



**Report prepared at**

Land at rear of Sturt Avenue  
Camelsdale  
Haslemere  
GU27 3SJ

**On behalf of**

Casa Coevo Group Ltd

**Report reference**

21-171.01  
Version 2

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November 2023

**Prepared by**

Aviron Associates Limited

## Report Quality Management

<b>Project Name</b>	Land at rear of Sturt Avenue, Camelsdale, Haslemere, GU27 3SJ		
<b>Project Title</b>	Phase I Geo-Environmental Risk Assessment		
<b>Client</b>	Casa Coevo Group Ltd		
<b>Project Number</b>	21-171.01		
<b>Version</b>	2 (updated November 2023)		<b>Date</b>
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## 1.0 PROJECT AND SITE INFORMATION

### 1.1 APPOINTMENT

Aviron Associates Limited (Aviron) was retained by the Casa Coevo Group Ltd (the “Client”) to prepare a Phase I Geo-Environmental Risk Assessment (GERA) of the following premises:

**Land at rear of Sturt Avenue, Camelsdale, Haslemere, GU27 3SJ** (hereafter referred to as the “site”).

The purpose of this Phase I GERA is to present a desk based study to identify potential areas of contaminative concern associated with the proposed residential development of the site. This desk study includes a Preliminary Risk Assessment (PRA) in accordance with the requirements of Chichester District Council. In addition geotechnical issues shall be highlighted which may impact re-development.

Aviron has relied upon information received from the Client and their agents as accurate, unless contradicted by written documentation or site observations.

### 1.2 THE SITE

Table 1.2 provides a summary of site details and surrounding area.

**Table 1.2 : Site Details**

<b>Site Location</b>	The site is located at the rear of Sturt Avenue in Camelsdale, Haslemere approximately 1.6 kilometres to the south-west of Haslemere town centre.
<b>National Grid Ref.</b>	Centred at approximately 488872E 132319N.
<b>Current Land Use</b>	At the time of the inspection the site comprised an undeveloped parcel of land almost entirely covered with trees.  <b>Figure 1</b> is presented as the Site Layout Plan (surveyed January 2016).  <b>Figures 2</b> and <b>3</b> are presented as Site Photographs taken by Aviron on 19 May 2021 and <b>Figures 4</b> and <b>5</b> are presented as Site Photographs provided by the design team and taken on 22 November 2023.
<b>Surrounding Land Use</b>	The site is bounded by Sturt Meadow Cottages to the north-west, a stream and pumping station to the north-east, numbers 1a to 16 Sturt Avenue to the south and the rear gardens of numbers 17 and 18 Sturt Avenue to the west.
<b>Proposed Land Use</b>	The proposed re-development aims to construct of a number of new homes with gardens and a centrally located access road.  <b>Figure 6</b> is presented as the Proposed Development Plan, including an indicative envelope of houses and gardens.

### 1.3 SITE RECONNAISSANCE

A site walkover survey was undertaken by on 19 May 2021 and included an inspection of the site and surrounding area, where safe and accessible. Further to version 2 of this report the design team provided Aviron with a selection of photographs taken on 22 November 2023 to confirm no changes to site usage and appearance had occurred for the purposed of developing the PRA.

The purpose of the survey is to identify any potential on-site or nearby contaminative activities or potential sources of land contamination.

Additionally, as part of the survey any features which may affect site re-development in terms of physical site and ground conditions were noted.

Table 1.3 provides a description of site features observed during the walkover survey and also current Ordnance Survey maps made available at the time of report writing.

**Table 1.3 : Summary of Walkover Survey**

Physical Site Characteristics	
<b>Existing Structures</b>	None observed.
<b>Basements</b>	None observed.
<b>Visual Topography and Site Surfacing</b>	<p>The site is generally level with local undulations and is almost entirely covered with trees and scrub vegetation.</p> <p>A watercourse (River Wey) within shallow banks is located along the north-eastern boundary of the site.</p> <p><i>Two concrete bases are shown on the topographic survey drawing (Jan 2016) however were not observed in May 2021 nor November 2023 most likely a result of 5-8 years of uncontrolled vegetation growth.</i></p>
<b>Retaining Structures and Slopes</b>	The site is generally level with local undulations and the river bank located along the north-eastern boundary of the site.
<b>Drainage Issues</b>	<p>River Wey within shallow banks is located along the north-eastern boundary of the site.</p> <p>A pond is located in the north-west of the site as well as ponded surface water and waterlogged soils locally.</p>
<b>Trees and Hedges</b>	The site is almost entirely covered with trees and scrub vegetation.
<b>Made and Infilled Ground</b>	No made ground or infilled ground anticipated.

Contaminative Characteristics	
Above or Underground Storage Tanks and Drums	None observed.
Fuel Interceptors	None observed.
Waste Storage and Disposal	None observed.
Hazardous Material Storage and Use	None observed.
Asbestos Containing Materials (ACMs)	None observed.
Boiler Houses	None observed.
Sub-stations	None observed.
Surface Staining	None observed.
Potentially Contaminative Activities	No potentially contaminative activities observed.

### 1.3.1 Summary of Physical Site Characteristics

Consideration should be made towards the competency of underlying strata and the influence of trees on the proposed development buildings.

### 1.3.2 Summary of Contaminative Site Characteristics

No potentially contaminative activities were observed during the site walkover survey.

## 2.0 HISTORICAL REVIEW

Historical Ordnance Survey (OS) maps were obtained as part of the Envirocheck database search within report package reference 279109553 dated 21 May 2021. The information contained in these maps is summarised in the following sections and included within **Appendix I** and are considered to remain relevant to this updated version of the report.

### 2.1 SITE HISTORY

#### 2.1.1 Summary of Site History - Available Historical Mapping

The earliest Ordnance Survey map edition of **1886, 1:2,500** indicates that the site comprised undeveloped open agricultural land to the west of Sturt Farm. A north-westerly flowing watercourse, comprising the River Wey is marked along the northern boundary of the site. The western extent of the site was defined as a tree lined field boundary at this time.

An additional internal field boundary is marked in the south-west of the site by the time of the **1890, 1:2,500** map edition, however the field boundary is shown to have been removed at the time of the **1898, 1:2,500** map edition.

At the time of the **1912, 1:2,500** map edition the south-eastern boundary of the site had been defined as the rear gardens of recently constructed residential premises of Sturt Avenue. The northern extent of the site was defined as a field boundary at this time. The north-eastern boundary was defined by the River Wey that appears to have been redirected from its original channel further to the north-east.

The site remained unchanged up until the time of the **1938, 1:2,500** map edition which shows the site as marshy ground.

The site remained unchanged up until the time of the **1968, 1:1,250** map edition which shows the site as an area of woodland in the north and east and two small detached buildings in the south-west. A pond is located in the north-west of the site and an enclosed paddock in the centre of the site. Access to the site appears to be via a footbridge across the stream at the eastern boundary of the site.

The site remained unchanged up until the time of the aerial photograph of **1999** and the **1999, 1:10,000** map edition which indicate that the site was almost entirely covered in trees at this time, and the detached buildings in the south-west of the site had been removed.

The site remained unchanged up until the time of the recent walkover survey of **May 2021**.

### 2.1.2 Summary of Site History

The site was first developed in 1968 as an enclosed paddock and woodland with two small detached buildings in the south-west. The site appears to have remained relatively unchanged albeit almost entirely covered with woodland by 1999, and the buildings were no longer marked at this time. Access to the site is shown to have been available via a small footbridge unsuited to vehicular access, therefore it may be assumed that the buildings in the south-west of the site were possibly temporary in nature.

### 2.1.3 Summary of Site History - Anecdotal Evidence

**Figure 1** comprising the Site Layout Plan (surveyed in January 2016) indicates that two concrete bases were located in the south-west of the site at this time, at the locations of the former buildings; however no evidence of the site buildings remained at the time of the site walkover. A number of gates along the south-eastern site boundary suggest that the site was historically accessible to residents of the neighbouring domestic premises.

## 2.2 SURROUNDING LAND HISTORY

Table 2.2 provides a summary of historical land uses in the immediate vicinity of the site. This is approximately defined by the search buffer at a radius of approximately 250 metres (m) on the 1:10,500/1:10,000 maps and 250m on the 1:2,500/1:1,250 maps.

**Table 2.2 : Historical Surrounding Land Uses**

Surrounding Features	Dates from mapping	Approximate distance	Direction
Railway line	1882-present	250m	N
Pumping station and electricity sub-station	1968-present	10m	NE
Works/warehouse	1968-present	238m	NE
Depot	1968-1996	221m	NW
Worked ground	1968-present	189m	S
Garage	1968-present	177m	SW
Garage	1968-1977	219m	SW
No further significant land uses have been observed in the historical data set within the specified vicinity to the site.			

### 2.2.1 Summary of Surrounding Land History

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The site is located in a mixed rural and urban setting with a number of historical commercial industrial premises within 250m of the site including a railway line, pumping station, works, depot, worked ground and garages. The depot and one of the garages have been more recently redeveloped.

### **2.3     ARCHAEOLOGICAL CONSIDERATIONS.**

The Local Authority archaeological officer has not been contacted as part of our project instruction.

### 3.0 ENVIRONMENTAL SETTING

Unless otherwise stated Geo-Environmental Setting information has been obtained from Landmarks Envirocheck Database within report package 279109553 dated 21 May 2021. This is included as **Appendix II**.

#### 3.1 GEOLOGY AND HYDROGEOLOGY

##### 3.1.1 Anticipated Geology

The British Geological Survey (BGS) sheet 301 (1:50,000 edition) of Haslemere was reviewed, and presented within table 3.3.1 is the anticipated geology.

Table 3.1.1 : Anticipated Geology

Stratum	Age	Possible Thickness (m)	Typical Description	Aquifer Status
<b>Artificial/Made Ground</b> None indicated on site	N/A	N/A	N/A	N/A
<b>Superficial</b> Head Deposits	Quaternary - Holocene	N/A	Polymict deposit: comprises gravel, sand and clay depending on upslope source and distance from source. Locally with lenses of silt, clay or peat and organic material	Secondary (undifferentiated) aquifer
<b>Solid</b> Atherfield Clay Formation <i>subcropping the Head Deposits across the majority of the site and subcropping the Hythe Formation</i>	Cretaceous – Aptian	10-18m	Sandy mudstone with an impersistent phosphatic pebble bed with vertebrate bones, gritty sandstone or very shelly sandy mudstone with glauconite, at the base	Unproductive strata
<b>Solid</b> Hythe Formation <i>along the north-eastern boundary of the site</i>	Cretaceous – Aptian	18-100m	Fine to medium grained sands, siltstones and silts with some clay interbeds.	Principal aquifer

The boundary between the Atherfield Clay Formation and the Hythe Formation is defined within and parallel to the north-eastern boundary of the site.

There is no artificial ground and there are no landslips recorded within 500m of the site.

There are no faults noted within 500m of the site.

### 3.1.2 BGS Borehole Records

There are a number of historical BGS borehole records and Aviron boreholes detailing geological strata encountered in similar anticipated geology within 250m of the site. The nearest borehole logs for historical drilling works undertaken in the site area are detailed in the table 3.1.2 below.

**Table 3.1.2 : BGS Borehole Records**

BGS/Aviron Reference	Date	Distance/ Direction	Depth of Made Ground (m bgl)	Depth of Superficial strata (m bgl)	Depth of Solid strata (m bgl)	Groundwater (m bgl)
SU83SE23	1986	60m/S	2.15	3.2 (Head)	5.15+ Hythe	0.7
SU83SE65	1979	130m/N	1.5	2.3+ (Sand)	-	Dry
19-176 WS1	2019	150m/NE	-	-	5.0+ Hythe	Dry

### 3.1.3 Summary of Anticipated Ground Conditions

Review of the geological extract and data provided in the Envirocheck report (**Appendix II**) and the BGS data indicates that in site area, superficial strata are anticipated above solid strata.

Therefore, the anticipated geology beneath the site is likely to comprise a thin layer of topsoil/subsoil over:

-  Head, comprising clay and sand; over
-  The Atherfield Clay Formation
-  Hythe Formation locally in the north-east of the site

### 3.1.4 Hydrogeology

The hydrogeology of the site has been determined by the superficial and the solid geology of the Head Deposits, the Atherfield Clay Formation and the Hythe Formation which according to the Envirocheck report

and the Environment Agency website (May 2021) are classified as a secondary (undifferentiated) aquifer, unproductive strata and a principal aquifer respectively. Secondary (undifferentiated) aquifers have been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type. Unproductive strata comprise rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow. Principal aquifers are layers of rock or drift deposits that have high intergranular and/or fracture permeability which may support water supply and/or river base flow on a strategic scale.

The groundwater vulnerability beneath the site is noted as 'Secondary Superficial Aquifer - High Vulnerability'.

Both the Envirocheck report and the Environment Agency website (May 2021) indicate that the eastern section of the site is located within an Environment Agency Total Catchment Zone 3 source protection zone (SPZ3).

The Envirocheck report indicates that there are four groundwater abstraction licences recorded for premises within 2000m of the site. Two of the licences relate to the abstraction of groundwater for the purpose of potable water supply, located immediately north-east of the River Wey bordering the north-east of the site at the location of the Sturt Road Pumping Stations A to C operated by Thames Water Utilities Ltd.

### **3.2 HYDROLOGY AND FLOODING**

The Envirocheck report indicates that the nearest surface water feature comprises the River Wey flowing along the north-eastern boundary of the site.

The Envirocheck report indicates that there is one surface water abstraction license noted for premises within 2000m of the site. The licence refers to water abstracted from 'Springs at Kingfisher Farm' 1717m to the west of the site for Aquaculture, fish farm use. There are no potable surface water abstraction licences related to premises within 2000m of the site.

The Envirocheck report indicates that there are no prosecutions or enforcements for premises located within 250m of the site.

The Envirocheck report indicates that there is one record detailing licensed discharge consent to controlled waters within 250m of the site. The consent refers to a location 86m to the south where the discharge comprise 'discharge of other matter-surface water' where the receiving water is noted as 'freshwater stream/river' (River Wey).

There are three references to pollution incidents to controlled waters within 250m of the site at locations 209m, 212m and 216m to the north-west, where 'oils unknown', 'chemicals unknown' and 'oils unknown' respectively are shown to have resulted in Category 3 'minor' incidents.

The Envirocheck report indicates that the north-eastern boundary and the northern tip of the site are at risk of extreme flooding and flooding from rivers or seas without defences. The Envirocheck report and the Environment Agency website (May 2021) however indicate that the majority of the site is not located within a Zone 2 or a Zone 3 flood zone.

There are no flood defences indicated and the site is not located within an area that benefits from flood defences. The site area is shown not to be used for flood storage.

The Envirocheck report indicates that areas of the north-east and north of the site are located in 1 in 30, 1 in 100 and a 1 in 1000 surface water flood extent.

The Envirocheck report indicates that in accordance with BGS groundwater flooding susceptibility data, the site is located in an area where there is 'potential for groundwater flooding to occur at surface' and 'potential for groundwater flooding of property situated below ground level'.

### **3.3 LANDFILLS AND GROUND GAS**

The Envirocheck report and the GOV.UK website (May 2021) indicates that there are no historic landfills within 500m of the site.

There are three references to potentially infilled land (water) 123m to the east and at the location of a former mill pond 147m to the north. A registered waste transfer site is located 216m to the north-west of the site.

The Envirocheck report indicates the site is located in an area where <1% of homes are above the Action Level, being the lowest band of radon characterisation. The site is in an area where no radon protection is necessary. It is advised 'environmental searches' procured during the acquisition of the property are reviewed to determine the requirement for radon protection, alternatively a domestic radon report can be acquired from [ukradon.org](http://ukradon.org).

Based on the above information gained through the desk-based research table 3.3 summarises the gas risk for the site. In accordance with current guidance (CIRIA C665), the gas generation potential for each source has been individually assessed, with references to potential gassing risk made according to the following definitions: Negligible, Very Low, Low, Moderate, High and Very High.

The objective of this exercise is to determine if potentially unacceptable ground gas risks exist and further investigation and assessment is necessary.

**Table 3.3 : Preliminary Ground Gas Risk Assessment**

Potential Source	Risk	Risk Rating	Rationale
Made Ground (CO <sub>2</sub> + CH <sub>4</sub> )	Human health Explosion	Very Low	Significant made ground is not anticipated below the site and thus a very low risk of ground gas production is considered.
Alluvial Strata (CO <sub>2</sub> + CH <sub>4</sub> )	Human health Explosion	Negligible	No alluvial strata reported near the site.
Landfills (CO <sub>2</sub> + CH <sub>4</sub> )	Human health Explosion	Negligible	No landfills identified within 500m of the site.
Infilled Ground + Burial Sites (CO <sub>2</sub> + CH <sub>4</sub> )	Human health Explosion	Low	Infilled ground at a location 123m east and the location of a former mill pond 147m to the north. Potential for gas generation is low considering the location of the pond, and migration through typically low permeability mixed clay strata of the Head Deposits and Atherfield Clay Formation and intersecting infrastructure to limit migratory pathway.
Coal and Mining (CO <sub>2</sub> + CH <sub>4</sub> )	Human health Explosion	Negligible	Non-coal mining areas. Mining not anticipated.
Radon	Human health	Very Low	<1% of homes above action level. Radon protection not recommended. Ukradon.org as of 28 November 2023 concurs with this.
<b>COMBINED RISK RATING = LOW – VERY LOW</b>			

A LOW risk from ground gas ingress and explosion is considered in connection with the infilled mill pond 147m to the north of the site.

Although a LOW – VERY LOW risk has been determined, precautionary ground gas monitoring should be considered.

## 4.0 REGULATORY INFORMATION, CONSULTATIONS AND OTHER

Unless otherwise stated regulatory database information has been obtained from the aforementioned Envirocheck report included as **Appendix II**.

### 4.1 STATUTORY REGISTERS AND AUTHORISATIONS

Table 4.1 includes the statutory registers and authorisations that relate to the site and surrounding area.

**Table 4.1 : Statutory Registers and Authorisations**

Item	0 – 250m	251 – 500m
<b>Contaminated Land Register Entries and Notices</b>	0	0
<b>Records of Licensed Discharge Consents</b>	86m south - Discharge of other matter-surface water - into freshwater stream (River Wey)	1
<b>Prosecutions Relating to Controlled Waters</b>	0	0
<b>Enforcements and Prohibition Notices</b>	0	0
<b>Integrated Pollution Controls</b>	0	0
<b>Integrated Pollution Prevention and Control</b>	0	0
<b>Local Authority Integrated Pollution Prevention and Control</b>	0	0
<b>Local Authority Pollution Prevention and Controls</b>	0	0
<b>Local Authority Pollution Prevention and Control Enforcements</b>	0	0
<b>Pollution Incidents to Controlled Waters</b>	209m NW - oils unknown - Cat 3 212m NW - chemicals unknown - Cat 3 216m NW - oils unknown - Cat 3	1

**Table 4.1 : Statutory Registers and Authorisations**

<b>Prosecutions Relating to Authorised Processes</b>	0	0
<b>Records of Radioactive Substances</b>	0	0
<b>Records of Water Industry Act Referrals</b>	0	0
<b>Explosive Sites</b>	0	0
<b>Planning Hazardous Substance Consents/Planning Hazardous Substance Enforcements</b>	0	0
<b>Notification of Installations Handling Hazardous Substances (NIHHS) Facilities and Control of Major Accident Hazards Facilities (COMAH)</b>	0	0
<b>Fuel Stations</b>	0	1
<b>Contemporary Trade Directory Entries (potentially contaminative)</b>	The following within 250m of the site: 204m SW - Camelsdale Garage - Mot Testing Centres - inactive 204m SW - Camelsdale Garage - Garage services - inactive	
<b>National Grid High Voltage Underground Electricity Transmission Cables</b>	0	0
<b>National Grid High Pressure Gas Transmission Pipelines</b>	0	0

## 4.2 CONSULTEES

### 4.2.1 Local Authority - Contaminated Land Officer

The Local Environmental Health Department has not been contacted as part of our project instruction.

### 4.2.2 Local Authority - Building Control Officer

The Local Planning Authority Building Control Officer has not been contacted as part of our project instruction.

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#### **4.2.3 Local Authority - Petroleum Officer**

The Local Planning Authority Petroleum Officer has not been contacted as part of our project instruction.

#### **4.2.4 Environment Agency - Contaminated Land and Groundwater**

The Contaminated Land and Groundwater Team of Environment Agency has not been contacted as part of our project instruction.

#### **4.2.5 Coal Authority and Mining Searches UK**

The Coal Authority and Mining Searches UK have not been contacted as part of our project instruction.

#### **4.2.6 Sensitive Land Uses (Immediate Vicinity)**

None located in the immediate vicinity of the site.

## 5.0 PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

### 5.1 METHODOLOGY

A Preliminary Risk Assessment (PRA) and Conceptual Site Model (CSM) have been prepared in accordance with CLR11 based on the information obtained as part of this desk study and site inspection. Possible risks associated with potential source of contamination and sensitive receptors identified have been assessed via a source-pathway-receptor (SPR) model in accordance with current UK protocols.

A risk may only exist where a plausible SPR linkage is presented and where the quantity or concentration of a contaminant is sufficient to pose harm. Under the statutory definition "Contamination" may only exist where contaminants pose a risk of harm to a receptor. Risk may be defined as a function of the likelihood and severity of any adverse effects resulting from a contamination event. This risk classification has been assessed in accordance with CIRIA C552. A summary of how risk is derived and the associated definition is presented in tables 5.1.1 and 5.1.2.

**Table 5.1.1 : Risk Ratings Matrix**

	Consequence			
Probability	Severe	Medium	Mild	Minor
High Likelihood	Very high risk	High risk	Moderate Risk	Moderate/low risk
Likely	High risk	Moderate Risk	Moderate/low risk	Low risk
Low Likelihood	Moderate Risk	Moderate/low risk	Low risk	Very low risk
Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

**Table 5.1.2 : Risk Ratings Definition**

Risk Rationale	Definition
Very high risk	A high probability that severe harm could occur to determined receptor from identified contaminant - OR - evidence exists that severe harm to receptor is currently occurring. Urgent investigation and remediation should be considered. If demonstrated this risk is likely to result in substantial liability.
High risk	Harm is likely to occur to determined receptor from identified contaminant. Urgent investigation and short term risk minimisation remediation followed by longer term fit for purpose remediation should be considered. If demonstrated this risk is likely to result in substantial liability.
Moderate Risk	It is possible that harm could occur to a determined receptor from identified contaminant. It is relatively unlikely that any harm would be severe or should harm occur it is likely to be relatively mild.
Moderate/low risk	It is possible that harm could occur to a determined receptor from identified contaminant. It is unlikely that any harm would be severe or should harm occur it is probable to be relatively mild.
Low risk	It is possible that harm could occur to a determined receptor from identified contaminant. It is unlikely that such harm, if indeed present, would at worst be mild.
Very low risk	There is a low possibility that harm could occur to a receptor. In such event the harm would not be severe.

## 5.2 POTENTIAL SOURCES OF CONTAMINATION

Based on the desk study and site inspection completed, table 5.1 presents a summary of the potential sources identified.

**Table 5.1 : Potential Sources**

Source	Description	Comments	On/off-site
No notable or potential sources of soil contamination	n/a	n/a	n/a
1. Ground gas	Made Ground associated with infilled land (water) to the east and infilled mill pond north of the site. Made Ground may contain organic contaminants or materials which may degrade forming carbon dioxide and methane	Complete precautionary ground gas monitoring.	Off-site 123m east 147m north

## 5.3 PATHWAYS

A pathway is one or more routes or means that a receptor can be exposed to, or affected by, a contaminant.

**Table 5.3 : Plausible Pathways**

On-Site and Locally
Direct contact; By humans and infrastructure
Underlying geology/hydrogeology; secondary (undifferentiated) aquifer above unproductive strata. Principal aquifer along north-eastern site boundary.
Inhalation and ingestion
Surface run-off/drainage

## 5.4 RECEPTORS

A receptor is either a living organism, a group of organisms, an ecological system, controlled waters or property that could be harmed or polluted by a contaminant. Table 5.4 examines the potential receptors.

**Table 5.4 : Potential Receptors**

Receptor	Description	Comments	Plausible
Construction workers	Groundworkers and general construction works	Construction works proposed within the site	Yes
End users	Occupants of the proposed development	Gardens and planted borders proposed around the site	Yes
Adjacent land users	Sensitive land uses identified in the immediate vicinity	Adjacent residential dwellings which could be effected by run-off or migration	Yes
Soft landscaping	Areas of new planting including lawns	Gardens and planted borders proposed around the site	Yes
Water supply pipes	Plastic pipework for potable water supply to new apartments may be effected if laid in contaminated soils	New supply required for redevelopment	Yes
Buildings & infrastructure	Buried concrete for new foundations may be in contact with aggressive ground (sulphur attack)	New building works proposed where potentially contaminated Made Ground could exist and pyritic ground	No
Groundwater	Controlled waters (aquifers) beneath the site	Site underlain by a secondary and principal aquifer, and SPZ 3 along in north-east of the site  Drinking water abstraction boreholes immediately north-east of the site	Yes
Surface waters	Controlled water such as lakes, streams, rivers or coastal waters	Inland river (River Wey) along north-eastern site boundary	Yes
Ecological receptors	Sensitive areas of ecological significance defined under Part 2A of EPA 1990	None within the immediate vicinity of the site	No

## 5.5 SUMMARY OF POLLUTANT LINKAGES FOR PROPOSED LAND USE - INITIAL CSM

The initial CSM is based upon the proposed site end use and the information currently consulted relating to various risk sources and plausible pollutant linkages and is presented within table 5.5.

**Table 5.5 : Initial Conceptual Site Model (for plausible pollutant linkage pathways)**

Source	Receptor	Pathway	Probability	Consequence	Risk & Justification
No evidence of soil contamination	Construction workers	Direct contact	Unlikely	Mild	<p>Very Low</p> <p>Mapping history and walkover survey has identified the site as being woodland with a former paddock and two former detached buildings (possibly for temporary use) in the south-west. No evidence of the former buildings remaining.</p> <p>No current evidence of contamination has been identified.</p> <p>The site is well vegetated.</p> <p>Natural sequences of geology are anticipated beneath the site, comprising Topsoil, Head, Clay and Sand.</p> <p><b>Ground Investigation shall be required prior to re-development to enable infrastructure design.</b></p> <p><b>Precautionary soil contamination testing should be completed on a spatial coverage basis.</b></p>
	End users	Direct contact			
	Adjacent land users	Direct contact via run-off			
	Soft landscaping	Root uptake			
	Water supply pipes	Direct contact			
	Buildings & infrastructure	Direct contact			
	Groundwater	Vertical migration through hydrogeology			
Ecological Receptors	Direct contact				
Source 1 <i>Soil ground gases</i>	Construction workers	Inhalation of vapours/gas	Unlikely	Mild	<p>Very Low</p> <p>Historical infilled land and mill pond 123m east and 146m north.</p> <p>Working in outdoor air shall fully ventilate working area.</p>
	Construction workers	Inhalation of vapours/gas	Low likelihood	Mild	<p>Low</p> <p>Historical infilled land and mill pond 123m east and 147m north, however potential for gas generation is low considering the location of the pond, and migration through typically low permeability mixed clay strata of the Head Deposits and Atherfield Clay Formation and intersecting infrastructure to limit migratory pathway.</p> <p><b>Complete Precautionary Ground Gas Monitoring</b></p>

The overall environmental risk classification for the site is generally **VERY LOW** however, further assessment of the following should be considered:

1. Complete precautionary/confirmatory soil contamination testing of overlying soils to confirm the anticipated absence of contaminants.
2. Ground gas risk assessment given potentially infilled ground 123m east and the infilled mill pond 147m north of the site.

## 5.5 CONTAMINANTS OF CONCERN FOR FUTURE SITE INVESTIGATION

Based on the known current and historical site and surrounding land uses the following analytical suites should be selected for future ground investigation works to chemically assess soil and soil leachate quality;

- 🌿 Aviron's "Suite 1" of laboratory analysis shall be applied to future site investigations which includes; arsenic, barium, cadmium, total chromium, copper, nickel, zinc, lead, mercury, selenium, water soluble boron, total cyanide, total sulphate, water soluble sulphide, speciated PAH, total phenols, pH.  
**In relation to general soil quality.**
- 🌿 Asbestos. **In relation to general soil quality.**
- 🌿 Total Petroleum Hydrocarbons (TPH CWG) to determine fuel/oil contamination. **In relation to general soil quality.**

The listed suite of analysis is considered suitable and will provide a screening for the majority of commonly found soil contaminants.

## 6.0 GEOTECHNICAL CONSIDERATIONS

### 6.1 GEOLOGICAL AND SUBSIDENCE RISK

Table 6.1 indicates potential mining and subsidence potential hazards identified within the Envirocheck report for the site. These should be considered in terms of the proposed re-development.

**Table 6.1 : Mining and Subsidence**

Item	Potential Hazard
Shrink-Swell Clay	Very Low and Moderate
Landslides	Very Low
Ground Dissolution of Soluble Rocks	No Hazard
Compressible Deposits	No Hazard
Collapsible Deposits	Very Low
Running Sands	Very Low
Infilled Land	Infilled land 123m east and 147m north
Mining	None within 250m

Information from the Envirocheck report indicates that there are two records of potentially infilled land (water) within 250m of the site. The potentially infilled land corresponds to an area 123m to the east of the site and the location of the infilled mill pond 147m to the north shown on the historical mapping.

The site area (250m buffer) is not affected by coal mining, non-coal mining or natural cavities, nor is it located in a brine compensation area.

The risk of 'non-coal mining' having occurred in the vicinity of the site is shown to be 'rare'.

There are no fault lines and no landslips recorded within influencing distance of the site.

### 6.2 NEW FOUNDATIONS AND DRAINAGE SUMMARY

The competency and material properties of the Head Deposits and Atherfield Clay Formation, in connection with the presence of trees, shall determine the suitability of the natural strata for the construction of conventional shallow foundations.

Shallow groundwater should be anticipated beneath the site.

A piled foundation solution is the most likely foundation solution to the proposed new homes on the basis:

- 🌿 Foundation depths are likely to require adjustment (deepening) on the basis Clay soils are anticipated and trees are to be retained, removed and also planted;
- 🌿 Desiccated Clay soils are anticipated beneath the site which shall result in heave once trees are removed;
- 🌿 The removal of trees and grubbing out of root balls shall disturb foundation strata, possible to excessive depths;
- 🌿 Anticipated shallow and perched groundwater may results in deep excavation instability enhance by the action of de-watering of excavations.

Notwithstanding and suitable ground investigation should be completed to evaluation the above aspects.

Conventional soakaway drainage is unlikely to be feasible due to the anticipation of Clay soils and groundwater at relatively shallow depth.

## 7.0 CONCLUSIONS AND RECOMMENDATIONS

This Phase I Geo-Environmental Risk Assessment has reviewed a number of desk based sources of information along with a site inspection to determine any potential environmental and geotechnical risks which may impact the site.

### 7.1 ENVIRONMENTAL

The risks present are considered to be generally very low due to the lack of significant development and absence of potential contaminative site usage.

Table 7.1 summarises the pertinent environmental risks providing advice on further works and assessment.

**Table 7.1 : Environment Risk Summary**

	Risk No.	Risk Description	Comments
Soils	1	Historical mapping indicates that the site has been in use as woodland and a former paddock and two former buildings possibly in temporary use.  Soil contamination not expected.  Very low risks to construction workers and end-users.	Complete confirmatory soil sampling and suitable chemical testing.
	2	Soil contamination not expected.  Very low risk to water main supply pipe.	Complete confirmatory soil sampling and suitable chemical testing.  Consult local water authority prior to water main installation.
	3	Soil contamination not expected.  Very low risk of chemical attack to buried concrete.	Complete confirmatory soil sampling and suitable chemical testing.
Groundwater	n/a	Groundwater anticipated at shallow depth beneath the site.  Lack of significant development on site and no potential contaminative site usage.	No source considered to be present on site.
Ground Gas/Vapour	4	Infilled land 123m east and 147m north of the site.  Ingress of hazardous ground gases (CH <sub>4</sub> , CO <sub>2</sub> ) and soil vapours into new building and depleted oxygen.	Complete precautionary gas monitoring and risk assessment.  If risk present mitigate by installing gas protection to ground floor slab and wall cavities.

In order to further evaluate and quantify risk a suitable ground investigation is required.

## 7.2 GEOTECHNICAL

The competency and material properties of the Head Deposits and Atherfield Clay Formation, in connection with the presence of trees, shall determine the suitability of the natural strata for the construction of conventional shallow foundations.

Shallow groundwater should be anticipated beneath the site.

A piled foundation solution is the most likely foundation solution to the proposed new homes on the basis:

- 🌿 Foundation depths are likely to require adjustment (deepening) on the basis Clay soils are anticipated and trees are to be retained, removed and also planted;
- 🌿 Desiccated Clay soils are anticipated beneath the site which shall result in heave once trees are removed;
- 🌿 The removal of trees and grubbing out of root balls shall disturb foundation strata, possible to excessive depths;
- 🌿 Anticipated shallow and perched groundwater may results in deep excavation instability enhance by the action of de-watering of excavations.

Conventional soakaway drainage is unlikely to be feasible due to the anticipation of Clay soils and groundwater at relatively shallow depth.

A ground investigation is recommended to determine foundation and drainage design.

## 8.0 PROJECT INSTRUCTION AND LIMITATIONS

### 8.1 SCOPE OF WORKS

The following scope of work was undertaken to an agreed brief set out in Aviron's proposal and involves the following:

- 📍 Site reconnaissance survey, to include inspection of the infrastructure and potential discussions with the owner regarding site activities.
- 📍 Procurement of available historical map editions, geo-environmental sensitivity data and British Geological Survey (BGS) borehole records.
- 📍 Identification of potential areas of environmental concern relating to current and/or historic site use and surroundings to prepare a refined Conceptual Site Model (CSM).
- 📍 Preparation of suitable conclusions and recommendations with regard to the site's suitability for use or the requirement for further assessment and site investigation on the basis of the CSM.

Aviron has relied upon information received from the Client and their agents as accurate, unless contradicted by written documentation or site observations.

### 8.2 PUBLISHED GUIDANCE

This report follows the technical approach presented in Contaminated Land Report 11 (CLR11) "Model Procedures for the Management of Land Contamination" prepared by the Environment Agency in 2004. CLR11 provides guidance on the application of management processes when assessing potentially contaminated land.

This project and report have been designed to fulfil the information requirements set out in the Environment Agency Guidance on Requirements for Land Contamination Reports prepared by the Environment Agency in 2005.

Notwithstanding the above this report is additionally prepared in accordance with current guidance notes, standards and practices as set out by the Environment Agency and statutory organisations in order to establish potential and significant pollutant linkages as defined in Part IIA of the Environmental Protection Act 1990.

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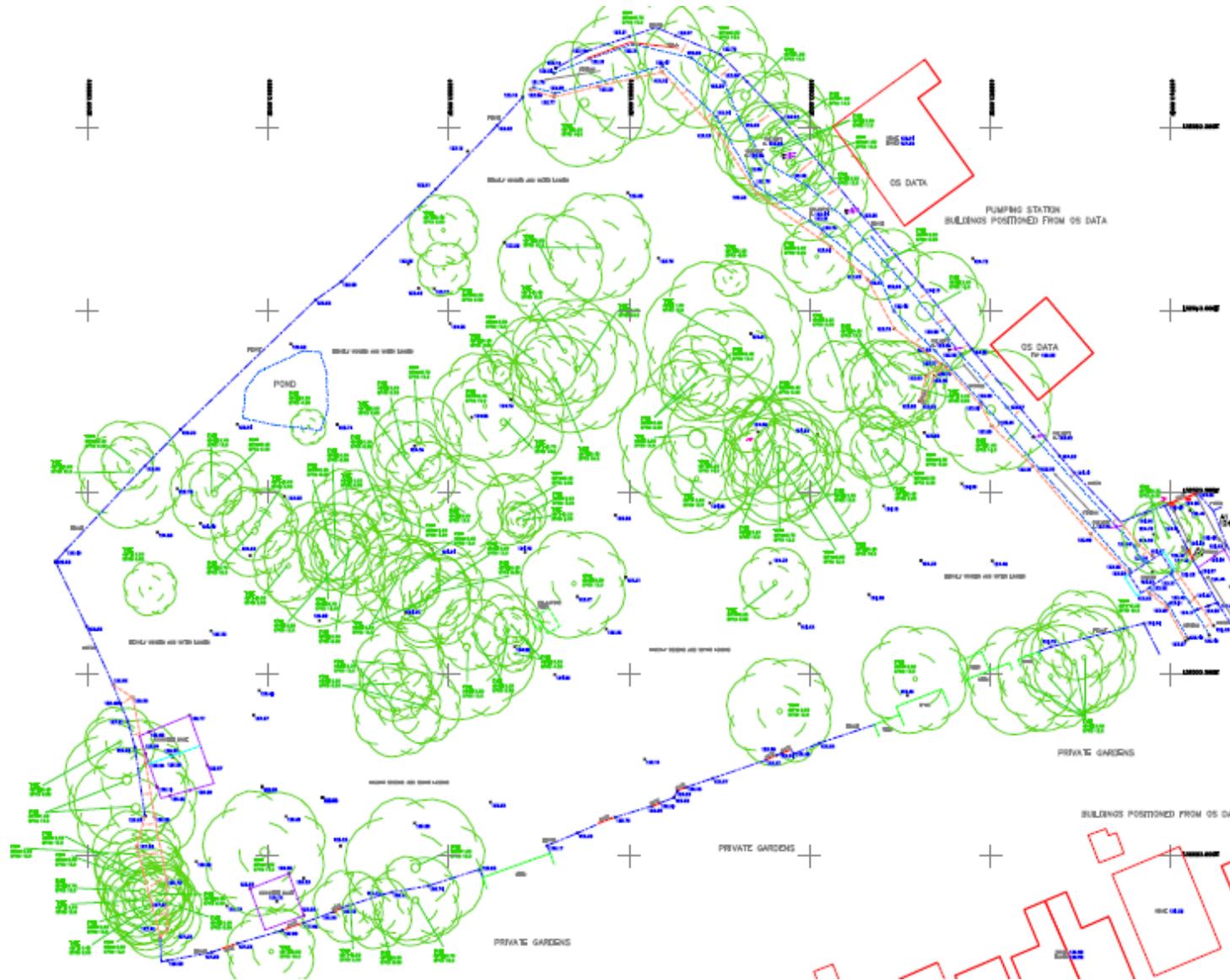
### **8.3 LIMITATIONS**

Should changes in legislation, statutory requirements or industry practices occurred following issue of this report, this report should be viewed in light of these changes.

Should a notable time period elapse between the date issue of this report and the date of application of this report changes to site dynamics may occur and in particular the site inspection notes may no longer be applicable should any change of use occur to the site in the interim.

## Figures

- 1 Site Layout Plan
- 2 Site Photographs – 2021
- 3 Site Photographs - 2021
- 4 Site Photographs – 2023
- 5 Site Photographs - 2023
- 6 Proposed Development Plan



### Legend

-  Site Boundary
-  Photo Direction of 19 May 2021

### Notes

Drawing provided to Aviron by Client Surveyed January 2016

### Figure 1

#### Drawing Title

Site Layout Plan

**Project Number** 21-171.01

#### Project Title

Land at rear of Sturt Avenue, Haslemere, GU27 3SJ

**Drawn by** GR

**Checked by** OB

**Scale** NTS





Photo 1



Photo 2



Photo 3



Photo 4

**Legend**

**Notes**

Taken on 19 May 2021

**Figure 2**

**Drawing Title**

Site Photographs

**Project Number** 21-171.01

**Project Title**

Land at rear of Sturt Avenue, Haslemere, GU27 3SJ

**Drawn by** GR

**Checked by** OB

**Scale** NTS





Photo 5



Photo 6



Photo 7



Photo 8

**Legend**

**Notes**

Taken on 19 May 2021

**Figure 3**

**Drawing Title**

Site Photographs

**Project Number** 21-171.01

**Project Title**  
Land at rear of Sturt Avenue, Haslemere,  
GU27 3SJ

**Drawn by** GR

**Checked by** OB

**Scale** NTS





Photo 9



Photo 10



Photo 11



Photo 12

**Legend**

**Notes**

Taken on 22 November 2023

**Figure 4**

**Drawing Title**

Site Photographs

**Project Number** 21-171.01

**Project Title**

Land at rear of Sturt Avenue, Haslemere, GU27 3SJ

**Drawn by** GR

**Checked by** OB

**Scale** NTS





Photo 13



Photo 14

**Legend**

**Notes**

Taken on 22 November 2023

**Figure 5**

**Drawing Title**

Site Photographs

**Project Number** 21-171.01

**Project Title**  
Land at rear of Sturt Avenue, Haslemere,  
GU27 3SJ

**Drawn by** GR

**Checked by** OB

**Scale** NTS





0 10m 20m 50m

INDICATIVE HARD LANDSCAPING

INDICATIVE SOFT LANDSCAPING

ADAPTED POND

PROPOSED NEW ROAD

EXISTING TREES RETAINED

ROOT PROTECTION ZONE

EXISTING STREAM

NEW BOUNDARIES

ECOLOGICAL BUFFER ZONE

EA Flood Zone 2

EA Flood Zone 3

INDICATIVE CONTOURS  
EACH LINE DENOTES A  
CHANGE IN LEVEL BY  
APPROXIMATELY 0.5M



**Legend**

**Notes**

Drawing provided to Aviron by Client

**Figure 6**

**Drawing Title**

Proposed Development Plan

**Project Number** 21-171.01

**Project Title**

Land at rear of Sturt Avenue, Haslemere, GU27 3SJ

**Drawn by** GR

**Checked by** OB

**Scale** NTS



## **Appendices**

- I Historical Maps
- II Envirocheck Report

## Appendix

### I Historical Maps

## Appendix

### II Envirocheck Report

## **AVIRON ASSOCIATES LIMITED**

**is a dynamic company of Chartered Environmental Surveyors and Geotechnical Engineers.**

We continuously work hard to ensure our services are the most technically competent, efficient and viable in our market place. Our years of experience of vastly varied sites and projects compliment our ability to deliver assured and effective Ground Investigations and Risk Assessments of both Brownfield, Greenfield and Currently Developed Land.

Our clients choose Aviron to plan, design and manage their Ground Investigations and Land Remediation Schemes assisting in land procurement to deliver engineering requirements, discharge planning and ensure their sites are suitable, developable and sustainable.

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## 9.0 REFERENCES AND OTHER SOURCES OF INFORMATION

Landmark Envirocheck database search report package reference 279109553 dated 21 May 2021.

DEFRA and Environment Agency, 2004. Model Procedures for the Management of Land Contamination, Contaminated Land Report 11.

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CIRIA. C552. Contaminated Land Risk Assessment. A Guide to Good Practice. January 2001.