GROUND CONSULTANTS LTD
ENVIRONMENTAL & GEOTECHNICAL SPECIALISTS

# PHASE 1
# PRELIMINARY RISK ASSESSMENT (PRA)

## Wainies Brook, Higher Crackington, Bude

EX23 0LD

For Nick and Angela Swann

Our Ref: 23329

27 March 2023

Ground Consultants Limited
Wadebridge, Cornwall, PL27 6AU
Tel: 01209 243192 | 07708 485373
Company Registration Number: 13561213

ENVIRONMENTAL GEOTECHNICAL SITE INVESTIGATION

## Project

Wainies Brook, Higher Crackington, Bude EX23 0LD

## Report Type

Phase 1 Preliminary Risk Assessment (PRA)

## Client

Nick and Angela Swann

## Project Ref

23329

## Date

27 March 2023

## Prepared by

**Frank Westcott**
Technical Consultant

## Checked by

**Dan Jobson**
Managing Director

## Table of Contents

## Figures



## Appendices



## Tables

| Executive Summary | | |
|---|---|---|
| **Commissioning** | Ground Consultants Limited (GCL) were commissioned by Nick and Angela Swann to undertake a Phase I Preliminary Risk Assessment at the site known as Wainies Brook, Higher Crackington, Bude EX23 0LD. GCL were formally instructed to proceed via email on the 2nd March 2023. | |
| **Development Proposals** | It is proposed to develop the site by conversion and extension of a small storage building as a single guest house property. ) | |
| **Site History** | On Site: The site has remained in assumed agricultural use from the earliest OS mapping. Three buildings were present on the west of the site by 1958, of which two were no longer present from 1999. The remaining building (understood to have been a dairy) remains extant.<br>Off Site: The surrounding area has remained primarily agricultural from the earliest OS mapping. | |
| **Geology** | The geological map shows no superficial deposits to be present on site.<br>The geological map indicates that the site is underlain by the Crackington Formation of Namurian (Carboniferous) age formed between 328 and 318 million years ago. The BGS describes this unit as “Rhythmically bedded, dark blue-grey mudstones and subordinate predominantly grey sandstones and siltstones.” | |
| **Conceptual Site Model Summary** | **Source** | **Risk Rating** |
| | On Site: Radon Gas | **Moderate** |
| | On Site: Imported fill | **Very Low** |
| **Recommendations** | Basic radon protective measures are required for the proposed development in-line with BRE guidelines.<br>In the event unexpected contamination is found during development, work should cease until the material can be identified and remediated appropriately.<br>All site workers should be equipped with the correct PPE and have undertaken suitable risk assessments, job safety and environmental analysis before work commences.<br>Waste material to be removed from site should be handled by a suitably licensed waste contractor. | |

# 1 INTRODUCTION

## 1.1 Commissioning

Ground Consultants Limited (GCL) were commissioned by Nick and Angela Swann to undertake a Phase I Preliminary Risk Assessment at the site known as Wainies Brook, Higher Crackington, Bude EX23 0LD. GCL were formally instructed to proceed via email on the 2nd March 2023.

This report has been prepared by GCL solely for the benefit of the client. It shall not be relied upon or transferred to any third party without the prior written authorisation of GCL.

## 1.2 Existing Reports

GCL has not been made aware of any previous land contamination reports commissioned for this site.

## 1.3 Scope and Objectives

The objective of this desk study is;

- ✓ To provisionally identify any land contamination associated with the proposed development and to support the discharge of relevant planning conditions and/or building control requirements.
- ✓ To provisionally assess the risk of ground instability
- ✓ To identify the need for investigation or remediation works to demonstrate that the site is suitable for use.

Any recommendations for further works have been made as deemed appropriate, based upon the findings of the investigation.

This assessment has been undertaken with guidance from BS10175:201, Environment Agency report CLR11, LCRM, and as such represents a Phase 1 Desk Study / Qualitative Risk Assessment.

## 1.4 Limitations

The opinions expressed in this report, and the comments and recommendations given, are based on the information obtained from the desk assessment and the site walkover survey. No intrusive investigations have been undertaken to confirm the actual ground conditions and hence the environmental status of the site.

Should additional information become available which may influence the report conclusions, GCL reserves the right to review such information and, if warranted, to alter the opinions accordingly.

The conclusions and recommendations of this report are valid for a period of 12 months from the date of issue. Outside of this time frame the report will require reviewing by a suitably qualified geoenvironmental engineer / environmental scientist, to ensure that the report complies with any changes to industry standards, policies and/or guidelines.

It is recommended that a copy of this report be submitted to the local authority for approval, prior to commissioning any further work which may be required.

## 1.5 Information Sources

This assessment has been based upon mapping and information obtained from a number of trusted third-party sources. Although we only use information from trusted sources, GCL cannot accept any responsibility for any inaccuracy of third party information. The sources used in this assessment are listed below:

- ✓ Environmental and historical data supplied by Groundsure
- ✓ Zetica Unexploded Ordnance (UXO) risk map
- ✓ British Geological Mapping (both online viewer and map scans)
- ✓ Planning application: PA22/10812

## 1.6 Proposed Development

It is proposed to develop the site by conversion and extension of a small storage building as a single guest house property.

The proposed site plan is contained in Figure 2.3, to the rear of the report.

# 2 SITE LOCATION AND DESCRIPTION

## 2.1 Site Location and Layout

The site is located between the hamlets of Higher Crackington and Sweets, off an unclassified lane 200m west of Higher Crackington, which is on an unclassified road from Marshgate and Tresparrett Posts to Crackington Haven. The site is approximately centred on National Grid Reference SX 15401 95504.

The site is roughly square in shape and covers an area of 0.15ha.

A site location plan (SLP) is contained in Figure 2.1, to the rear of the report.

The current site plan is contained in Figure 2.2, to the rear of the report.

## 2.2 Surrounding Area

Table 2.1: Surrounding Land Use

| Direction | Land Use |
|---|---|
| North | Residential, woodland and agricultural |
| East | Agricultural, residential beyond |
| South | Agricultural |
| West | Agricultural |

## 2.3 Site Walkover Survey

GCL conducted a site walkover survey on 27th March 2023. Photographs from the walkover survey are provided in Appendix A.

The site is accessed on its northern edge [Plate 1]. The site is currently a small field, with a small single storey block walled, steel sheet roofed, concrete floored building on its western side (Plates 2, 3). The remainder of the site is laid to rough pasture (Plates 4, 5), sloping steeply down to a brook on its eastern edge (Plates 6, 7), and wet underfoot close to the brook.

The building contains tools and other items belonging to the client.

The access to the site has recently been surfaced with locally sourced imported material comprising mainly natural gravel derived from local strata (“Shillet”). Some pieces of brick and concrete were visible but no tarmacadam or asbestos containing material was visible [Plate 8].

Mature trees bound the site to the east and west [plates 3, 6]. A hedge borders the lane to the north [plate 1]. To the south, the boundary is delineated by a fence and recent hedge planting [Plates 5, 7].

No potential sources of contamination were noted on site.

## 2.4 Ecological Observations

No invasive species were noted in or around the immediate surroundings of the site during the site walkover.

## 2.5 Anecdotal Information

According to the client the blockwork building was constructed in the 1940s and was used as a dairy. Evidence of this use is visible in the floor slab.

# 3 SITE HISTORY

## 3.1 Historical Map Review

Using historical Ordnance Survey mapping and recent aerial photography provided by Groundsure, an overview of pertinent findings relating to the site and its surroundings can be found below in Table 3.1.

*Table 3.1: Summary of Historical Site Usage*

| On Site | Surroundings | Date & Scale |
|---|---|---|
| The site is part of a field in assumed agricultural use. A watercourse runs along its eastern edge. | A spring is located 5m west of the site. Buildings, assumed residential or agricultural, are present 20-30m north-east. | 1884<br>1:2,500, 1:10,560 |
| No significant changes | A small cutting is mapped 5m north, on the north side of the lane. | 1906-7<br>1:2,500, 1:10,560 |
| A small building is located on the western side of the site. | No significant changes | 1958<br>1:10,560 |
| Group of three buildings, assumed agricultural, shown on the site, one at same location as current building and the others to the north and south. | Residential properties 40m north-west, 40m north-east and 90m east. Small building (use not known) 20m west. | 1979-83<br>1:2,500, 1:10,000 |
| No significant changes | No significant changes | 1994<br>1:2,500 |
| Site part of larger pasture field. Single building present on west side of site. | No significant changes. Surrounding fields in arable and pasture use. | 1999<br>Aerial photo |
| No significant changes | Building 20m west no longer shown. | 2001-3<br>1:1,250, 1:10,000 |
| No significant changes | No significant changes | 2005<br>Aerial photo |
| Scale too small to show detail | No significant changes | 2010<br>1:10,000 |
| No significant changes | No significant changes | 2013-21<br>Aerial photos |

| | | |
|---|---|---|
| Scale too small to show detail | No significant changes | 2023<br>1:10,000 |

## 3.2 Site History Summary

On Site: The site has remained in assumed agricultural use from the earliest OS mapping. Three buildings were present on the west of the site by 1958, of which two were no longer present from 1999. The remaining building (understood to have been a dairy) remains extant.

Off Site: The surrounding area has remained primarily agricultural from the earliest OS mapping, with scattered residential properties.

## 3.3 UXO Risk

The risk to the site and its surroundings from the presence of UXO is low (see Appendix D).

## 3.4 Nearby Planning Applications

The following pertinent planning applications have been identified in the Cornwall Council online planning register.

*Table 3.2: Nearby Pertinent Planning Applications*

| Distance (m) / Direction | Planning Application Reference | Pertinent Information |
|---|---|---|
| On site | PA22/10812 | Prior notification application for current development. Planning authority determined that planning consent required.. |
| 30m east | PA18/08477 | Outline application for the construction of two self build dwellings with associated access and layout. No information of relevance to current site. |
| Other minor applications at nearby existing residential properties do not contain information of relevance to current assessment. | | |

# 4 GEOLOGICAL & GEOTECHNICAL SETTING

## 4.1 Geological Setting

Reference has been made to the BGS geological mapping at 1:50,000 scale in the Groundsure report, as well as the BGS online map viewer.

The geological map shows no superficial deposits to be present on site.

The geological map indicates that the site is underlain by the Crackington Formation of Namurian (Carboniferous) age formed between 328 and 318 million years ago. The BGS describes this unit as "Rhythmically bedded, dark blue-grey mudstones and subordinate predominantly grey sandstones and siltstones."

## 4.2 Borehole Records

There are no BGS borehole records within 100m of the site.

## 4.3 Anticipated Geological Sequence

Based on our experience of the local area, as well as BGS mapping, it is anticipated that the following geological sequence can be expected;

*Table 4.1: Anticipated Geological Sequence*

| Strata | Description | Estimated Thickness (m) | Estimated Permeability | Location |
|---|---|---|---|---|
| Made Ground | Concrete and brick hardcore. | 0 – 0.4 | Unsuitable for conventional drainage | Access driveway and building only |
| Topsoil | Brown friable clay or silt | 0.3 – 0.5 | Unsuitable for conventional drainage | Across the site |
| Weathered Crackington Formation | Mudstone and siltstone, weathered to clayey gravel near surface | 20m+ | Poor – good | Across the site |

## 4.4 Potential for Ground Instability

There are many natural and human-induced geotechnical processes which can give rise to ground stability issues. While in all cases instability may arise whether or not there is any development on the surface, it is important to recognise that the development itself or the intensification of development may be the triggering factor, which initiates instability problems.

The risks posed by common types of unstable ground are tabulated below. The assessment of risk is based upon the proposed development, using a range of information sources, including geological and topographical mapping, as well as Groundsure data.

*Table 4.2: Unstable Ground Risk Summary*

| Instability Risk | Risk Rating | Details |
|---|---|---|
| Shrinking or Swelling Clay | Very Low | Ground conditions predominantly low plasticity. |
| Running Sand | Negligible | Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions. |
| Compressible Deposits | Negligible | Compressible strata are not thought to occur. |
| Collapsible Deposits | Very Low | Deposits with potential to collapse when loaded and saturated are unlikely to be present. |
| Landslides | Low | Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site. |
| Ground Dissolution of Soluble Rocks | Negligible | Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present. |

## 4.5 Mining, Ground Workings & Natural Cavities

According to the Groundsure data (Appendix B) the site is in an area where localised small scale underground mining for vein mineral including tin may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered. No mining cavity records are noted in the Groundsure data. No underground mining features were noted on the historical maps. A surface working, described as an unspecified pit, is identified 5m north however this may represent a road cutting

## 4.6 Groundwater

Given the presence of surface watercourses, the historically recorded presence of a spring and waterlogging of the ground near to the brook, it is possible that groundwater will be shallow in this area. It is anticipated that groundwater will flow to the northeast.

# 5 ENVIRONMENTAL, HYDROLOGICAL & HYDROGEOLOGICAL SETTING

## 5.1 Hydrology & Hydrogeology

A summary of the hydrological and hydrogeological setting is tabulated below, with respect to the anticipated geological sequence set out in section 4.1.

*Table 5.1: Overview of the hydrological and hydrogeological setting*

| | |
|---|---|
| **Hydrogeology** | |
| Superficial Aquifer | There are no superficial deposits recorded on site. |
| Bedrock Aquifer | The Crackington Formation is designated as a "Secondary A" Aquifer. The Environment Agency describes this type of aquifer as Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers |
| Groundwater Vulnerability | Bedrock geology is designated as high vulnerability. The flow mechanism is defined as well connected fractures. |
| Groundwater Abstractions | There are no groundwater abstraction licenses within 500m of the site. |
| Surface Water Abstractions | There are no surface water abstraction licences within 500m of the site. |
| Source Protection Zones | The site is not within a groundwater Source Protection Zone. |
| **Hydrology** | |
| Ordnance Survey Water Network and Surface Water Features | The nearest surface watercourse is an un-named stream on the eastern boundary of the site, flowing north-westward and not influenced by normal tidal action. A smaller tributary stream is present on the western edge of the site. |
| Water Framework Directive (WFD) Surface Water Body Catchments | The site is within the Crackington Stream surface water body catchment. |
| **Flooding and Drainage** | |
| Risk of Flooding from Rivers and Sea (RoFRaS) | The site is not in an area considered to be at risk from flooding from rivers and the sea. |
| Historical Flood Events | None recorded. |
| Flood Defences | None within 250m of the site. |
| Areas Benefitting from Flood Defences | The site is not in an area benefitting from flood defences. |
| Flood Storage Areas | None within 250m of the site. |
| Flood Zones | The site is not within a Zone 2 or Zone 3 area at risk from flooding. |
| Surface Water Flooding | The majority of the site is considered to be at negligible risk from surface water flooding. The eastern boundary is at risk of flooding greater than 1.0m depth during a 1:30 year return period event. |
| Groundwater Flooding | The site is considered to be at a negligible risk of groundwater flooding. |

## 5.2 Environmental Setting

The following table summarises all pertinent environmental factors relating to the site, with respect to the ground conditions set out in section 4.

*Table 5.2: Environmental Setting*

| **Radon** | |
|---|---|
| **Percentage of Properties in above Action Level for Radon** | **Required Protection Levels** |
| Less than 1% (Groundsure Data) | Radon Protection Not Required |
| Between 5% and 10% (UK Radon Map) | Basic Radon Protection |
| *There is inconsistency between the Groundsure Data and the UK Radon map. Provision of basic radon protection is recommended on a precautionary basis. Radon protection measures should be installed in line with Building Research Establishment (BRE) 211 "Guidance on Protective Measures for New Buildings."* | |

| **BGS Background Estimated Soil Chemistry (mg / kg)** | | |
|---|---|---|
| Arsenic | 25 - 35 | Levels of heavy metals are not predicted to exceed the relevant generic assessment criteria |
| Cadmium | 1.8 | |
| Chromium | 60 - 90 | |
| Lead | 100 | |
| Nickel | 15 - 30 | |

| **Sensitive Land Uses** | | | |
|---|---|---|---|
| **Sensitive Land Use** | **Within pertinent radius of site? (250m)*** | | **Distance & Direction (Comments if applicable)** |
| | **Yes** | **No** | |
| Site of Special Scientific Interest | ☐ | ☒ | |
| Ramsar Sites | ☐ | ☒ | |
| Special Areas of Conservation | ☐ | ☒ | |
| Special Protection Area | ☐ | ☒ | |
| National Nature Reserves | ☐ | ☒ | |
| Local Nature Reserves | ☐ | ☒ | |
| Designated Ancient Woodland | ☐ | ☒ | |
| Biosphere Reserves | ☐ | ☒ | |
| Forest Parks | ☐ | ☒ | |
| Marine Conservations Zones | ☐ | ☒ | |
| Green Belt | ☐ | ☒ | |
| Proposed Ramsar Sites | ☐ | ☒ | |
| Possible Special Area of Conservation | ☐ | ☒ | |
| Potential Special Protection Areas | ☐ | ☒ | |
| Nitrate Sensitive Areas | ☐ | ☒ | |

| | | | |
|---|---|---|---|
| Nitrate Vulnerable Zones | ☐ | ☒ | |

## Waste & Landfill

| Environmental Source | Within pertinent radius of site? (250m)* | | Distance & Direction (Comments if applicable) |
|---|---|---|---|
| | Yes | No | |
| Active or Recent Landfill | ☐ | ☒ | |
| Historical Landfill (BGS, LA or EA) | ☐ | ☒ | |
| Historical Waste Sites | ☐ | ☒ | |
| Licensed Waste Sites | ☐ | ☒ | |

**Initial search extent limited to 250m from site, unless source of contamination and/or sensitive receptor is considered significant enough to warrant a greater radius of up to 1,000m.*

## Past and Present Land Uses

| Land Use | Within pertinent radius of site? (100m)* | | Distance & Direction (Comments if applicable) |
|---|---|---|---|
| | Yes | No | |
| Historical Industrial Land Uses | ☒ | ☐ | ➡ Unspecified pit 5m north |
| Historical Tanks | ☐ | ☒ | |
| Historical Energy Features | ☐ | ☒ | |
| Historical Petrol Stations | ☐ | ☒ | |
| Historical Military Land | ☐ | ☒ | |
| Recent Industrial Land Uses | ☐ | ☒ | |
| Current Or Recent Petrol Stations | ☐ | ☒ | |
| Electricity Cables | ☐ | ☒ | |
| Gas Pipelines | ☐ | ☒ | |
| Sites Determined as Contaminated Land | ☐ | ☒ | |
| Control Of Major Accident Hazards | ☐ | ☒ | |
| Regulated Explosive Sites | ☐ | ☒ | |
| Hazardous Substance Storage/Usage | ☐ | ☒ | |
| Historical Licensed Industrial Activities | ☐ | ☒ | |
| Licensed Industrial Activities (Part A(1)) | ☐ | ☒ | |
| Licensed Industrial Activities (Part A(2)/B) | ☐ | ☒ | |
| Radioactive Substance Authorisations | ☐ | ☒ | |
| Licensed Discharge to Controlled Water | ☐ | ☒ | |
| Pollutant Release to Surface Waters | ☐ | ☒ | |
| Pollutant Release to Public Sewer | ☐ | ☒ | |
| List 1 Dangerous Substances | ☐ | ☒ | |
| List 2 Dangerous Substances | ☐ | ☒ | |
| Pollution Incidents | ☐ | ☒ | |

**Initial search extent limited to 100m from site, unless source of contamination and/or sensitive receptor is considered significant enough to warrant a greater radius of up to 1,000m.*

# 6 PRELIMINARY CONCEPTUAL MODEL

## 6.1 Introduction

A Preliminary Risk Assessment is underpinned by the conceptual model, which is based on the relationship between the source of contamination, potential receptors, and any pathway between. If a viable source, pathway and receptor is identified, an assessment of the risk is required. CIRIA C552 offers guidance on risk valuation, based on the likelihood of an event, and its severity.

The following table outlines the classification of probability, based on CIRIA C552;

*Table 6.1: Classification of Probability*

| Classification | Definition |
|---|---|
| **High Likelihood** | A pollutant link has been identified and a pollution event is very likely in the short term and almost inevitable in the long term. |
| **Likely** | A pollutant link has been identified, and it is probable that an event will occur in the long term, and possible in the short term. |
| **Low Likelihood** | There is a pollutant linkage and circumstances are such that an event could occur, but it is not probable in the long term and even less likely in the short term. |
| **Unlikely** | There is a pollutant linkage but it is unlikely that and event would occur even in the very long term. |

The following table outlines the classification of consequence, based on CIRIA C552;

*Table 6.2: Classification of Consequence*

| Classification | Definition |
|---|---|
| **Severe** | Short term (acute) risk to human health likely to result in “significant harm” as defined by the Environmental Protection Act 1990 and/or short-term risk of pollution of sensitive water resources and/or catastrophic damage to buildings or property. |
| **Medium** | Long term (chronic) damage to human health likely to result in “significant harm” as defined by the Environmental Protection Act 1990 and/or significant pollution of sensitive water resources and/or significant change in a defined ecosystem. |
| **Mild** | Long term harm to human health but not significant as defined by the Environmental Protection Act 1990 and/or pollution of non-sensitive water resources and non-significant pollution of sensitive water resources. |
| **Minor** | Harm, not significant, but that could result in financial loss or cost implications. Non-permanent human health effects. |

Following classification of the probability and severity, a risk category can be assigned. The following table, taken from CIRIA C552 summarises this process;

*Table 6.3: Risk Classification Matrix*

| Risk Classification Matrix | | | | | |
|---|---|---|---|---|---|
| Taken from CIRIA C552 | | Consequence | | | |
| | | Severe | Medium | Mild | Minor |
| Probability | High Likelihood | Very High | High | Moderate | Moderate / Low |
| | Likely | High | Moderate | Moderate / Low | Low |
| | Low Likelihood | Moderate | Moderate / Low | Low | Very Low |
| | Unlikely | Moderate / Low | Low | Very Low | Very Low |

The risk categories are defined as follows;

*Table 6.4: Risk Categories*

| Classification | Definition |
|---|---|
| **Very High** | There is a high probability that severe harm could arise to a designated receptor from an identified hazard OR there is evidence that severe harm to a designated receptor is currently happening. Urgent investigation and remediation are likely to be required. |
| **High** | Harm is likely to arise to a designated receptor from an identified hazard. Urgent investigation is required and remedial works may be necessary. |
| **Moderate** | It is possible that harm could arise to a designated receptor from and identified hazard. However it is relatively unlikely that any such harm would be severe. |
| **Low** | It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. |
| **Very Low** | There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe. |

## 6.2 Preliminary Conceptual Site Model

This conceptual site model has been undertaken with due regard to guidance provided in BS10175:2011, CLR11 and CIRIA C552. The assessment of risk from land contamination also pays due regard to the definition of contaminated land, as defined within Part 2A of the Environment Protection Act 1990. This legislation defines contaminated land as any land that is in such a condition that by reason of substances in, on or under the land:

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

Potential sources of contamination identified from current activities and the history of the site and surrounding area are presented in table 6.5 below.

*Table 6.5: Potential Sources of Contamination*

| Potential Sources | Contaminants of Concern |
|---|---|
| Natural Geology | Radon Gas |

The conceptual site model is derived from an assessment of the above potential sources of contamination, using the criteria set out in CIRIA C552 and tables 6.1-6.4 above. The table, overleaf, is based on the proposed use and the site in its current condition.

## 6.3 Preliminary Conceptual Site Model Matrix

*Table 6.6: Preliminary Conceptual Site Model*

| Preliminary Conceptual Model | | | | | |
|---|---|---|---|---|---|
| **Source(s)** | **Pathway(s)** | **Receptor(s)** | **Probability** | **Severity** | **Risk Assessment** |
| On Site: Radon Gas | Ingress into proposed buildings | Future site users | Likely | Medium | **Moderate Risk** – There is inconsistency between the Groundsure data and the UK Radon Map. Taking the worst case, development is within an area where between 5% and 10% of properties are above the action level. |
| On Site: Imported material forming site access | Dermal contact Soil and dust ingestion and inhalation | Future site users<br>Site workers<br>Site flora and fauna | Unlikely | Mild | **Very Low Risk** – The material comprises mainly gravel derived from local bedrock ("Shillet") with occasional brick and concrete pieces but no evidence of tarmacadam or asbestos containing materials. |

# 7 CONCLUSIONS AND RECOMMENDATIONS

## 7.1 Geotechnical Considerations

Shallow foundations should be placed in the underlying natural material, preferably bearing on slate/siltstone that is not highly weathered.

Conventional strip foundations may be viable at this site; however a site investigation would be required to confirm this. It would also be considered prudent to carry out soakaway testing in accordance with BRE 365 to assess the sites suitability for conventional surface water drainage.

## 7.2 Conclusions

There is inconsistency between the Groundsure data and the UK Radon Map. Taking the worst case, development is within an area where between 5% and 10% of properties are above the action level.

Levels of heavy metals are not predicted to exceed the relevant generic assessment criteria and therefore are assumed to present a low risk to human health.

The site has remained in assumed agricultural use from the earliest OS mapping. Three buildings were present on the west of the site by 1958, of which two were no longer present from 1999. The remaining building (understood to have been a dairy) remains extant.

In the absence of a significant source of contamination, it can be concluded that this site is suitable for its intended future use and that no further investigation in relation to contamination will be required.

## 7.3 Recommendations

Basic radon protective measures are required for the proposed development in-line with BRE guidelines.

In the event unexpected contamination is found during development, work should cease until the material can be identified and remediated appropriately.

All site workers should be equipped with the correct PPE and have undertaken suitable risk assessments, job safety and environmental analysis before work commences.

Waste material to be removed from site should be handled by a suitably licensed waste contractor.

# 8 REFERENCES

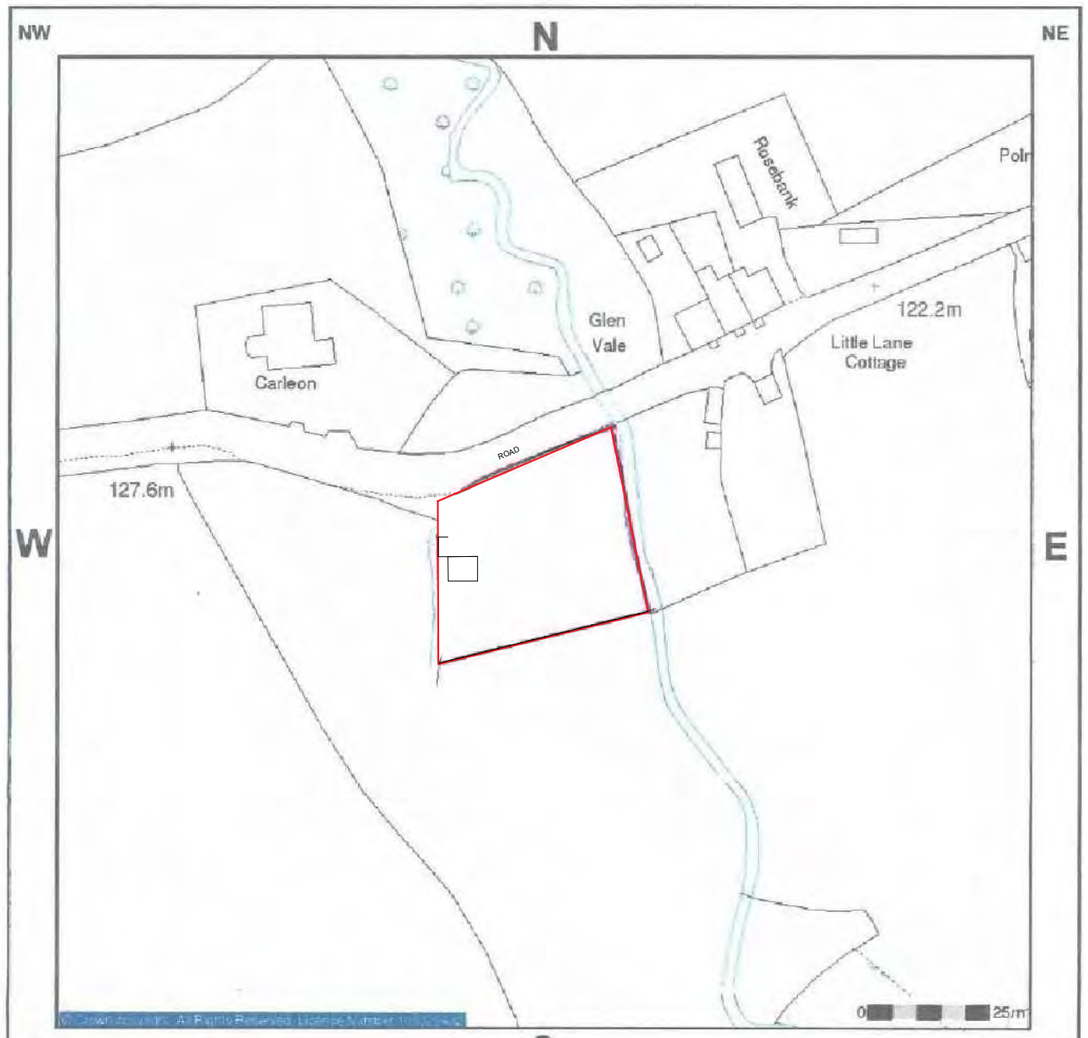

- BSI (2011) BS 10175:2011 +a1:2013 Investigation of Potentially Contaminated Sites – Code of Practice. London, British Standards Institution
- Building Research Establishment (BRE) (2007) BR211 - Radon: Guidance on Protective Measures for New Buildings. Watford, BRE
- CIRIA (2001) CIRIA C552 - Contaminated land risk assessment: A guide to good practice. London, CIRIA
- CIRIA (2007) CIRIA C665 – Assessing Risks Posed by Hazardous Ground Gases to Buildings. London, CIRIA
- Contaminated Land: Applications in Real Environments (CL:AIRE), Association of Geotechnical and Geo-environmental Specialists (AGS) and The Environmental Industries Commission (EIC) (2010) Soil Generic Assessment Criteria for Human Health Risk Assessment. London, CL:AIRE
- Department of Communities and Local Government (2012) National Planning Policy Framework. London, DCLG
- Environment Agency (2004) Contaminated Land Report 11 - Model Procedures for the Management of Land Contamination. Bristol, Environment Agency
- Environment Agency (2005) Guidance on Assessing the Risk Posed by Land Contamination and Its Remediation on Archaeological Resource Management. Bristol, EA
- Great Britain. Environmental Protection Act (1990). London, The Stationery Office
- Great Britain. Environmental Damage (Prevention and Remediation) Regulations (2009). London, The Stationery Office
- Great Britain. Water Act (2003). London, The Stationery Office
- Great Britain. The Water Framework Directive (Standards and Classification) Directions (England and Wales) (2015). London, The Stationery Office
- Land Quality Press (2015) The LQM/CIEH Suitable 4 Use Levels for Human Health Risk Assessment (2nd Edition). Nottingham, Land Quality Press
- National House Building Council (NHBC), Environment Agency and Chartered Institute of Environmental Health (CIEH) (2008) Research & Development Publication 66: Guidance for the Safe Development of Housing on Land Affected by Contamination. Amersham, NHBC
- Royal Institution of Chartered Surveyors (RICS) (2012) Japanese Knotweed and Residential Property. Coventry, RICS

GCL GROUND CONSULTANTS LTD
ENVIRONMENTAL & GEOTECHNICAL SPECIALISTS

# Figure 2.1

# Site Location Plan

*Plan may be provided by third party*




Map Legend

Site Boundary

Map data

Search Details:

Search Address: Reference: BRM.WAR287.1
Barn, Higher Crackington,
Crackington Haven, Bude,
Cornwall,
EX23 0LD

Grid Reference: 215410,95500

Date of Report: 29 June 2021

Full Terms and Conditions can be found on the following link:
http://www.landmarkinfo.co.uk/Terms/Show/534

Site area : 1406 m²

# Site Location Plan

12.5 25 37.5 50
M.

Any dimensions shown should be checked on site and discrepancies reported to the Architect prior to construction.
Designs are not coordinated with engineer projects.
Do not scale for construction purposes.

The Clubhouse, 50 Grosvenor Hill,
London W1K 3QTT
0203 581 1233
info@studiocharrette.co.uk
www.studiocharrette.co.uk

| | |
|---|---|
| Drawing Name | Site Location Plan |
| Project Adress | Wainies Brook, EX23 0LD |
| Scale: 1/1250 at A3 | Date: 20.02.2023 |
| Designer: DG | Revision: V1 |
| Drawing No. | WainiesBrook_ SiteLocationPlan_V1 |

GCL GROUND CONSULTANTS LTD
ENVIRONMENTAL & GEOTECHNICAL SPECIALISTS

# Figure 2.2

# Site Layout

*Plan may be provided by third party*


Existing Block Plan

5 10 15 20
M.

Any dimensions shown should be checked on site and discrepancies reported to the Architect prior to construction.
Designs are not coordinated with engineer projects.
Do not scale for construction purposes.

Block Plans are scaled from the Ordinance Survey Location Maps. Please see the licence number for the Os Maps in the Location Plans

Existing

The Clubhouse, 50 Grosvenor Hill,
London W1K 3QTT
0203 581 1233
info@studiocharrette.co.uk
www.studiocharrette.co.uk

Drawing Name
Existing Block Plan

Project Adress
Wainies Brook, EX23 0LD

| Scale | Date |
|---|---|
| 1/500 at A3 | 20.02.2023 |

| Designer | Revision |
|---|---|
| DG | V1 |

Drawing No.
WainiesBrooke_
ExistingBlockPlan_V1

GCL GROUND CONSULTANTS LTD
ENVIRONMENTAL & GEOTECHNICAL SPECIALISTS

# Figure 2.3

# Proposed Site Plan

*Plan may be provided by third party*

Any dimensions shown should be checked on site and discrepancies reported to the Architect prior to construction.
Designs are not coordinated with engineer projects.
Do not scale for construction purposes.

Block Plans are scaled from the Ordinance Survey Location Maps. Please see the licence number for the Os Maps in the Location Plans


Existing

The Clubhouse, 50 Grosvenor Hill,
London W1K 3QTT
0203 581 1233
info@studiocharrette.co.uk
www.studiocharrette.co.uk

Drawing Name
Proposed Block Plan

Project Adress
Wainies Brook, EX23 0LD

| Scale | Date |
|---|---|
| 1/500 at A3 | 20.02.2023 |

| Designer | Revision |
|---|---|
| DG | V1 |

Drawing No.
WainiesBrook_ExistingBlockPlan_V1

# Proposed Block Plan

5 10 15 20
M.

# Appendix A

# Site Photographs

# SITE PHOTOGRAPHS

PLATE 1

PLATE 2

| | |
|---|---|
| SITE: | Wainies Brook, Higher Crackington, Bude |
| REF: | 23329 |
| CLIENT: | Nick and Angela Swann |

# SITE PHOTOGRAPHS

PLATE 3

PLATE 4

| | |
|---|---|
| SITE: | Wainies Brook, Higher Crackington, Bude |
| REF: | 23329 |
| CLIENT: | Nick and Angela Swann |

# SITE PHOTOGRAPHS

PLATE 5

PLATE 6

| | |
|---|---|
| SITE: | Wainies Brook, Higher Crackington, Bude |
| REF: | 23329 |
| CLIENT: | Nick and Angela Swann |

# SITE PHOTOGRAPHS

PLATE 7

PLATE 8

| | |
|---|---|
| SITE: | Wainies Brook, Higher Crackington, Bude |
| REF: | 23329 |
| CLIENT: | Nick and Angela Swann |