Phase 2 Site Investigation

Sir Robert's Farm, Goose Green Lane,

Pulborough, RH20 2LW

June 2023

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Phase 2 Site Investigation

Sir Robert's Farm, Goose Green Lane, Pulborough, RH20 2LW

12/06/2023

Peter Isherwood

Westlands Farm

Horsehill

Hookwood

Surrey

RH6 0HN

Document Control:

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9961		Sir Robert's Farm, Pulborough		
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V0	Elena Francis	Stefan Cannon	Richard Schofield	12/06/2023

Phlorum Limited

Southern Office: Unit 12, Hunns Mere Way, Woodingdean, Brighton, East Sussex, BN2 6AH

T: 01273 307 167 E: info@phlorum.com W: www.phlorum.com

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1. Introduction

1.1 Phlorum Ltd has been commissioned by the client, Peter Isherwood, to undertake a Contamination Phase 2 Assessment at Sir Robert's Farm, Pulborough, RH20 2LW.

1.2 The purpose of the works was to:

- test for the presence of potentially hazardous contamination in the ground;
- provide a quantitative contamination risk assessment; and
- provide a quantitative site specific conceptual model.

1.3 The analysis and discussions contained in this report are based on the ground conditions encountered during the recent site work, together with the findings from a programme of laboratory analyses. The possibility of a variation in ground and groundwater conditions away from the positions investigated should not be overlooked.

1.4 This report should be read in conjunction with the Phase 1 contamination assessment report which was written for this development.

1.5 It is noted that the investigation was undertaken and the report was prepared specifically for the Client's project and the recommendations given may not be appropriate to alternative schemes. The copyright for the report and licence for use shall remain vested in Phlorum Limited (the Company) who disclaim all responsibility or liability (whether at common law or under the express or implied terms of the Contract between the Company and the Client) for any loss or damage of whatever nature in the event that this report is relied on by a third party, or is issued in circumstances or for projects for which it was not originally commissioned, or where the exploratory hole records and test results contained therein are interpreted by anyone other than the Company.

1.6 The general methodology adopted for the investigation of the site follows the guidance published within:

- BS 10175:2011+A2:2017, Investigation of Potentially Contaminated Sites - Code of Practice;
- BS 5930:2015+A1:2020 Code of Practice for Site Investigations;
- BS EN 1997-2:2010 Geotechnical Design – Part 2: Ground investigation and testing;
- Land Contamination Risk Management (LCRM) 2021;
- National Planning and Policy Framework;
- DEFRA SP1010, C4SL values; and

- LQM/CIEH Suitable 4 Uses Levels (S4UL).

1.7 The risk assessment presented in this report follows 'source-pathway-receptor' techniques for the determination of whether a site is contaminated, which are standard practice in the UK, being intrinsic to the Contaminated Land (England) Regulations 2006, as amended, - Part 2A of the Environmental Protection Act 1990.

1.8 The report considers end users as the most sensitive human health receptors. If significant risks to construction workers are identified by the preliminary assessment attention is drawn to this. No assessment of risk from acute exposure has been undertaken in this connection.

1.9 This report is not intended to be either an ecological or archaeological assessment. An appropriate specialist should be consulted about any concerns that may arise in this regard.

2. Factual Report

Site Details

2.1 The site is located in the east of Pulborough, approximately 7,560m east of Pulborough train station and 2,735m north-west from A24.

2.2 The site is located in an agricultural setting and is surrounded by few residential dwellings and large areas of agricultural land. The site is accessed via Goose Green Lane, which lies to the south.

Site History

2.3 The site was historically comprised within agricultural fields, c.1875-1876. A review of historical mapping available for the site revealed that from the earliest available maps (1875-1876) a structure named Sir Roberts Barn had already been constructed, to the west of the site. Goose Green Lane is also present, running south of the site. A sparce area of land to the south of site is labelled Goose Green.

2.4 To the north-east of the site, within and beyond the 100m area, is an area named Sir Robert's Copse, this can be defined as a thicket of small trees or bushes. This area remains the same to the present day.

2.5 Besides the above mentioned, the area within 100m of the study site remains agricultural land from the first available map to the present day.

2.6 Further detail is provided in the Phase 1 Preliminary Risk Assessment undertaken by Phlorum, dated June 2022.

Geology, Hydrogeology and Hydrology

Expected Geology

Table 1. Anticipated Geology Strata

Type	Stratum	Age
Superficial Deposits	No superficial deposits recorded onsite.	N/A
Bedrock and Solid Geology	Weald Clay Formation- Mudstone.	Cretaceous Period.

GroGround investigation

Introduction

2.7 The ground investigation comprised the excavation of six trial pits. The fieldwork was carried out on 24th May 2023. The exploratory trial pit locations are shown on Figure 1.

2.8 Descriptions of the strata encountered conditions are shown in the trial pit logs given in Appendix A. Notes to assist in the interpretation of the records are also contained in the appendix.

Investigation and Sampling Strategy

2.9 The trial pits were located across the site to provide spatial coverage for contamination sampling. They were also placed in locations where there would be green landscaping space, close to the onsite structures, in the redevelopment. The trial pit locations were deemed acceptable by Horsham County Council. Email attachments of these confirmations can be found in Appendix F.

2.10 The pattern and density of sampling adopted is considered adequate for a quantitative assessment of the extent of contamination at the site. The results from the ground investigation, together with the desk study work, provide information allowing preparation of a quantitative risk assessment.

Methodology

Trial Pits

2.11 Six trial pits (designated TP1 to TP6) were excavated to depths of approximately 1.0m below ground level. The below ground depth was agreed with Horsham County Council who confirmed a maximum depth of 1m was sufficient for the sampling.

2.12 The trial pits were formed by a tractor and mounted auger.

Sampling

2.13 Disturbed samples of soil were taken at the depths shown in the exploratory hole records and collected in 1Kg plastic tubs and 250g amber jars fitted with gas tight lids. On collection, amber jars were stored in cool boxes containing cooling blocks to maintain temperatures below 4°C and were transferred to refrigerators upon return to the office until forwarded to the external accredited laboratory.

Laboratory Testing

2.14 Results from the laboratory tests are provided in Appendix B.

Chemical Testing

2.15 Chemical testing of selected samples was scheduled by Phlorum, and was undertaken by a laboratory with recognised (UKAS and MCERTS) accreditation for quality control.

2.16 The types and numbers of tests undertaken are detailed in the following table. The rationale for testing is discussed further in Section 4.

Table 2. Chemical Testing

Determinant	No. of soil samples tested
Arsenic	8
Cadmium	8
Chromium	8
Lead	8
Mercury	8
Nickel	8
Selenium	8
Copper	8
Zinc	8
Hexavalent Chromium	8
pH	8
Organic Matter	8
Speciated PAH	8
Speciated TPH	8
Asbestos (Identification)	8

Ground Conditions

Stratigraphy

Surface Covering

2.17 Each trial pit was excavated through a surface cover of topsoil some 10mm to 70mm in thickness.

Stability and groundwater Conditions

2.18 All trial pits remained stable for the duration of the assessment.

2.19 No groundwater was recorded at any of the six trial pits.

3. Phase 2 Contamination Assessment

Introduction

Soils

3.1 The results from the majority of the analyses can be assessed by way of careful consideration of the proposed end use as well as physical features of the soil type and wider environment as part of a quantitative 'Contaminated Land Exposure Assessment' or 'CLEA model' assessment.

3.2 Quantitative risk assessment using the CLEA model is the method preferred by the regulatory authorities in the UK to assist in determining the contamination status of soils in terms of risk to human health.

Analysis of Contamination Test Results

3.3 Results from the chemical (contamination) testing are summarised in Appendix B.

3.4 A quantitative assessment of the results of this investigation has been undertaken comparing soil contaminant concentrations on site against the published Soil Guidance Values (SGV's) or LQM/CIEH Generic Assessment Criteria (GAC) for the end use of the site, which for this report is residential land use with associated landscaped areas.

Inorganic Contamination

3.5 The following table summarises the calculated soil screening values along with the maximum concentration recorded for each contaminant.

Table 3. Soil Screening Values and Maximum Concentrations of Inorganic contaminants

Contaminant	Soil screening value (mg/kg)	Maximum concentration recorded (mg/kg)	No. of samples exceeding SSV
Arsenic	37	23.6	0
Cadmium	26	0.8	0
Chromium	910	81.2	0
Copper	2,400	56.5	0
Lead	200	197	0

Mercury	1	0.3	0
Nickel	130	28.8	0
Selenium	250	<1.0	0
Zinc	3,700	455	0

3.6 The above Table 3 shows none of the samples taken produced elevated results of the tested inorganic contaminants.

Polycyclic Aromatic Hydrocarbons (PAH)

3.7 Polycyclic Aromatic Hydrocarbons (PAH) are a group of chemicals that contain two or more benzene rings fused together. In general PAH have relatively low solubility in water but are soluble in organic solvents. Due to their low vapour pressures they tend to readily adsorb onto airborne particulates.

3.8 Individual PAH compounds exhibit a range of physical properties and human toxicities and therefore, where they are present, a risk assessment cannot effectively be made against the total PAH concentration.

3.9 To allow an assessment to be made, the PAH concentrations within the soil samples were speciated to give concentrations of 16 individual PAH defined by the United States Environmental Protection Agency (USEPA).

3.10 The following table summarises the calculated soil screening values along with the maximum concentration recorded for each compound.

Table 4. Soil Screening Values and Upper Confidence Limits for PAH Compounds

Contaminant	Soil Screening Value (mg/kg)	Maximum Concentration Recorded (mg/kg)	No. of samples exceeding SSV
Acenaphthene	210	0.03	0
Acenaphthylene	170	0.05	0
Anthracene	2,400	0.18	0
Benzo(a)anthracene	7.2	0.5	0
Benzo(a)pyrene	2.2	0.62	0
Benzo(b)fluoranthene	2.6	0.44	0
Benzo(ghi)perylene	320	0.33	0
Benzo(k)fluoranthene	77	0.67	0
Chrysene	15	0.69	0

Dibenzo(a,h)anthracene	0.24	0.11	0
Fluoranthene	280	1.45	0
Fluorene	170	0.05	0
Indeno(123-cd)pyrene	27	0.29	0
Naphthalene	2.3	0.06	0
Phenanthrene	95	0.87	0
Pyrene	620	1.19	0

3.11 The above Table 4 shows no results above the SGV for the PAH.

Petroleum Hydrocarbons

3.12 Petroleum hydrocarbons encompass a large number of individual chemical compounds found within substances such as petrol, diesel, lubricating oil, waxes and tar based substances. Consequently they are associated with a wide range of land uses and encountered on a large number of sites investigated, from fuel filling stations and car maintenance garages to more innocuous land uses such as domestic garages and car parking areas.

Table 5. Soil Screening Values and Maximum Concentrations for Speciated Petroleum Hydrocarbons Compounds

Contaminant	Soil Screening Value (mg/kg)	Maximum Concentration Recorded (mg/kg)	No. of samples exceeding SSV
Aliphatic >C5-C6	42	<0.01	0
Aliphatic >C6-C8	100	<0.01	0
Aliphatic >C8-C10	27	<1.0	0
Aliphatic >C10-C12	130	<1.0	0
Aliphatic >C12-C16	110	<1.0	0
Aliphatic >C16-C21	6,500	<1.0	0
Aliphatic >C21-C35	6,500	<1.0	0
Aliphatic >C35-C40	6,500	2.3	0
Aromatic >C5-C7	70	<0.01	0
Aromatic >C7-C8	130	<0.01	0
Aromatic >C8-C10	34	<1.0	0

Aromatic >C10-C12	74	<1.0	0
Aromatic >C12-C16	140	<1.0	0
Aromatic >C16-C21	260	<1.0	0
Aromatic >C21-C35	1,100	<1.0	0
Aromatic >C35-C40	1,100	<1.0	0

3.13 The above Table 5 shows that there are no exceedances of the SGV for the respective petroleum hydrocarbon fraction.

Asbestos

3.14 No asbestos was detected in any of the samples taken.

Quantitative Contamination Risk Assessment

3.15 The quantitative risk assessment takes into account the findings of the intrusive works and laboratory testing along with on-site observations in order to identify potentially significant risks. A significant risk is only deemed to exist where a significant pollutant linkage has been identified i.e. where a significant source is linked to the receptor via a significant pollutant pathway.

Potential Sources of Contamination

3.16 No potential sources of contamination were identified from the intrusive site investigation.

Potential Pathways

3.17 The site lies over an Unproductive Stratum for the solid geology. Normally the higher the organic matter and clay content within soil, the greater the adsorption of organic compounds and the lower their mobility. However, other properties of the soil, such as water and organic content will also influence the migration potential of contaminants.

3.18 The following potential pathways have been identified in the context of the current site condition:

- Leaching of localised mobile inorganic and organic contamination into surface and ground water;
- soil ingestion, dermal contact, inhalation;
- plant uptake; and
- migration of volatile contaminants through the ground.

Potential Receptors

3.19 The risk of contamination exposure to any future ground workers can generally be mitigated via the use of appropriate Health & Safety Risk Assessments and PPE. The following potential receptors have been identified:

- Ecological environment;
- Construction workers;
- Future site users; and
- Ground/surface water.

3.20 The revised risk assessment is reproduced in Table 6, the classifications of likelihood, severity and risk are included in Appendix E.

3.21 The revised conceptual model is included in Appendix D.

Quantitative Contamination Risk Assessment for Human Health

3.22 A quantitative human health contamination risk assessment is reproduced below in Table 6 and classifications are described in Appendix D.

3.23 The level of risk is determined using the following risk matrix.

		Likelihood of significant impact			
Severity of potential impact		Very Low Likelihood	Low Likelihood	Moderate Likelihood	High likelihood
	Very Minor	Negligible	Very Low	Low	Low/ Moderate
	Minor	Very Low	Low	Low/ Moderate	Moderate
	Moderate	Low	Low/ Moderate	Moderate	High
	Severe	Low/ Moderate	Moderate	High	Very High

3.24 The risk assessment is based on the site being redeveloped for housing including soft landscaped areas. Should the proposed end use be altered, a revised risk assessment may be required.

Table 6: Quantitative Human Health Conceptual Model – Pollutant Linkages and Assessment of Risk

Soil Samples	Potential contamination	Pathway	Receptor	Hazard classification	Likelihood classification	Risk classification
Soil sampling results	Heavy metals	Soil ingestion, dermal contact, inhalation uptake, leaching migration, groundwater migration.	Current users of the site or adjacent land.	Very Minor	Very Low	Negligible
			Construction workers on the site.	Very Minor	Very Low	Negligible
			Future users of the proposed site.	Very Minor	Very Low	Negligible
	Lead	Soil ingestion, dermal contact, inhalation uptake, leaching migration, vegetation uptake, groundwater migration.	Future users of the site or adjacent land.	Very Minor	Very Low	Negligible
			Controlled water bodies in/on/under and close to the site (surface /ground water).	Very Minor	Very Low	Negligible
	Polycyclic Aromatic Hydrocarbons (PAH)	Soil ingestion, vegetable/root uptake, dermal contact, inhalation	Current users of the site or adjacent land.	Very Minor	Very Low	Negligible

Soil Samples	Potential contamination	Pathway	Receptor	Hazard classification	Likelihood classification	Risk classification
		uptake, leaching migration, groundwater migration.	Construction workers on the site.	Very Minor	Very Low	Negligible
			Future users of the proposed site.	Very Minor	Very Low	Negligible
	Benzo(a)pyrene and Benzo(b)fluoranthene	Soil ingestion, vegetable/root uptake, dermal contact, inhalation uptake, leaching migration, groundwater migration.	Controlled water bodies in/on/under and close to the site (surface /ground water).	Very Minor	Very Low	Negligible
			Future users of the proposed site.	Very Minor	Very Low	Negligible
	Petroleum Hydrocarbons (PHC)	Soil ingestion, vegetable/root uptake, dermal contact, inhalation uptake, leaching migration, groundwater migration.	Current users of the site or adjacent land.	Very Minor	Very Low	Negligible
			Construction workers on the site.	Very Minor	Very Low	Negligible
			Future users of the proposed site.	Very Minor	Very Low	Negligible

Soil Samples	Potential contamination	Pathway	Receptor	Hazard classification	Likelihood classification	Risk classification
Soil Samples	Asbestos	Inhalation uptake.	Current user, construction worker, future users.	Very Minor	Very Low	Negligible

Recommended Remediation

Human Health

3.25 The following recommendations are designed to break the source - pathway - receptor linkage between the known areas of contamination and the future users of the site by either removing the contaminated soil or limiting future use. Plus importing a sufficient layer of clean material where soil has been removed.

Soil Contamination

3.26 Due to no elevated levels of Inorganic contaminants, PAH's or Petroleum hydrocarbons being found in the samples, no remediation works are required.

Risks to Other Potential Receptors

3.27 The following general guidance is given with regards to other potential on site receptors, which may not necessarily be statutory drivers for remedial works.

Construction Workers

3.28 As a minimum and in accordance with industry best practise all ground-workers should be issued with the appropriate PPE and should be instructed in safe working methods. As a precaution instructions should also be given in the recognition of potentially hazardous materials, including oily and odorous soil and water and discoloured or fibrous substances. Any oil-like substances contacting the skin must be washed off immediately using an appropriate cleanser. Operatives should be warned to avoid contact between hands and mouth before washing. The consumption of food and smoking must be confined to designated clean areas. Suitable welfare (washing) facilities should be provided.

Services

3.29 It is considered that the service providers' requirements represent the most informed decision when it comes to the protection of their services. It is recommended that service providers should be contacted to determine any specific precautions they may require for the protection of their equipment.

Discovery Strategy

3.30 Should materials not previously identified or suspected of being 'contaminants' be encountered during the course of the works, advice should be sought immediately on their identification and how they should be treated.

3.31 If necessary the newly identified contaminants will be subject to a revised risk assessment and remediation strategy.

Handling and Disposal of Waste

3.32 Soils and other materials taken for disposal should be handled, transferred and disposed of as controlled waste in accordance with the requirements of the Waste Management, Duty of Care Regulations. Copies of waste transfer notes detailing the site address, the waste type, details of the haulage contractor and full details of the disposal site must be kept.

4. Conclusions

4.1 No reliance should be placed on any point of the conclusions until the whole of the report has been read as other sections of the report may put into context the information contained herein.

Contamination Status Assessment

4.2 Phlorum undertook six trial pits from across the land at Sir Robert's Farm, Pulborough on Wednesday 24th May 2023 to the maximum depth of 1m bgl at locations selected by Phlorum, and in agreement with the local authority, to represent the various conditions on site based on the final development plan provided by the client. Eight soil samples from these trial pits were analysed for contaminants.

4.3 The soil types found amongst the six trial pits were silty loam and silty clayey loam soils. The laboratory testing of the soils confirmed no presence of contaminants in the soils.

4.4 A human health risk assessment was undertaken which compared the laboratory test results from eight samples taken from the six trial pits with published DEFRA C4SL values and LQM/CIEH Suitable for Use Levels (S4UL), for soils samples.

Verification

4.5 Although no verification measures are recommended for this site based off of the intrusive investigation, should any verification works be required at further work stages records of any remedial measures undertaken should be kept for inclusion into a verification report for submission to regulators on completion of the works.

4.6 Records should include photographs, copies of waste transfer notes and weigh bridge tickets for all contaminated soil removed from site, and certificates from all soils brought onto site.

Site Investigation Photographs

Photo No.	Description	Photograph
1	Trial pit 1 drilling.	
2	Trial pit 1.	
3	Trial pit 2 drilling.	

Photo No.	Description	Photograph
4	Trial pit 2.	
5	Trial pit 3 location.	

Photo No.	Description	Photograph
6	Trial pit 3.	
7	Trial pit 4 location.	
8	Trial pit 5 drilling.	

Photo No.	Description	Photograph
9	Topsoil layer of trial pit 5.	
10	Trial pit 5.	

Photo No.	Description	Photograph
11	Trial pit 6 drilling.	
12	Trial pit 6.	

Figures and Appendices

Figure 1: Trial Pit Location Plan

Legend

Potential Borehole Locations
Points
Buildings for Redevelopment
Areas
Site boundary
Lines

Figure 1: Sir Roberts Farm, Goose Green Lane, RH20 2LW

Scale: NTS
Job no.: 9961
Drawn by: EF
Printed at: 26/05/2023
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Figure 2: Site Plan

Sir Roberts Farm Site Plan

MapServe

General Notes

Property Boundary edged in red.

No.	Revision/Issue	Date

Drawing:
Drawing 1: Existing Site Plan

Project Name and Address
Sir Roberts Farm

Project	Sheet
Sir Roberts Farm	1
Date: 30 Dec 2021	
Scale:	

Appendix A:

Exploratory Trial Pit Notes

Exploratory Trial Pit Records

Exploratory Trial Pits Notes

Date: 24/05/2023
Address: Sir Roberts Farm
Samplers: EF SC
Weather: Sunny, dry

TP5
Time: 9.30am
0.7mm topsoil
Sample 1-
0.1m depth taken
clay
small amount of organic material
Sample 2:
1m depth
grey colour from 0.6m

TP6
Time: 9.45am
small amount of flint
worms in top layer
made ground 0.4m
cable found 0.2m deep, clay beyond this
medium-firm clay

TP1
Time: 10am
0.45m made ground
clay beyond
dark brown soil, clay breaks apart easier
chalk and flint seen
0.3m sample depth

TP2
Time: 10.15am
Dry, loose soil
Lighter brown
0.5m sample
0.3m made ground

TP4
Time: 10.30am
Sample 1 (A):
0.1m sample depth

0.3m made ground
Bramble and glass above surface
Sample 2 (B):
Yellow/orange colour
clumpy, softer clay
0.7m sample depth

TP3
Time: 10.45am
Darker brown soil
0.2m made ground
0.6m sample depth
Brick, flint, bramble

SIR ROBERTS FARM BOREHOLE LOGS TP1

PROJECT NUMBER 9961
PROJECT NAME Sir Robert's Farm
CLIENT Peter Isherwood

DRILLING DATE 24/05/2023
DRILLER Client
DRILLING METHOD Tractor Mounted Auger

LOGGED BY EF
CHECKED BY SC

COMMENTS No asbestos detected.

Depth (m)	Samples	Graphic Log	Material Description
	TP1		MADE GROUND: 0.45m Sample taken at 0.3m. SILTY LOAM: Dark brown colour, easily breaks apart. Stones and clinker seen.
0.5			Undisturbed Clay beyond 0.45m.
1			End of Borehole

SIR ROBERTS FARM BOREHOLE LOGS TP2

PROJECT NUMBER 9961
PROJECT NAME Sir Robert's Farm
CLIENT Peter Isherwood

DRILLING DATE 24/05/2023
DRILLER Client
DRILLING METHOD Tractor Mounted Auger

LOGGED BY EF
CHECKED BY SC

COMMENTS No asbestos detected.

Depth (m)	Samples	Graphic Log	Material Description
	TP2		MADE GROUND: 0.3m Sample taken at 0.5m. SILTY LOAM: Dry, loose soil, lighter brown. Stones and organics seen.
			Undisturbed Clay beyond 0.3m.
0.5			
1			
			End of Borehole

SIR ROBERTS FARM BOREHOLE LOGS TP3

PROJECT NUMBER 9961
PROJECT NAME Sir Robert's Farm
CLIENT Peter Isherwood

DRILLING DATE 24/05/2023
DRILLER Client
DRILLING METHOD Tractor Mounted Auger

LOGGED BY EF
CHECKED BY SC

COMMENTS No asbestos detected.

Depth (m)	Samples	Graphic Log	Material Description
	TP3		MADE GROUND: 0.2m Sample taken at 0.6m. SILTY LOAM: Dry, loose soil, lighter brown. Stones and organics seen.
			Undisturbed Clay beyond 0.2m.
0.5			
1			
			End of Borehole

SIR ROBERTS FARM BOREHOLE LOGS TP4

PROJECT NUMBER 9961
PROJECT NAME Sir Robert's Farm
CLIENT Peter Isherwood

DRILLING DATE 24/05/2023
DRILLER Client
DRILLING METHOD Tractor Mounted Auger

LOGGED BY EF
CHECKED BY SC

COMMENTS No asbestos detected.

Depth (m)	Samples	Graphic Log	Material Description
	TP4 2 Samples Taken		MADE GROUND: 0.3m. Samples taken at 0.1m and 0.7m. SILTY CLAYEY LOAM: Clumpy, softer clay. Yellow/orange colour. Stones clinker and organics seen.
			Undisturbed Clay beyond 0.3m.
0.5			
1			
			End of Borehole

SIR ROBERTS FARM BOREHOLE LOGS TP5

PROJECT NUMBER 9961
PROJECT NAME Sir Robert's Farm
CLIENT Peter Isherwood

DRILLING DATE 24/05/2023
DRILLER Client
DRILLING METHOD Tractor Mounted Auger

LOGGED BY EF
CHECKED BY SC

COMMENTS No asbestos detected.

Depth (m)	Samples	Graphic Log	Material Description
	TP5 2 Samples Taken		MADE GROUND: 0.07m. Samples taken at 0.1m and 1m. SILTY CLAYEY LOAM: Grey colour seen from 0.6m.
			Undisturbed Clay beyond 0.07m.
0.5			
1			
			End of Borehole

SIR ROBERTS FARM BOREHOLE LOGS TP6

PROJECT NUMBER 9961
PROJECT NAME Sir Robert's Farm
CLIENT Peter Isherwood

DRILLING DATE 24/05/2023
DRILLER Client
DRILLING METHOD Tractor Mounted Auger

LOGGED BY EF
CHECKED BY SC

COMMENTS No asbestos detected.

Depth (m)	Samples	Graphic Log	Material Description
	TP6		MADE GROUND: 0.4m. Sample taken at 0.4m. SILTY CLAYEY LOAM: Cable seen at 0.2m. Stones and clinker observed.
0.5			Undisturbed Clay beyond 0.4m.
1			End of Borehole

Appendix B:

Laboratory Test Results

Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
Telephone: (01424) 718618

cs@elab-uk.co.uk
info@elab-uk.co.uk

UKAS TESTING 2683

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	23-48278
Issue:	1
Date of Issue:	02/06/2023
Contact:	Elena Francis
Customer Details:	Phlorum Ltd (Brighton) Unit 12 Hunns Mere Way Brighton BN2 6AH
Quotation No:	Q23-03884
Order No:	Not Supplied
Customer Reference:	9961
Date Received:	25/05/2023
Date Approved:	02/06/2023
Details:	Sir Roberts
Approved by:	[redacted]

Tim Reeve, Quality Officer

Sample Summary

Report No.: 23-48278, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
323803	TP1 0.30	24/05/2023	25/05/2023	Silty loam	
323804	TP2 0.50	24/05/2023	25/05/2023	Silty loam	
323805	TP3 0.20	24/05/2023	25/05/2023	Silty loam	
323806	TP4A 0.10	24/05/2023	25/05/2023	Silty clayey loam	
323807	TP4B 0.70	24/05/2023	25/05/2023	Silty clayey loam	
323808	TP5 0.10	24/05/2023	25/05/2023	Silty loam	
323809	TP5 1.00	24/05/2023	25/05/2023	Silty clayey loam	
323810	TP6 0.40	24/05/2023	25/05/2023	Silty clayey loam	

Results Summary

Report No.: 23-48278, issue number 1

ELAB Reference				323803	323804	323805	323806	323807	323808	323809	323810
Customer Reference											
Sample ID											
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP1	TP2	TP3	TP4A	TP4B	TP5	TP5	TP6
Sample Depth (m)				0.30	0.50	0.20	0.10	0.70	0.10	1.00	0.40
Sampling Date				24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Determinand	**Codes**	**Units**	**LOD**								
Soil sample preparation parameters											
Moisture Content	N	%	0.1	26.8	19.6	25.5	26.5	21.0	26.1	23.4	21.2
Material removed	N	%	0.1	28.9	14.5	52.0	29.9	35.7	55.1	37.4	45.4
Description of Inert material removed	N		0	Stones	Stones	Stones, clinker	Stones, clinker, wood	Stones	Stones	Stones	Stones
Metals											
Arsenic	M	mg/kg	0.5	18.2	16.0	14.3	15.5	15.3	12.3	23.6	14.0
Cadmium	M	mg/kg	0.2	< 0.2	< 0.2	0.3	0.8	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	M	mg/kg	1	31.6	27.5	30.3	81.2	36.6	24.2	48.9	28.1
Chromium (III)	N	mg/kg	5	31.6	27.5	30.3	81.2	36.6	24.2	48.9	28.1
Copper	M	mg/kg	4	37.1	18.7	56.5	44.1	25.8	19.1	33.7	18.2
Lead	M	mg/kg	1	83.8	41.3	197	86.5	30.0	34.3	24.8	23.4
Mercury	M	mg/kg	0.1	0.1	< 0.1	0.3	0.2	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	M	mg/kg	1	17.2	16.4	28.8	25.5	21.5	12.2	22.5	14.2
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	4.5	198	83.8	455	143	111	66.2	66.3	59.8
Inorganics											
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	1.3	< 1.0	< 1.0	< 1.0	< 1.0

Results Summary

Report No.: 23-48278, issue number 1

ELAB Reference				323803	323804	323805	323806	323807	323808	323809	323810
Customer Reference											
Sample ID											
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP1	TP2	TP3	TP4A	TP4B	TP5	TP5	TP6
Sample Depth (m)				0.30	0.50	0.20	0.10	0.70	0.10	1.00	0.40
Sampling Date				24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Determinand	**Codes**	**Units**	**LOD**								
Miscellaneous											
pH	M	pH units	0.1	7.1	7.0	7.1	6.7	6.7	6.4	5.7	6.4
Total Organic Carbon	N	%	0.01	4.5	1.3	7.8	2.6	0.90	2.5	0.43	1.0
Phenols											
Phenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Polyaromatic hydrocarbons											
Naphthalene GCMS	N	mg/kg	0.01	0.06	0.01	0.04	0.02	0.01	0.02	< 0.01	0.01
Acenaphthylene GCMS	N	mg/kg	0.01	0.04	< 0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene GCMS	N	mg/kg	0.01	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene GCMS	N	mg/kg	0.01	0.05	< 0.01	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene GCMS	N	mg/kg	0.01	0.87	0.02	0.41	0.04	< 0.01	0.05	< 0.01	0.02
Anthracene GCMS	N	mg/kg	0.01	0.18	< 0.01	0.09	< 0.01	< 0.01	0.01	< 0.01	< 0.01
Fluoranthene GCMS	N	mg/kg	0.01	1.45	0.03	0.83	0.07	< 0.01	0.11	< 0.01	0.04
Pyrene GCMS	N	mg/kg	0.01	1.19	0.02	0.70	0.06	< 0.01	0.10	< 0.01	0.03
Benzo(a)anthracene GCMS	N	mg/kg	0.01	0.50	0.01	0.33	0.03	< 0.01	0.04	< 0.01	0.01
Chrysene GCMS	N	mg/kg	0.01	0.69	0.02	0.51	0.04	< 0.01	0.07	< 0.01	0.02
Benzo(b)fluoranthene GCMS	N	mg/kg	0.01	0.44	0.02	0.32	0.03	< 0.01	0.05	< 0.01	0.02
Benzo(k)fluoranthene GCMS	N	mg/kg	0.01	0.67	0.01	0.49	0.04	< 0.01	0.07	< 0.01	0.02
Benzo(a)pyrene GCMS	N	mg/kg	0.01	0.62	< 0.01	0.38	0.02	< 0.01	0.04	< 0.01	0.01
Indeno(1,2,3-cd)pyrene GCMS	N	mg/kg	0.01	0.29	0.01	0.18	0.02	< 0.01	0.03	< 0.01	0.01
Dibenzo(a,h)anthracene GCMS	N	mg/kg	0.01	0.11	< 0.01	0.08	< 0.01	< 0.01	0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene GCMS	N	mg/kg	0.01	0.33	0.02	0.20	0.02	< 0.01	0.04	< 0.01	0.01
Total PAH(16) GCMS	N	mg/kg	0.04	7.52	0.19	4.64	0.40	0.04	0.66	< 0.04	0.23

Tests marked N are not UKAS accredited.

Results Summary

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				ELAB Reference	323803	323804	323805	323806	323807	323808	323809	323810
				Customer Reference								
				Sample ID								
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Location	TP1	TP2	TP3	TP4A	TP4B	TP5	TP5	TP6
				Sample Depth (m)	0.30	0.50	0.20	0.10	0.70	0.10	1.00	0.40
				Sampling Date	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023	24/05/2023
Determinand	**Codes**	**Units**	**LOD**									
BTEX												
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
MTBE	U	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
TPH CWG												
>C5-C6 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	2.0	2.3	< 1.0	1.8	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Aliphatic (HS_1D_MS+EH_CU_1D_AL)	N	mg/kg	1	2.0	2.3	< 1.0	1.8	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Aromatic (HS_1D_MS+EH_CU_1D_AR)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro (HS_1D_MS+EH_CU_1D_Total)	N	mg/kg	1	2.0	2.3	< 1.0	1.8	< 1.0	< 1.0	< 1.0	< 1.0

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
Tel: +44 (0)1424 718618, Email: info@elab-uk.co.uk, Web: www.elab-uk.co.uk

Results Summary

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Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
323803	0.30	TP1	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
323804	0.50	TP2	Brown Soil, Stones, Organics	No asbestos detected	n/t	n/t	n/t	n/t
323805	0.20	TP3	Brown Soil, Stones, Clinker, Organics	No asbestos detected	n/t	n/t	n/t	n/t
323806	0.10	TP4A	Brown Soil, Stones, Clinker, Organics	No asbestos detected	n/t	n/t	n/t	n/t
323807	0.70	TP4B	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
323808	0.10	TP5	Brown Soil	No asbestos detected	n/t	n/t	n/t	n/t
323809	1.00	TP5	Brown Soil (Clay)	No asbestos detected	n/t	n/t	n/t	n/t
323810	0.40	TP6	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

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Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
PAH (GC-MS)	N	As submitted sample	30/05/2023		GC-MS
Hexavalent chromium	N	As submitted sample	30/05/2023	110	Colorimetry
pH	M	Air dried sample	02/06/2023	113	Electromeric
Phenols in solids	M	As submitted sample	30/05/2023	121	HPLC
Low range Aliphatic hydrocarbons soil	N	As submitted sample	02/06/2023	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	02/06/2023	181	GC-MS
BTEX in solids	M	As submitted sample	02/06/2023	181A	GC-MS
Total cyanide	M	As submitted sample	02/06/2023	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	31/05/2023	210	IR
Aliphatic hydrocarbons in soil	N	As submitted sample	30/05/2023	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	02/06/2023	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	31/05/2023	214	GC-FID
Asbestos identification	U	Air dried sample	01/06/2023	281	Microscopy
Aqua regia extractable metals	M	Air dried sample	01/06/2023	300	ICPMS

Tests marked N are not UKAS accredited

Report Information

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Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"
LOD	LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.

ELAB are unable to provide an interpretation or opinion on the content of this report.

The results relate only to the sample received.

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

TPH Classification - HWOL Acronym System

HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
2D	GC-GC - Double coil gas chromatography
#1	EH_Total but with humics mathematically subtracted
#2	EH_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

Appendix C:

Summary Table of SGV and GAC

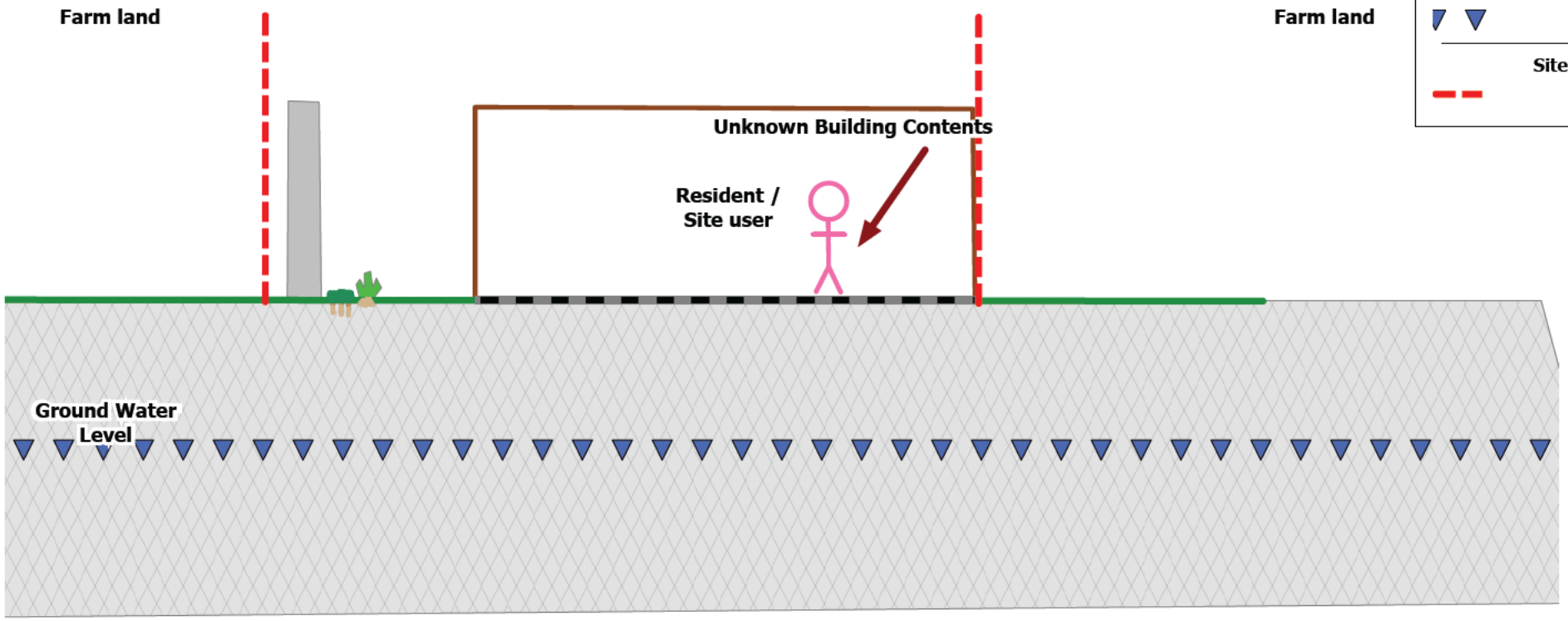
Land Use		Residential with Plant Uptake		Commercial		
Soil Organic Matter		1	6	6		
Type		(mg kg-1)	(mg kg-1)	(mg kg-1)	**Source**	**Date**
Metals	Arsenic		37	640	C4SL, DEFRA	2014
	Cadmium		26	410	C4SL, DEFRA	2014
	Chromium		910	8600	S4UL, LQM/CIEH	2015
	Chromium IV		21	49	C4SL, DEFRA	2014
	Copper		2,400	68,000	S4UL, LQM/CIEH	2015
	Lead		200	2330	C4SL, DEFRA	2014
	Mercury (Elemental)		1.0	26	SGV, DEFRA	2012
	Nickel		130	1,800	SGV, DEFRA	2012
	Selenium		350	13,000	SGV, DEFRA	2012
	Zinc		3,700	730,000	S4UL, LQM/CIEH	2015
Phenols	Total Monohydric Phenols	280	1,100	3,200	S4UL, LQM/CIEH	2015
Petroleum Hydrocarbons Fractions	Aliphatic >C5-C6	42	160	12,000	S4UL, LQM/CIEH	2015
	Aliphatic >C6-C8	100	530	40,000	S4UL, LQM/CIEH	2015
	Aliphatic >C8-C10	27	150	11,000	S4UL, LQM/CIEH	2015
	Aliphatic >C10-C12	130	760	47,000	S4UL, LQM/CIEH	2015
	Aliphatic >C12-C16	110	4,300	90,000	S4UL, LQM/CIEH	2015
	Aliphatic >C16-C35	6500	110,000	1,800,000	S4UL, LQM/CIEH	2015
	Aliphatic >C35-C44	6500	140,000	1,800,000	S4UL, LQM/CIEH	2015
	Aromatic >C5-C7	70	300	86,000	S4UL, LQM/CIEH	2015
	Aromatic >C7-C8	130	660	180,000	S4UL, LQM/CIEH	2015
	Aromatic >C8-C10	34	190	17,000	S4UL, LQM/CIEH	2015
	Aromatic >C10-C12	74	380	34,000	S4UL, LQM/CIEH	2015
	Aromatic >C12-C16	140	660	38,000	S4UL, LQM/CIEH	2015
	Aromatic >C16-C21	260	930	28,000	S4UL, LQM/CIEH	2015
	Aromatic >C21-C35	1100	1,700	28,000	S4UL, LQM/CIEH	2015
	Aromatic >C35-C44	1100	1,700	28,000	S4UL, LQM/CIEH	2015
Polycyclic Aromatic Hydrocarbons (PAH's)	Acenaphthene	210	1,100 ,		S4UL, LQM/CIEH	2015
	Acenaphthylene	170	920	100,000	S4UL, LQM/CIEH	2015
	Anthracene	2400	11,000	540,000	S4UL, LQM/CIEH	2015
	Benzo(a)anthracene	7.2	13	180	S4UL, LQM/CIEH	2015
	Benzo(a)pyrene	2.2	5	36	S4UL, LQM/CIEH	2015
	Benzo(b)fluoranthene	2.6	3.7	45	S4UL, LQM/CIEH	2015
	Benzo(ghi)perylene	320	250	4,000	S4UL, LQM/CIEH	2015
	Benzo(k)fluoranthene	77	100	1,200	S4UL, LQM/CIEH	2015
	Chrysene	15	27	350	S4UL, LQM/CIEH	2015
	Dibenz(a,h)anthracene	0.24	0.3	3.6	S4UL, LQM/CIEH	2015
	Fluoranthene	280	890	23000	S4UL, LQM/CIEH	2015
	Fluorene	170	860	71,000	S4UL, LQM/CIEH	2015
	Indeno(1,2,3-cd)pyrene	27	41	510	S4UL, LQM/CIEH	2015
	Naphthalene	2.3	13	1,100	S4UL, LQM/CIEH	2015
	Phenanthrene	95	440	23,000	S4UL, LQM/CIEH	2015
	Pyrene	620	2,000	54,000	S4UL, LQM/CIEH	2015

Notes:

SGV, DEFRA	2012: Soil Guideline Value (SGV) (Environment Agency, 2009)
C4SL, DEFRA:	2014: Category 4 Screening Level (C4SL) (Contaminated Land: Application in Real Environment (CL:ARE), 2014)
S4UL, LQM/CIEH:	2015: Suitable 4 Use Level (S4UL) (Nathanail et al, 2015)

Appendix D:

Conceptual Model



Legend

Sources

Contamination

Areas

Pathways

Potential Pathways

Receptors

Figures

Residents

Water Table

Lines

Site Boundary

Lines

Sir Roberts Farm, Goose Green Lane, RH20 2LW
Contamination Conceptual Model

phlorum

Scale:NTS
Job no.: 9961
Drawn by: EF
Printed at: 08/06/2023
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Rev0.1

Appendix E:

Risk assessment classifications

Qualitative Risk Assessment Classifications

The assessment of risk has been carried out using the risk matrix presented in the following table. Classifications of likelihood, severity and risk are provided in subsequent tables.

Risk Assessment Matrix – Comparison of severity and likelihood

		Likelihood of significant impact			
Severity of potential impact (hazard)		Very Low	Low	Moderate	High
	Very Minor	**Negligible**	**Very Low**	**Low**	**Low/Moderate**
	Minor	**Very Low**	**Low**	**Low/Moderate**	**Moderate**
	Moderate	**Low**	**Low/Moderate**	**Moderate**	**High**
	Severe	**Low/Moderate**	**Moderate**	**High**	**Very High**

Classification of Likelihood

Likelihood Classification	Definition
High	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Moderate	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Very Low	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

Classification of Severity (hazard)

Severity Classification	Definition
Severe	Short term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution of sensitive water resource. Catastrophic damage to buildings/property. A short term risk to a particular ecosystem or organisation forming part of such ecosystem.
Moderate	Chronic damage to Human Health "significant harm". Pollution of sensitive water resources. A significant change in a particular ecosystem or organism forming part of such ecosystem.
Minor	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services "significant harm". Damage to sensitive buildings/structures/services or the environment.
Very Minor	Harm, although not necessarily significant harm, which may result in a financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc). Easily repairable effects of damage to buildings, structures and services.

Classification of Risk

Risk 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. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the long term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from an identified hazard, but there is a low likelihood of this hazard occurring and if realised, harm 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.

Appendix F:

Horsham County Council Documents

Elena Francis | Phlorum

From: Kevin.Beer <Kevin.Beer@horsham.gov.uk>
Sent: 05 May 2023 15:31
To: Peter Isherwood
Cc: Michael Isherwood; Elena Francis | Phlorum
Subject: RE: Phase II Ground Investigation at Sir Roberts Farm,

Dear Peter,

Thank you for your email.

I can confirm that I am happy with the proposed investigation.

As stated in your email should there be significant variation in the made ground or visual/olfactory evidence of contamination is detected at the sampling locations then we will expect the sampling strategy to be amended accordingly.

Kind regards

Kevin

Kevin Beer
Environmental Protection Officer

Telephone: 01403 215420
Email: Kevin.Beer@horsham.gov.uk

Horsham District Council

Horsham District Council, Parkside, Chart Way, Horsham, West Sussex RH12 1RL
Telephone: 01403 215100 (calls may be recorded) www.horsham.gov.uk Chief Executive: Jane Eaton

From: Peter Isherwood [redacted]
Sent: 04 May 2023 06:05
To: Kevin.Beer <Kevin.Beer@horsham.gov.uk>
Cc: [redacted] Elena Francis | Phlorum <Elena.Francis@phlorum.com>
Subject: Re: Phase II Ground Investigation at Sir Roberts Farm,

Kevin,

Thank you for meeting with me at short notice yesterday afternoon, your assistance is greatly appreciated.

As discussed, I attach a plan showing test borehole numbering/locations together with a corresponding spreadsheet detailing findings in each sample borehole sunk adjacent (3m apart) the proposed test boreholes that will be drilled when our consultant is present.

The agreed test borehole sampling rates detailed on the attached spreadsheet are based on the assumption that the test boreholes have broadly similar ground logs to those of the sample boreholes. Should the surface material depths

significantly increase then additional surface samples will be taken. Only one site sample is required in undisturbed clay and is due to be taken from test borehole No. 5.

Although not discussed yesterday, I propose stopping borehole excavations once a minimum of 200mm of undisturbed clay has been penetrated. The only exception to this is borehole 5 which is due to give the undisturbed clay sample and will be sunk to a depth of 1m regardless .

I trust the detail is to your satisfaction and would be grateful if you confirm your agreement.

Many thanks
Peter Isherwood

On Thu, Apr 27, 2023 at 11:25 AM Kevin.Beer <Kevin.Beer@horsham.gov.uk> wrote:

> Dear Peter,
>
> No problem.
>
> Yes 1pm on Friday 5th May will be fine – see you then.
>
> Kind regards
>
> Kevin
>
> **Kevin Beer**
> Environmental Protection Officer
>
> **Telephone:** 01403 215420
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>
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> Telephone: 01403 215100 (calls may be recorded) www.horsham.gov.uk Chief Executive: Jane Eaton
>
> **From:** Peter Isherwood [redacted]
> **Sent:** 27 April 2023 05:30
> **To:** Kevin.Beer <Kevin.Beer@horsham.gov.uk>

Cc: Michael Isherwood [redacted]
Subject: Re: Phase II Ground Investigation at Sir Roberts Farm,

Kevin,

Thank you for your helpful response.

Please could we meet on site at 1pm on Friday 5th May. Please confirm this is acceptable.

Kind regards

Peter Isherwood

Many

On Wed, Apr 26, 2023 at 5:49 PM Kevin.Beer <Kevin.Beer@horsham.gov.uk> wrote:

> Dear Peter,
>
> Thank you for your email and for running your site investigation proposals by us.
>
> I can confirm that the locations and proposed testing suites are acceptable. I note that 12 samples will be subject to chemical testing, 2 from each location. My only comment to make on this is that the made ground and the natural ground should be tested at each location, if however significant variation of the made ground is present then we would ask that samples are collected from each change in strata, following the principles detailed in BS:10175, which may increase the number of samples. Given our experience dealing with similar sites I think its unlikely however that you will find significant depths of made ground or significant variation in the made ground but, as I say, I just wanted to make you aware of this requirement.
>
> I note in your email you requested that I visit afternoon of 4th April. I assume you meant the 4th May, if you did unfortunately I cannot do this date as I am working the Elections for Horsham District Council. I can though visit anytime between 10am and 3pm on Friday 5th May if that would help?

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From: Peter Isherwood [redacted]
Sent: 26 April 2023 06:02
To: Kevin.Beer <Kevin.Beer@horsham.gov.uk>
Cc: Michael Isherwood [redacted]
Subject: Phase II Ground Investigation at Sir Roberts Farm,

Kevin,

Further to our conversation last week, please find attached consultant's proposal for ground investigation works at Sir Roberts Farm comprising their quote and proposed borehole locations.

As discussed, the following provisions have been allowed for:-

1. Borehole depths will be limited to a maximum of 1metre provided undisturbed clay is reached within the excavation. (The quote references borehole depth of 3 - 5 metres but the consultant is happy with 1 metres boreholes provided virgin clay is reached)

2. Borehole excavation can be halted once undisturbed clay has been reached.

I will be sinking additional advance boreholes three metres from each of the chosen borehole locations. This will provide certainty in respect of survey completion by substantially proving the depth of virgin clay (local to each chosen borehole location) and demonstrate the auger's ability to reliably reach 1 metre depth.

Please confirm that the approach, proposed borehole locations and quote content meet with your requirements for the site.

It is intended to sink the additional advance boreholes on Wednesday 3rd April. I would be very grateful if you could attend the site on the afternoon of 4th April (time to suit you) to view the open boreholes and agree the presence of virgin clay in each borehole.

The actual survey boreholes will be sunk at a later date with our consultant in attendance.

I look forward to your early response and thank you for your assistance in this matter.

Kind regards

Peter Isherwood

Elena Francis | Phlorum

From: Peter Isherwood [redacted]
Sent: 04 May 2023 06:05
To: Kevin.Beer
Cc: Michael Isherwood; Peter Isherwood; Elena Francis | Phlorum
Subject: Re: Phase II Ground Investigation at Sir Roberts Farm,
Attachments: Test borehole numbering.pdf; Sample Bore Log and Agreed Sampling.pdf

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Kind regards

Peter Isherwood

Trial Borehole No.	Surface Material mm	Virgin Clay mm	Surface Samples* No.	Undisturbed Clay Samples No.
1	200	800	1	0
2	100	900	1	0
3	400	600	1	0
4	700	300	2	0
5	50	950	1	1
6	75	925	1	0

*** Agreed no. surface samples assumes that adjacent witnessed boreholes have broadly similar surface material depths.**

Phlorum Limited

Head Office & Registered Office:
Unit 12
Hunns Mere Way
Woodingdean
Brighton
East Sussex
BN2 6AH
T: 01273 307 167

Northern Office:
Ground Floor
Adamson House
Towers Business Park
Wilmslow Road
Didsbury
Manchester
M20 2YY
T: 0161 955 4250

Western Office:
One Caspian Point
Pierhead Street
Cardiff Bay
Cardiff
CF10 4DQ
T: 029 2092 0820

info@phlorum.com
www.phlorum.com

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