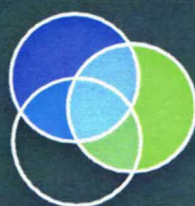


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DISCUSS - INVESTIGATE - DELIVER



CLIENT: ELIZABETH FORD

PROJECT: STENAK, ST DAY, CORNWALL

REPORT TITLE: PHASE 2 SITE INVESTIGATION

REPORT REF: YES 1198b

REPORT DATE: 15th AUGUST 2023

WRITTEN BY:



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- Appendix B: Trial Pit Logs
- Appendix C: Chemical Results
- Appendix D: Statistical and CLEA Assessments



SUMMARY

Your Environmental Solutions Ltd (YES) has been commissioned by Elizabeth Ford to undertake a Phase 2 Site Investigation at a site known as Stenak, St Day in Cornwall. This report has been commissioned to assess the site for planning requirements in line with the proposed residential development with soft garden areas.

The site investigation identified that the site is overlain by topsoil comprising of natural silty clay, beneath which was subsoil consisting of natural silty, sandy clay with cobbles of mudstone and sandstone.

Groundwater was not encountered during the site investigation. Alluvium was not encountered during the site investigation. Made ground was not encountered during the site investigation.

In accordance with the quantitative contamination risk assessment, the risks to human health are considered to be low. Contamination with the potential to impact on human health has not been identified at the site. Therefore no further action or assessment is required.

The risk to controlled waters is considered to be low with no further action or assessment required.

The risk to flora, fauna and ecosystems is considered to be low with no further action or assessment required.

Standard plastic pipework is considered suitable for potable water supplies at the site.

A DS 1 grade of concrete will be suitable for any new building foundations at the site.

The development will require radon protective measures in line with building regulations.



1.0 INTRODUCTION

1.1 Background

Your Environmental Solutions Ltd (YES) has been commissioned by Elizabeth Ford to undertake a Phase 2 Site Investigation at a site known as Stenack, St Day in Cornwall. This report has been commissioned to assess the site for planning requirements in line with the proposed development.

1.2 Objectives

The objectives of the site investigation report are as follows:

Summarise the site setting and desk study findings.

Detail the on site investigation(s) undertaken.

Present the ground conditions encountered.

Discuss the significance of the chemical analyses and produce a quantitative contamination risk assessment.

Discuss a remediation strategy (if appropriate) and recommendations for any further works.

1.3 Sources of Information

The following sources of information have been used:

Site Investigation Photographs (Appendix A).

Trial Pit Logs (Appendix B).

Chemical Results (Appendix C).

CLEA and Statistical Assessments (Appendix D).

1.4 Development Proposals/End Use

It is proposed to construct a single new residential dwelling with soft, private garden areas.

2.0 SUMMARY OF THE DESK STUDY FINDINGS

The site is located at coordinates: 174210 42670, postcode: TR16 5JL.

The site comprises the garden area of a dwelling.

Throughout recorded history, the site remained undeveloped, open space/farmland prior to its current use.

The surrounding area of the site has seen considerable utilisation for metalliferous mining activities. A mine shaft is recorded at 40m to the southeast of the site. A lode (mineralised structure), believed to lie at a depth, passes beneath the northern boundary of the site. Topsoil arsenic concentrations in the area of the site are recorded to range between 448mg/kg and 1,948mg/kg.

The site and immediate surrounding area are not recorded to be overlain by superficial deposits. The site is recorded to be underlain by the Porthtowan Formation. These are mudstones and sandstones which later became metamorphosed.

The site is located in an area where more than 30% of homes have elevated radon concentrations within indoor air.

The site is recorded to be underlain by a secondary aquifer (A). The only surface water feature within 250m of the site is a pond at 155m distance to the southwest. The site is not recorded to be within a water source protection zone.

Due to the local mineralogy and nearby historical mining activity, a potential for heavy metals to be present within the site's soils was identified. The preliminary contamination risk assessment concluded a moderate risk to human health and building materials in line with its proposed use for a residential development with soft garden areas. A Phase 2 Site Investigation with soil sampling and chemical analyses was recommended to quantify the true risks.

The risk to flora, fauna and ecosystems is considered to be low with no further action required.



The risk to controlled waters is considered to be low with no further action required.

Standard plastic pipework will be suitable for the proposed water supply at the site.

The site is in a radon affected area. As such radon protection measures should be installed in all buildings in line with building regulations.

The mining report recommended a mining site investigation prior to any development at the site. It was further recommended that this should be followed by an inspection of any new footings trenches prior to being infilled with concrete.

3.0 ON SITE INVESTIGATIONS

3.1 Intrusive Site Investigations

A contamination site investigation was undertaken on 20th July 2023. The site investigation comprised three trial pits (TP) undertaken across the site using a stratified random layout.

The site investigation plan is shown on Figure 3.

The site investigation was carried out in accordance with:

Soil Quality – Conceptual Site Models for Potentially Contaminated Sites (BS EN ISO 21365:2020).

Code of Practice for Ground Investigations (BS5930, 2020).

Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination Development, R & D Technical Report P5-066/TR, (Environment Agency, 2000).

3.2 Ground Conditions Encountered

The descriptions given below are based on visual observations made during site investigation.

3.2.1 *Topsoil*

Topsoil was encountered in all trial pits from surface to a maximum depth of 0.2m below ground level (bgl). Topsoil consisted of brown silty clay.

3.2.2 *Subsoil/Bedrock*

Subsoil was encountered in all trial pits from beneath the topsoil to a maximum recorded depth of 1.0m bgl. Subsoil consisted of reddish brown silty, sandy clay with subrounded cobbles of mudstone and siltstone.

Rock head was not encountered during the site investigation.

3.2.3 *Made Ground*

Made ground was not encountered during the site investigation.

3.2.4 *Alluvial Deposits*

Alluvial deposits were not encountered during the site investigation.

3.2.5 *Groundwater*

Groundwater was not encountered during the site investigation.

3.2.6 *Visual Signs of Fuel and/or Odours*

There were no signs of any fuels, oil stains or odours identified during the site investigation.

3.3 Contamination Sampling and Laboratory Analysis

3.3.1 Sampling

Soil samples for contamination analyses were taken on site at depths between 0.1m and 0.7m bgl from trial pits.

The samples were collected in appropriate sampling containers, stored and transported in cool boxes to Eurofins Chemtest, a fully accredited laboratory.

3.3.2 Laboratory Analysis

All laboratory results are enclosed within Appendix C.

The following chemical analyses were carried out on selected soil samples at Eurofins Chemtest:

- 1 no. Water soluble sulphate.
- 3 no. pH.
- 6 no. Heavy metals.
- 2 no. UNIFIED BARGE arsenic bioaccessibility.



4.0 SIGNIFICANCE AND INTERPRETATION OF CHEMICAL RESULTS

Guidance on contaminated land, including a definition and risk assessment protocol, has been enclosed within Appendix E.

4.1 Human Health Risk Assessment Methodology

The human health risk assessment has been carried out using the following documents and tools:

Contaminated Land Exposure Assessment (CLEA) 1.071 Model (Environment Agency, 2015).

Contaminated land information sheet: risk assessment approaches for polycyclic aromatic hydrocarbons (PAHs) (Public Health England, 2017).

Guidance on Comparing Soil Contamination Data with a Critical Concentration (Contaminated Land: Applications In Real Environments (CL:AIRE), 2020).

Land contamination risk management (LCRM) Stage 1 Risk Assessment (EA, 2020).

Land Quality Management (LQM) & Chartered Institute of Environmental Health (CIEH) Suitable 4 Use Levels (S4ULs) for Human Health Risk Assessment (LQM/CIEH, 2015).

Soil Generic Assessment Criteria for Human Health Risk Assessment (CL:AIRE, 2010).

Soil Quality – Conceptual Site Models for Potentially Contaminated Sites (BS EN ISO 21365:2020).

Standard Guide for Developing Conceptual Site Models for Contaminated Sites, (ASTM E1689 – 95, 2014).

Where available, this risk assessment has been undertaken using the residential with homegrown produce Suitable for Use Levels (S4ULs). Where required, Site Specific Assessment Criteria (SSAC) based on a Category 4 Screening Level (C4SL) for a female child, have been produced using the CLEA model.

If a potential contaminant has a maximum value that exceeds the applicable S4UL/SSAC, an assessment is undertaken to establish the following statistical variables of the results dataset in order to establish its true mean:

Data distribution (symmetric, log-symmetric, flat-tailed or other).

Key statistics (mean, median, upper quartile).

Mean confidence intervals inline with the data distribution.

Should a contaminant show a true mean concentration which exceeds the S4UL/SSAC and potential for laboratory bioaccessibility testing is available, this may be undertaken for input into the CLEA model for the production of a revised SSAC.

4.2 Flora, Fauna and Ecosystems Risk Assessment Methodology

The risks to flora, fauna and ecosystems were not further assessed in this report as the desk study identified a low risk with no further action required.

4.3 Building Materials and Pipework Risk Assessment Methodologies

The risk to building materials has been assessed in accordance with Concrete in Aggressive Ground - Special Digest 1 (Building Research Establishment, 2005). Special Digest 1 is used to establish a suitable grade of concrete for building foundations in accordance with on site water soluble sulphate concentrations.

4.4 Controlled Waters Risk Assessment Methodology

The risks to controlled waters were not further assessed in this report as the desk study identified a low risk, with no further action required. This analysis was confirmed by on site conditions, as detailed in Section 3.2.

This contamination risk assessment has been carried out using documents and tools available at the date of this report. New guidance may be issued in the future which may supersede these.



4.5 Soil Contamination and Risks to Human Health/End Users at the Site

4.5.1 Heavy Metals

The following heavy metal concentrations were detected and are assessed in comparison to the available Suitable 4 Use Levels (S4ULs) for a residential with homegrown produce end use.

Table 4.1: Heavy Metal Concentrations in Comparison to S4ULs for a Residential with Homegrown Produce End Use			
Substance	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	S4UL (mg/kg)
Arsenic	140.00	480.00	37
Beryllium	0.60	0.80	1.7
Cadmium	0.14	0.26	11
Total Chromium	16.00	25.00	*910
Copper	110.00	260.00	2,400
Mercury	0.05	0.15	1.2
Nickel	12.00	20.00	180
Lead	25.00	92.00	**201
Selenium	0.79	1.00	250
Zinc	140.00	180.00	3,700
Hexavalent Chromium	0.50	0.50	6
*S4UL for Chromium III			
**Lead SSAC produced in the CLEA Model			
All results below the laboratory of detection have been rounded to the limit			

As may be noted from Table 4.1, all heavy metals tested, with the exception of arsenic, have concentrations less than their applicable S4UL/SSAC. As such the risks to human health from these heavy metals are considered to be low, with no further action required.

To further assess the risks from arsenic, a statistical assessment of its results was undertaken. The graphical summary of the assessment is presented in Appendix D and the following table outlines the key outcomes of the assessment.



Table 4.2: Variables Produced during the Statistical Assessment of Arsenic									
Contaminant	Data Distribution	Median (mg/kg)	Mean (mg/kg)	Upper Quartile (mg/kg)	80% Confidence Interval (mg/kg)		95% Confidence Interval (mg/kg)		S4UL
					Lower Limit	Upper Limit	Lower Limit	Upper Limit	
Arsenic	Symmetric - Other	320.00	301.67	375.00	231.79	371.55	194.16	409.17	37

The data produced a symmetric histogram indicating that the defined averaging zone ('total area of soil encompassing a similar contaminant') and dataset size are sufficient to determine a representative results distribution.

Given that the data produced a symmetric histogram, the lower and upper confidence intervals of 80% and 95%, respectively, were applied, where:

The 80% confidence intervals estimate that the true mean concentration is most likely to be inside this range.

The 95% confidence intervals estimate that the true mean concentration is most likely to be less than this range.

As may be noted from Table 4.2, all the statistical variables for arsenic exceed the residential S4UL. It is therefore considered that a risk to human health from arsenic cannot be ruled out at this stage of the assessment.

To further assess the risk to human health, laboratory bioaccessibility testing was undertaken on samples at TP1, 0.1m bgl and TP3, 0.5m bgl, which contain the highest concentrations of arsenic within the topsoil and subsoil, respectively.

The results of the bioaccessibility testing indicate that arsenic has a maximum bioaccessibility of 1.6%. This percentage was input into the CLEA model to produce a Site Specific Assessment Criterion (SSAC) for comparison against the statistical variables for arsenic as outlined in the following table.



Table 4.3: Variables Produced during the Statistical Assessment of Arsenic

Contaminant	Data Distribution	Median (mg/kg)	Mean (mg/kg)	Upper Quartile (mg/kg)	80% Confidence Interval (mg/kg)		95% Confidence Interval (mg/kg)		SSAC
					Lower Limit	Upper Limit	Lower Limit	Upper Limit	
					Arsenic	Symmetric - Other	320.00	301.67	

As may be noted from Table 4.3, all the statistical variables for arsenic are less than the SSAC. As such the risk to human from arsenic is considered to be low with no further action required.

4.6 Building Materials

The water soluble sulphate test showed a concentration of 13mg/l, which is less than the 500mg/l Design Standard (DS) 1 threshold. It is therefore considered that a DS 1 grade of concrete will be suitable for any new building foundations at the site.

5.0 QUANTITATIVE CONTAMINATION RISK ASSESSMENT

The following table is a revised contamination risk assessment following the quantitative analyses of the laboratory results in line with the proposed development layout.

Sources	Receptors and Pathways	Categorisation of Risk		
		Probability	Consequence	Risk
Radon: Natural Mineralogy	Human Health: Inhalation of gas	Likely	Medium	Moderate
Heavy Metals: Natural Mineralogy Historical Mining Activity	Human Health: Direct soil and dust ingestion Consumption of vegetation Dermal contact with soils Inhalation of dust	Unlikely	Medium	Low
	Controlled Waters: Migration into groundwater Migration through soil Surface water runoff Deposition onto surface water	Unlikely	Mild	Low
	Flora/Fauna and Ecosystems: Plant uptake and accumulation	Unlikely	Mild	Low
	Building Materials: Direct contact with soils	Unlikely	Medium	Low

6.0 CONCLUSIONS AND RECOMMENDATIONS

The site investigation identified that the site is overlain by topsoil comprising of natural silty clay, beneath which was subsoil consisting of natural silty, sandy clay with cobbles of mudstone and sandstone.

Groundwater was not encountered during the site investigation. Alluvium was not encountered during the site investigation. Made ground was not encountered during the site investigation.

In accordance with the quantitative contamination risk assessment, the risks to human health are considered to be low. Contamination with the potential to impact on human health has not been identified at the site. Therefore no further action or assessment is required.

The risk to controlled waters is considered to be low with no further action or assessment required.

The risk to flora, fauna and ecosystems is considered to be low with no further action or assessment required.

Standard plastic pipework is considered suitable for potable water supplies at the site.

A DS 1 grade of concrete will be suitable for any new building foundations at the site.

The development will require radon protective measures in line with building regulations.

7.0 LIMITATIONS

The work undertaken to provide the basis of this report includes a study of the readily available documented information from a variety of sources. The information reviewed should not be considered exhaustive and has been accepted in good faith by Your Environmental Solutions (“YES”) as providing a true indication of the site conditions. However, no liability can be accepted for the detailed accuracy or otherwise of any of the reports or documents prepared by others for the Client or for third parties, or for any associated errors or omissions.

The exploratory holes carried out during the fieldwork, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. The comments made and recommendations given in this report are based on the ground conditions apparent at the site of the exploratory holes. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal or other effects.

It should be noted that the environment and contaminated land guidance and legislation are constantly under review, with authoritative guidance documents subject to change. The conclusions presented herein are based on guidance and legislation available at the time of issuing this report, and no liability can be accepted for the retrospective effects of any changes or amendments to such guidance and/or legislation.

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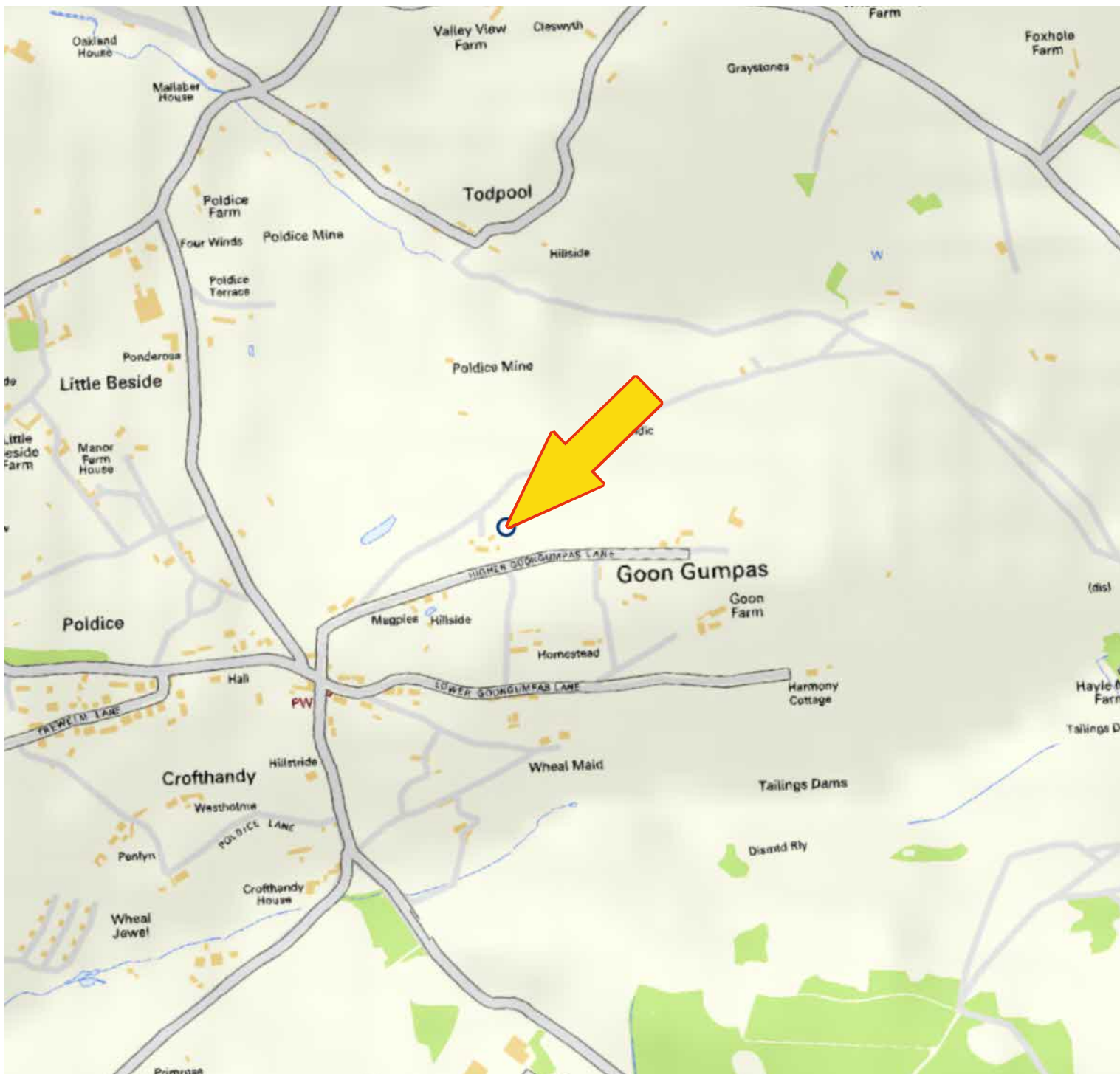
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FIGURES



Drawing Notes:

Legend:

Client:

Elizabeth Ford

Figure 1:

Site Location Plan

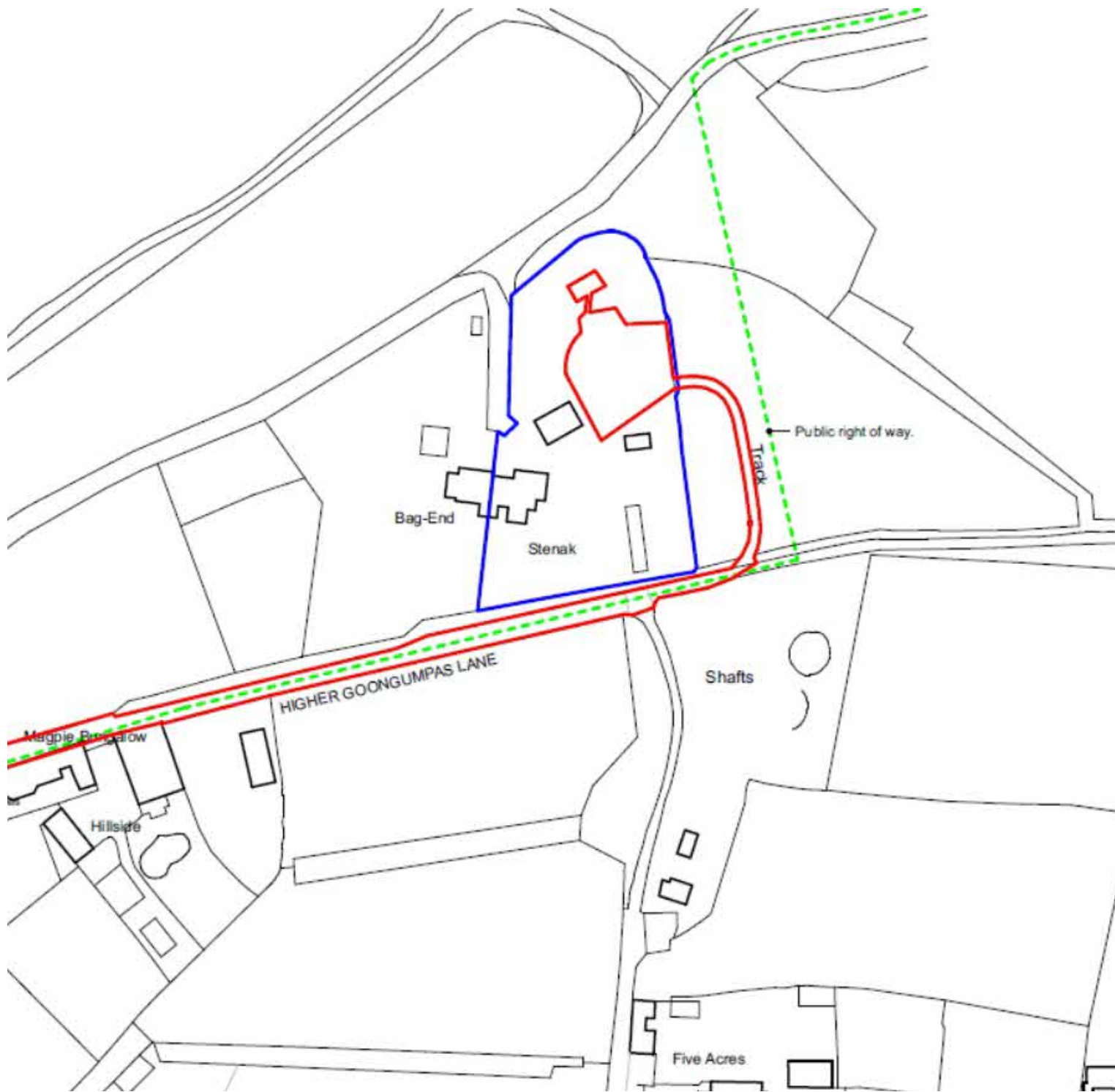
Stenak, St Day, Cornwall

Project Ref: YES 1198a	Drawing Ref: YES 1198a
Drawn By: AM	Date: 03/04/22
Checked By: AW	Date: 03/04/22
Grid Ref: 174210, 42670	Not To Scale

yes
YOUR ENVIRONMENTAL
SOLUTIONS LTD



Woodcocks Roost,
Fore Street, Barrripper,
Camborne, Cornwall TR14 0QR
M. 07766 850351
E. info@urenvironmentalsolutions.com
W. www.urenvironmentalsolutions.com



Drawing Notes:

Legend:

- Site Boundary
- Ownership Boundary

Client:

Elizabeth Ford

Figure 2:

Site Boundary Plan
Stenak, St Day, Cornwall

Project Ref: YES 1198a	Drawing Ref: YES 1198a
Drawn By: AM	Date: 03/04/22
Checked By: AW	Date: 03/04/22
Grid Ref: 174210, 42670	Not To Scale

yes
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Camborne, Cornwall TR14 0QR
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Drawing Notes:

Legend:

█ Site Boundary

Client:

Elizabeth Ford

Figure 3:

Proposed Development Layout
& Site Investigation Plan

Stenak, St Day, Cornwall

Project Ref: YES 1198a Drawing Ref: YES 1198a

Drawn By: AM Date: 15/08/23

Checked By: AW Date: 15/08/23

Grid Ref: 174210, 42670 Not To Scale



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APPENDIX A

SITE INVESTIGATION PHOTOGRAPHS

SITE INVESTIGATION PHOTOGRAPHS



PHOTOGRAPH 1: TP1 location on site



PHOTOGRAPH 2: TP1



PHOTOGRAPH 3: TP2 location on site



PHOTOGRAPH 4: TP2



PHOTOGRAPH 5: TP2 excavated arisings



PHOTOGRAPH 6: TP2 excavated arisings



PHOTOGRAPH 7: TP3



PHOTOGRAPH 8: TP3



PHOTOGRAPH 9: TP3 location on site

APPENDIX B

TRIAL PIT LOGS

Yes

YOUR ENVIRONMENTAL SOLUTIONS

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Job Number: YES 1198b

Sampling Location: TP1

Project: Stenack, St Day

Client: Elizabeth Ford

Logged By: AM

Checked By: AW

Method of Excavation: Mechanical

Equipment Used: Excavator

Excavation Date: 15/08/2023

E (m)	Insitu Testing		Samples			Strata			
	Depth	Test Type - Results	Type	No.	Depth	Description of Strata	Thickness	Legend	Groundwater
0.0			Soil	1	0.10	Brown silty CLAY (TOPSOIL)	0.20		
0.2									
0.4									
0.6			Soil	1	0.70	Reddish brown silty sandy CLAY with subrounded cobbles of mudstone and sandstone	0.80		
0.8									
1.0						End of Trial Pit			
1.2									
1.4									
1.6									
1.8									
2.0									
2.2									
2.4									
2.6									
2.8									
3.0									

Remarks:



Job Number: YES 1198b	Sampling Location: TP2
Project: Stenack, St Day	
Client: Elizabeth Ford	
Logged By: AM	Checked By: AW
Method of Excavation: Mechanical	Equipment Used: Excavator
Excavation Date: 15/08/2023	

E (m)	Insitu Testing		Samples			Strata			
	Depth	Test Type - Results	Type	No.	Depth	Description of Strata	Thickness	Legend	Groundwater
0.0			Soil	1	0.10	Brown silty CLAY (TOPSOIL)	0.20		
0.2									
0.4			Soil	1	0.50	Reddish brown silty sandy CLAY with subrounded cobbles of mudstone and sandstone	0.80		
0.6									
0.8									
1.0						End of Trial Pit			
1.2									
1.4									
1.6									
1.8									
2.0									
2.2									
2.4									
2.6									
2.8									
3.0									

Remarks:

Yes

YOUR ENVIRONMENTAL SOLUTIONS

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E: info@urenvironmentalsolutions.com M: 07766 850351 W: www.urenvironmentalsolutions.com



Job Number: YES 1198b

Sampling Location: TP3

Project: Stenack, St Day

Client: Elizabeth Ford

Logged By: AM

Checked By: AW

Method of Excavation: Mechanical

Equipment Used: Excavator

Excavation Date: 15/08/2023

E (m)	Insitu Testing		Samples			Strata			
	Depth	Test Type - Results	Type	No.	Depth	Description of Strata	Thickness	Legend	Groundwater
0.0			Soil	1	0.10	Brown silty CLAY (TOPSOIL)	0.20		
0.2									
0.4			Soil	1	0.50	Reddish brown silty sandy CLAY with subrounded cobbles of mudstone and sandstone	0.80		
0.6									
0.8									
1.0						End of Trial Pit			
1.2									
1.4									
1.6									
1.8									
2.0									
2.2									
2.4									
2.6									
2.8									
3.0									

Remarks:

APPENDIX C

CHEMICAL RESULTS



Amended Report

Report No.:	23-24933-2	Date of Re-Issue:	14-Aug-2023
Initial Date of Issue:	27-Jul-2023		
Re-Issue Details:	This report has been revised and directly supersedes 23-24933-1 in its entirety		
Client	Your Environmental Solutions (YES)		
Client Address:	Woodcocks Roost, Fore Street Barripper Camborne Cornwall TR14 0QR		
Contact(s):	Andrea Woodcock Anne Mihalop		
Project	1198 Stenak, St Day		
Quotation No.:	Q23-31628	Date Received:	25-Jul-2023
Order No.:	1198	Date Instructed:	25-Jul-2023
No. of Samples:	6		
Turnaround (Wkdays):	15	Results Due:	14-Aug-2023
Date Approved:	14-Aug-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: 1198 Stenak, St Day

Client: Your Environmental Solutions (YES)	Chemtest Job No.:		23-24933	23-24933	23-24933	23-24933	23-24933	23-24933	23-24933	
Quotation No.: Q23-31628	Chemtest Sample ID.:		1678593	1678594	1678595	1678596	1678597	1678598		
	Client Sample ID.:		TP1	TP1	TP2	TP2	TP3	TP3		
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
	Top Depth (m):		0.1	0.7	0.1	0.5	0.2	0.5		
	Date Sampled:		20-Jul-2023	20-Jul-2023	20-Jul-2023	20-Jul-2023	20-Jul-2023	20-Jul-2023		
Determinand	Accred.	SOP	Units	LOD						
Moisture	N	2030	%	0.020	17	14	16	28	15	12
pH	U	2010		4.0	7.8	7.8				7.3
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010		0.013				
Arsenic	U	2455	mg/kg	0.5	480	160	390	140	330	310
Beryllium	U	2455	mg/kg	0.5	0.8	0.6	0.7	0.7	0.6	0.6
Cadmium	U	2455	mg/kg	0.10	0.24	0.16	0.26	0.14	0.22	0.20
Chromium	U	2455	mg/kg	0.5	18	22	18	25	16	17
Copper	U	2455	mg/kg	0.50	220	130	260	110	220	200
Mercury	U	2455	mg/kg	0.05	0.15	< 0.05	0.12	< 0.05	0.11	0.11
Nickel	U	2455	mg/kg	0.50	15	17	14	20	12	13
Lead	U	2455	mg/kg	0.50	92	36	82	25	67	46
Selenium	U	2455	mg/kg	0.25	0.96	1.0	0.97	0.86	0.79	0.92
Zinc	U	2455	mg/kg	0.50	140	180	160	170	140	140
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
As Barge Stomach Phase	N	2630	mg/kg	N/A	27					30
As Barge Stomach + Intestinal Phase	N	2630	mg/kg	N/A	38					50
As Barge Bioaccessible Fraction	N	2630	%	N/A	0.79					1.6

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2630	PBET	PBET	Extraction at 37C / ICP-MS

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

APPENDIX D

STATISTICAL ASSESSMENT & CLEA MODEL

CLEA Software Version 1.071

Page 1 of 11

Report generated 15-Aug-23

Report title Stenack, St day

Created by Anne Mihalop at YES



RESULTS



	Average Daily Exposure (mg kg ⁻¹ bw day ⁻¹)							Distribution by Pathway (%)							
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
21															
22															
23															
24															
25															
26															
27															
28															
29															
30															

o1a. CLEA 1.071 Lead and Arsenic SSAC

Test Results

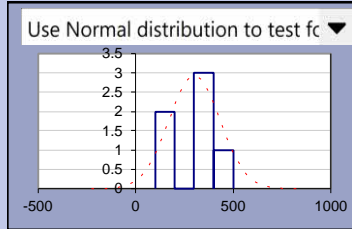
As

Client/client ref:
Project ref: 1198

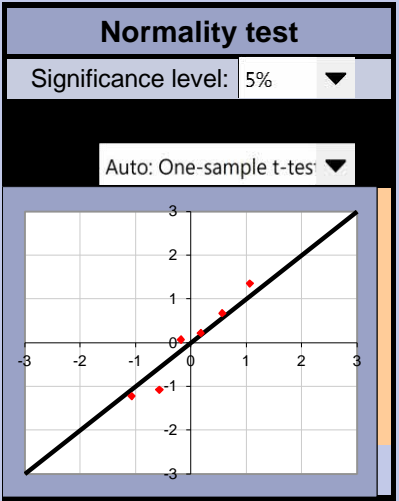
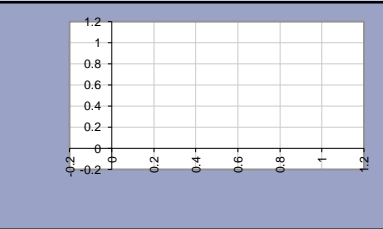
Site ref: Stennack, St Day
Data description:

Date: 01-Aug-2023
User details: Anne Mihalop

Dataset: As
Sample mean \bar{x}
Sample standard deviation, s
Sample size, n
Critical concentration, Cc



Outliers & non-detects	
Outliers present?	No
Significance level	5%
Outliers excluded	
Non-detects	



Test scenario: Planning: is true mean lower than critical concentration ($\mu < Cc$)

Null hypothesis:

Alternative hypothesis:

Evidence against Null hypothesis:

Base decision on: evidence level

Evidence level required: **95%**

Balance of probability?

Reject Null Hypothesis?

$\mu \geq Cc$

[Back to data](#)

[Back to summary](#)

[Go to outlier test](#)

[Go to normality test](#)



Mean Confidence Interval Calculation

Contaminant	Mean (From Stats)	Standard Deviation (From Stats)	Number of Samples (Site Data)	Square Root of Sample Size (Calculated)	Standard Error (Calculated)	T Value for 80% Confidence Interval (Stats Guidance)	T Value for 95% Confidence Interval (Stats Guidance)	80%		95%	
								Lower Confidence Limit	Upper Confidence Limit	Lower Confidence Limit	Upper Confidence Limit
Arsenic	301.666667	131.6687764	6	2.449489743	53.75355285	1.3	2	231.79	371.55	194.16	409.17

YES

Your Environmental Solutions

Woodcocks Roost, Fore Street
Barripper, Camborne
Cornwall, TR14 0QR

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www.urenvironmentalsolutions.com
info@urenvironmentalsolutions.com

