



Ground Condition Consultants

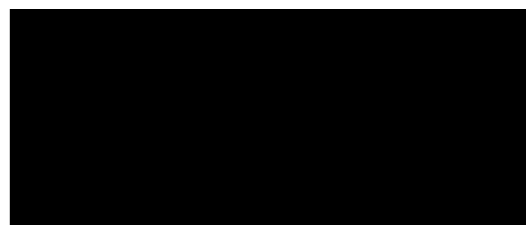
THE STEDDLES, NORTH END ROAD, YAPTON, BN18 0DT

GENERIC QUANTITATIVE RISK ASSESSMENT

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0. EXECUTIVE SUMMARY

Brief	The brief was to undertake a site investigation and assessment to identify any ground contamination issues that may affect the proposed development.
Current Site Status	The site is located at The Steddles, North End Road, Yapton, BN18 0DT and is currently occupied by a single residential dwelling and separate garage building with associated garden areas. The remnants of the greenhouse base are evident on the lawn in the north of the site. North End Road forms the southern boundary beyond which a residential development under construction at the time of this assessment. Further residential dwellings with gardens are located to east of the site with the areas to the north and west of the site being occupied by agricultural land with some farm buildings.
Site History	According to the Ordnance Survey maps provided and reviewed from 1876 to 2019 (scales 1:2,500, 1:10,000, 1:1,250, 1:10,560), the early map extracts show the site to be developed with a few buildings (likely to be a farm) in the same general layout as the current buildings. No significant changes are shown on the map extracts until the 1970's when the site is shown as a garden centre with greenhouses to the north and southwest of the buildings. A few of the older & smaller buildings previously shown on-site are no longer shown. By the mid-1980's the site is shown as The Steddles and probably used as a residential dwelling, initially with 2 separate buildings, which were subsequently joined, the greenhouse in the north and associated garden areas. The additional garage building was added to the site at a later date. The greenhouse in the north had been taken down prior to the walkover survey with its component parts stacked adjacent to the north of the house. The site owner at the time of the walkover survey noted that an ornamental pond had been present in the northwest of the site but had been infilled, possibly with hardcore, and grassed over to form part of the lawn.
Geology	Reference to the British Geological Survey (BGS) Map extracts indicate the site to overlie superficial River Terrace Deposits (undifferentiated - sand, silt and clay) over bedrock geology of the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated).
Hydrogeology	The Environment Agency Groundwater Vulnerability Map extracts indicate the site to overlie a superficial Secondary (undifferentiated) Aquifer, interpreted as the River Terrace Deposits over a Principal Aquifer, interpreted as the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation. The site is not located within a Groundwater Source Protection Zone.
Hydrology	There are no identified surface water features within 250m of the site.
Investigation Scope	The site investigation works were undertaken by GCC on the 24 th September 2021. The scope and rationale of the site investigation are presented below. 5no. windowless sample boreholes (WS201 to WS205) to a maximum depth of 5.0mbgl.
Conclusions and Recommendations (Contamination)	No potentially significant sources of contamination have been identified with regard to the proposed development. Therefore, the risk of impact to receptors in the context of the proposed development from contamination is considered to be negligible . As such, further investigation, assessment and remediation are not considered necessary for this site. Appropriate PPE is recommended during any redevelopment of the site to address any as yet unidentified contamination that may be identified during the works.

A discovery strategy is also recommended to outline the procedures to follow in the event that any as yet unidentified contamination is encountered during the works.

As with all development sites, vigilance for asbestos containing materials in the soil should be maintained throughout the development and reported under the discovery strategy. On this site, particular consideration should be given to the former pond area in this regard.

This sheet is intended to provide a summary only of the initial indicative assessment study of the site in relation to ground contamination. It does not provide a definitive engineering analysis for the purposes of costing or construction, and is subject to the limitation of the agreed brief.

1. INTRODUCTION

1.1 INSTRUCTION

Ground Condition Consultants Ltd. (GCC) was commissioned by Pallant Homes Limited in September 2021 to undertake a Generic Quantitative Risk Assessment of a site located at The Steddles, North End Road, Yapton, BN18 0DT.

The brief was to undertake a site investigation and assessment to identify any ground contamination issues that may affect the proposed development. This report provides an assessment of the identified and potential ground conditions of the site, with regard to the proposed works in accordance with the Land Contamination Risk Management (LCRM) guidance, published by the Environment Agency.

This report is prepared in line with the agreed brief and is subject to the report conditions shown in Appendix 1.

1.2 LEGAL CONTEXT

Part IIA of the Environmental Protection Act 1990 (inserted by Section 57 of the Environment Act 1995) provides a regime for the control of specific threats to health or the environment from land contamination. In accordance with the Act and the statutory guidance document 'The Contaminated Land (England) Regulations 2000', the definition of contaminated land is intended to embody the concept of risk assessment. Within the meaning of the Act, land is only "contaminated land" where it appears to the Regulatory Authority, by reason of substances within or under the land, that:

- Significant harm is being caused, or there is a significant possibility of such harm being caused; or
- Pollution of controlled waters is being, or is likely to be, caused."

Inherent in this definition is the requirement for contamination risk assessment to be undertaken on a site-specific basis, as the potential for harm is determined by the site's end use and its specific environmental setting.

The guidance defines "risk" as the combination of:

- The probability, or frequency, of occurrence of a defined hazard (for example, exposure of a property to a substance with the potential to cause harm); and
- The magnitude (including the seriousness) of the consequences.

While Part IIA of the Environmental Protection Act provides a risk based approach to the identification and remediation of land where contamination poses an unacceptable risk to human health or the environment, the regime does not take into account future uses. New developments are therefore controlled by the planning regime, with reference to the National Planning Policy Framework (NPPF), rather than directly by Part IIA of the Environmental Protection Act.

The NPPF is based on the principal that the site should be suitable for its new use, taking account of ground conditions, including from natural hazards or former activities and states that “Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner”. The NPPF also links the planning and Part IIA regimes by stating that “after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990”. Key components of the Part IIA regime, such as the definition of Contaminated Land and the associated risk-based assessment approach, are therefore considered to also be applicable to the planning regime.

1.3 METHODOLOGY

This report has been prepared in accordance with published Environment Agency guidance (‘Land Contamination Risk Management (LCRM)’). LCRM provides the technical framework for structured decision making about land contamination and builds on previous work carried out under the Contaminated Land Research Programme (of the former Department of the Environment) and the Model Procedures for the Management of Land Contamination – Contaminated Land Report (CLR) 11. LCRM has adopted and refined the well recognised methodology and terminology that has been used in contaminated land risk assessment for a number of years.

1.3.1. Pollutant linkage concept

In the context of land contamination, there are three essential elements to any risk:

- A **contaminant source** – a substance that is in, on or under the land and has the potential to cause harm or to cause pollution of controlled waters.
- A **receptor** – in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property, or a water body.
- A **pathway** – a route or means by which a receptor can be exposed to, or affected by, a contaminant.

Each of these elements can exist independently, but they create a risk only where they are linked together, so that a particular contaminant affects a particular receptor through a particular pathway. This kind of linked combination of contaminant–pathway–receptor is described as a pollutant linkage.

1.3.2. Conceptual model

An important thread throughout the overall process of risk assessment is the need to formulate and develop a **conceptual model** for the site, which supports the identification and assessment of pollutant linkages. A conceptual model represents the characteristics of the site in diagrammatic or written form that shows the possible relationships between contaminants, pathways and receptors (pollutant linkages).

1.3.3. Risk assessment

LCRM advocates a phased approach to risk assessment comprising the following in order, as necessary:

Preliminary Risk Assessment – a desk study consisting of a review of documentary, anecdotal and site walk over evidence.

Generic Quantitative Risk Assessment (GQRA) - comparison of contaminant concentrations obtained from site investigation with generic assessment criteria.

Detailed Quantitative Risk Assessment (DQRA) - comparison of contaminant concentrations obtained from site investigation with site-specific assessment criteria.

This document follows on from the GCC Ground Condition Desk Top Study (Ref: J19-064-R01, dated November 2019) and constitutes a Generic Quantitative Risk Assessment with relevant details from the Preliminary Risk Assessment repeated.

1.4 PROPOSED USE

It is currently understood that the site is proposed to be developed with residential units with private gardens.

A change in the site use from that currently proposed may result in the need for re-assessment of risk criteria and the conclusions and recommendations resulting from the risk assessment could therefore significantly change.

1.5 REPORT SCOPE AND LIMITATIONS

This report is based upon a review of readily available historical and current information and the recent site investigation data detailed herein. The report presents an interpretation of the borehole and laboratory data provided by the GCC site investigation undertaken on the 24th September 2021. In addition, this report outlines the basic ground conditions encountered in the exploratory holes and the results of any monitoring of ground installations.

This information has been collated, processed and used to provide an interpretation of the ground conditions, with recommendations on potential ground contamination risks for the proposed development.

The recommendations and opinions expressed in this report are based on the strata observed in the exploratory holes, the results of the site and laboratory tests, and information obtained as part of the desk study or provided by others. GCC takes no responsibility for conditions that have not been revealed by the exploratory holes, or which occur between them.

Whilst every effort has been made to interpret the conditions between investigation locations, such information is only indicative and liability cannot be accepted for its accuracy. Information provided from other sources is taken in good faith and GCC cannot guarantee its accuracy.

The information contained in this report is intended for the use of Pallant Homes Limited and GCC can take no responsibility for the use of this information by any other party or for uses other than that described in this report.

2. PRELIMINARY RISK ASSESSMENT

2.1 SITE LOCATION AND DESCRIPTION

The site is located at The Steddles, North End Road, Yapton, BN18 0DT and is currently occupied by a single residential dwelling and separate garage building with associated garden areas. The remnants of the greenhouse base are evident on the lawn in the north of the site. North End Road forms the southern boundary beyond which a residential development under construction at the time of this assessment. Further residential dwellings with gardens are located to east of the site with the areas to the north and west of the site being occupied by agricultural land with some farm buildings.

North End Road forms the southern boundary beyond which a new residential development is being built. Further residential dwellings with gardens are located to east of the site with the areas to the north and west of the site being occupied by agricultural land with some farm buildings.

2.2 SITE HISTORY

According to the Ordnance Survey maps provided and reviewed from 1876 to 2019 (scales 1:2,500, 1:10,000, 1:1,250, 1:10,560), the early map extracts show the site to be developed with a few buildings (likely to be a farm) in the same general layout as the current buildings. No significant changes are shown on the map extracts until the 1970's when the site is shown as a garden centre with greenhouses to the north and southwest of the buildings. A few of the older & smaller buildings previously shown on-site are no longer shown. By the mid-1980's the site is shown as The Steddles and probably used as a residential dwelling, initially with 2 separate buildings, which were subsequently joined, the greenhouse in the north and associated garden areas. The additional garage building was added to the site at a later date.

The greenhouse in the north had been taken down prior to the walkover survey with its component parts stacked adjacent to the north of the house. The site owner at the time of the walkover survey noted that an ornamental pond had been present in the northwest of the site but had been infilled, possibly with hardcore, and grassed over to form part of the lawn.

The immediate surrounding areas to the west, south and east have mainly been in agricultural use until present day. The land opposite the site, across North End Road, has recently (2019) been developed with residential dwellings. The land to the east of the site has been occupied by a residential dwelling from the earliest available maps, as a Vicarage with garden areas.

2.3 DOCUMENTATED GROUND CONDITIONS

Ground conditions recorded in readily available sources are summarised below.

2.3.1. Geology

Reference to the British Geological Survey (BGS) Map extracts (see Desk Top Study) indicate the site to overlie superficial River Terrace Deposits (undifferentiated - sand, silt and clay) over bedrock geology of the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated).

A limited intrusive ground investigation was undertaken by GCC in October 2019 to install groundwater level monitoring wells (reported under separate cover). This investigation confirmed RTD, comprising orange brown silty gravelly clay, to 1.3mbgl in the west of the site and 2.2mbgl in the north of the site over off-white weathered Chalk to a maximum investigation depth of 5.0mbgl.

2.3.2. Hydrogeology

The Environment Agency Groundwater Vulnerability Map extracts (see Desk Top Study) indicate the site to overlie a superficial Secondary (undifferentiated) Aquifer, interpreted as the River Terrace Deposits over a Principal Aquifer, interpreted as the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation.

Secondary (undifferentiated) Aquifers are assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

Principal Aquifers are geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers.

The site is not located within a Groundwater Source Protection Zone.

Groundwater was monitored between the 31st October 2019 and the 1st April 2020 at between 2.53mbgl and 4.42mbgl in the west of the site and at between 4.59mbgl and greater than 5.0m in the north of the site.

2.3.3. Hydrology

There are no identified surface water features within 250m of the site.

2.3.4. Radon

Radon is a naturally occurring radioactive gas which may be harmful to human health. Radon is generally released into the atmosphere in areas underlain by granite and limestone. Harmful concentrations of radon may build up if it becomes trapped in an enclosed space such as a building.

BGS/Public Health England data presented within the Groundsure Report indicates that the percentage of houses exceeding the Action Levels for Radon in this area is less than 1%. Therefore the property is not in a Radon Affected Area, as defined by the Health Protection Agency (HPA), and radon protection measures are not necessary in new dwellings or extensions.

2.4 ENVIRONMENTAL DATA SEARCH

A search of an environmental database was undertaken together with information from various other organisations as part of the desk study and is summarised in the following sections. The following summary is generally limited to locations within 250m of the site boundaries unless it is considered that installations or activities beyond that range could potentially have an impact on the Site or be affected by the redevelopment of the site.

Table 2.1. Data search results

Discharge consents	There are no discharge consents located within 250m of the site.
Pollution incidents	There are no recorded pollution incidents within 250m of the site.
Water abstractions	There is one (historical) recorded groundwater abstraction located within 500m of the site. • Located on-site, used for horticultural watering.
Fuel Stations	There are no fuel stations within 250m of the site.
Landfill Sites	There are no historic or current landfill sites within 250m of the site.

2.5 DEPARTMENT OF ENVIRONMENT – INDUSTRY PROFILES

The Department of the Environment Industry Profiles are not available for the current or past uses of the site.

2.6 CONCLUSIONS OF THE PRELIMINARY RISK ASSESSMENT

The conceptual model, based on information obtained as part of the preliminary risk assessment, identified the following potential contaminant sources:

- Potential for asbestos containing material fragments in the material used to fill the former pond.

It should be noted that additional sources of contamination may become apparent during any future investigation and development of the site.

The risk of impact to identified receptors from the potential asbestos containing materials, in relation to the proposed use, is considered to be **Low/Moderate**.

It is recommended that a limited investigation of the former pond fill material is undertaken to determine if the fill material is likely to be a significant issue and vigilance for asbestos containing materials will be required when dealing with this fill material during the development.

Intrusive investigation for foundation design purposes and to inform waste disposal options may also be necessary.

3. FIELDWORK SUMMARY OF SCOPE AND RATIONALE

3.1 RATIONALE AND SUMMARY OF SCOPE

The site investigation works were undertaken by GCC on the 24th September 2021. The scope and rationale of the site investigation are presented below.

- 5no. windowless sample boreholes (WS201 to WS205) to a maximum depth of 5.0mbgl.

Table 3.1. Exploratory hole location rationale

Location	Rationale	Max depth (mbgl)
WS201	Windowless sample borehole positioned within the vicinity of the former pond to investigate the nature and stratigraphy of the subsurface materials and allow collection of representative samples for chemical and geotechnical laboratory analysis.	5.00
WS202 to WS205	Windowless sample boreholes positioned within the vicinity of the proposed structures and gardens to investigate the nature and stratigraphy of the subsurface materials and allow collection of representative samples for chemical and geotechnical laboratory analysis.	5.00

The layout of the exploratory hole positions is presented in Figure 2.

3.2 SAMPLING

Soil sampling of the near surface materials was undertaken to assess the contamination risks to human health and controlled waters. Soil samples were also taken from various depths in the boreholes for geotechnical testing purposes.

3.3 SITE INVESTIGATION STANDARDS

Methods employed during the site investigation were generally undertaken in accordance with BS10175, BS EN 1997-2 and BS5930.

4. GROUND CONDITIONS ENCOUNTERED

4.1 SOIL CONDITIONS

Ground conditions encountered during the site investigation were broadly in agreement with those presented in the published literature and comprised Topsoil and Made Ground overlying River Terrace Deposits over Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated). The River Terrace Deposits comprised a sequence of fine-grained over discontinuous coarse-grained material. Variations in strata thicknesses are summarised in Table 4.1 and engineering logs are presented in Appendix 2.

Table 4.1. Summary of encountered ground conditions

Location	Topsoil/Made Ground		River Terrace Deposits		Chalk	
	From (mbgl)	Thickness (m)	From (mbgl)	Thickness (m)	From (mbgl)	Thickness (m)
WS201	GL	0.70	0.70	>3.30	4.00	>1.00
WS202	GL	0.20	0.20	2.30	2.50	>0.50
WS203	GL	0.20	0.20	4.30	4.50	>0.50
WS204	GL	0.20	0.20	2.80	3.00	>2.00
WS205	GL	0.50	0.50	1.50	2.00	>1.00

4.2 TOPSOIL/MADE GROUND

The investigation indicates that a 0.15-0.2m layer of Topsoil is present in all of the investigation locations and comprises dark brown very silty slightly gravelly Clay with rootlets.

0.55m of Made Ground was encountered beneath the Topsoil in WS202 and comprised light brown slightly clayey very sandy limestone slab fragments and concrete fragments with a fibreglass layer at the base. This is considered to be hardcore backfill of the former pond with the fibreglass layer considered to be the lining of the former pond.

Made Ground, comprising reworked slightly gravelly Clay with occasional brick, fragments, was encountered beneath the topsoil in WS205 at between 0.2m and 0.5mbgl.

4.3 RIVER TERRACE DEPOSITS

River Terrace Deposits were encountered beneath the Topsoil or Made Ground in all locations and predominantly comprised a 1.5-2.8m thick layer of orange brown and brown silty sandy locally slightly gravelly Clay.

In WS201, this Clay was underlain by 0.9m of light brown very sandy very gravelly Clay over 1.0m of light brown silty gravelly Sand.

In WS203, this Clay was underlain by 0.9m of orange brown slightly clayey silty Sand over 0.9m of light greenish grey silty Sand.

In the remaining boreholes, the Clay layer was directly underlain by the Chalk.

4.4 LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK FORMATION AND PORTSDOWN CHALK FORMATION (UNDIFFERENTIATED)

The Chalk was encountered beneath the River Terrace Deposits in all of the windowless sample boreholes at between 2.0mbgl and 4.5mbgl with a proven thickness of greater than 2.0m, forming the basal stratum in all of these locations. The Chalk comprised both structureless clayey silty sandy Gravel (CIRIA Grade Dc) and structureless clayey sandy gravelly Silt (CIRIA Grade Dm). WS202 and WS205 both refused within the Chalk at 3.0m, although it was not apparent if this was due to flint or dense Chalk clasts.

4.5 EXCAVATION STABILITY

The window sample boreholes generally remained stable throughout the investigation.

4.6 OBSTRUCTIONS

No obstructions were encountered within the boreholes although two boreholes refused within the Chalk.

4.7 GROUNDWATER CONDITIONS

Groundwater was monitored between the 31st October 2019 and the 1st April 2020 at between 2.53mbgl and 4.42mbgl in the west of the site and at between 4.59mbgl and greater than 5.0m in the north of the site.

No additional groundwater monitoring wells were installed and no additional groundwater monitoring has been undertaken as part of this scope of works.

4.8 VISUAL/OLFACTORY EVIDENCE OF CONTAMINATION

No visual or olfactory evidence of contamination was observed during the investigation.

5. GENERIC RISK ASSESSMENT

5.1 CONTAMINATION ASSESSMENT METHODOLOGY

In order to assess the human health and environmental risks posed by potential contaminants within the underlying soils and groundwater, GCC undertook an initial screen of the laboratory results from the recent investigation using generic assessment criteria. Generic assessment criteria (GAC) are conservative contaminant concentration values used for comparison purposes to assess the risk associated with contaminant concentrations found on site and are derived using non-site-specific information

5.1.1. Soils

In order to assess the soil analyses results with regard to potential human health risks, GCC has adopted the LQM/CIEH Suitable 4 Use Levels (S4ULs), generic assessment criteria (GACs) derived in accordance with the UK framework set out in the most recent CLR (Contaminated Land Report) documents using the Contaminated Land Exposure Assessment (CLEA) Model.

S4ULs have been published for an extensive suite of contaminants, with assessment criteria derived for each contaminant for four different land use scenarios namely:

- Residential with homegrown produce;
- Residential without homegrown produce
- Allotments; and
- Commercial and industrial.

A full list of the GACs together with an indication of the method used for their derivation is provided in Appendix 3. GACs applicable to residential with homegrown produce end use have been used for the assessment of the site. Contaminant concentrations below the GACs are considered not to warrant further risk assessment. However, concentrations of contaminants above the GACs may require further consideration through statistical analysis, if appropriate, or further detailed assessment using site specific data.

This document does not constitute a Site Assessment Report (SAR) as outlined in the UKWIR Guidance for the Selection of Water Supply Pipes to be Used in Brownfield Sites (Ref: 10/WM/03/21, 2010). As such, the full generic suite of testing recommended in the UKWIR guidance may not have been undertaken for this site and may be required by some water companies. However, consideration has been given to the 'threshold' concentrations presented in Table 3.1 of the UKWIR guidance, where they are applicable to the analysis undertaken, to provide an indication of the potential risks to buried water supply pipes.

5.1.2. Assessment framework

In regards to human health, the CLEA model states that, 'the contamination is assumed to be at or within 1m of the surface' (CLR10 pg10). It is considered that at depths greater than 1m, the probability of human exposure via the direct contact pathways are significantly reduced, leaving inhalation of volatile compounds as the dominant pathway with regard to human health risks. Typically, volatile compounds only significantly affect the indoor inhalation pathway. Therefore, for the purposes of statistical analysis, data from the top 1.0 to 1.5m is used for assessment of risks to human health via direct contact pathways in accordance with the CLEA model, dependant on proposed future site levels.

5.1.3. Groundwater

Groundwater analyses, where undertaken, shall be assessed by direct comparison with the freshwater Environmental Quality Standards (EQS), or, in the absence of EQSs, UK or WHO Drinking Water Standards or other appropriate guidance values. For certain compounds, the EQS is quoted as a range of values based on the alkalinity of the water, where the measured concentration lies within this range, the results are interpreted qualitatively. The guideline values selected as appropriate GACs for each contaminant are presented in Appendix 3.

5.1.4. Leachate

Leachate analyses, where undertaken, shall be assessed in the same manner as the groundwater samples. The guideline values selected as appropriate GACs for each contaminant are presented in Appendix 3.

5.1.5. Ground Gas

The criteria used to assess the ground gas monitoring results, where monitored, have been taken from the following guidance documents:

- Assessing risks posed by ground gases to buildings, CIRIA Report C665, 2007
- Code of practice for the characterisation and remediation from ground gas in affected developments, British Standard BS 8576, 2013
- A Pragmatic Approach to Ground Gas Risk Assessment, CL:AIRE Research Bulletin RB17, 2012

The frequency and period of monitoring is assessed based on the gas generation potential of the source material and the sensitivity of the development, in accordance with Figure 6 of BS8576 and Table 5.5 of CIRIA C665. As BS8576 promotes a risk based approach to ground gas assessment, it recognises that ground gas monitoring might not be necessary if a viable pollutant linkages is not present, e.g. if a 'credible' source with significant ground gas generation potential and/or a 'credible' migration pathway are not present.

The Characteristic Situation for a monitoring location is determined using the worst case gas screening value for methane or carbon dioxide from all of the monitoring rounds at that location. Following the precautionary principal, the most stringent of the Characteristic Situations for the monitoring locations within the Site is generally used to classify the site as a whole.

5.2 SOIL ASSESSMENT

5.2.1. General

A total of 5no. soil samples collected during the site investigation of soil that could potentially be reused on site at or near surface during the proposed development works were submitted to a UKAS accredited laboratory for analysis for a suite of heavy metals, phenols, speciated polycyclic aromatic hydrocarbons (PAHs), fractionated total petroleum hydrocarbons (TPH), BTEX compounds and several inorganic parameters. The results of the laboratory analyses are summarised in Appendix 4, in which they are compared to the relevant generic assessment criteria. A full set of all the laboratory test certificates is presented as Appendix 5.

The range of potentially hazardous contaminants present on the site can be wide and varied and the suite has been chosen to reflect both commonly found contaminants and others indicated by research to have a significant risk of being present. It is, however, possible that others may exist for which analyses have not been carried out or which were outside the scope of completed exploratory holes.

The decision to recommend acceptability or a requirement for remediation is based on the evaluation of a number of factors which when combined present a statutory or non-statutory risk that may require remedial action.

5.2.2. Heavy metals

The heavy metals included in the analysis of the samples from the site were identified at concentrations below the relevant GACs in all of the samples across the site. Therefore, heavy metals in the soils across the site are not considered to present a significant source of contamination with regard to human health or environmental receptors.

5.2.3. Petroleum hydrocarbons

Total petroleum hydrocarbon (TPH) concentrations were recorded to be well below GACs in the soil samples across the site and predominantly below the laboratory detection limits. Therefore, TPH is not considered to represent a significant source of contamination with regard to human health or environmental receptors.

Concentrations of TPH C11-C40 fractions were not recorded to exceed the UKWIR 'threshold' values for mineral oil. TPH is therefore not considered to represent a significant source of contamination to proposed water supply pipes. However, the designers of the water supply pipes for this site should review the data in this report to inform their decision-making process.

5.2.4. Polycyclic aromatic hydrocarbons (PAHs)

Polycyclic aromatic hydrocarbon (PAH) compound concentrations were recorded to be well below the relevant GACs and generally below the laboratory detection limits in all the soil samples across the site. Therefore, PAHs are not considered to represent a significant source of contamination with regard to human health or environmental receptors.

5.2.5. BTEX compounds and MTBE

BTEX compounds and MTBE were not identified at concentrations in excess of the laboratory detection limits and were well below the relevant GACs in all of the samples from across the site. Therefore, BTEX compounds and MTBE are not considered to represent a significant source of contamination with regard to human health.

Concentrations of BTEX and MTBE were not recorded to exceed the UKWIR 'threshold' values. BTEX and MTBE are therefore not considered to represent a significant source of contamination to proposed water supply pipes.

5.2.6. Inorganics

The concentrations of free cyanide fell below laboratory detection limits in all of the soil samples analysed.

The pH of the soil samples analysed was generally within the 5-9 range, indicating neutral soils although one sample (WS201 at 0.2-0.5mbgl) recording a pH of 12.05. This isolated alkaline sample is considered to be the result of the limestone noted in the fill material in the former pond and is not considered to represent a significant source of contamination or an indicator of a more significant impact.

5.2.7. Asbestos

No asbestos containing materials or debris were identified in any of the 5no soil samples tested or observed in the soil during the investigation, including the fill material in the former pond. The fill material encountered in the former pond appeared to be indicative of debris from the dismantling of the pond with the observed limestone slab fragments and the concrete fragments likely to be remnants of the ponds surround and decorative features. While asbestos containing materials are not likely to have been associated with this type of fill, there is a chance that fill material from other sources may also have been used to fill the pond and vigilance should be maintained for asbestos containing materials

5.3 STATISTICAL ANALYSIS

Statistical analysis on the test results from this site was not considered to be appropriate.

5.4 GROUND GAS ASSESSMENT

The Desk Top Study element of this assessment did not identify any potential substantial on or off site natural soils or landfills with a high organic matter content with the potential for significant ground gas generation that might impact the site. The intrusive investigation went on to confirm the absence of substantial Made Ground on site and that the soils underlying the site do not have a significant organic matter content or potential for significant ground gas generation.

Therefore, based on the conceptual site model and with reference to BS8576 and CL:AIRE Research Bulletin RB17, ground gas monitoring and ground gas protection measures were not considered to be necessary for this site as there is not considered to be a viable ground gas pollutant linkage present in relation to the proposed development.

6. CONCEPTUAL SITE MODEL

6.1 SOURCES

The conceptual model, based on information obtained as part of the preliminary risk assessment and subsequent generic quantitative risk assessment has not identified any significant contaminant sources.

It should be noted that additional sources of contamination may become apparent during any future investigation and development of the site.

6.2 PATHWAYS AND RECEPTORS

As no potentially significant sources of contamination have been identified, no potentially viable pollutant linkages are considered to be present with regard to the proposed development. Further discussion of pathways and receptors is therefore not considered to be appropriate.

7. CONCLUSIONS AND RECOMMENDATIONS

No potentially significant sources of contamination have been identified with regard to the proposed development. Therefore, the risk of impact to receptors in the context of the proposed development from contamination is considered to be **negligible**. As such, further investigation, assessment and remediation are not considered necessary for this site.

Appropriate PPE is recommended during any redevelopment of the site to address any as yet unidentified contamination that may be identified during the works. A discovery strategy is also recommended to outline the procedures to follow in the event that any as yet unidentified contamination is encountered during the works (see Appendix 6).

As with all development sites, vigilance for asbestos containing materials in the soil should be maintained throughout the development and reported under the discovery strategy. On this site, particular consideration should be given to the former pond area in this regard.

FIGURE 1: SITE LOCATION PLAN



Ground Condition Consultants Ltd
10 Waldegrave Close Southampton SO19 9RY
Telephone 07971 450113
ask@groundcc.co.uk www.groundcc.co.uk

client
PALLANT HOMES

site
THE STEDDLES, NORTH END ROAD, YAPTON

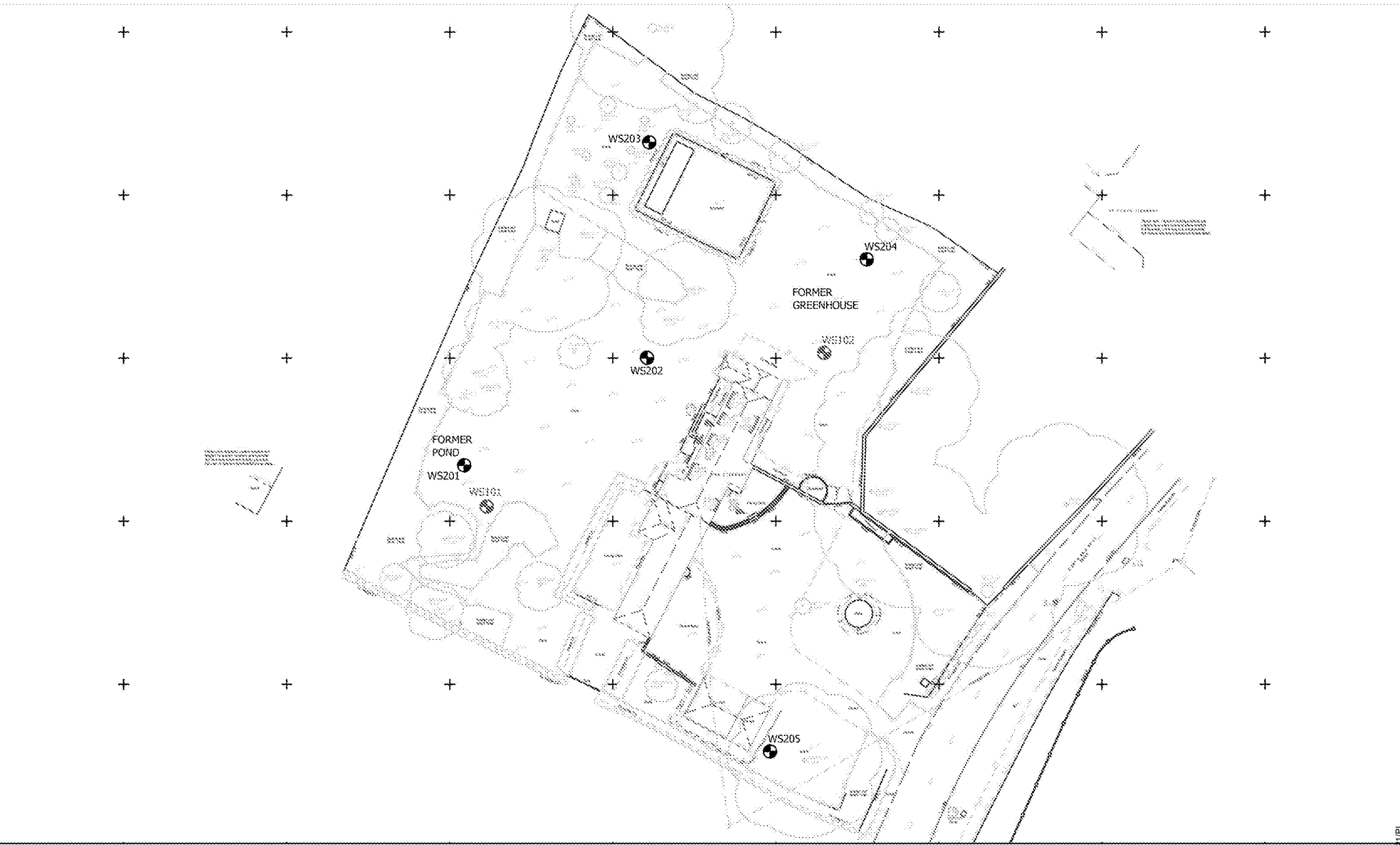
title
LOCATION PLAN

scale **NTS** drawn by **AP** checked by **RP**

date **24 SEP 2021** job no **J21-084**

drawing number **FIGURE 1** rev. **-**

FIGURE 2: INVESTIGATION LOCATION PLAN



Ground Condition Consultants Ltd
10 Waldegrave Close Southampton SO19 9RY
Telephone 07971 450113
ask@groundcc.co.uk www.groundcc.co.uk

client
PALLANT HOMES

project
THE STEDDLES, YAPTON

title
INVESTIGATION LOCATION PLAN

scale NTS drawn by AP checked by RP

date 24 SEP 2021 cad file J21-084

drawing number FIGURE 2 rev. 0

APPENDIX 1: REPORT CONDITIONS

This report is produced solely for the benefit of **Pallant Homes Limited** and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report refers, within the limitations stated, to the condition of the Site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the Site.

This report is based on a visual Site inspection, study of readily accessible referenced historical records, information supplied by those parties noted in the text and preliminary discussions with local and Statutory Authorities. Some of the opinions are based on unconfirmed data and information and are presented in good faith without exhaustive clarification. Where ground contamination is suspected but no physical Site test results are available to confirm this, the report must be regarded as initial advice only, and further assessment should be undertaken prior to detailed activities related to the Site. Where test results undertaken by others have been made available these can only be regarded as a limited sample. The possibility of the presence of contaminants, not revealed by this research cannot be discounted.

Whilst confident in the findings detailed within this report because there are no exact UK definitions of these matters, being subject to risk analysis, we are unable to give categorical assurances that they will be accepted by Authorities or Funds etc. without question, as such bodies may have unpublished, often more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to Ground Condition Consultants Ltd. In time improved practices or amended legislation may necessitate a re-assessment.

The report is necessarily limited to those aspects of land contamination specifically reported on and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents that may occur. The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous use and abuse of the Site and adjacent Sites. The report concentrates on the Site as defined in the report and provides an opinion on surrounding Sites. If migrating pollution or contamination (past or present) exists this can only practically be better assessed following extensive on and off Site intrusive investigations and monitoring.

APPENDIX 2: ENGINEERING LOGS

BOREHOLE LOG WS201

PROJECT NUMBER J21-084
PROJECT NAME The Steddles
CLIENT Pallant Homes
ADDRESS Yapton
DATE 24/09/21

DRILLING COMPANY South Coast Drilling
DRILLING METHOD Windowless Sampling
DRILLING RIG Terrier Mk2
LOGGED BY AP

CASING

COMMENTS No groundwater encountered during drilling

Samples	SPT N	Water	Depth (m)	Graphic Log	Material Description	Well Installation
ES - 0.2-0.5			0.2		Grass over dark brown silty sandy slightly gravelly CLAY (Topsoil)	
			0.4		Light brown slightly clayey very sandy fine to coarse angular limestone slab and concrete fragments with a fibreglass pond lining at the base (Made Ground)	
			0.6			
	N = 10 (2,2/2,2,3,3)		0.8		Firm orange brown silty sandy CLAY	
			1			
			1.2			
			1.4			
L - 1.5-2.0			1.6			
	N = 14 (2,2/3,3,4,4)		1.8			
			2			
			2.2		Firm to stiff light brown very sandy very gravelly CLAY. Gravel is fine to coarse angular to rounded flint and chalk.	
			2.4			
B - 2.5-3.0			2.6			
	N = 36 (6,7/9,8,7,8)		2.8			
			3			
			3.2		Light brown silty gravelly fine SAND. Gravel is fine to coarse angular to rounded flint and chalk.	
			3.4			
B - 3.5-4.0			3.6			
	N = 29 (6,6/9,7,7,6)		3.8			
			4			
			4.2		Structureless CHALK comprised of light brown and off white clayey silty sandy chalk GRAVEL (Grade Dc)	
			4.4			
			4.6			
	N = 30 (4,5/6,7,8,9)		4.8			
			5			
			5.2		Termination Depth at: 5.0m	
			5.4			

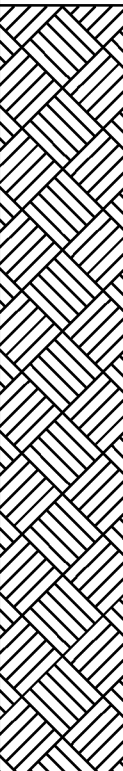
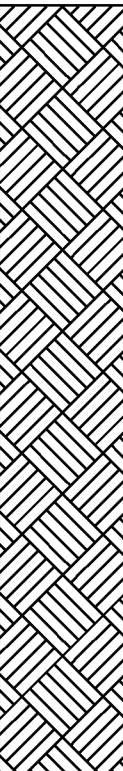
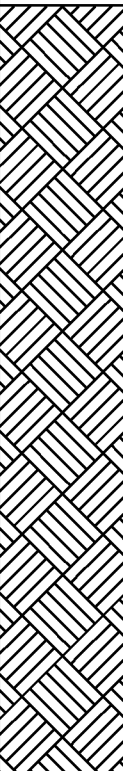
BOREHOLE LOG WS202

PROJECT NUMBER J21-084
PROJECT NAME The Steddles
CLIENT Pallant Homes
ADDRESS Yapton
DATE 24/09/21

DRILLING COMPANY South Coast Drilling
DRILLING METHOD Windowless Sampling
DRILLING RIG Terrier Mk2
LOGGED BY AP

CASING

COMMENTS No groundwater encountered during drilling. Refusal at 3.0m

Samples	SPT N	Water	Depth (m)	Graphic Log	Material Description	Well Installation
ES - 0.1-0.2	N = 11 (0,0/3,2,3,3)		0.2		Grass over dark brown silty sandy slightly gravelly CLAY (Topsoil)	
					Firm to stiff orange brown very silty slightly sandy slightly gravelly CLAY	
L - 0.6-1.0						
L - 1.5-2.0						
	N = 17 (2,2/2,4,5,6)		1.2		Firm to stiff orange brown very silty slightly sandy slightly gravelly CLAY	
L - 2.5-3.0	N = 50 (10,11/18,19 13=60mm)		1.6		Structureless CHALK comprised of light brown and off white very clayey very silty sandy chalk GRAVEL (Grade Dc)	
			1.8		Termination Depth at: 3.0m	

BOREHOLE LOG WS203

PROJECT NUMBER J21-084
PROJECT NAME The Steddles
CLIENT Pallant Homes
ADDRESS Yapton
DATE 24/09/21

DRILLING COMPANY South Coast Drilling
DRILLING METHOD Windowless Sampling
DRILLING RIG Terrier Mk2
LOGGED BY AP

CASING

COMMENTS No groundwater encountered during drilling

Samples	SPT N	Water	Depth (m)	Graphic Log	Material Description	Well Installation
					Grass over dark brown very silty CLAY (Topsoil)	
ES - 0.2-0.4			0.2		Firm to stiff orange brown silty sandy CLAY	
			0.4			
L - 0.5-1.0			0.6			
	N = 9 (0,0/0,3,3,3)		0.8			
			1			
			1.2			
			1.4			
L - 1.5-2.0			1.6			
	N = 14 (0,0/3,3,4,4)		1.8			
			2			
			2.2			
			2.4			
			2.6			
B - 2.7-3.0			2.8		Orange brown slightly clayey silty fine to medium SAND	
	N = 13 (3,2/3,3,3,4)		3			
			3.2			
			3.4			
			3.6			
B - 3.6-4.5			3.8		Light greenish grey silty fine SAND.	
	N = 44 (11,13/15,11,11,17)		4			
			4.2			
			4.4			
			4.6		Structureless CHALK comprised of light brown and off white clayey silty sandy chalk GRAVEL (Grade Dc)	
	N = 50 (8,8/13,15,14,8=40mm)		4.8			
			5		Termination Depth at: 5.0m	
			5.2			
			5.4			

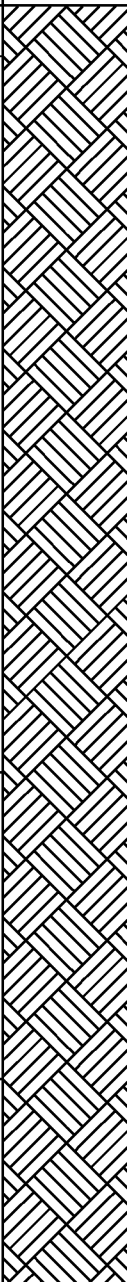
BOREHOLE LOG WS204

PROJECT NUMBER J21-084
PROJECT NAME The Steddles
CLIENT Pallant Homes
ADDRESS Yapton
DATE 24/09/21

DRILLING COMPANY South Coast Drilling
DRILLING METHOD Windowless Sampling
DRILLING RIG Terrier Mk2
LOGGED BY AP

CASING

COMMENTS No groundwater encountered during drilling

Samples	SPT N	Water	Depth (m)	Graphic Log	Material Description	Well Installation
ES - 0.1-0.2			0.2		Grass over dark brown very silty slightly gravelly CLAY with rare fine brick fragments (Topsoil)	
			0.4		Firm to stiff orange brown very silty sandy slightly gravelly CLAY	
L - 0.5-1.0			0.6			
	N = 16 (0,3/4,4,4,4)		0.8			
			1			
			1.2			
			1.4			
L - 1.5-2.0			1.6			
	N = 19 (4,3/5,5,4,5)		1.8			
			2			
			2.2			
			2.4			
L - 2.5-3.0			2.6			
	N = 5 (0,0/0,2,2,1)		2.8			
			3			
			3.2		Structureless CHALK comprised of light brown and off white clayey sandy gravelly SILT (Grade Dm)	
			3.4			
B - 3.5-4.0			3.6			
	N = 47 (7,10/10,10,15,12)		3.8			
			4			
			4.2		Structureless CHALK comprised of light brown and off white clayey silty sandy chalk GRAVEL (Grade Dc)	
			4.4			
			4.6			
	N = 28 (7,6/7,8,7,6)		4.8			
			5		Termination Depth at: 5.0m	
			5.2			
			5.4			

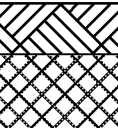
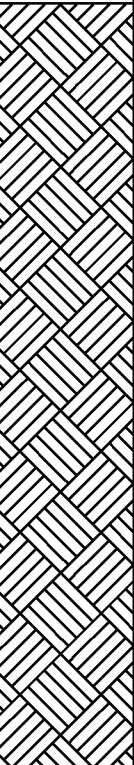
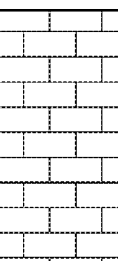
BOREHOLE LOG WS205

PROJECT NUMBER J21-084
PROJECT NAME The Steddles
CLIENT Pallant Homes
ADDRESS Yapton
DATE 24/09/21

DRILLING COMPANY South Coast Drilling
DRILLING METHOD Windowless Sampling
DRILLING RIG Terrier Mk2
LOGGED BY AP

CASING

COMMENTS No groundwater encountered during drilling. Refusal at 3.0m

Samples	SPT N	Water	Depth (m)	Graphic Log	Material Description	Well Installation
ES - 0.2-0.5	N = 16 (3,3/4,4,4,4)		0.2		Grass over dark brown very silty slightly gravelly CLAY with rare fine brick fragments (Topsoil)	
L - 0.5-1.0			0.4		Firm to stiff orange brown silty sandy slightly gravelly CLAY with occasional brick and mortar fragments (Made Ground - reworked natural)	
			0.6		Firm to stiff brown very silty sandy slightly gravelly CLAY	
	N = 50 (7,9/12,13,14,11)		0.8			
			1.0			
			1.2			
			1.4			
			1.6			
			1.8			
L - 1.5-2.0	N = 50 (9,16/16,16,16)		2.0		Structureless CHALK comprised of light brown and off white clayey sandy gravelly chalk SILT with occasional flint gravel (Grade Dm)	
			2.2			
			2.4			
			2.6			
			2.8			
			3.0			
B - 2.5-3.0			3.2		Termination Depth at: 3.0m	
			3.4			
			3.6			
			3.8			
			4.0			
			4.2			
			4.4			
			4.6			
			4.8			
			5.0			
			5.2			
			5.4			

APPENDIX 3: GENERIC ASSESSMENT CRITERIA

SOIL - HUMAN HEALTH SCREENING VALUES

Status	End Use	Issue No	Issue Date
ISSUE	Residential with Homegrown Produce	1	June 2015

Determinand	Units	SOIL ORGANIC MATTER			SOURCE
		1%	2.5%	6%	
pH		<5, >9			
Asbestos	%	Presence			
HEAVY METALS/METALLOIDS					
Arsenic	mg/kg	37			S4UL
Cadmium	mg/kg	11			S4UL
Chromium (III)	mg/kg	910			S4UL
Chromium (VI)	mg/kg	6			S4UL
Lead	mg/kg	200			C4SL
Mercury (Elemental)	mg/kg	1.2			S4UL
Mercury (Inorganic)	mg/kg	40			S4UL
Mercury (Methyl)	mg/kg	11			S4UL
Nickel	mg/kg	130			S4UL
Selenium	mg/kg	250			S4UL
Beryllium	mg/kg	1.7			S4UL
Boron	mg/kg	290			S4UL
Vanadium	mg/kg	410			S4UL
Copper	mg/kg	2,400			S4UL
Zinc	mg/kg	3,700			S4UL
GENERAL INORGANICS					
Easily Liberatable Cyanide (free)	mg/kg	36			Acute effects infant 1 dose 3g soil
US EPA PRIORITY PAHs					
Acenaphthene	mg/kg	210	510	1100	S4UL
Acenaphthylene	mg/kg	170	420	920	S4UL
Anthracene	mg/kg	2,400	5,400	11000	S4UL
Benzo(a)Anthracene	mg/kg	72	11	13	S4UL
Benzo(b)fluoranthene	mg/kg	2.6	3.3	3.7	S4UL
Benzo(k)fluoranthene	mg/kg	77	93	100.0	S4UL
Benzo(g,h,i)perylene	mg/kg	320	340	350	S4UL
Benzo(a)Pyrene	mg/kg	2.20	2.7	3	S4UL
Chrysene	mg/kg	15	22	27.0	S4UL
Di-benzo(a,h)anthracene	mg/kg	0.24	0.28	0.30	S4UL
Fluoranthene	mg/kg	280	560	890	S4UL
Fluorene	mg/kg	170	400	860	S4UL
Indeno(1,2,3-cd)pyrene	mg/kg	27.0	36	41.0	S4UL
Naphthalene	mg/kg	2.3	5.6	13.0	S4UL
Phenanthrene	mg/kg	95	220	440	S4UL
Pyrene	mg/kg	620	1200	2000	S4UL
Total PAHs	mg/kg	No Sum	No Sum	No Sum	
Chlorinated Solvents/VOCs					
1,2-Dichloroethane (DCE)	mg/kg	0.0071	0.011	0.019	S4UL
1,1,1-Trichloroethane (111 TCA)	mg/kg	8.8	18	39	S4UL
1,1,1,2-Tetrachloroethane (1112 PCA)	mg/kg	1.2	2.8	6.40	S4UL
1,1,2,2-Tetrachloroethane (1122 PCA)	mg/kg	1.60	3.4	7.5	S4UL
Tetrachloroethene (PCE)	mg/kg	0.18	0.39	0.9	S4UL
Tetrachloromethane (Carbon Tetrachloride)	mg/kg	0.026	0.056	0.13	S4UL
Trichloroethene (TCE)	mg/kg	0.016	0.034	0.075	S4UL
Trichloromethane (Chloroform)	mg/kg	0.91	1.7	3.4	S4UL
Vinyl Chloride	mg/kg	0.00064	0.00087	0.0014	S4UL
Chlorobenzene	mg/kg	0.46	1	2.4	S4UL
1,2-Dichlorobenzene	mg/kg	23	55	130	S4UL
1,3-Dichlorobenzene	mg/kg	0.4	1	2.3	S4UL
1,4-Dichlorobenzene	mg/kg	61	150	350	S4UL
1,2,3-Trichlorobenzene	mg/kg	1.5	3.6	8.6	S4UL
1,2,4-Trichlorobenzene	mg/kg	2.6	6.4	15	S4UL
1,3,5-Trichlorobenzene	mg/kg	0.33	0.81	1.9	S4UL
1,2,3,4-Tetrachlorobenzene	mg/kg	15	36	78	S4UL
1,2,3,5-Tetrachlorobenzene	mg/kg	0.66	1.6	3.7	S4UL
1,2,4,5-Tetrachlorobenzene	mg/kg	0.33	0.77	1.6	S4UL
Pentachlorobenzene	mg/kg	5.8	12	22	S4UL
Hexachlorobenzene	mg/kg	1.8	3.3	4.9	S4UL
Carbon Disulphide	mg/kg	0.14	0.29	0.62	S4UL

Hexachlorobutadiene	mg/kg	0.29	0.7	1.6	S4UL
Phenolics					
Phenol	mg/kg	280	550	1100	S4UL
Chlorophenols	mg/kg	0.87	2.00	4.50	S4UL
Pentachlorophenol	mg/kg	0.22	0.52	1.20	S4UL
Explosives					
2,4,6 Trinitrotoluene (TNT)	mg/kg	1.6	3.7	8.1	S4UL
RDX	mg/kg	120.0	250.0	540.0	S4UL
HMX	mg/kg	5.7	13.0	26.0	S4UL
Insecticides/Herbicides					
Aldrin	mg/kg	5.70	6.60	7.10	S4UL
Dieldrin	mg/kg	0.97	2.00	3.50	S4UL
Atrazine	mg/kg	3.30	7.60	17.40	S4UL
Dichlorvos	mg/kg	0.032	0.066	0.140	S4UL
Alpha-Endosulfan	mg/kg	7.4	18.0	41.0	S4UL
Beta-Endosulfan	mg/kg	7.0	17.0	39.0	S4UL
Alpha-Hexachlorocyclohexane	mg/kg	0.23	0.55	1.20	S4UL
Beta-Hexachlorocyclohexane	mg/kg	0.085	0.200	0.460	S4UL
Gamma-Hexachlorocyclohexanes (Lindane)	mg/kg	0.06	0.14	0.33	S4UL
TPH					
TPH Aliphatic >C5-6	mg/kg	42	78	160	S4UL
TPH Aliphatic >C6-8	mg/kg	100	230	530	S4UL
TPH Aliphatic >C8-10	mg/kg	27	65	150	S4UL
TPH Aliphatic >C10-12	mg/kg	130	330	760	S4UL
TPH Aliphatic >C12-16	mg/kg	1100	2,400	4,300	S4UL
TPH Aliphatic >C16-35	mg/kg	65,000	92,000	110,000	S4UL
TPH Aliphatic >C35-44	mg/kg	65,000	92,000	110,000	S4UL
TPH Aromatic >EC5-7 (Benzene)	mg/kg	70	140.00	300	S4UL
TPH Aromatic >EC7-8	mg/kg	130	290	660	S4UL
TPH Aromatic >EC8-10	mg/kg	34	83	190	S4UL
TPH Aromatic >EC10-12	mg/kg	74	180	380	S4UL
TPH Aromatic >EC12-16	mg/kg	140	330	660	S4UL
TPH Aromatic >EC16-21	mg/kg	260	540	930	S4UL
TPH Aromatic >EC21-35	mg/kg	1100	1,500	1,700	S4UL
TPH Aromatic >EC35-44	mg/kg	1100	1,500	1,700	S4UL
TPH Aliphatic & Aromatic >EC44-70	mg/kg	1,600	1,800	1,900	S4UL
Total TPH	mg/kg	No Sum	No Sum	No Sum	
BTEX					
Benzene	mg/kg	0.087	0.17	0.37	S4UL
Toluene	mg/kg	130	290	660	S4UL
Ethylbenzene	mg/kg	47	110	260	S4UL
m-Xylene	mg/kg	60	140	330	S4UL
o-Xylene	mg/kg	59	140	320	S4UL
p-Xylene	mg/kg	56	130	310	S4UL

NOTES

- 1) Compare individual samples values against Soil Screening Values (SSV). If exceedences are noted consider further in relation to averaging areas and statistical analysis.
- 2) These values are for initial screening for potential **risk to human health only**. They are **not remediation thresholds**. **Screening for other receptors to be done separately as appropriate for the site, e.g. for water, ecology, building materials.**
- 3) Screening criteria denoted with an asterisk (*) were capped at the lower vapour/aqueous saturation limits for Tier 1 human health risk assessment purposes and considered conservative. Where concentrations are recorded at levels greater than the SSV, free phase (NAPL) contamination may be present and should be considered qualitatively. Further information to support the interpretation of assessment criteria that exceed theoretical soil saturation limits is provided in Section 4.12 of the CLEA Software Handbook (SR4).
- 4) Screening criteria denoted with hash (#) were capped at 1000000mg/kg. It is noted that aesthetic (e.g. odour) and other site specific factors may also be relevant when providing advice relating to these compounds.
- 5) LQM/CIEH S4ULs November 2014 - Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3439. All rights reserved.
- 6) SSVs derived for certain constituents may be low in relation to standard laboratory Limits of Detection (LoD). It is the responsibility of the project engineer to check with the laboratory that appropriate detection limits can be achieved. As a target, an LoD would be no larger than 10% of the SSV, but this is not practicable for some constituents. Clearly an LoD greater than the SSV would prevent use of this SSV screening and/or be interpreted as if all samples exceeded the SSV.
- 7) Human Health Soil Screening Values (SSV) were calculated using a Soil Organic Matter (SOM) value of 1.0%, 2.5% and 6%. This is equivalent to an Fraction Organic Carbon (FOC) values of approx. 0.6%, 1.45% and 3.5% respectively (For reference FOC = 0.58*SOM). Note that some soils have different SOM/FOC, which may give require more stringent SSVs for organic compounds. It is the responsibility of the project engineer to check the SOM with the site specific conditions.

- 8) In general, SSVs above 100mg/kg are rounded down to 3 significant figures. Similarly, SSVs below 100mg/kg are rounded down to 2 significant figures

APPENDIX 4: SOIL SCREENING SUMMARY

Project Name: Yapton
Project Ref: J21-084
GAC Comparison: GCC - Residential with homegrown produce (1% SOM)

Sample ID	Units	GAC	WS201	WS202	WS203	WS204	WS205
Depth to Top			0.20	0.10	0.20	0.10	0.20
Depth to Bottom			0.50	0.20	0.40	0.20	0.50
Date Sampled			24-Sep-21	24-Sep-21	24-Sep-21	24-Sep-21	24-Sep-21
pH	pH	5-9	12.05	7.52	7.07	7.43	7.75
Cyanide (free)	mg/kg	36	<1	<1	<1	<1	<1
Phenols - Total by HPLC	mg/kg	280	<0.2	<0.2	<0.2	<0.2	<0.2
Organic matter	% w/w		0.8	0.9	0.8	1.8	1
Total Organic Carbon	% w/w		0.44	0.54	0.46	1.08	0.57
Antimony	mg/kg		<5	<5	<5	<5	<5
Arsenic	mg/kg	37	4	4	2	4	4
Cadmium	mg/kg	11	<0.5	0.9	0.8	0.8	0.7
Copper	mg/kg	2400	8	15	13	19	11
Chromium	mg/kg		25	26	18	20	18
Chromium (hexavalent)	mg/kg	6	<1	<1	<1	<1	<1
Lead	mg/kg	200	71	16	19	139	21
Mercury	mg/kg	40	1.33	<0.17	<0.17	<0.17	<0.17
Nickel	mg/kg	130	15	20	14	16	13
Selenium	mg/kg	250	<1	<1	<1	<1	<1
Zinc	mg/kg	3700	37	45	39	52	45
Asbestos in soil		NAD	NAD	NAD	NAD	NAD	NAD
PAH-16MS (MSD order)							
Naphthalene	mg/kg	2.3	<0.03	<0.03	<0.03	<0.03	<0.03
Acenaphthylene	mg/kg	170	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	mg/kg	210	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	mg/kg	170	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	mg/kg	95	0.1	<0.03	<0.03	0.03	<0.03
Anthracene	mg/kg	2400	<0.02	<0.02	<0.02	<0.02	<0.02
Fluoranthene	mg/kg	280	0.34	<0.08	<0.08	0.12	<0.08
Pyrene	mg/kg	620	0.39	<0.07	<0.07	0.11	<0.07
Benzo(a)anthracene	mg/kg	72	0.25	<0.04	<0.04	0.07	<0.04
Chrysene	mg/kg	15	0.28	<0.06	<0.06	0.08	<0.06
Benzo(b)fluoranthene	mg/kg	2.6	0.26	<0.05	<0.05	0.09	0.06
Benzo(k)fluoranthene	mg/kg	77	0.09	<0.07	<0.07	<0.07	<0.07
Benzo(a)pyrene	mg/kg	2.2	0.24	<0.04	<0.04	0.08	<0.04
Indeno(123-cd)pyrene	mg/kg	27.0	0.16	<0.03	<0.03	0.07	0.04
Dibenzo(ah)anthracene	mg/kg	0.24	<0.04	<0.04	<0.04	<0.04	<0.04
Benzo(ghi)perylene	mg/kg	320	0.15	<0.05	<0.05	<0.05	<0.05
Total PAH-16MS (MSD order)	mg/kg		2.26	<0.08	<0.08	0.65	0.1
TPH CWG							
Ali >C5-C6	mg/kg	42	<0.01	<0.01	<0.01	<0.01	<0.01
Ali >C6-C8	mg/kg	100	<0.01	<0.01	<0.01	<0.01	<0.01
Ali >C8-C10	mg/kg	27	<1	<1	<1	<1	<1
Ali >C10-C12	mg/kg	130	<1	<1	<1	<1	<1
Ali >C12-C16	mg/kg	1100	<1	<1	<1	<1	<1
Ali >C16-C21	mg/kg	65000	1	<1	<1	<1	<1
Ali >C21-C35	mg/kg	65000	10	<1	<1	1	<1
Total Aliphatics	mg/kg		11	<1	<1	1	<1
Aro >C5-C7	mg/kg	70	<0.01	<0.01	<0.01	<0.01	<0.01
Aro >C7-C8	mg/kg	130	<0.01	<0.01	<0.01	<0.01	<0.01
Aro >C8-C10	mg/kg	34	6	<1	<1	<1	<1
Aro >C10-C12	mg/kg	74	<1	<1	<1	<1	<1
Aro >C12-C16	mg/kg	140	1	<1	<1	<1	<1
Aro >C16-C21	mg/kg	260	4	<1	<1	<1	<1
Aro >C21-C35	mg/kg	1100	18	<1	<1	3	<1
Total Aromatics	mg/kg		30	<1	<1	3	<1
TPH (Ali & Aro >C5-C35)	mg/kg		41	<1	<1	4	<1
BTEX - Benzene	mg/kg	0.087	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - Toluene	mg/kg	130	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - Ethyl Benzene	mg/kg	47	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - m & p Xylene	mg/kg	56	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - o Xylene	mg/kg	59	<0.01	<0.01	<0.01	<0.01	<0.01
MTBE	mg/kg		<0.01	<0.01	<0.01	<0.01	<0.01

APPENDIX 5: CHEMICAL LABORATORY TEST CERTIFICATES

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/10532
Issue Number: 1

Date: 08 October, 2021

Client: Ground Condition Consultants Ltd
10 Waldegrave Close
Southampton
SO19 9RY

Project Manager: Antony Platt
Project Name: Yapton
Project Ref: J21-084
Order No: J21-084
Date Samples Received: 28/09/21
Date Instructions Received: 28/09/21
Date Analysis Completed: 08/10/21

Prepared by:

Approved by:

[Redacted signature area]

Melanie Marshall
Laboratory Coordinator

Richard Wong
Client Manager

Envirolab Job Number: 21/10532

Client Project Name: Yapton

Client Project Ref: J21-084

Lab Sample ID	21/10532/1	21/10532/2	21/10532/3	21/10532/4	21/10532/5			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS201	WS202	WS203	WS204	WS205					
Depth to Top	0.20	0.10	0.20	0.10	0.20					
Depth To Bottom	0.50	0.20	0.40	0.20	0.50					
Date Sampled	24-Sep-21	24-Sep-21	24-Sep-21	24-Sep-21	24-Sep-21					
Sample Type	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	7	6AE	6AE	6AE	6A					
% Stones >10mm _A	<0.1	<0.1	<0.1	3.2	10.5			% w/w	0.1	A-T-044
pH _D ^{MF}	12.05	7.52	7.07	7.43	7.75			pH	0.01	A-T-031s
Cyanide (free) _A ^{MF}	<1	<1	<1	<1	<1			mg/kg	1	A-T-042sFCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2	<0.2	<0.2			mg/kg	0.2	A-T-050s
Organic matter _D ^{MF}	0.8	0.9	0.8	1.8	1.0			% w/w	0.1	A-T-032 OM
Total Organic Carbon _D ^{MF}	0.44	0.54	0.46	1.08	0.57			% w/w	0.03	A-T-032s
Antimony _D	<5	<5	<5	<5	<5			mg/kg	5	A-T-024s
Arsenic _D ^{MF}	4	4	2	4	4			mg/kg	1	A-T-024s
Cadmium _D ^{MF}	<0.5	0.9	0.8	0.8	0.7			mg/kg	0.5	A-T-024s
Copper _D ^{MF}	8	15	13	19	11			mg/kg	1	A-T-024s
Chromium _D ^{MF}	25	26	18	20	18			mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1			mg/kg	1	A-T-040s
Lead _D ^{MF}	71	16	19	139	21			mg/kg	1	A-T-024s
Mercury _D	1.33	<0.17	<0.17	<0.17	<0.17			mg/kg	0.17	A-T-024s
Nickel _D ^{MF}	15	20	14	16	13			mg/kg	1	A-T-024s
Selenium _D ^{MF}	<1	<1	<1	<1	<1			mg/kg	1	A-T-024s
Zinc _D ^{MF}	37	45	39	52	45			mg/kg	5	A-T-024s

Envirolab Job Number: 21/10532

Client Project Name: Yapton

Client Project Ref: J21-084

Lab Sample ID	21/10532/1	21/10532/2	21/10532/3	21/10532/4	21/10532/5			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS201	WS202	WS203	WS204	WS205					
Depth to Top	0.20	0.10	0.20	0.10	0.20					
Depth To Bottom	0.50	0.20	0.40	0.20	0.50					
Date Sampled	24-Sep-21	24-Sep-21	24-Sep-21	24-Sep-21	24-Sep-21					
Sample Type	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	7	6AE	6AE	6AE	6A					
Asbestos in Soil (inc. matrix)^ @										
Asbestos in soil [#]	NAD	NAD	NAD	NAD	NAD					A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	N/A					A-T-045

Envirolab Job Number: 21/10532

Client Project Name: Yapton

Client Project Ref: J21-084

Lab Sample ID	21/10532/1	21/10532/2	21/10532/3	21/10532/4	21/10532/5			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS201	WS202	WS203	WS204	WS205					
Depth to Top	0.20	0.10	0.20	0.10	0.20					
Depth To Bottom	0.50	0.20	0.40	0.20	0.50					
Date Sampled	24-Sep-21	24-Sep-21	24-Sep-21	24-Sep-21	24-Sep-21					
Sample Type	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	7	6AE	6AE	6AE	6A					
PAH-16MS (MSD order)										
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03			mg/kg	0.03	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-019s
Acenaphthene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-019s
Phenanthrene _A ^{M#}	0.10	<0.03	<0.03	0.03	<0.03			mg/kg	0.03	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	<0.02	<0.02	<0.02			mg/kg	0.02	A-T-019s
Fluoranthene _A ^{M#}	0.34	<0.08	<0.08	0.12	<0.08			mg/kg	0.08	A-T-019s
Pyrene _A ^{M#}	0.39	<0.07	<0.07	0.11	<0.07			mg/kg	0.07	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.25	<0.04	<0.04	0.07	<0.04			mg/kg	0.04	A-T-019s
Chrysene _A ^{M#}	0.28	<0.06	<0.06	0.08	<0.06			mg/kg	0.06	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.26	<0.05	<0.05	0.09	0.06			mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.09	<0.07	<0.07	<0.07	<0.07			mg/kg	0.07	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.24	<0.04	<0.04	0.08	<0.04			mg/kg	0.04	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.16	<0.03	<0.03	0.07	0.04			mg/kg	0.03	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04	<0.04			mg/kg	0.04	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.15	<0.05	<0.05	<0.05	<0.05			mg/kg	0.05	A-T-019s
Total PAH-16MS (MSD order) _A ^{M#}	2.26	<0.08	<0.08	0.65	0.10			mg/kg	0.03	A-T-019s

Envirolab Job Number: 21/10532

Client Project Name: Yapton

Client Project Ref: J21-084

Lab Sample ID	21/10532/1	21/10532/2	21/10532/3	21/10532/4	21/10532/5			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS201	WS202	WS203	WS204	WS205					
Depth to Top	0.20	0.10	0.20	0.10	0.20					
Depth To Bottom	0.50	0.20	0.40	0.20	0.50					
Date Sampled	24-Sep-21	24-Sep-21	24-Sep-21	24-Sep-21	24-Sep-21					
Sample Type	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	7	6AE	6AE	6AE	6A					
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	<1	<1	<1	<1			mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1	<1	<1	<1			mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	<1	<1	<1	<1			mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	1	<1	<1	<1	<1			mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	10	<1	<1	1	<1			mg/kg	1	A-T-055s
Total Aliphatics _A	11	<1	<1	1	<1			mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	6	<1	<1	<1	<1			mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	<1	<1	<1	<1			mg/kg	1	A-T-055s
Aro >C12-C16 _A	1	<1	<1	<1	<1			mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	4	<1	<1	<1	<1			mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	18	<1	<1	3	<1			mg/kg	1	A-T-055s
Total Aromatics _A	30	<1	<1	3	<1			mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	41	<1	<1	4	<1			mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s

REPORT NOTES

General

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

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

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.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

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, 9 = INCINERATOR ASH.

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.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR

Client:	Ground Condition Consultants Ltd, 10 Waldegrave Close, Southampton, SO19 9RY	Project No:	21/10532
Project:	Yapton	Date Received:	28/09/2021 (am)
Clients Project No:	J21-084	Cool Box Temperatures (°C):	14.0

NO DEVIATIONS IDENTIFIED with respect to sampling dates or containers received.

Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples $5 \pm 3^{\circ}\text{C}$), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	21/10532/1	21/10532/2	21/10532/3	21/10532/4	21/10532/5
Client Sample No					
Client Sample ID/Depth	WS201 0.20-0.50m	WS202 0.10-0.20m	WS203 0.20-0.40m	WS204 0.10-0.20m	WS205 0.20-0.50m
Date Sampled	24/09/21	24/09/21	24/09/21	24/09/21	24/09/21
A-T-019s	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021
A-T-022s	05/10/2021	05/10/2021	05/10/2021	05/10/2021	05/10/2021
A-T-024s	08/10/2021	08/10/2021	08/10/2021	08/10/2021	08/10/2021
A-T-031s	06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
A-T-032 OM	06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
A-T-032s	06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
A-T-040s	06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
A-T-042sFCN	04/10/2021	04/10/2021	04/10/2021	04/10/2021	04/10/2021
A-T-044	05/10/2021	05/10/2021	05/10/2021	05/10/2021	05/10/2021
A-T-045	30/09/2021	30/09/2021	30/09/2021	30/09/2021	30/09/2021
A-T-050s	01/10/2021	01/10/2021	01/10/2021	01/10/2021	01/10/2021
A-T-055s	05/10/2021	05/10/2021	05/10/2021	05/10/2021	05/10/2021

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

APPENDIX 6: DISCOVERY STRATEGY

Attn: Ground Works Contractors

The Steddles, Yapton – Discovery Strategy

Background

This document presents a brief summary of the actions to be taken if suspected contamination of the soil or groundwater is encountered during the development of the site and follows on from the GCC Ground Condition Assessment dated October 2021.

Evidence of contamination

Evidence of contamination may be in the following forms, although other indicators may be observed.

- Dark staining of the soil
- Ash in soil
- Oily sheen on soil or water
- Tanks and pipework
- Smell of oil/diesel/petrol
- Asbestos containing material fragments
- Large deposits of made ground (e.g. waste deposits)

Actions following identification of evidence of contamination

Contractors encountering evidence of contamination are to report the discovery to the site office/site manager.

- Further development of the potentially contaminated area should cease and Site Manager should contact GCC (ask@groundcc.com) to attend site and assess the implications of the discovered impact.
- GCC will in turn inform the Local Authority and/or the Environment Agency as appropriate.
- Potentially contaminated material is to be left in situ where possible, or stockpiled in bunded areas where it is not possible to leave in situ, until an assessment is complete and appropriate action is agreed with the relevant regulator.
- Potentially contaminated material to be disposed of off site may require further chemical testing.