: 1 of 1

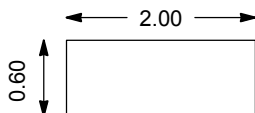
Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.50 0.50	1	ES PID	<0.1ppm			Soft dark brown very sandy CLAY. Sand is fine to coarse. With rootlets. (TOPSOIL) Orangish brown very sandy very gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flints with a significant proportion of anthropogenic material: fragments of bricks, concrete, bituminous material, charcoal, ceramic, structured chalk. with rare glass, slate, fragmented wood. with cobbles of concrete, bricks and bituminous material. With clayey very sandy gravel in places. (MADE GROUND)	(0.30) 0.30	
							(3.10)	
						Trial pit terminated at 3.4m depth	3.40	

Plan (Not to Scale) 		General Remarks 1. Permit to dig approved 2. No groundwater was encountered 3. Trial pit remained stable during excavation 4. Trial pit was backfilled with arisings on completion	
Method Used: Machine dug		Plant Used: JCB-3CX	
Logged By: ???		Checked By: ???	
All dimensions in metres		Scale: 1:25	

TRIAL PIT LOG

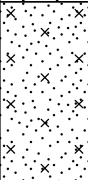
Contract: Hitchin, London Rd		Client: Martin Grant Homes		Trial Pit: TP6
Contract Ref: 1920378	Start: 03.12.18 End: 03.12.18	Ground Level: 78.07	National Grid Co-ordinate: E:518936.4 N:227352.0	Sheet: 1 of 1

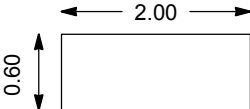
Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.50 0.50	1	ES PID	<0.1ppm			Soft dark brown very sandy CLAY. Sand is fine to coarse. With rootlets. (TOPSOIL)	(0.30) 0.30	
						Orangish brown very sandy very gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flints with a significant proportion of anthropogenic material: fragments of bricks, concrete, bituminous material, charcoal, ceramic, structured chalk. with rare glass. with cobbles of concrete, bricks and bituminous material. (MADE GROUND)	(1.20) 1.50	
						Medium dense to very dense yellowish brown silty SAND. Sand is fine to medium. (GLACIOFLUVIAL DEPOSITS) Trial pit terminated at 1.7m depth	1.70	

Plan (Not to Scale)		General Remarks		
		1. Permit to dig approved 2. No groundwater was encountered 3. Trial pit remained stable during excavation 4. Trial pit was backfilled with arisings on completion		
All dimensions in metres		Scale: 1:25		
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: ???	Checked By:	

TRIAL PIT LOG

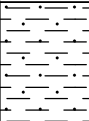
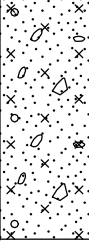
Contract: Hitchin, London Rd			Client: Martin Grant Homes		Trial Pit: TP7
Contract Ref: 1920378	Start: 03.12.18 End: 03.12.18	Ground Level: 77.83	National Grid Co-ordinate: E:518970.9 N:227343.6		Sheet: 1 of 1

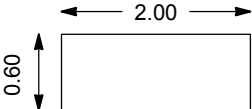
Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES				Soft dark brown very sandy CLAY. Sand is fine to coarse. With rootlets. (TOPSOIL)	(0.30)	
						Dark yellow silty SAND. Sand is fine to medium. (GLACIOFLUVIAL DEPOSITS)	(0.60)	
						Trial pit terminated at 0.9m depth	0.90	

Plan (Not to Scale)			General Remarks		
			1. Permit to dig approved 2. No groundwater was encountered 3. Trial pit remained stable during excavation 4. Trial pit was backfilled with arisings on completion		
All dimensions in metres			Scale: 1:25		
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: ???	Checked By:		

TRIAL PIT LOG

Contract: Hitchin, London Rd			Client: Martin Grant Homes		Trial Pit: TP8
Contract Ref: 1920378	Start: 03.12.18 End: 03.12.18	Ground Level: 80.21	National Grid Co-ordinate: E:518987.4 N:227375.9		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES				Soft dark brown very sandy CLAY. Sand is fine to coarse. With rootlets. (TOPSOIL)	(0.40) 0.40	
						Dark yellow/reddish brown silty slightly gravelly SAND. Sand is fine to medium. Gravel is angular to rounded fine flints. (GLACIOFLUVIAL DEPOSITS)	(0.80) 1.20	
						Trial pit terminated at 1.2m depth		

Plan (Not to Scale)		General Remarks			
		1. Permit to dig approved 2. No groundwater was encountered 3. Trial pit remained stable during excavation 4. Trial pit was backfilled with arisings on completion			
		All dimensions in metres		Scale:	1:25
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: ???	Checked By:		

TRIAL PIT LOG

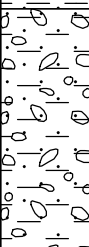
Contract: Hitchin, London Rd			Client: Martin Grant Homes		Trial Pit: TP9
Contract Ref: 1920378		Start: 03.12.18 End: 03.12.18	Ground Level: 80.32	National Grid Co-ordinate: E:518972.4 N:227379.3	Sheet: 1 of 1

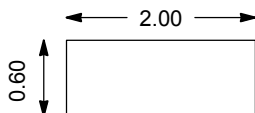
[illegible]

Plan (Not to Scale)		General Remarks						
A diagram showing a rectangular trial pit. The width is labeled as 2.00 and the depth is labeled as 0.60.		1. Permit to dig approved 2. No groundwater was encountered 3. Trial pit remained stable during excavation 4. Trial pit was backfilled with arisings on completion						
		All dimensions in metres	Scale:	1:25				
Method Used:	Machine dug	Plant Used:	JCB-3CX	Logged By:	???	Checked By:		

TRIAL PIT LOG

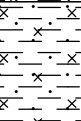
Contract: Hitchin, London Rd		Client: Martin Grant Homes		Trial Pit: TP10
Contract Ref: 1920378	Start: 03.12.18 End: 03.12.18	Ground Level: 80.87	National Grid Co-ordinate: E:518978.8 N:227394.8	Sheet: 1 of 1

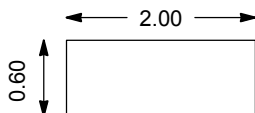
Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES	<0.1ppm			Soft dark brown very sandy CLAY. Sand is fine to coarse. With rootlets. (TOPSOIL)	(0.30) 0.30	
0.50 0.50	2	ES PID				Orangish brown sandy clayey GRAVEL. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint (GLACIOFLUVIAL DEPOSITS)	(0.80) 1.10	
						Trial pit terminated at 1.1m depth		

Plan (Not to Scale) 		General Remarks 1. Permit to dig approved 2. No groundwater was encountered 3. Trial pit remained stable during excavation 4. Trial pit was backfilled with arisings on completion		
		All dimensions in metres		Scale: 1:25
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: ???	Checked By:	

TRIAL PIT LOG

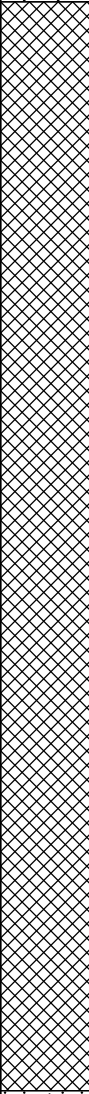
Contract: Hitchin, London Rd			Client: Martin Grant Homes		Trial Pit: TP11
Contract Ref: 1920378	Start: 03.12.18 End: 03.12.18	Ground Level: 78.31	National Grid Co-ordinate: E:519008.4 N:227355.4		Sheet: 1 of 1

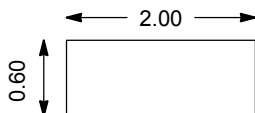
Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.20	1	ES				Soft dark brown very sandy CLAY. Sand is fine to coarse. With rootlets. (TOPSOIL)	(0.30) 0.30	
						Medium dense orangish brown clayey very gravelly SAND. Gravel is angular to rounded fine to coarse flints. Sand is fine to coarse (GLACIOFLUVIAL DEPOSITS)	(1.10) 1.40	
						Firm orangish brown slightly sandy silty CLAY becoming stiff at 1.6m (GLACIOFLUVIAL DEPOSITS)	(0.40) 1.80	
						Trial pit terminated at 1.8m depth		

Plan (Not to Scale)			General Remarks		
			1. Permit to dig approved 2. No groundwater was encountered 3. Trial pit remained stable during excavation 4. Trial pit was backfilled with arisings on completion		
All dimensions in metres			Scale: 1:25		
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: ???	Checked By:		

TRIAL PIT LOG

Contract: Hitchin, London Rd		Client: Martin Grant Homes		Trial Pit: TP12
Contract Ref: 1920378	Start: 03.12.18 End: 03.12.18	Ground Level: 78.28	National Grid Co-ordinate: E:518962.4 N:227357.4	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.50 0.50	0.5	ES PID	<0.1ppm			Soft dark brown very sandy CLAY. Sand is fine to coarse. With rootlets. (TOPSOIL)	(0.30) 0.30	
2.00	2	ES				Orangish brown very sandy very gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flints with a significant proportion of anthropogenic material: fragments of bricks, concrete, bituminous material, charcoal, ceramic, structured chalk. with rare glass. with cobbles of concrete, bricks and bituminous material. With clayey very sandy gravel in places (MADE GROUND)	(3.60)	
						Medium dense yellowish brown silty SAND. Sand is fine to medium. (GLACIOFLUVIAL DEPOSITS)	3.90 4.00	
Trial pit terminated at 4.0m depth								

Plan (Not to Scale)		General Remarks		
		1. Permit to dig approved 2. No groundwater was encountered 3. Trial pit remained stable during excavation 4. Trial pit was backfilled with arisings on completion		
		All dimensions in metres	Scale:	1:25
Method Used: Machine dug	Plant Used: JCB-3CX	Logged By: ???	Checked By:	

APPENDIX E

LABORATORY CERTIFICATES FOR SOIL ANALYSIS

FINAL ANALYTICAL TEST REPORT

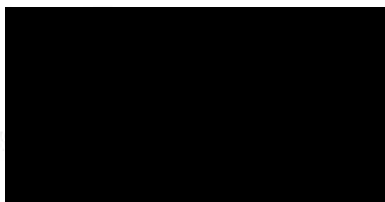
Envirolab Job Number: 18/10279
Issue Number: 1

Date: 19 December, 2018

Client: RSK Environment Ltd Hemel
18 Frogmore Road
Hemel Hempstead
Hertfordshire
UK
HP3 9RT

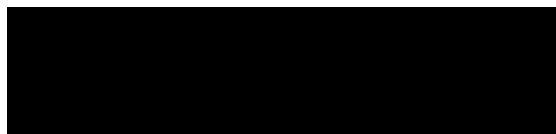
Project Manager: Dave Anchor/Sylwia Mianowska
Project Name: Hitchin, London Rd
Project Ref: 1920378
Order No: N/A
Date Samples Received: 06/12/18
Date Instructions Received: 06/12/18
Date Analysis Completed: 18/12/18

Prepared by:



Elisha Hartley
Admin Assistant

Approved by:



Danielle Brierley
Client Manager

Envirolab Job Number: 18/10279

Client Project Name: Hitchin, London Rd

Client Project Ref: 1920378

Lab Sample ID	18/10279/1	18/10279/2	18/10279/3	18/10279/4	18/10279/5	18/10279/6			Units	Method ref
Client Sample No										
Client Sample ID	TP3	TP5	TP6	TP9	TP10	TP12				
Depth to Top	0.50	0.50	0.50	0.50	0.50	0.50				
Depth To Bottom										
Date Sampled	03-Dec-18	03-Dec-18	03-Dec-18	03-Dec-18	03-Dec-18	03-Dec-18				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	4A	4AE	4A	5A	4AE	4AE				
% Stones >10mm _A	15.5	18.8	3.1	14.2	44.3	4.3			% w/w	A-T-044
pH _D ^{M#}	8.39	8.19	8.22	8.17	7.82	7.86			pH	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			g/l	A-T-026s
Sulphate (acid soluble) _D ^{M#}	<200	240	380	430	<200	270			mg/kg	A-T-028s
Arsenic _D ^{M#}	7	9	9	8	43	11			mg/kg	A-T-024s
Cadmium _D ^{M#}	0.8	0.6	0.7	0.7	1.2	0.7			mg/kg	A-T-024s
Copper _D ^{M#}	15	14	16	20	12	14			mg/kg	A-T-024s
Chromium _D ^{M#}	33	23	31	21	16	33			mg/kg	A-T-024s
Lead _D ^{M#}	28	38	51	53	17	29			mg/kg	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17			mg/kg	A-T-024s
Nickel _D ^{M#}	33	28	29	22	53	33			mg/kg	A-T-024s
Selenium _D [#]	<1	<1	<1	<1	1	<1			mg/kg	A-T-024s
Zinc _D ^{M#}	78	87	86	113	135	71			mg/kg	A-T-024s

Envirolab Job Number: 18/10279

Client Project Name: Hitchin, London Rd

Client Project Ref: 1920378

Lab Sample ID	18/10279/1	18/10279/2	18/10279/3	18/10279/4	18/10279/5	18/10279/6			Units	Method ref
Client Sample No										
Client Sample ID	TP3	TP5	TP6	TP9	TP10	TP12				
Depth to Top	0.50	0.50	0.50	0.50	0.50	0.50				
Depth To Bottom										
Date Sampled	03-Dec-18	03-Dec-18	03-Dec-18	03-Dec-18	03-Dec-18	03-Dec-18				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	4A	4AE	4A	5A	4AE	4AE				
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	NAD	-	NAD				A-T-045
Asbestos ACM - Suitable for Water Absorption Test?	N/A	N/A	N/A	N/A	-	N/A				

Envirolab Job Number: 18/10279

Client Project Name: Hitchin, London Rd

Client Project Ref: 1920378

Lab Sample ID	18/10279/1	18/10279/2	18/10279/3	18/10279/4	18/10279/5	18/10279/6			Units	Method ref
Client Sample No										
Client Sample ID	TP3	TP5	TP6	TP9	TP10	TP12				
Depth to Top	0.50	0.50	0.50	0.50	0.50	0.50				
Depth To Bottom										
Date Sampled	03-Dec-18	03-Dec-18	03-Dec-18	03-Dec-18	03-Dec-18	03-Dec-18				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	4A	4AE	4A	5A	4AE	4AE				
PAH-16MS										
Acenaphthene _A ^{M#}	0.38	0.02	0.11	0.12	<0.01	<0.01			mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	0.06	0.03	<0.01	0.15	<0.01	<0.01			mg/kg	A-T-019s
Anthracene _A ^{M#}	1.09	0.12	0.13	0.86	<0.02	<0.02			mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	2.91	0.77	0.18	2.52	<0.04	0.04			mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	1.99	0.64	0.13	1.62	<0.04	<0.04			mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	2.56	0.83	0.16	2.16	<0.05	<0.05			mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.82	0.31	0.06	0.69	<0.05	<0.05			mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.88	0.28	<0.07	0.75	<0.07	<0.07			mg/kg	A-T-019s
Chrysene _A ^{M#}	2.65	0.85	0.19	2.40	<0.06	<0.06			mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.18	0.07	<0.04	0.17	<0.04	<0.04			mg/kg	A-T-019s
Fluoranthene _A ^{M#}	7.29	1.50	0.47	6.59	<0.08	<0.08			mg/kg	A-T-019s
Fluorene _A ^{M#}	0.21	0.02	0.07	0.29	<0.01	<0.01			mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	1.17	0.43	0.09	0.97	<0.03	<0.03			mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03			mg/kg	A-T-019s
Phenanthrene _A ^{M#}	4.37	0.35	0.51	3.65	<0.03	<0.03			mg/kg	A-T-019s
Pyrene _A ^{M#}	5.98	1.35	0.39	5.23	<0.07	<0.07			mg/kg	A-T-019s
Total PAH-16MS _A ^{M#}	32.5	7.57	2.49	28.2	<0.08	<0.08			mg/kg	A-T-019s

Envirolab Job Number: 18/10279

Client Project Name: Hitchin, London Rd

Client Project Ref: 1920378

Lab Sample ID	18/10279/1	18/10279/2	18/10279/3	18/10279/4	18/10279/5	18/10279/6			Units	Method ref
Client Sample No										
Client Sample ID	TP3	TP5	TP6	TP9	TP10	TP12				
Depth to Top	0.50	0.50	0.50	0.50	0.50	0.50				
Depth To Bottom										
Date Sampled	03-Dec-18	03-Dec-18	03-Dec-18	03-Dec-18	03-Dec-18	03-Dec-18				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	4A	4AE	4A	5A	4AE	4AE				
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	A-T-022s
Ali >C8-C10 _A ^{M#}	<1	<1	<1	<1	<1	<1			mg/kg	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1	<1	<1	<1	<1			mg/kg	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	<1	<1	<1	<1	<1			mg/kg	A-T-055s
Ali >C16-C21 _A ^{M#}	<1	<1	<1	<1	<1	<1			mg/kg	A-T-055s
Ali >C21-C35 _A	2	<1	3	3	<1	1			mg/kg	A-T-055s
Total Aliphatics _A	2	<1	3	3	<1	1			mg/kg	A-T-055s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	A-T-022s
Aro >C8-C10 _A ^{M#}	<1	<1	<1	<1	<1	<1			mg/kg	A-T-055s
Aro >C10-C12 _A ^{M#}	<1	<1	<1	<1	<1	<1			mg/kg	A-T-055s
Aro >C12-C16 _A	2	<1	12	2	<1	<1			mg/kg	A-T-055s
Aro >C16-C21 _A ^{M#}	16	3	47	34	<1	3			mg/kg	A-T-055s
Aro >C21-C35 _A ^{M#}	47	12	73	128	<1	12			mg/kg	A-T-055s
Total Aromatics _A	66	15	132	164	<1	16			mg/kg	A-T-055s
TPH (Ali & Aro >C5-C35) _A	66	16	135	167	<1	17			mg/kg	A-T-055s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	A-T-022s

REPORT NOTES

General:

This report shall not be reproduced, except in full, without written approval from Envirolab.

All samples contained within this report, and any received with the same delivery, will be disposed of one month after the date of this report.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed.

Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

APPENDIX F

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH

Generic assessment criteria for human health: residential scenario with home-grown produce

Background

RSK's generic assessment criteria (GAC) were initially prepared following the publication by the Environment Agency (EA) of soil guideline value (SGV) and toxicological (TOX) reports, and associated publications in 2009⁽¹⁾. RSK GAC were updated following the publication of GAC by LQM/CIEH in 2009⁽²⁾. RSK GAC are periodically revised when updated information on toxicological, land use or receptor parameters is published.

Updates to the RSK GAC

In 2014, the publication of Category 4 Screening Levels (C4SL)^(3,4), as part of the Defra-funded research project SP1010, included modifications to certain exposure assumptions documented within EA Science Report SC050221/SR3 (herein after referred to as SR3)⁽⁵⁾ used in the generation of SGVs.

C4SL were published for six substances (cadmium, arsenic, benzene, benzo(a)pyrene, chromium VI and lead) for a sandy loam soil type with 6% soil organic matter, based on a low level of toxicological concern (LLTC; see Section 2.3 of research project report SP1010⁽³⁾). Where a C4SL has been published, the RSK GAC duplicates the C4SL published values using all input parameters within the SP1010 final project report⁽³⁾ and associated appendices⁽⁶⁾, and adopts them as GAC for these six substances.

For all other substances the C4SL exposure modifications, with the exception of the “top two” produce type approach taken in the C4SL, have been applied to the current RSK GAC. These include alterations to daily inhalation rates for residential and commercial scenarios, reducing soil adherence factors in children (age classes 1 to 12 only) for residential land use, reducing exposure frequency for dermal contact outdoors for residential land use, and updated produce type consumption rates (90th percentile) based on recent data from the National Diet and Nutrition Survey.

The RSK GAC have also been revised with updated toxicology published by LQM/CIEH in 2015⁽⁷⁾ or by the USEPA⁽¹⁴⁾, where a C4SL has not been published.

RSK GAC derivation for metals and organic compounds

Model selection

Soil assessment criteria (SAC) were calculated using the Contaminated Land Exposure Assessment (CLEA) tool v1.071, supporting EA guidance^(5,8,9) and revised exposure scenarios published for the C4SL⁽³⁾. The SAC are also termed GAC.

Conceptual model

In accordance with SR3⁽⁵⁾, the residential with home-grown produce scenario considers risks to a female child between the ages of 0 and 6 years old as the highest risk scenario. In accordance with Box 3.1 of SR3⁽⁵⁾, the pathways considered for production of the SAC in the residential with home-grown produce scenario are

- direct soil and dust ingestion

- consumption of home-grown produce
- consumption of soil attached to home-grown produce
- dermal contact with soil and indoor dust
- inhalation of indoor and outdoor dust and vapours.

Figure 1 is a conceptual model illustrating these linkages.

In line with guidance in the EA SGV report for cadmium⁽¹⁾, the RSK GAC for cadmium has been derived based on estimates representative of lifetime exposure. Although young children are generally more likely to have higher exposures to soil contaminants, the renal toxicity of cadmium, and the derivation of the TDI_{oral} and TDI_{inh} , are based on considerations of the kidney burden accumulated over 50 years or so. It is therefore reasonable to consider exposure not just in childhood but averaged over a longer period.

With respect to volatilisation, the CLEA model assumes a simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase⁽⁹⁾. The upper boundaries of this partitioning are represented by the maximum aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA model estimates saturated soil concentrations where these limits are reached⁽⁹⁾. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous- or vapour-based soil saturation limits. Model output cells are flagged red where the saturated soil concentration has been exceeded and the contribution of the indoor and outdoor vapour pathway to total exposure is greater than 10%. In this case, further consideration of the following is required⁽⁹⁾:

- Free phase contamination may be present.
- Exposure from the vapour pathways will be over-predicted by the model, as in reality the vapour phase concentration will not increase at concentrations above saturation limits
- Where the vapour pathway contribution is greater than 90%, it is unlikely the relevant health criteria value (HCV) will be exceeded at soil concentrations at least a factor of ten higher than the relevant HCV.

Where the vapour pathway is the predominant pathway (contributes greater than 90% of exposure) or the only exposure route considered and the cell is highlighted red (SAC exceeds saturation limit), the risk based on the assumed conceptual model is likely to be negligible as the vapour risk is assumed to be tolerable at maximum possible soil concentrations. In such circumstances, the vapour pathway exposure should be considered based on the presence of free phase or non-aqueous phase liquid sources and the measured concentrations of volatile organic compounds (VOC) in the vapour phase. Screening could be considered based on setting the SAC as the modelled soil saturation limits. However, as stated within the CLEA handbook⁽⁹⁾, this is likely to not be practical in many cases because of the very low saturation limits and, in any case, is highly conservative.

It should also be noted that for mixtures of compounds, free phase may be present where soil (or groundwater) concentrations are well below saturation limits for individual compounds.

Where the vapour pathway is only one of the exposure pathways considered, an additional approach can then be utilised as detailed within Section 4.12 of the CLEA model handbook⁽⁹⁾, which explains how to calculate an effective assessment criterion manually.

SR3⁽⁵⁾ states that, as a general rule of thumb, it is recognised that estimating vapour phase concentrations from dissolved and sorbed phase contamination by petroleum hydrocarbons are

at least a factor of ten higher than those likely to be measured on-site. RSK has therefore applied an empirical subsurface to indoor air correction factor of 10 into the CLEA model chemical database for all petroleum hydrocarbon fractions (including BTEX, trimethylbenzenes and the polycyclic aromatic hydrocarbons (PAH) naphthalene, acenaphthene and acenaphthylene) to reduce this conservatism.

Input selection

The most up-to-date published chemical and toxicological data was obtained from EA Report SC050021/SR7⁽¹⁰⁾, the EA TOX⁽¹⁾ reports, the C4SL SP1010 project report and associated appendices^(3,6), the 2015 LQM/CIEH report⁽⁷⁾ or the USEPA IRIS database⁽¹⁴⁾. Where a C4SL has been published, the RSK GAC have duplicated the C4SL published values using all input parameters within the SP1010 final project report⁽³⁾ and associated appendices⁽⁶⁾, and has adopted them as GAC for these six substances. Toxicological and specific chemical parameters for 1,2,4-trimethylbenzene and methyl tertiary-butyl ether (MTBE) were obtained from the CL:AIRE Soil Generic Assessment Criteria report⁽¹¹⁾.

For TPH, aromatic hydrocarbons C₅–C₈ were not modelled, as this range comprises benzene (>EC5-EC7) and toluene (>EC7-EC8), which are modelled separately.

Physical parameters

For the residential with home-grown produce scenario, the CLEA default building is a small, two-storey terrace house with a concrete ground-bearing slab. The house is assumed to have a 100m² private garden consisting of lawn and flowerbeds, incorporating a 20m² plot for growing fruit and vegetables consumed by the residents. SR3⁽⁵⁾ notes this residential building type to be the most conservative in terms of potential for vapour intrusion. The building parameters used in the production of the RSK GACs are the default CLEA v1.06 inputs presented in Table 3.3 of SR3⁽³⁾, with a dust loading factor detailed in Section 9.3 of SR3⁽⁵⁾. The parameters for a sandy loam soil type were used in line with Table 4.4 of SR3⁽⁵⁾. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for SOM, RSK has produced an additional set of GAC for SOM of 1% and 2.5% for all substances using the CLEA tool.

Summary of modifications to the default CLEA SR3⁽⁵⁾ input parameters for residential with home-grown produce land-use scenario

In summary, the RSK GAC were produced using the default input parameters for soil properties, the air dispersion model, building properties and the vapour model detailed in SR3⁽⁵⁾. Modifications to the default SR3⁽⁵⁾ exposure scenarios based on the C4SL exposure scenarios⁽³⁾ are presented in Tables 2 and 3 below.

The final selected GAC are presented by pathway in Table 4 and the combined GAC in Table 5.

Figure 1: Conceptual model for residential scenario with home-grown produce

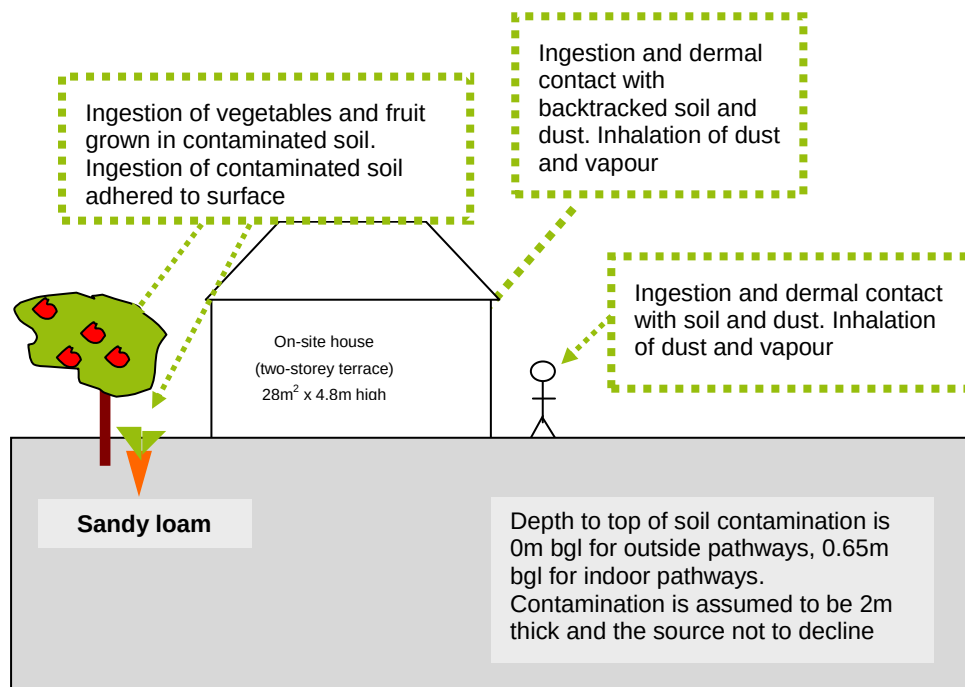


Table 1: Exposure assessment parameters for residential scenario with home-grown produce – inputs for CLEA model

Parameter	Value	Justification
Land use	Residential with homegrown produce	Chosen land use
Receptor	Female child age 1 to 6	Key generic assumption given in Box 3.1, SR3 ⁽⁵⁾
Building	Small terraced house	Key generic assumption given in Box 3.1, SR3. Small, two-storey terraced house chosen, as it is the most conservative residential building type in terms of protection from vapor intrusion (Section 3.4.6, SR3) ⁽⁵⁾
Soil type	Sandy Loam	Most common UK soil type (Section 4.3.1, from Table 3.1, SR3) ⁽⁵⁾
Start AC (age class)	1	Range of age classes corresponding to key generic assumption that the critical receptor is a young female child aged 0–6. From Box 3.1, SR3 ⁽⁵⁾
End AC (age class)	6	
SOM (%)	6	Representative of sandy loamy soil according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents' ⁽¹³⁾
	1	To provide SAC for sites where SOM <6% as often observed by RSK
	2.5	
pH	7	Model default

Table 2: Residential with home-grown produce – modified home-grown produce data

Name	Consumption rate 90 th percentile (g FW kg ⁻¹ BW day ⁻¹) by age class						Dry weight conversion factor (g DW g ⁻¹ FW)	Home-grown fraction (average)	Home-grown fraction (high end)	Soil loading factor (g g ⁻¹ DW)	Preparation correction factor
	1	2	3	4	5	6					
Green vegetables	7.12	5.87	5.87	5.87	4.53	4.53	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	10.7	2.83	2.83	2.83	2.14	2.14	0.103	0.06	0.4	1.00E-03	1.00E+00
Tuber vegetables	16	6.6	6.6	6.6	4.95	4.95	0.21	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	1.83	3.39	3.39	3.39	2.24	2.24	0.058	0.06	0.4	1.00E-03	6.00E-01
Shrub fruit	2.23	0.46	0.46	0.46	0.19	0.19	0.166	0.09	0.6	1.00E-03	6.00E-01
Tree fruit	3.82	10.3	10.3	10.3	5.16	5.16	0.157	0.04	0.27	1.00E-03	6.00E-01
Justification	Table 3.4, SP1010 ⁽³⁾						Table 6.3, SR3 ⁽⁵⁾	Table 4.19, SR3 ⁽⁵⁾		Table 6.3, SR3 ⁽⁵⁾	

Table 3: Residential with home-grown produce – modified and use and receptor data

Parameter	Unit	Age class					
		1	2	3	4	5	6
EF (soil and dust ingestion)	day yr ⁻¹	180	365	365	365	365	365
EF (consumption of home-grown produce)	day yr ⁻¹	180	365	365	365	365	365
EF (skin contact, indoor)	day yr ⁻¹	180	365	365	365	365	365
EF (skin contact, outdoor)	day yr ⁻¹	170	170	170	170	170	170
EF (inhalation of dust and vapour, indoor)	day yr ⁻¹	365	365	365	365	365	365
EF (inhalation of dust and vapour, outdoor)	day yr ⁻¹	365	365	365	365	365	365
Justification		Table 3.5, SP1010 ⁽³⁾ ; Table 3.1, SR3 ⁽⁵⁾					
Soil to skin adherence factor (outdoor)	mg cm ⁻² day ⁻¹	0.1	0.1	0.1	0.1	0.1	0.1
Justification		Table 3.5, SP1010 ⁽³⁾					
Inhalation rate	m ³ day ⁻¹	5.4	8.0	8.9/f	10.1	10.1	10.1
Justification		Mean value USEPA, 2011 ⁽¹²⁾ ; Table 3.2, SP1010 ⁽³⁾					
Notes: For cadmium , the exposure assessment for a residential land use is based on estimates representative of lifetime exposure AC1-18. This is because the TDI _{oral} and TDI _{inh} are based on considerations of the kidney burden accumulated over 50 years. It is therefore reasonable to consider exposure not just in childhood but averaged over a longer period. See the Environment Agency Science Report SC05002/ TOX 3 ⁽¹⁾ , Science Report SC050021/Cadmium SGV ⁽¹⁾ and the project report SP1010 ⁽³⁾ for more information.							

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GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE



Table 4
Human Health Generic Assessment Criteria by Pathway for Residential With Home-Grown Produce Scenario

Compound	Media	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Metals													
Arsenic	(a,b)	3.71E+01	5.26E+02	NR	NR	3.71E+01	5.26E+02	NR	NR	3.71E+01	5.26E+02	NR	NR
Cadmium	(a)	2.30E+01	4.88E+02	2.21E+01	NR	2.30E+01	4.88E+02	2.21E+01	NR	2.30E+01	4.88E+02	2.21E+01	NR
Chromium (III) - trivalent	(c)	1.84E+04	9.07E+02	NR	NR	1.84E+04	9.07E+02	NR	NR	1.84E+04	9.07E+02	NR	NR
Chromium (VI) - hexavalent	(a,d)	5.85E+01	2.06E+01	NR	NR	5.85E+01	2.06E+01	NR	NR	5.85E+01	2.06E+01	NR	NR
Copper		2.72E+03	1.41E+04	2.47E+03	NR	2.72E+03	1.41E+04	2.47E+03	NR	2.72E+03	1.41E+04	2.47E+03	NR
Lead	(a)	2.01E+02	NR	NR	NR	2.01E+02	NR	NR	NR	2.01E+02	NR	NR	NR
Elemental Mercury (Hg ⁰)	(d)	NR	2.35E-01	NR	4.31E+00	NR	5.60E-01	NR	1.07E+01	NR	1.22E+00	NR	2.58E+01
Inorganic Mercury (Hg ²⁺)		3.95E+01	3.63E+03	3.91E+01	NR	3.95E+01	3.63E+03	3.91E+01	NR	3.95E+01	3.63E+03	3.91E+01	NR
Methyl Mercury (Hg ²⁺)		1.26E+01	1.87E+01	7.52E+00	7.33E+01	1.26E+01	3.62E+01	9.34E+00	1.42E+02	1.26E+01	7.68E+01	1.08E+01	3.04E+02
Nickel	(d)	1.27E-02	1.81E-02	NR	NR	1.27E-02	1.81E-02	NR	NR	1.27E-02	1.81E-02	NR	NR
Selenium	(b)	2.58E-02	NR	NR	NR	2.58E-02	NR	NR	NR	2.58E-02	NR	NR	NR
Zinc	(b)	3.86E+03	3.63E+07	NR	NR	3.86E+03	3.63E+07	NR	NR	3.86E+03	3.63E+07	NR	NR
Cyanide (free)		1.37E+00	1.37E+04	1.37E+00	NR	1.37E+00	1.37E+04	1.37E+00	NR	1.37E+00	1.37E+04	1.37E+00	NR
Volatile Organic Compounds													
Benzene	(a)	2.62E-01	9.01E-01	2.03E-01	1.22E+03	5.39E-01	1.68E+00	4.08E-01	2.26E+03	1.16E+00	3.48E+00	8.72E-01	4.71E+03
Toluene		1.53E+02	9.08E+02	1.31E+02	8.69E+02	3.49E+02	2.00E+03	2.97E+02	1.92E+03	7.95E+02	4.55E+03	6.77E+02	4.36E+03
Ethylbenzene		1.10E+02	8.34E+01	4.74E+01	5.18E+02	2.61E+02	1.96E+02	1.12E+02	1.22E+03	6.00E+02	4.58E+02	2.60E+02	2.84E+03
Xylene - m		2.10E+02	8.25E+01	5.92E+01	6.25E+02	5.01E+02	1.95E+02	1.40E+02	1.47E+03	1.15E+03	4.56E+02	3.27E+02	3.46E+03
Xylene - o		1.92E+02	8.87E+01	6.07E+01	4.78E+02	4.56E+02	2.08E+02	1.43E+02	1.12E+03	1.05E+03	4.86E+02	3.32E+02	2.62E+03
Xylene - p		1.98E+02	7.93E+01	5.66E+01	5.76E+02	4.70E+02	1.86E+02	1.33E+02	1.35E+03	1.08E+03	4.36E+02	3.10E+02	3.17E+03
Total xylene		1.92E+02	7.93E+01	5.66E+01	6.25E+02	4.56E+02	1.86E+02	1.33E+02	1.47E+03	1.05E+03	4.36E+02	3.10E+02	3.46E+03
Methyl tertiary-Butyl ether (MTBE)		1.54E+02	1.04E+02	6.22E+01	2.04E+04	2.97E+02	1.69E+02	1.08E+02	3.31E+04	6.03E+02	3.21E+02	2.10E+02	6.27E+04
Trichloroethene		2.83E-01	1.72E-02	1.62E-02	1.54E+03	3.59E-02	3.40E-02	3.22E+03	1.41E+00	7.98E-02	7.55E-02	7.14E-03	
Tetrachloroethene		4.49E+00	1.79E-01	1.76E-01	4.24E+02	1.04E+01	4.02E-01	3.94E-01	9.51E+02	2.38E+01	9.21E-01	9.04E-01	2.18E+03
1,1,1-Trichloroethane		3.33E+02	9.01E+00	8.77E+00	1.43E+03	7.26E+02	1.84E+01	1.80E+01	2.92E+03	1.62E+03	4.04E+01	3.94E+01	6.39E+03
1,1,1,2-Tetrachloroethane		5.39E+00	1.54E+00	1.20E+00	2.60E+03	1.27E+01	3.56E+00	2.78E+00	6.02E+03	2.92E+01	8.29E+00	6.46E+00	1.40E+04
1,1,2,2-Tetrachloroethane		2.81E+00	3.92E+00	1.64E+00	2.67E+03	6.10E+00	8.04E+00	3.47E+00	5.46E+03	1.36E+01	1.76E+01	7.67E+00	1.20E+04
Carbon Tetrachloride		3.10E+00	2.58E-02	2.57E-02	1.52E+03	7.11E+00	5.65E-02	5.62E-02	3.32E+03	1.62E+01	1.28E-01	1.27E-01	7.54E+03
1,2-Dichloroethane		3.17E-02	9.20E-03	7.13E-03	3.41E+03	5.73E-02	1.33E-02	1.08E-02	4.91E+03	1.09E-01	2.28E-02	1.88E-02	8.43E+03
Vinyl Chloride		3.82E-03	7.73E-04	6.43E-04	1.36E+03	6.87E-03	1.00E-03	8.73E-04	1.76E+03	1.25E-02	1.53E-03	1.36E-03	2.69E+03
1,2,4-Trimethylbenzene		NR	1.76E+00	NR	4.74E+02	NR	4.26E+00	NR	1.16E+03	NR	9.72E+00	NR	2.76E+03
1,3,5-Trimethylbenzene	(e)	NR	NR	NR	2.30E+02	NR	NR	NR	5.52E+02	NR	NR	NR	1.30E+03
Semi-Volatile Organic Compounds													
Acenaphthene		2.27E+02	4.86E+04	2.26E+02	5.70E+01	5.41E+02	1.18E+05	5.38E+02	1.41E+02	1.18E+03	2.68E+05	1.17E+03	3.36E+02
Acenaphthylene		1.85E+02	4.59E+04	1.84E+02	8.61E+01	4.42E+02	1.11E+05	4.40E+02	2.12E+02	9.78E+02	2.53E+05	9.74E+02	5.06E+02
Anthracene		2.43E+03	1.53E+05	2.39E+03	1.17E+00	5.53E+03	3.77E+05	5.45E+03	2.91E+00	1.10E+04	8.76E+05	1.09E+04	6.96E+00
Benzo(a)anthracene		1.01E+01	2.47E+01	7.18E+00	1.71E+00	1.42E+01	4.37E+01	1.07E+01	4.28E+00	1.69E+01	6.26E+01	1.33E+01	1.03E+01
Benzo(a)pyrene	(a)	4.96E+00	3.51E+01	NR	9.11E-01	4.96E+00	3.77E+01	NR	2.28E+00	4.96E+00	3.89E+01	NR	5.46E+00
Benzo(b)fluoranthene		2.96E+00	1.93E+01	2.56E+00	1.22E+00	3.89E+00	2.13E+01	3.29E+00	3.04E+00	4.43E+00	2.22E+01	3.69E+00	7.29E+00
Benzo(g,h,i)perylene		3.77E+02	1.87E+03	3.14E+02	1.54E-02	4.09E+02	1.94E+03	3.38E+02	3.85E-02	4.23E+02	1.97E+03	3.48E+02	9.23E-02
Benzo(k)fluoranthene		8.92E+01	5.41E+02	7.66E+01	6.87E-01	1.10E+02	5.76E+02	9.22E+01	1.72E+00	1.21E+02	5.91E+02	1.00E+02	4.12E+00
Chrysene		1.66E+01	1.19E+02	1.46E+01	4.40E-01	2.54E+01	1.49E+02	2.17E+01	1.10E+00	3.19E+01	1.66E+02	2.67E+01	2.64E+00
Dibenzo(a,h)anthracene		2.90E-01	1.45E+00	2.41E-01	3.93E-03	3.43E-01	1.64E+00	2.84E-01	9.82E-03	3.69E-01	1.74E+00	3.04E-01	2.36E-02
Fluoranthene		2.87E+02	3.83E+04	2.85E+02	1.89E+01	5.63E+02	8.87E+04	5.60E+02	4.73E+01	9.00E+02	1.83E+05	8.96E+02	1.13E+02
Fluorene		1.77E+02	6.20E+03	1.72E+02	3.09E+01	4.19E+02	1.53E+04	4.07E+02	7.65E+01	8.98E+02	3.62E+04	8.77E+02	1.83E+02
Indeno(1,2,3-cd)pyrene		3.09E+01	2.12E+02	2.70E+01	6.13E-02	4.22E+01	2.38E+02	3.59E+01	1.53E-01	4.92E+01	2.50E+02	4.11E+01	3.68E-01
Naphthalene		2.78E+01	2.33E+01	1.27E+01	7.64E+01	6.66E+01	5.58E+01	3.04E+01	1.83E+02	1.53E+02	1.31E+02	7.06E+01	4.32E+02
Phenanthrene		9.85E+01	7.17E+03	9.72E+01	3.60E+01	2.24E+02	1.76E+04	2.22E+02	8.96E+01	4.48E+02	4.07E+04	4.43E+02	2.14E+02
Pyrene		6.25E+02	8.79E+04	6.20E+02	2.20E+00	1.25E+03	2.04E+05	1.24E+03	5.49E+00	2.05E+03	4.23E+05	2.04E+03	1.32E+01
Phenol		1.60E+02	4.58E+02	1.20E+02	2.42E+04	2.96E+02	6.95E+02	2.09E+02	3.81E+04	5.86E+02	1.19E+03	3.93E+02	7.03E+04
Total Petroleum Hydrocarbons													
Aliphatic hydrocarbons EC ₉ -EC ₆		4.99E+03	4.24E+01	4.23E+01	3.04E+02	1.13E+04	7.79E+01	7.78E+01	5.58E+02	2.50E+04	1.61E+02	1.60E+02	1.15E+03
Aliphatic hydrocarbons >EC ₉ -EC ₆		1.49E+04	1.04E+02	1.03E+02	1.44E+02	3.43E+04	2.31E+02	2.31E+02	3.22E+02	7.11E+04	5.29E+02	5.28E+02	7.36E+02
Aliphatic hydrocarbons >EC ₉ -EC ₁₀		1.61E+03	2.68E+01	2.67E+01	7.77E+01	2.91E+03	6.55E+01	6.51E+01	1.90E+02	4.26E+03	1.56E+02	1.54E+02	4.51E+02
Aliphatic hydrocarbons >EC ₁₀ -EC ₁₂		4.57E+03	1.33E+02	1.32E+02	4.75E+01	5.51E+03	3.31E+02	3.26E+02	1.18E+02	5.98E+03	7.93E+02	7.65E+02	2.83E+02
Aliphatic hydrocarbons >EC ₁₂ -EC ₁₆		6.27E+03	1.11E+03	1.06E+03	2.37E+01	6.34E+03	2.78E+03	2.41E+03	5.91E+01	6.36E+03	6.67E+03	4.34E+03	1.42E+02

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE



Table 4

Human Health Generic Assessment Criteria by Pathway for Residential With Home-Grown Produce Scenario

Compound	Notes	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Aliphatic hydrocarbons >EC ₁₀ -EC ₂₀	(b)	6.46E+04	NR	NR	8.48E+00	9.17E+04	NR	NR	2.12E+01	1.10E+05	NR	NR	5.09E+01
Aliphatic hydrocarbons >EC ₂₀ -EC ₃₄	(b)	6.46E+04	NR	NR	8.48E+00	9.17E+04	NR	NR	2.12E+01	1.10E+05	NR	NR	5.09E+01
Aromatic hydrocarbons >EC8-EC ₁₀		5.76E+01	4.74E+01	3.45E+01	6.13E+02	1.38E+02	1.16E+02	8.38E+01	1.50E+03	3.07E+02	2.77E+02	1.94E+02	3.58E+02
Aromatic hydrocarbons >EC ₁₀ -EC ₁₂		8.29E+01	2.58E+02	7.52E+01	3.64E+02	1.96E+02	6.39E+02	1.79E+02	8.99E+02	4.25E+02	1.52E+03	3.91E+02	2.15E+03
Aromatic hydrocarbons >EC ₁₂ -EC ₁₆		1.47E+02	2.85E+03	1.45E+02	1.69E+02	3.36E+02	7.07E+03	3.32E+02	4.19E+02	6.81E+02	1.68E+04	6.74E+02	1.00E+03
Aromatic hydrocarbons >EC ₁₆ -EC ₂₁	(b)	2.63E+02	NR	NR	5.37E+01	5.45E+02	NR	NR	1.34E+02	9.34E+02	NR	NR	3.21E+02
Aromatic hydrocarbons >EC ₂₁ -EC ₃₅	(b)	1.09E+03	NR	NR	4.83E+00	1.47E+03	NR	NR	1.21E+01	1.70E+03	NR	NR	2.90E+01
Aromatic hydrocarbons >EC ₃₅ -EC ₄₄	(b)	1.09E+03	NR	NR	4.83E+00	1.47E+03	NR	NR	1.21E+01	1.70E+03	NR	NR	2.90E+01

Notes:

EC - equivalent carbon. SAC - soil assessment criteria.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.

	Calculated SAC exceeds soil saturation limit and may significantly affect the interpretation of any exceedances as the contribution of the indoor and outdoor vapour pathway to total exposure is >10%.
	Calculated SAC exceeds soil saturation limit but the exceedance will not affect the SAC significantly as the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.
	Calculated SAC does not exceed the soil saturation limit.

The SAC for organic compounds are dependant upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, PAHs naphthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway (Section 10.1.1, SR3)

(a) SAC for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead are derived using the C4SL toxicology data.

(b) SAC for selenium should not include the inhalation pathway as no expert group HCV has been derived; aliphatic and aromatic hydrocarbons >EC16 should not include inhalation pathway due to their non-volatile nature and inhalation exposure being minimal (oral, dermal and inhalation exposure is compared to the oral HCV); arsenic should only be based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report. The Oral SAC should be adopted for zinc and benzo(a)pyrene.

(c) SAC for CrIII should be based on the lower of the oral and inhalation SAC (see LQM/CIEH 2015 Section 6.8)

(d) SAC for elemental mercury, chromium VI and nickel should be based on the inhalation pathway only.

(e) SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE



Table 5
Human Health Generic Assessment Criteria for Residential with home-grown produce

Compound	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 2.5% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
Metals			
Arsenic	37	37	37
Cadmium	22	22	22
Chromium (III) - trivalent	910	910	910
Chromium (VI) - hexavalent	21	21	21
Copper	2,500	2,500	2,500
Lead	200	200	200
Elemental Mercury (Hg ⁰)	0.2	0.6	1.2
Inorganic Mercury (Hg ²⁺)	39	39	39
Methyl Mercury (Hg ⁴⁺)	10	10	10
Nickel	130	130	130
Selenium	258	258	258
Zinc	3,900	3,900	3,900
Cyanide (free)	1.4	1.4	1.4
Volatile Organic Compounds			
Benzene	0.20	0.41	0.87
Toluene	130	300	680
Ethylbenzene	50	110	260
Xylene - m	59	140	327
Xylene - o	61	143	332
Xylene - p	57	133	310
Total xylene	57	133	310
Methyl tertiary-Butyl ether (MTBE)	60	110	210
Trichloroethene	0.02	0.03	0.08
Tetrachloroethene	0.2	0.4	0.9
1,1,1-Trichloroethane	9	18	39
1,1,1,2-Tetrachloroethane	1.2	2.8	6.5
1,1,2,2-Tetrachloroethane	1.6	3.5	7.7
Carbon Tetrachloride	0.026	0.056	0.127
1,2-Dichloroethane	0.007	0.011	0.019
Vinyl Chloride	0.0006	0.0009	0.0014
1,2,4-Trimethylbenzene	1.8	4.3	9.7
1,3,5-Trimethylbenzene	NR	NR	NR
Semi-Volatile Organic Compounds			
Acenaphthene	230	540	1,170
Acenaphthylene	180	440	970
Anthracene	2,400	5,500	10,900
Benzo(a)anthracene	7	11	13
Benzo(a)pyrene	5	5	5
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(g,h,i)perylene	310	340	350
Benzo(k)fluoranthene	77	92	100
Chrysene	15	22	27
Dibenzo(a,h)anthracene	0.24	0.28	0.30
Fluoranthene	290	560	900
Fluorene	170	410	880
Indeno(1,2,3-cd)pyrene	27	36	41
Naphthalene	13	30	71
Phenanthrene	100	220	440
Pyrene	620	1,240	2,040
Phenol	120	210	390
Total Petroleum Hydrocarbons			
Aliphatic hydrocarbons EC ₅ -EC ₆	42	78	160
Aliphatic hydrocarbons >EC ₆ -EC ₈	100	230	530
Aliphatic hydrocarbons >EC ₈ -EC ₁₀	27	65	154
Aliphatic hydrocarbons >EC ₁₀ -EC ₁₂	130 (48)	330 (118)	760 (283)
Aliphatic hydrocarbons >EC ₁₂ -EC ₁₆	1,100 (24)	2,400 (59)	4,300 (142)
Aliphatic hydrocarbons >EC ₁₆ -EC ₃₅	65,000 (8)	92,000 (21)	110,000
Aliphatic hydrocarbons >EC ₃₅ -EC ₄₄	65,000 (8)	92,000 (21)	110,000
Aromatic hydrocarbons >EC ₈ -EC ₁₀	30	80	190
Aromatic hydrocarbons >EC ₁₀ -EC ₁₂	80	180	390
Aromatic hydrocarbons >EC ₁₂ -EC ₁₆	140	330	670
Aromatic hydrocarbons >EC ₁₆ -EC ₂₁	260	540	930
Aromatic hydrocarbons >EC ₂₁ -EC ₃₅	1,100	1,500	1,700
Aromatic hydrocarbons >EC ₃₅ -EC ₄₄	1,100	1,500	1,700
Minerals			
Asbestos	No asbestos detected with ID or <0.001% dry weight ¹		
Notes:			
1/2 Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.			
NR - SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used			
EC - equivalent carbon. SAC - soil assessment criteria.			
1 LOD for weight of asbestos per unit weight of soil calculated on a dry weight basis using PLM, handpicking and gravimetry.			
The SAC for organic compounds are dependent on Soil Organic Matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58.			
1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.			
SAC for TPH fractions, PAHs naphthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3.			
(VALUE IN BRACKETS)			
RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/CIEH whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limits given in brackets.			

APPENDIX G

GQRA DATA SCREENING TABLES

Project name	London Road, Hitchin	Notes	
Project code	1920378		
Client name	Martin Grant Homes		
Address			
NGR			
Land use	Residential with home-grown produce		
SOM	1%		
GAC version	2018_02		

									Lab sample ID	18/10279/1	18/10279/2	18/10279/3	18/10279/4	18/10279/5	18/10279/6				
									Client sample ID	TP3	TP5	TP6	TP9	TP10	TP12				
									Depth to top	0.5	0.5	0.5	0.5	0.5	0.5				
									Depth to bottom										
									Date sampled	03/12/18	03/12/18	03/12/18	03/12/18	03/12/18	03/12/18				
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects											
Metals and Inorganics																			
Arsenic	mg/kg	37		43	7	6	6	0	7	9	9	8	43	11					
Cadmium	mg/kg	22		1.2	0.6	6	6	0	0.8	0.6	0.7	0.7	1.2	0.7					
Chromium	mg/kg	910	21	33	16	6	6	0	33	23	31	21	16	33					
Copper	mg/kg	2500		20	12	6	6	0	15	14	16	20	12	14					
Lead	mg/kg	200		53	17	6	6	0	28	38	51	53	17	29					
Mercury	mg/kg	39	0.2		<0.17	6	0	6	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17					
Nickel	mg/kg	130		53	22	6	6	0	33	28	29	22	53	33					
Selenium	mg/kg	258		1	<1	6	1	5	<1	<1	<1	<1	1	<1					
Zinc	mg/kg	3900		135	71	6	6	0	78	87	86	113	135	71					
Asbestos																			
Asbestos in soil						5	0	5	NAD	NAD	NAD	NAD		NAD					
Petroleum Hydrocarbons																			
Ali >C5-C6	mg/kg	42			<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Ali >C6-C8	mg/kg	100			<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Ali >C8-C10	mg/kg	27			<1	6	0	6	<1	<1	<1	<1	<1	<1					
Ali >C10-C12	mg/kg	130	48		<1	6	0	6	<1	<1	<1	<1	<1	<1					
Ali >C12-C16	mg/kg	1100	24		<1	6	0	6	<1	<1	<1	<1	<1	<1					
Ali >C16-C21	mg/kg				<1	6	0	6	<1	<1	<1	<1	<1	<1					
Ali >C21-C35	mg/kg			3	<1	6	4	2	2	<1		3	3	<1		1			
Ali >C16-C35 calculated	mg/kg	65000	8	3	<1	6	4	2	2	<1		3	3	<1		1			
Total Aliphatics	mg/kg			3	<1	6	4	2	2	<1		3	3	<1		1			
Aro >C5-C7	mg/kg				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Aro >C7-C8	mg/kg				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Aro >C8-C10	mg/kg	30			<1	6	0	6	<1	<1	<1	<1	<1	<1					
Aro >C10-C12	mg/kg	80			<1	6	0	6	<1	<1	<1	<1	<1	<1					
Aro >C12-C16	mg/kg	140		12	<1	6	3	3	2	<1		12	2	<1		<1			
Aro >C16-C21	mg/kg	260		47	<1	6	5	1	16	3	47	34	<1			3			
Aro >C21-C35	mg/kg	1100		128	<1	6	5	1	47	12	73	128	<1			12			
Total Aromatics	mg/kg			164	<1	6	5	1	66	15	132	164	<1			16			
TPH (Ali & Aro)	mg/kg			167	<1	6	5	1	66	16	135	167	<1			17			
BTEX - Benzene	mg/kg	0.2			<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01			
BTEX - Toluene	mg/kg	130			<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01			
BTEX - Ethyl Benzene	mg/kg	50			<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01			
BTEX - o Xylene	mg/kg	61			<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01			
BTEX - m & p Xylene	mg/kg	57			<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01			
MTBE	mg/kg	60			<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01			
Polycyclic aromatic hydrocarbons																			
Acenaphthene	mg/kg	230		0.38	<0.01	6	4	2	0.38	0.02	0.11	0.12	<0.01	<0.01					
Acenaphthylene	mg/kg	180		0.15	<0.01	6	3	3	0.06	0.03	<0.01	0.15	<0.01	<0.01					
Anthracene	mg/kg	2400		1.09	<0.02	6	4	2	1.09	0.12	0.13	0.86	<0.02	<0.02					
Benzo(a)anthracene	mg/kg	7		2.91	<0.04	6	5	1	2.91	0.77	0.18	2.52	<0.04			0.04			
Benzo(a)pyrene	mg/kg	5		1.99	<0.04	6	4	2	1.99	0.64	0.13	1.62	<0.04	<0.04					
Benzo(b)fluoranthene	mg/kg	2.6		2.56	<0.05	6	4	2	2.56	0.83	0.16	2.16	<0.05	<0.05					

Project name	London Road, Hitchin		Notes	
Project code	1920378			
Client name	Martin Grant Homes			
Address				
NGR				
Land use	Phytotoxic (pH >7.0)			
SOM	1%			
GAC version	2012_01			

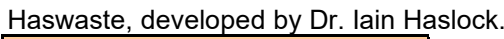
									Lab sample ID	18/10279/1	18/10279/2	18/10279/3	18/10279/4	18/10279/5	18/10279/6				
									Client sample ID	TP3	TP5	TP6	TP9	TP10	TP12				
									Depth to top	0.5	0.5	0.5	0.5	0.5	0.5				
									Depth to bottom										
									Date sampled	03/12/18	03/12/18	03/12/18	03/12/18	03/12/18	03/12/18				
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects											
Metals and Inorganics																			
Arsenic	mg/kg			43	7	6	6	0	7	9	9	8	43	11					
Cadmium	mg/kg	3		1.2	0.6	6	6	0	0.8	0.6	0.7	0.7	1.2	0.7					
Chromium	mg/kg			33	16	6	6	0	33	23	31	21	16	33					
Copper	mg/kg	200		20	12	6	6	0	15	14	16	20	12	14					
Lead	mg/kg	300		53	17	6	6	0	28	38	51	53	17	29					
Mercury	mg/kg	1			<0.17	6	0	6	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17					
Nickel	mg/kg	110		53	22	6	6	0	33	28	29	22	53	33					
Selenium	mg/kg			1	<1	6	1	5	<1	<1	<1	<1	1	<1					
Zinc	mg/kg	300		135	71	6	6	0	78	87	86	113	135	71					
Asbestos																			
Asbestos in soil						5	0	5	NAD	NAD	NAD	NAD		NAD					
Petroleum Hydrocarbons																			
Ali >C5-C6	mg/kg				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Ali >C6-C8	mg/kg				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Ali >C8-C10	mg/kg				<1	6	0	6	<1	<1	<1	<1	<1	<1					
Ali >C10-C12	mg/kg				<1	6	0	6	<1	<1	<1	<1	<1	<1					
Ali >C12-C16	mg/kg				<1	6	0	6	<1	<1	<1	<1	<1	<1					
Ali >C16-C21	mg/kg				<1	6	0	6	<1	<1	<1	<1	<1	<1					
Ali >C21-C35	mg/kg			3	<1	6	4	2	2	<1	3	3	<1	1					
Ali >C16-C35 calculated	mg/kg			3	<1	6	4	2	2	<1	3	3	<1	1					
Total Aliphatics	mg/kg			3	<1	6	4	2	2	<1	3	3	<1	1					
Aro >C5-C7	mg/kg				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Aro >C7-C8	mg/kg				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Aro >C8-C10	mg/kg				<1	6	0	6	<1	<1	<1	<1	<1	<1					
Aro >C10-C12	mg/kg				<1	6	0	6	<1	<1	<1	<1	<1	<1					
Aro >C12-C16	mg/kg			12	<1	6	3	3	2	<1	12	2	<1	<1					
Aro >C16-C21	mg/kg			47	<1	6	5	1	16	3	47	34	<1	3					
Aro >C21-C35	mg/kg			128	<1	6	5	1	47	12	73	128	<1	12					
Total Aromatics	mg/kg			164	<1	6	5	1	66	15	132	164	<1	16					
TPH (Ali & Aro)	mg/kg			167	<1	6	5	1	66	16	135	167	<1	17					
BTEX - Benzene	mg/kg				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
BTEX - Toluene	mg/kg				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
BTEX - Ethyl Benzene	mg/kg				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
BTEX - o Xylene	mg/kg				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
BTEX - m & p Xylene	mg/kg				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
MTBE	mg/kg				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Polycyclic aromatic hydrocarbons																			
Acenaphthene	mg/kg			0.38	<0.01	6	4	2	0.38	0.02	0.11	0.12	<0.01	<0.01					
Acenaphthylene	mg/kg			0.15	<0.01	6	3	3	0.06	0.03	<0.01	0.15	<0.01	<0.01					
Anthracene	mg/kg			1.09	<0.02	6	4	2	1.09	0.12	0.13	0.86	<0.02	<0.02					
Benzo(a)anthracene	mg/kg			2.91	<0.04	6	5	1	2.91	0.77	0.18	2.52	<0.04	0.04					
Benzo(a)pyrene	mg/kg			1.99	<0.04	6	4	2	1.99	0.64	0.13	1.62	<0.04	<0.04					
Benzo(b)fluoranthene	mg/kg			2.56	<0.05	6	4	2	2.56	0.83	0.16	2.16	<0.05	<0.05					

										Lab sample ID	18/10279/1	18/10279/2	18/10279/3	18/10279/4	18/10279/5	18/10279/6				
										Client sample ID	TP3	TP5	TP6	TP9	TP10	TP12				
										Depth to top	0.5	0.5	0.5	0.5	0.5	0.5				
										Depth to bottom										
										Date sampled	03/12/18	03/12/18	03/12/18	03/12/18	03/12/18	03/12/18				
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects												
Benzo(ghi)perylene	mg/kg			0.82	<0.05	6	4	2	0.82	0.31	0.06	0.69	<0.05	<0.05						
Benzo(k)fluoranthene	mg/kg			0.88	<0.07	6	3	3	0.88	0.28	<0.07	0.75	<0.07	<0.07						
Chrysene	mg/kg			2.65	<0.06	6	4	2	2.65	0.85	0.19	2.4	<0.06	<0.06						
Dibenzo(ah)anthracene	mg/kg			0.18	<0.04	6	3	3	0.18	0.07	<0.04	0.17	<0.04	<0.04						
Fluoranthene	mg/kg			7.29	<0.08	6	4	2	7.29	1.5	0.47	6.59	<0.08	<0.08						
Fluorene	mg/kg			0.29	<0.01	6	4	2	0.21	0.02	0.07	0.29	<0.01	<0.01						
Indeno(123-cd)pyrene	mg/kg			1.17	<0.03	6	4	2	1.17	0.43	0.09	0.97	<0.03	<0.03						
Naphthalene	mg/kg				<0.03	6	0	6	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03						
Phenanthrene	mg/kg			4.37	<0.03	6	4	2	4.37	0.35	0.51	3.65	<0.03	<0.03						
Pyrene	mg/kg			5.98	<0.07	6	4	2	5.98	1.35	0.39	5.23	<0.07	<0.07						
Total PAH-16MS	mg/kg			32.5	<0.08	6	4	2	32.5	7.57	2.49	28.2	<0.08	<0.08						
Other analytes																				
% Stones >10mm	% w/w			44.3	3.1	6	6	0	15.5	18.8	3.1	14.2	44.3	4.3						
pH	pH			8.39	7.82	6	6	0	8.39	8.19	8.22	8.17	7.82	7.86						
Sulphate (acid soluble)	mg/kg			430	<200	6	4	2	<200	240	380	430	<200	270						
Sulphate (water sol 2:1)	g/l				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01						

										Lab sample ID	18/10279/1	18/10279/2	18/10279/3	18/10279/4	18/10279/5	18/10279/6				
										Client sample ID	TP3	TP5	TP6	TP9	TP10	TP12				
										Depth to top	0.5	0.5	0.5	0.5	0.5	0.5				
										Depth to bottom										
										Date sampled	03/12/18	03/12/18	03/12/18	03/12/18	03/12/18	03/12/18				
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects												
Benzo(ghi)perylene	mg/kg	310		0.82	<0.05	6	4	2	0.82	0.31	0.06	0.69	<0.05	<0.05						
Benzo(k)fluoranthene	mg/kg	77		0.88	<0.07	6	3	3	0.88	0.28	<0.07	0.75	<0.07	<0.07						
Chrysene	mg/kg	15		2.65	<0.06	6	4	2	2.65	0.85	0.19	2.4	<0.06	<0.06						
Dibenzo(ah)anthracene	mg/kg	0.24		0.18	<0.04	6	3	3	0.18	0.07	<0.04	0.17	<0.04	<0.04						
Fluoranthene	mg/kg	290		7.29	<0.08	6	4	2	7.29	1.5	0.47	6.59	<0.08	<0.08						
Fluorene	mg/kg	170		0.29	<0.01	6	4	2	0.21	0.02	0.07	0.29	<0.01	<0.01						
Indeno(123-cd)pyrene	mg/kg	27		1.17	<0.03	6	4	2	1.17	0.43	0.09	0.97	<0.03	<0.03						
Naphthalene	mg/kg	13			<0.03	6	0	6	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03						
Phenanthrene	mg/kg	100		4.37	<0.03	6	4	2	4.37	0.35	0.51	3.65	<0.03	<0.03						
Pyrene	mg/kg	620		5.98	<0.07	6	4	2	5.98	1.35	0.39	5.23	<0.07	<0.07						
Total PAH-16MS	mg/kg			32.5	<0.08	6	4	2	32.5	7.57	2.49	28.2	<0.08	<0.08						
Other analytes																				
% Stones >10mm	% w/w			44.3	3.1	6	6	0	15.5	18.8	3.1	14.2	44.3	4.3						
pH	pH			8.39	7.82	6	6	0	8.39	8.19	8.22	8.17	7.82	7.86						
Sulphate (acid soluble)	mg/kg			430	<200	6	4	2	<200	240	380	430	<200	270						
Sulphate (water sol 2:1)	g/l				<0.01	6	0	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01						

APPENDIX H

WM3 ASSESSMENT



TP/WS/BH
Depth (m)
Envirolab reference

If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

TP3	TP5	TP6	TP9	TP10	TP12			
0.50	0.50	0.50	0.50	0.50	0.50			
18/10279/1	18/10279/2	18/10279/3	18/10279/4	18/10279/5	18/10279/6			

2,3,7,8-TeCDD
1,2,3,7,8-PeCDD
1,2,3,4,7,8-HxCDD
1,2,3,6,7,8-HxCDD
1,2,3,7,8,9-HxCDD
1,2,3,4,6,7,8-HpCDD
OCDD
2,3,7,8-TeCDF
1,2,3,7,8-PeCDF
2,3,4,7,8-PeCDF
1,2,3,4,7,8-HxCDF
1,2,3,6,7,8-HxCDF
2,3,4,6,7,8-HxCDF
1,2,3,7,8,9-HxCDF
1,2,3,4,6,7,8-HpCDF
1,2,3,4,7,8,9-HpCDF
OCDF
Total Dioxins and Furans

[illegible]

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Aldrin
α Hexachlorocyclohexane (alpha-HCH) <i>(leave empty if total HCH results used)</i>
β Hexachlorocyclohexane (beta-HCH) <i>(leave empty if total HCH results used)</i>
α Cis-Chlordane (alpha) OR Total Chlordane
δ Hexachlorocyclohexane (delta-HCH) <i>(leave empty if total HCH results used)</i>
Dieldrin
Endrin
γ Hexachlorocyclohexane (gamma-HCH) (lindane) OR Total HCH
Heptachlor
Hexachlorobenzene
o,p'-DDT <i>(leave empty if total DDT results used)</i>
p,p'-DDT OR Total DDT
γ Trans-Chlordane (gamma) <i>(leave empty if total Chlordane results used)</i>
Chlordecone (kepone)
Polychlorobenzene
Mirex
Toxaphene (camphechlor)

[illegible][illegible]

Tin (leave empty if Organotin and Tin excl Organotin results used)

mg/kg

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Dibutyltin; DiBT
Tributyltin; TriBT
Triphenyltin; TriPT
Tetrabutyltin; TeBT
Tin excluding Organotin
Tin excl Organotin

mg/kg
mg/kg
mg/kg
mg/kg
mg/kg



Haswaste, developed by Dr. Iain Haslock.

Site Code and Name

TP/WS/BH

Depth (m)

Envirolab reference

Asbestos in Soil

Asbestos detected in Soil (enter Y or N)

Thresholds

Y

Asbestos % Composition in Soil (Matrix Loose Fibres or Microscopic Identifiable Pieces only)

see "Carc HP7 % Asbestos in Soil (Fibres)" below

%

Carcinogenic HP7 % Asbestos in Soil (fibres or micro pieces)

Please be advised, if the calculation cell is "0.00000" DOES NOT MEAN asbestos testing has been undertaken and the result is zero.

≥0.1%

Asbestos Identifiable Pieces visible with the naked eye detected in the Soil (enter Y or N)

Y

Please enter available data in the rows associated with the test (grey) cells. Calculation cells initially display either "0.0000" or "#DIV/0!".
If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

TP3	TP5	TP6	TP9	TP10	TP12			
0.50	0.50	0.50	0.50	0.50	0.50			
18/10279/1	18/10279/2	18/10279/3	18/10279/4	18/10279/5	18/10279/6			

n	n	n	n	n	n			
If Asbestos in Soil above is "Y", the soil is Hazardous Waste HP5 and HP7								
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
If Asbestos in Soil above is "Y", but Asbestos % above is "<0.1%", the soil is Non Hazardous Waste. You can only use Asbestos % results where loose fibres or micro pieces are only present. You cannot use Asbestos % results when visual identifiable pieces are present.								

If visual identifiable pieces of asbestos are present, you cannot use Asbestos % results and the whole soil sample is Hazardous Waste HP5 and HP7 Construction material containing Asbestos 17 06 05. Therefore, if Asbestos in Soil above is "Y", the Asbestos % above is "<0.1%", but the Asbestos Identifiable Pieces visible with the naked eye is "Y", the soil is Hazardous Waste.

Identifiable Pieces are Cement, Fragments, Board, Rope etc. ie anything ACM that is not Loose Fibres.
All visual asbestos pieces need to be removed leaving only fibres (or micro pieces) with an Asbestos % Composition in Soil result of <0.1% for the soil to become non-hazardous waste.

Hazardous Property	Thresholds	Cut Off Value
Corrosive HP8	≥5%	<1%
Irritant HP4	≥10%	<1%
Irritant HP4	≥20%	<1%
Specifc Target Organ Toxicity HP5	≥1%	
Specifc Target Organ Toxicity HP5	≥20%	
Specifc Target Organ Toxicity HP5	≥1%	
Specifc Target Organ Toxicity HP5	≥10%	
Aspiration Toxicity HP5	≥10%	
Acute Toxicity HP6	≥0.1%	<0.1%
Acute Toxicity HP6	≥0.25%	<0.1%
Acute Toxicity HP6	≥5%	<0.1%
Acute Toxicity HP6	≥25%	<1%
Acute Toxicity HP6	≥0.25%	<0.1%
Acute Toxicity HP6	≥2.5%	<0.1%
Acute Toxicity HP6	≥15%	<0.1%
Acute Toxicity HP6	≥55%	<1%
Acute Toxicity HP6	≥0.1%	<0.1%
Acute Toxicity HP6	≥0.5%	<0.1%
Acute Toxicity HP6	≥3.5%	<0.1%
Acute Toxicity HP6	≥22.5%	<1%
Carcinogenic HP7	≥0.1%	
Carcinogenic HP7	≥0.1%	
Carcinogenic HP7	≥1%	
Carcinogenic HP7 Unknown TPH with ID	≥1,000mg/kg	
Carcinogenic HP7 b(a)p marker test (Unknown TPH with ID only) Cell only applicable if TPH >1,000mg/kg	≥0.01%	
pH Corrosive HP8 pH (soil or leachate)	H8 ≥11.5	
pH Corrosive HP8 pH (soil or leachate)	H8 ≤2	
Toxic for Reproduction HP10	≥0.3%	
Toxic for Reproduction HP10	≥3%	
Mutagenic HP11	≥0.1%	
Mutagenic HP11 Unknown TPH with ID	≥1,000mg/kg	
Mutagenic HP11 b(a)p marker test (Unknown TPH with ID only) Cell only applicable if TPH >1,000mg/kg	≥0.01%	
Mutagenic HP11	≥1%	
Produces Toxic Gases HP12 Sulphide	≥1,400mg/kg	
Produces Toxic Gases HP12 Cyanide	≥1,200mg/kg	
Produces Toxic Gases HP12 Thiocyanate	≥2,600mg/kg	
HP13 Sensitising	≥10%	

If cells below turn yellow and the text turns red, the samples should be classified as Hazardous Waste.								
0.00726	0.00560	0.00714	0.00509	0.00875	0.00779	0.00000	0.00000	0.00000
0.00262	0.00277	0.00300	0.00332	0.00703	0.00303	0.00000	0.00000	0.00000
0.00955	0.00743	0.00778	0.00771	0.01208	0.00827	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00044	0.00004	0.00005	0.00037	0.00000	0.00000	0.00000	0.00000	0.00000
0.00667	0.00566	0.00595	0.00444	0.01071	0.00667	0.00000	0.00000	0.00000
0.00660	0.00380	0.01350	0.01670	0.00170	0.00290	0.00000	0.00000	0.00000
0.00660	0.00160	0.01350	0.01670	0.00010	0.00170	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00094	0.00121	0.00121	0.00107	0.00569	0.00147	0.00000	0.00000	0.00000
0.00648	0.00456	0.00609	0.00417	0.00321	0.00648	0.00000	0.00000	0.00000
0.01242	0.01129	0.01294	0.01312	0.01390	0.01123	0.00000	0.00000	0.00000
0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00000	0.00000	0.00000
0.00634	0.00442	0.00595	0.00403	0.00307	0.00634	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00008	0.00006	0.00007	0.00007	0.00012	0.00007	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00643	0.00449	0.00604	0.00412	0.00321	0.00642	0.00000	0.00000	0.00000
0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00000	0.00000	0.00000
0.01116	0.01104	0.01277	0.01201	0.01376	0.01115	0.00000	0.00000	0.00000
0.00667	0.00566	0.01350	0.01670	0.01071	0.00667	0.00000	0.00000	0.00000
0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0.00012	0.00004	0.00001	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8.39	8.19	8.22	8.17	7.82	7.86	0.00	0.00	0.00
8.39	8.19	8.22	8.17	7.82	7.86	0.00	0.00	0.00
0.00667	0.00566	0.00586	0.00530	0.01071	0.00667	0.00000	0.00000	0.00000
0.00660	0.00442	0.01350	0.01670	0.00307	0.00634	0.00000	0.00000	0.00000
0.00660	0.00442	0.01350	0.01670	0.00307	0.00634	0.00000	0.00000	0.00000
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
0.00667	0.00566	0.00586	0.00444	0.01071	0.00667	0.00000	0.00000	0.00000
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	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.00667	0.00566	0.00595	0.00444	0.01071	0.00667	0.00000	0.00000	0.00000



Please enter available data in the rows associated with the test (grey) cells. Calculation cells initially display either "0.0000" or "#DIV/0!".
If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

Haswaste, developed by Dr. Iain Haslock.

Site Code and Name

TP/WS/BH
Depth (m)
Envirolab reference

TP3	TP5	TP6	TP9	TP10	TP12			
0.50	0.50	0.50	0.50	0.50	0.50			
18/10279/1	18/10279/2	18/10279/3	18/10279/4	18/10279/5	18/10279/6			

Ecotoxic HP14 amended v6	≥25%	<0.1%	0.03154	0.02845	0.03114	0.03415	0.03972	0.02810	0.00000	0.00000	0.00000
Ecotoxic HP14 amended v6	≥25%	<0.1% (except Be, V, Te, Tl, Petrol, Diesel, Crude Oil, Kerosene, White Spirit, Crosote, TPH, TPHCWG, Phenol, Cresols, Xylenols, T-Phenols, CompCN, Thiocyanate, Toluene, Ethylbenzene, Xylene + BTEX 1%).	0.03815	0.03005	0.04464	0.05086	0.03983	0.02980	0.00000	0.00000	0.00000
Ecotoxic HP14 amended v6	≥25%	<0.1% (except Be, V, Te, Tl, Petrol, Diesel, Crude Oil, Kerosene, White Spirit, Crosote, TPH, TPHCWG, Phenol, Cresols, Xylenols, T-Phenols, CompCN, Thiocyanate, Toluene, Ethylbenzene, Xylene + BTEX 1%).	3.22030	2.86090	3.24880	3.58230	3.97330	2.82690	0.00000	0.00000	0.00000
Persistent Organic Pollutant (PCB, PBB or POP Pesticides)	>0.005%		0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
Persistent Organic Pollutant (Total Dioxins+Furans)	>0.0000015%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000
Persistent Organic Pollutant (Individual Dioxins+Furans)	>0.0000015%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000

If other contaminants need adding to Haswaste, please contact Envirolab.

APPENDIX I

PHOTOGRAPHIC LOG

	Report No: 1920378 L01 (00)	PHOTOGRAPHIC LOG
Client name: Martin Grant Homes	Site Location: London Road, Hitchin	Date: 03.12.2018

No. 1	Direction/Description: South/Overall view of the southern field
	

No. 2	Direction/Description South/A fallen tree identified along the suspected infilled former sand pit
	

No. 3	Direction/Description: South/A pathway bisecting the southern field south to north
	

No. 4	Direction/Description Northeast/View of a car home, located at Mill Lane, between the southern and northern field of the site
	



Report No: 1920378 L01 (00)

PHOTOGRAPHIC LOG

Client name:
Martin Grant Homes

Site Location:
London Road, Hitchin

Date:
03.12.2018

No. 5

Description:
TP1



No. 6

Description
TP2





Report No: 1920378 L01 (00)

PHOTOGRAPHIC LOG

Client name:
Martin Grant Homes

Site Location:
London Road, Hitchin

Date:
03.12.2018

No. 7

Description:
TP3



No. 8

Description
TP4





Report No: 1920378 L01 (00)

PHOTOGRAPHIC LOG

Client name:
Martin Grant Homes

Site Location:
London Road, Hitchin

Date:
03.12.2018

No. 9

Description:
TP5



No. 10

Description
TP6

