



Revised Remedial Strategy & Verification Report (Topsoil Cover System)

Land South of 17 Main Street
Woodnewton
Peterborough
PE8 5EB

Prepared for:

Quilla Ltd
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Main Street
Sudborough
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LAND SOUTH OF 17 MAIN STREET, WOODNEWTON

NON-TECHNICAL CLIENT SUMMARY

This report presents the findings of a revised remedial strategy and topsoil verification exercise which was undertaken to confirm that an appropriate thickness and quality of imported cover soil has been installed within areas of gardens associated with the converted barns at the land south of 17 Main Street, Woodnewton. Pertinent findings and conclusions are summarised as follows:

The development of the land south of 17 Main Street in Woodnewton has involved the conversion of two barns into residential dwellings which at the time of writing are nearing completion.

In early 2022, EPS undertook supplementary works following the stripping of some made ground materials in order to be able to revise an original remedial strategy prepared as part of a previous phase of works. The supplementary works involved the client / developer excavating some shallow trial pits from which soil samples were collected and submitted for laboratory analysis.

The laboratory analysis of the shallow soils collected as part of the supplementary phase of work identified a marginal exceedance of the heavy metal arsenic. As such, a revised remedial strategy was prepared which outlined the need to import a minimum thickness of 100mm of certified clean cover soil in the areas of gardens associated with each converted barn.

The cover soil was imported in May 2023 and the client has provided evidence of this in the form of photographs, invoices showing the purchase of the topsoil and a topsoil analysis report confirming the chemical suitability of the imported soil, EPS has also verified that the minimum thickness of 100mm of suitable imported soil is in place in the relevant areas associated with the converted barns.

A copy of this report should be presented to East Northamptonshire Council and the NHBC so that it may be used to support the discharge of the relevant outstanding planning conditions.

The above points represent a simplified summary of the findings of this assessment and should not form the basis for key decisions for the proposed development. A thorough review of the details contained within the following report, or discussion with EPS is recommended.



Project Reference:	UK22.5787	
Title:	Revised Remedial Strategy & Verification Report (Topsoil Cover System) – Land South of 17 Main Street, Woodnewton	
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Status:	Issue 1	

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No part of this report, or references to it, may be included in published documents of any kind without approval from EPS.

This report and its contents, together with any supporting correspondence or other documentation, remain the property of Environmental Protection Strategies Ltd until paid for in full.

Where ground investigations have been conducted, these have been limited to the level of detail required for the site in order to achieve the objectives of the investigation.

The report has been written, reviewed and authorised by the persons listed above. It has also undergone EPS' in house quality management inspection. Should you require any further assistance regarding the information provided within the report, please do not hesitate to contact us.

The National Planning Policy Framework requires a competent person to prepare site investigation information, which is defined as a person with a recognised relevant qualification, sufficient experience in dealing with the type(s) of pollution or land instability, and membership of a relevant professional organisation. EPS considers that it fulfils these criteria and would welcome any request for staff CVs or case studies to demonstrate it.



TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	Site Location & Description	1
1.2	Background, Previous Reports & Remedial Strategy.....	2
1.3	Objectives	3
1.4	Scope of Works	3
1.5	Limitations & Constraints	4
2	SUPPLEMENTARY WORKS & REVISED REMEDIAL STRATEGY	5
2.1	Supplementary Works	5
2.2	Laboratory Analysis –Soil	6
2.3	Revised Remedial Strategy	7
2.3.1	<i>Land Use Setting & Generic Screening Criteria</i>	7
2.3.2	<i>Assessment & Discussion of Soil Results</i>	7
3	VERIFICATION WORKS	9
3.1	Verification of Clean Soil Installation & Thickness	9
3.2	Origin & Nature of Cover Material	11
4	VERIFICATION STATEMENT	13

Figures

- Figure 1 Site Location Plan
Figure 2 Supplementary Exploratory Hole Location Plan

Appendices

- Appendix A Development Plan
Appendix B Supplementary Site-Specific Trial Pit Logs
Appendix C Laboratory Results –Environmental Supplementary Soil Samples
Appendix D Summary of Generic Screening Criteria
Appendix E Revised Cover System Calculations
Appendix F Invoice for Purchase of British Sugar Topsoil (23rd April 2023)
Appendix G Topsoil Supplier Analysis Report & Certification

1 INTRODUCTION

In January 2022, Environmental Protection Strategies Ltd (EPS) was commissioned by Quilla Ltd to undertake verification works and produce a Revised Remedial Strategy & Verification Report following the conversion of two barns to residential dwellings at the land south of 17 Main Street, Woodnewton, Peterborough, PE8 5EB ('the site') see Figure 1.

The work was commissioned in order to fulfil planning requirements relating to contamination for the conversion of two barns into residential dwellings including private gardens (East Northamptonshire Council, Reference No. 19/01665/PDU). A proposed development plan is included in Appendix A.

This report presents a summary of the works undertaken by EPS in early 2022 as instructed, to ensure that the previously recommended remedial measures have been satisfactorily implemented to ensure that the following contaminant linkages will not become active post redevelopment works.

Source	Pathway	Receptor
Contaminated Soil (made ground)	Direct contact and inadvertent ingestion by eating or smoking with dirty hands	Construction workers during redevelopment & site users
	Inhalation of fugitive dusts	Site users
	Direct uptake and / or adherence of contaminated soil to vegetation and subsequent ingestion	
	Direct uptake via root systems	Plants

It should be appreciated that the verification of radon protection measures is outside of the scope of this report. The site is known to lie in an area where the percentage of homes above the radon action level is greater than 30% and as such, full radon protection should be installed in the converted barns.

1.1 Site Location & Description

The site is located to the southeast of Woodnewton, situated approximately 1.2km southeast of Apethorpe.

During EPS' first visit to the site as part of a walkover for a Phase I Geo-Environmental Desk Study that was completed in 2018, the area was noted to include two large barns. One was to the north of the site, closest to the access point from Main Street and the other slightly further south. Both barns appeared to be constructed from suspected asbestos containing concrete cladding (roof and upper floors) which was generally in good condition. The more northerly barn had a concrete floor in good condition and was in use for the storage of furniture and household goods. Directly to the south of this barn was a medium sized metal above ground oil tank on a breezeblock plinth. The tank appeared to be connected to a heating system present on the western side of the barn but close

inspection was not possible to the area being extremely overgrown. An area of hardstanding was present to the east of the southern barn with a retaining wall to the south. Some old toys, oil drums and a car battery were noted on this hardstanding however there were no visible signs of contamination. A small fire was located to the north of this hardstanding which appears to be the remnants of burnt vegetation. A large area of the site was a recently mowed meadow which went down slope to the Willow Brook which formed the southern boundary of the site. The meadow was surrounded by mature trees including an ash, field maple and sycamore. Other mature trees (sycamore) were noted to the north of the site to the southern extent of house no 17. It was also noted that an above ground oil tank (modern plastic) is located in the south west corner of the extent of no 17's boundary, directly adjacent to the site. The area accessed from the north of the site also featured some poor-quality hardstanding that appeared to have been used for the storage of gravel at some point. The western edge of the site was extremely over grown and access was not possible during the site walkover in 2018.

When EPS returned to the site to undertake a Phase II works in February 2020 the site was largely as described above however, when EPS visited the site in January 2022, redevelopment works had commenced and the area was largely clear with the exception of the structural elements of the barns and some stockpiled soil in the south east. By this time, some of the surficial soils had been stripped and throughout 2022 and into 2023, redevelopment works continued with the external works to the barn and surrounding area including the gardens and access roads gaining pace. The final visit to the site by EPS took place on June 14th 2023, during this visit which was undertaken to confirm the required thickness of imported soil had been achieved in the relevant areas, the external works on the barns were largely completed. Internal works were ongoing at this time and the imported topsoil which was placed / laid in May 2023 by the client had been recently seeded with immature grass growing in the rear garden areas.

1.2 Background, Previous Reports & Remedial Strategy

The verification works outlined in this report follows on from previous phases also completed by EPS for the conversion of the two barns. EPS' previous phases of work and correspondence with the local authority are referenced and briefly summarised below:

Phase I Geo-Environmental Desk Study– Land to the South of 17 Main Street, Woodnewton (EPS Ref: UK18.4119) –Dated 20th August 2018

The above reference report was originally commissioned to fulfil pre planning requirements for a different development which was proposed to include the demolition of one of the barns and the development of a 4-bed residential dwelling with associated garage, car parking spaces and gardens. It is understood that development plans changed to include the conversion of the barns to dwellings following the issue of this Phase I Geo-Environmental Desk Study.

The desk study ultimately concluded that, due to the historic use of the site and Spinney Farm, Phase II investigations should be undertaken to investigate the identified contaminant linkages.

Phase II Geo-Environmental Assessment– Land to the South of 17 Main Street, Woodnewton (EPS Ref: UK18.4119b) –Dated 28th February 2020

EPS' Phase II investigation involved the drilling of seven hand auger boreholes, made ground materials were encountered at the majority of borehole locations and at some of these locations the depth of the made ground exceeded 0.60m.

Shallow soil samples were submitted for laboratory analysis to confirm their quality and through a generic quantitative risk assessment and screening process, exceedances of the heavy metal arsenic and the PAH compound benzo(a)pyrene were identified, no asbestos containing materials were detected in the shallow soil samples. Through a process of statistical analysis, upper 95th percentile confidence limits (U95) values were calculated for both the arsenic and benzo(a)pyrene exceedance, these U95 values were ultimately used to recommend control measures to reduce risks to acceptable levels. While it is appreciated that the approach to statistical analysis used as part of the Phase II assessment in 2020 is now obsolete and has been superseded by a more robust approach to statistical analysis, given that the calculated U95 values for the shallow soil dataset were actually slightly greater than the exceedances themselves, the recommendations are still considered to be applicable and appropriate.

The recommendations made to reduce risks to future site users to acceptable levels (which essentially constitute the original remedial strategy for the site) centred on importing a minimum thickness of 495mm of certified clean cover soils in areas of proposed gardens and soft landscaping associated with the barn conversions. Given that a proportion of the made ground materials were stripped from the areas of future gardens prior to EPS' site visit in January 2022, the original remedial strategy has been revised as part of this report.

1.3 Objectives

The objective of this Revised Remedial Strategy & Verification Report is as follows:

To revise the original remedial strategy to accommodate the removal of a proportion of the shallow made ground in the garden areas of the converted barns, in line with sustainable remediation principals.

To demonstrate that relevant aspects of the Revised Remedial Strategy have been implemented so that risks to future site users have been successfully mitigated to a safe level.

1.4 Scope of Works

To undertake a verification exercise of the existing Remedial Strategy (Topsoil Cover System only) in accordance with the principles and requirements of the Environment Agency's *Land Contamination: Risk Management* (2020) guidance, the *National Planning Policy Framework*, DEFRA's '*Contaminated Land Statutory Guidance*' and the NHBC's *Standards and Technical Requirements*, the following tasks were undertaken:

Site visit to inspect the quality and nature of the surficial soils following the stripping of a proportion of the made ground prior to EPS' instruction to undertake verification works.

Excavation of four trial pits in the areas of the gardens of the converted barns following the stripping of a proportion of the made ground.

Collection of shallow soil samples and composite samples of the stockpiled material and submissions of soil samples for laboratory analysis so that results can be used in the revised remedial strategy.

Client liaison, discussion, and revised remedial strategy.

Compiling evidence relating to the source of imported cover soil and evidence to prove that the imported soil is clean and of suitable quality for the converted barns and collation of the above information to produce a Revised Remedial Strategy & Verification Report.

1.5 Limitations & Constraints

The purpose of this report is to present the findings of a soil validation exercise conducted at the location(s) specified. When examining the data collected from the investigations made during the assessment, Environmental Protection Strategies Ltd (EPS) makes the following statements:

No investigation method is capable of completely identifying all ground conditions that might be present in the soil or groundwater under a site. Where outlined in our report, we have examined the ground beneath a site by constructing a number of boreholes and / or trial pits. The locations of these excavations and sampling points are considered to be representative of the condition of the whole site subsurface however, ground conditions are naturally variable and it may be possible that localised ground controls could influence the spread of contaminants within the site subsurface. For this reason, it is possible that samples collected during the investigation may not represent the conditions across the entire site.

If third parties have been contracted / consulted during compilation of this report, the validity of any data that has been supplied, and which are referenced in the report, have been assessed as far as possible by EPS, however EPS cannot guarantee the validity of these data and accepts no responsibility for any errors.

EPS Ltd cannot confirm that Japanese Knotweed rhizomes do not exist at the site, this is due to the difficulty of identifying the plant, especially in the early stages of growth. It is recommended that if Japanese Knotweed, (or any other similarly invasive plants,) is suspected to be present, a specialist contractor should be commissioned to make a detailed assessment.

2 SUPPLEMENTARY WORKS & REVISED REMEDIAL STRATEGY

The overall aim of both the original and revised remedial strategy is to ensure the following contaminant linkages will not become active following redevelopment.

Source	Pathway	Receptor
Contaminated Soil (made ground)	Direct contact and inadvertent ingestion by eating or smoking with dirty hands	Construction workers during redevelopment & site users
	Inhalation of fugitive dusts	Site users
	Direct uptake and / or adherence of contaminated soil to vegetation and subsequent ingestion	
	Direct uptake via root systems	Plants

2.1 Supplementary Works

It is understood that prior to EPS instruction to undertake verification works in January 2022, a proportion of the made ground materials were stripped from the garden areas of both barns. When EPS visited the site on 25th January 2022, a total of four trial pits were excavated by the contractors undertaking the redevelopment works and shallow soil samples were collected and submitted for laboratory analysis. Composite samples of the stockpiled material were also collected and submitted for laboratory analysis to confirm if the stockpiled material would be suitable for re-use on site.

The ground conditions encountered during the excavation of the trial pits in January 2022, from surface level, have been interpreted to comprise:

- Topsoil
- Northampton Sand Formation

Supplementary site-specific trial pit logs are included as Appendix B and give descriptions and depths of strata encountered and descriptions of the encountered soil types are presented in the following sub sections. A supplementary exploratory hole location plan is included as Figure 2.

Topsoil

The soils present from ground level at the location of all four trial pits appeared to be natural topsoil however, there was some artificial materials such as bricks, concrete, ash and charcoal present at the surface throughout the garden areas where a proportion of the made ground had been stripped. This topsoil material was consistently recovered as sandy silty clay / clayey silty sand with common roots and rootlets and rare cobbles. This material extended to depths of around 0.50m to 0.55m below ground level.

Northampton Sand Formation

The natural soils beneath what was interpreted as topsoil was recovered as coarse sand and gravel with the gravel being noted as coarse and cobble sized sandstone and ironstone.

Stockpiled Soil

The stockpile soils in the south east were separated into 3 distinct stockpiles, two of which appeared to be natural topsoil and one of which appeared to be made ground containing artificial materials such as brick, concrete, timber, plastic, scrap metal and asphalt. Samples of these stockpiles were submitted for laboratory analysis but were ultimately found to be unsuitable for re-use as part of the barn conversions and after the client was informed of this, it is understood that the stockpiled soil was disposed of off-site. Given that the stockpile soil was found to be unsuitable for use in a residential setting, the results of the composite samples of stockpiled soil have not been included within this report.

2.2 Laboratory Analysis –Soil

An environmental laboratory analysis testing schedule is presented as Table 1 and all environmental sample results from the soil samples collected from the trial pits excavated in January 2022 obtained from the laboratory are included as Appendix C. The key results of laboratory testing on environmental soil samples are summarised below.

Contaminant	No. of Samples	No of Detections	Range of Detections (mg/ kg)		Highest Location & Depth (m bgl)
			Min	Max	
Arsenic	4	4	27.3	41.3	TP01 (0.2-0.5)
Cadmium	4	4	0.4	0.7	TP01 (0.2-0.5)
Chromium III	4	4	90.9	136.9	TP02 (0.1-0.4)
Chromium VI	4	0	-	-	-
Copper	4	4	6	23	TP04 (0.1-0.5)
Lead	4	4	48	135	TP04 (0.1-0.5)
Mercury	4	0	-	-	-
Nickel	4	4	31.6	47.6	TP02 (0.1-0.4)
Selenium	4	4	2	5	TP02 (0.1-0.4)
Zinc	4	4	189	270	TP01 (0.2-0.5)
Naphthalene	4	0	-	-	-
Benzo (a)pyrene	4	2	0.06	0.10	TP03 (0.1-0.4)
Dibenz(ah)anthracene	4	0	-	-	-
PAH (Total of 16)	4	2	0.8	1.1	TP03 (0.1-0.4)
TPH (Total Ali & Aro)	2	1	416		TP03 (0.1-0.4)
MTBE	2	0	-	-	-
BTEX	2	0	-	-	-
Total Cyanide	4	1	0.6		TP01 (0.2-0.5)
Asbestos (% of sample)	4	0	-	-	-

Notes

- Contaminant not identified above laboratory detection limits
 PAH Polycyclic Aromatic Hydrocarbons TPH Total Petroleum Hydrocarbons
 MTBE Methyl Tertiary Butyl Ether BTEX Benzene, Toluene, Ethylbenzene, Xylenes

2.3 Revised Remedial Strategy

In order to revise the original remedial strategy outlined in EPS' Phase II Geo-Environmental Assessment, EPS has considered the laboratory results of the soil samples collected from the trial pits excavated in January 2022.

2.3.1 Land Use Setting & Generic Screening Criteria

In order to screen laboratory data for concentrations of contaminant in soil with potential to cause harm to human health at a residential setting (given that the barns are being converted to residential dwellings), relevant generic screening values have been used. These values are all based on suitable for use criteria for contaminants in soil and the technical framework used to derive the screening values and the documents in which they are published are summarised as follows:

EA Science Reports (SC050021/SR2, SC050021/SR3, and SC050021/SR7)

EA Soil Guideline Value Science Reports

Suitable For Use Levels (S4ULs) for Human Health Risk Assessment – LQM and CIEH (2015).

Soil Generic Assessment Criteria for Human Health Risk Assessment - EIC/AGS/CL:AIRE (2010)

Development of Category 4 Screening Levels for assessment of land affected by contamination - SP1010
– DEFRA (2013)

It is considered reasonable to utilise Benzo(a)pyrene (BaP) as a risk driver or marker representative of genotoxic PAHs (i.e. including dibenzo(ah)anthracene and benzo(b)fluoranthene) given the absence of any 'low risk' (C4SL) equivalent screening values for these compounds.

Category 4 Screening Levels (C4SLs) provide generic suitable for use screening values for common contaminants in a variety of land uses and are also utilised as appropriate generic screening criteria. For concentrations of Arsenic, Lead and BaP in soil, EPS has used DEFRA's C4SL as an appropriate guide for professional judgement with respect to reasonable 'low risk' levels in the context of this site and its suitability for use.

For assessing concentrations of cyanide in soil, in the absence of any commonly accepted national criteria, reference has been made to the Dutch Intervention Value (DIV) of 20mg/kg for free cyanide. It is acknowledged that there are significant limitations in the derivation of these figures and they are not based on UK exposure modelling, so they have only been used to further inform the initial screening of the dataset.

A summary of the screening criteria and the methodology used to derive them is included in Appendix D.

2.3.2 Assessment & Discussion of Soil Results

Through the screening process for on-site human receptors of the laboratory results of the soil samples collected from the trial pits excavated in January 2022, one exceedance of the heavy metal arsenic has been identified as summarised in the below table.



Contaminant	Generic Screening Criteria (mg/kg)	Number of Exceedances	Exceedance (mg/kg), Sampling Location & Depth
Arsenic	37	1	41.3, TP01, 0.2m-0.5m

While the results of the laboratory testing of the soil samples excavated from the trial pits in January 2022 generally show that the soils are of good quality and are unlikely to be artificial made ground that is understood to have been previously stripped from the site, the arsenic exceedance identified and the associated risks does need to be considered further.

In order to further assess the risks associated with the marginal exceedance of arsenic in the shallow soil, reference has been made to the British Geological Surveys Normal Background Concentration of Arsenic in soil dataset. While the site itself falls within an area where arsenic concentrations can be expected to be in the 50th to 75th rectangle range, it is known that the underlying Northampton Sand Formation is associated with elevated concentrations of arsenic, as such, the marginal arsenic exceedance is not completely unexpected. Nonetheless, in line with a conservative approach, EPS recommended to the client that rather than finishing the development with the shallow soils where the marginal exceedance of arsenic was identified at the surface, a nominal thickness of at least 100mm of clean imported cover soil should be imported within the garden of each converted barn. This revised remedial strategy can hence be summarised as follows:

For the private gardens associated with each of the converted barns, a minimum thickness of **100mm** imported certified clean soil is required to reduce risks to future site users to acceptable levels.

It should be noted that this recommendation is made only for domestic garden areas and landscaping over made ground, and there is no such requirement for areas beneath any hardstanding/building footprint or where natural material is encountered.

The revised cover system calculations on which this minimum thickness is broadly based are included as Appendix E.

3 VERIFICATION WORKS

In May 2023, EPS were contacted by the client who confirmed that the installation of cover soils within the gardens associated with the converted barns had been completed. The client has provided supporting evidence to confirm this and this supporting evidence is presented and discussed in the following sections.

3.1 Verification of Clean Soil Installation & Thickness

The client has provided a range of supporting documentation that is relevant to these verification works. These include an invoice showing the purchase of topsoil from British Sugar plc (Appendix F) and a topsoil analysis report from Tim O'Hare Associates confirming the quality of the British Sugar topsoil (Appendix G).

A selection of photographs have also been provided by the client showing the delivery, installation and levelling of the topsoil in the garden areas of each converted barn are included below.







<p>Photo 1: Image showing the delivery of the topsoil sourced from British Sugar –provided by client</p>	<p>Photo 2: Image showing the spreading of topsoil in the gardens of the converted barns –provided by client</p>
	
<p>Photo 3: Image showing the topsoil in the gardens of the converted barns –provided by client</p>	<p>Photo 4: Image showing the topsoil in the gardens of the converted barns –provided by client</p>
	
<p>Photo 5: Image showing the topsoil in the gardens of the converted barns being suitably compacted –provided by client</p>	<p>Photo 6: Image showing the topsoil in the gardens of the converted barns after being suitably compacted and ready to be turfed / seeded – provided by client</p>



As part of the verification works, EPS also visited the site on 14th May 2023 in order to confirm that the minimum thickness of 100mm of imported clean cover soil has been achieved in the required areas. To do this, a number of hand auger boreholes were undertaken throughout the garden areas of both barns. The location of the hand auger boreholes are presented on the supplementary exploratory hole location plan presented as Figure 2. At all of the hand auger borehole locations, topsoil was recovered as brown silty fine sand with some rootlets from the recently seeded grass, the topsoil was particularly dry due to the recent hot weather. This topsoil was found to exceed 100mm at all of the hand auger locations, it was only penetrated at the location of HA03 and the underlying soil here was described as dark brown slightly clayey sand with occasional orange sand inclusions. The depths of the hand auger boreholes (and the depth of the topsoil imported by the client in May 2023) are summarised in the table below.

Location ID	Depth of Topsoil (mm)
HA01	> 120
HA02	> 140
HA03	130
HA04	> 130
HA05	> 120

The following photographs taken during EPS site visit on 14th June 2023 also confirm that the depth of topsoil meets the minimum 100mm requirement.

<p>Photo 7: Image showing the profile of the topsoil imported by the client in May 2023 (above green line) photo taken by EPS, 14/06/23</p>	<p>Photo 8: Image showing the location of HA01 –photo taken by EPS, 14/06/23</p>
	
<p>Photo 9: Image showing the depth of topsoil at hand auger borehole location HA01 –photo taken by EPS, 14/06/23</p>	<p>Photo 10: Image showing the depth of topsoil at hand auger borehole location HA02 –photo taken by EPS, 14/06/23</p>
	
<p>Photo 11: Image showing the depth of topsoil at hand auger borehole location HA04 –photo taken by EPS, 14/ 06/ 23</p>	<p>Photo 12: Image looking north across the rear garden areas of the converted barns –photo taken by EPS, 14/06/23</p>
	

3.2 Origin & Nature of Cover Material

The soils imported to the site for use in the gardens of the converted barns were sourced from British Sugar plc, this topsoil is the product known as 'Landscape 20 Topsoil'. An invoice showing the purchase of this topsoil is included as Appendix F.

British Sugar have a long-standing reputation for providing high quality topsoil, sourced from their sugar beet washings, with the key added assurance that they have the topsoil tested for common contaminants at source.

A topsoil analysis report and certification from Tim O'Hare Associates of the topsoil supplied by British Sugar has also been provided by the client and is included in as Appendix G. The report dated 11th April 2023 states that the soil was described as '*very dark greyish brown, slightly moist, friable, moderately calcareous SANDY LOAM with a weakly developed, very fine to medium granular and subangular blocky structure*' the topsoil analysis report also states that '*the sample was stone-free and no unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed*'. These descriptions which matched the topsoil observed throughout the relevant areas during EPS return site visit on 14th June 2023, coupled with the chemical results of the topsoil included in the topsoil analysis report, are considered to be fully compliant with the requirements of the British Standard for Topsoil (BS3882:2015), and suitable for use within the cover system outlined in EPS' Revised Remedial Strategy earlier in this report.



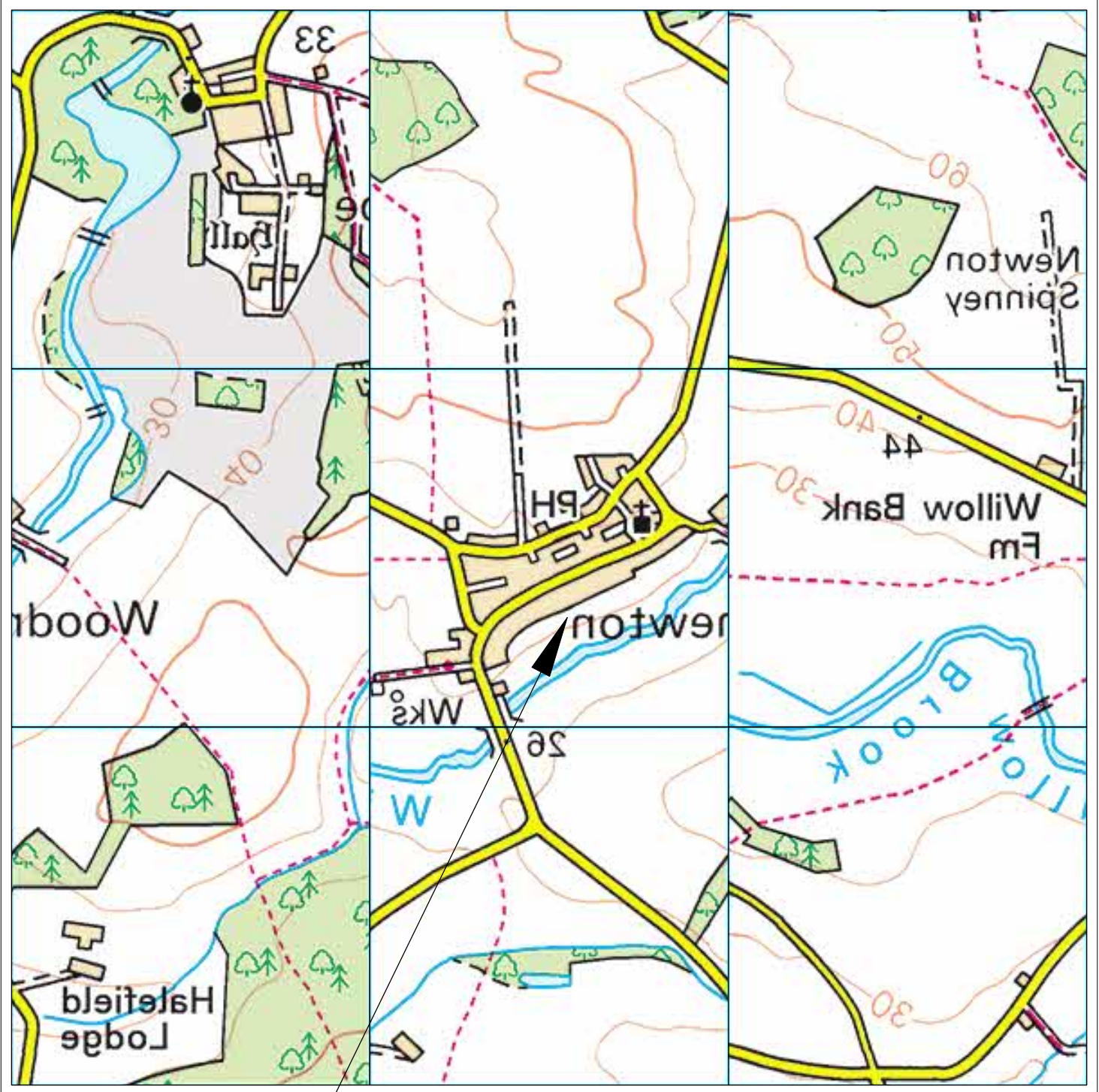
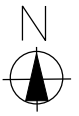
4 VERIFICATION STATEMENT

On the basis of the information provided by the client / developer and the findings of the verification works described in this report, it is concluded by EPS that the topsoil that is currently in place within the gardens of the converted barns at the land south of 17 Main Street, Woodnewton is suitable to adequately manage the associated risks through provision of a simple clean cover soil system.

It is recommended that a copy of this report is provided to the Environmental Health Department of East Northamptonshire Council and the NHBC so that it may be incorporated into their land quality records, and to support the discharge of the associated planning conditions relating to contamination for planning application 19/01665/PDU.



FIGURES



Approximate Site Location

Crown Copyright. All rights reserved.
Licence Number: 100054115



Title: Site Location Plan

Project: Land South of 17 Main Street,
Woodnewton, Peterborough
PE8 5EB

Fig No: 1

Scale: NTS



Drawn By: TA **Approved By:** WE

Job No: UK22.5787

Dwg No: UK22.5787/0623/01

Date: June 2023



-  Approximate Supplementary Trial Pit Location (January 2021)
-  Approximate Hand Auger Borehole Location (June 2023)

Please Note: Figure reproduced from drawing provided by client



Title:	Supplementary Trial Pit Location Plan		
Project:	Land South of 17 Main Street, Woodnewton, Peterborough PE8 5EB		
Fig No:	2	Scale:	NTS
		Drawn By:	TA
		Approved By:	WE
		Job No:	UK22.5787
		Dwg No:	UK22.5787/ 0623/ 02
		Date:	June 2023

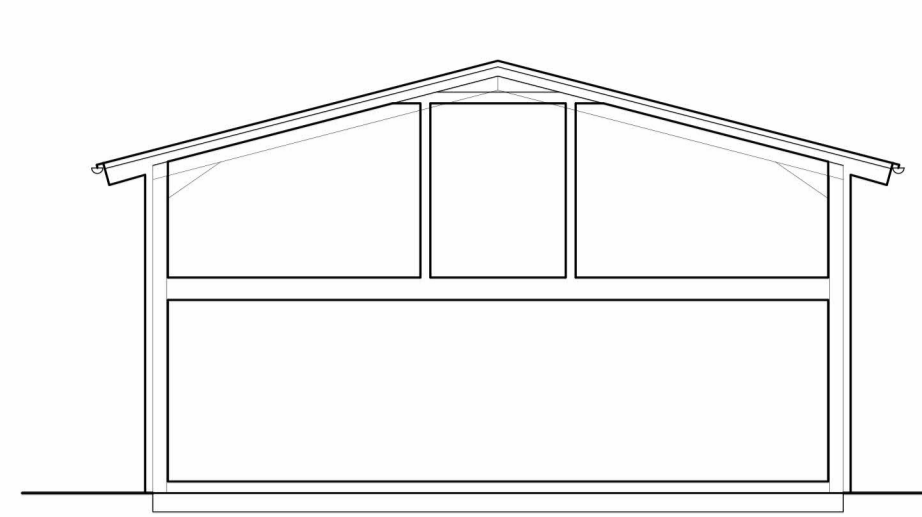


APPENDICES



APPENDIX A

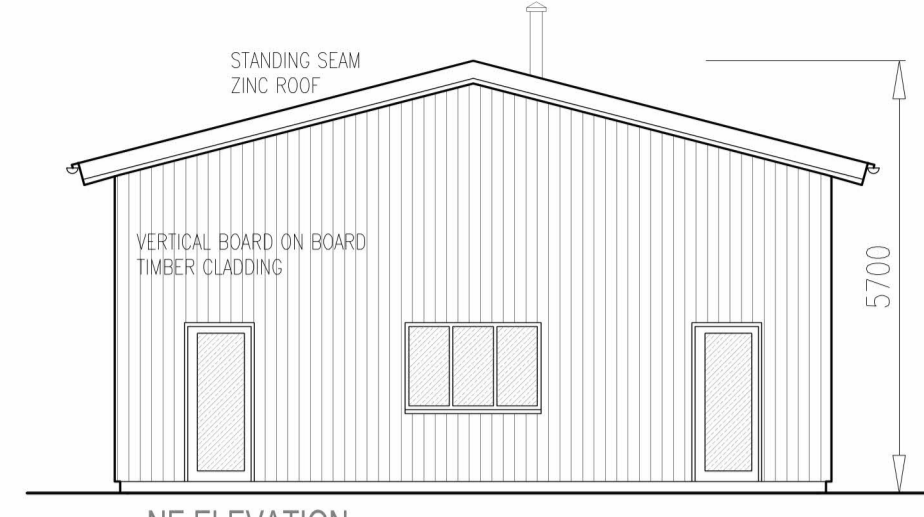
Development Plan



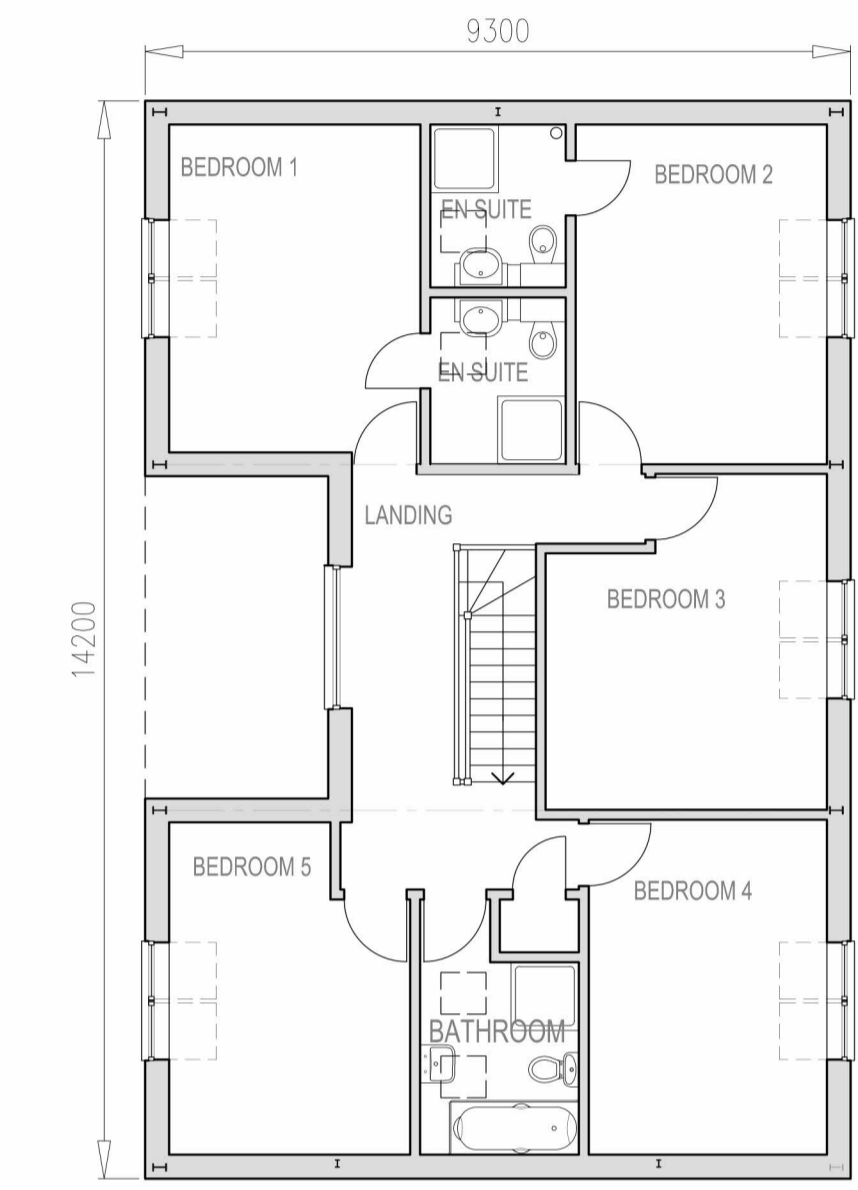
SECTION



SE ELEVATION

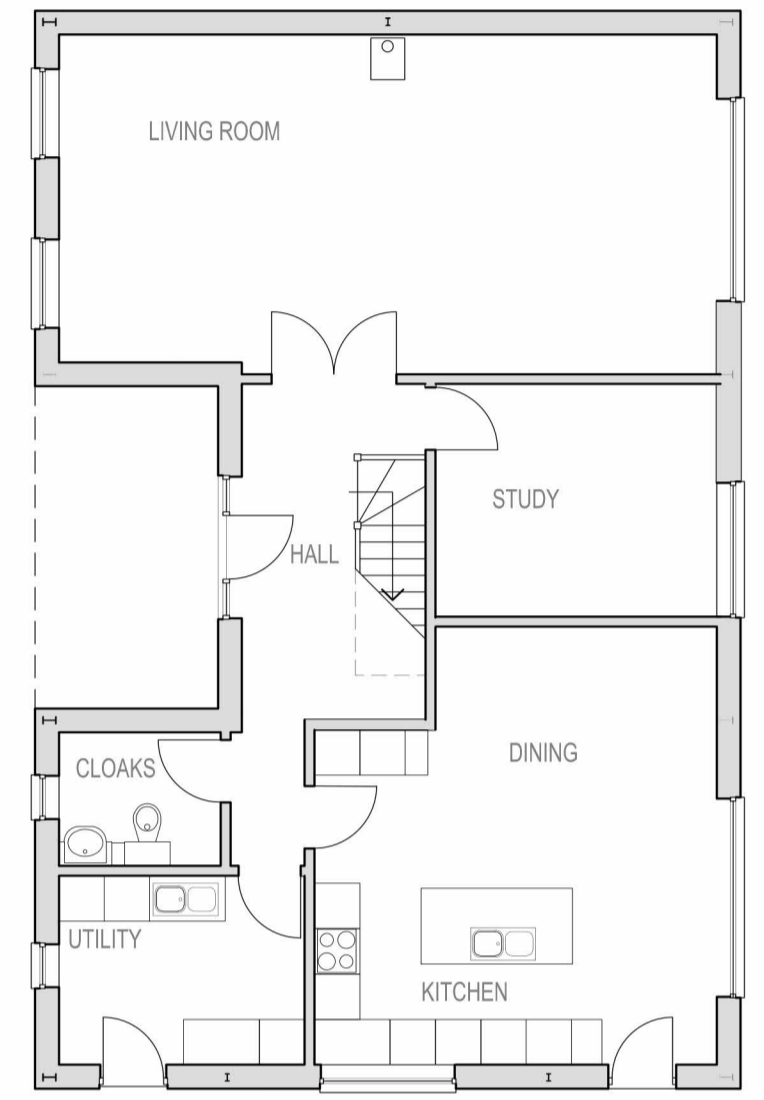


NE ELEVATION

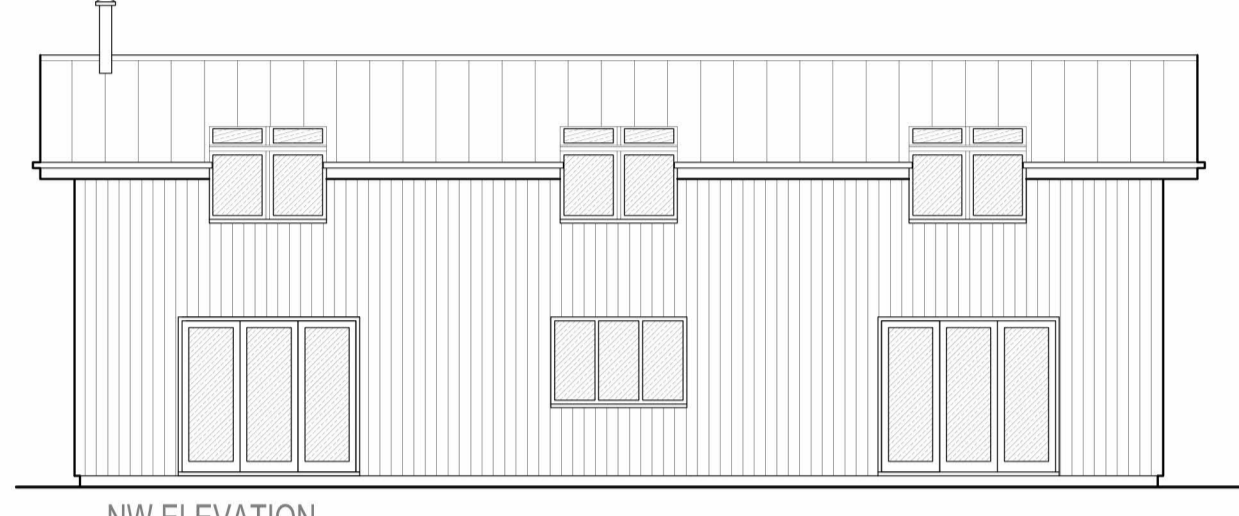


FIRST FLOOR PLAN 107m2

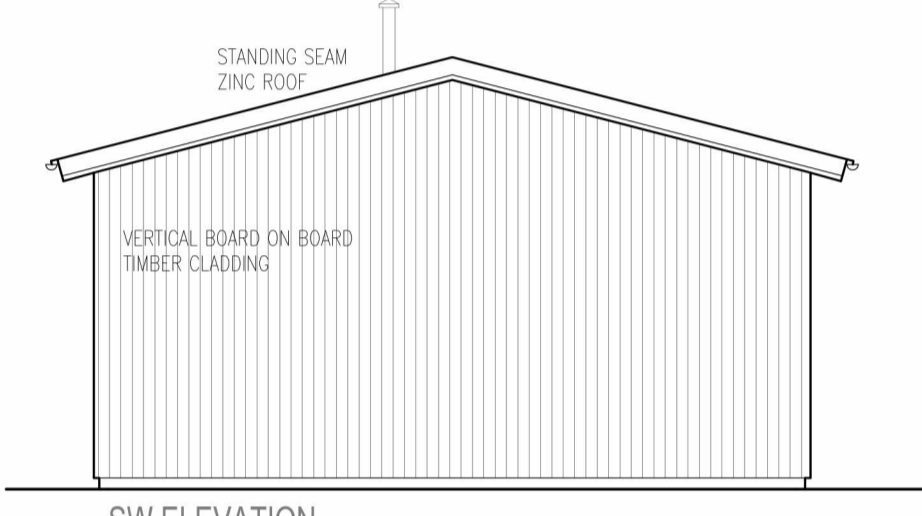
BARN 1 - PROPOSED PLANS, SECTION & ELEVATIONS



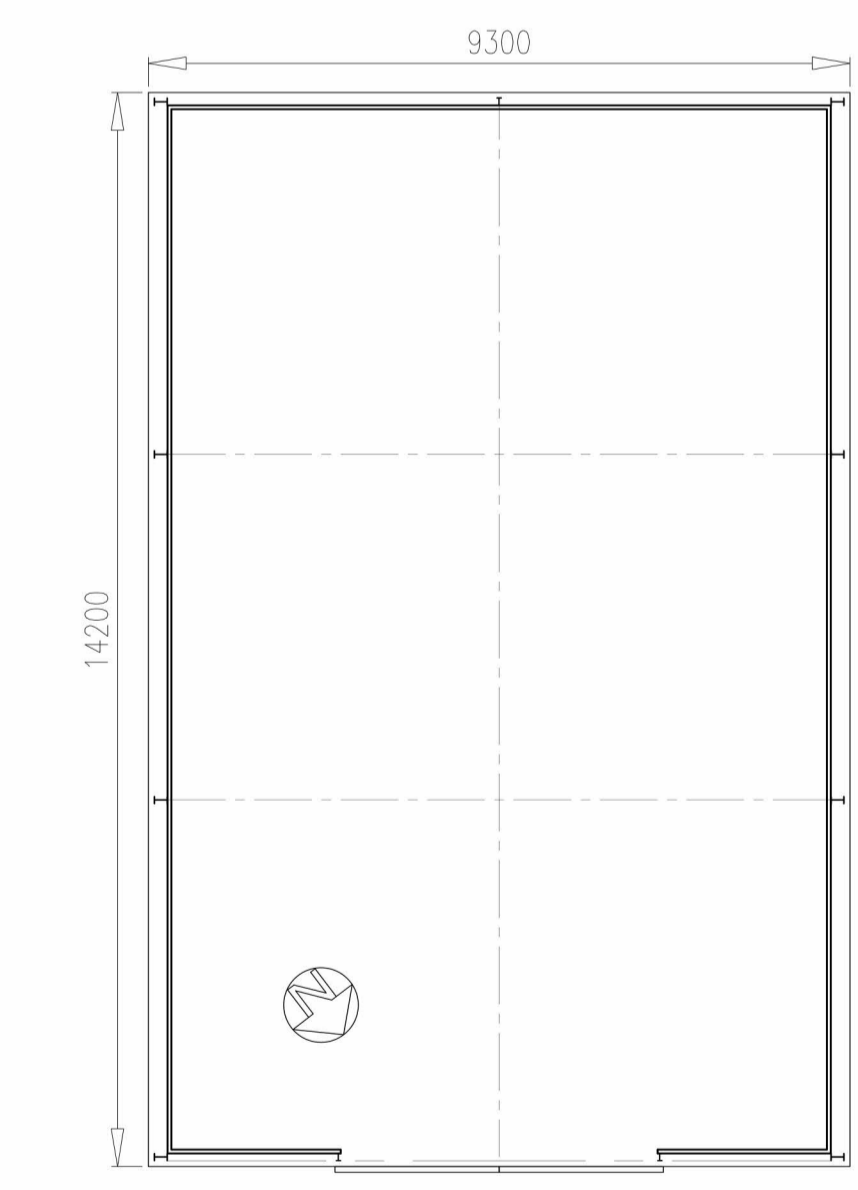
GROUND FLOOR PLAN 107m2



NW ELEVATION

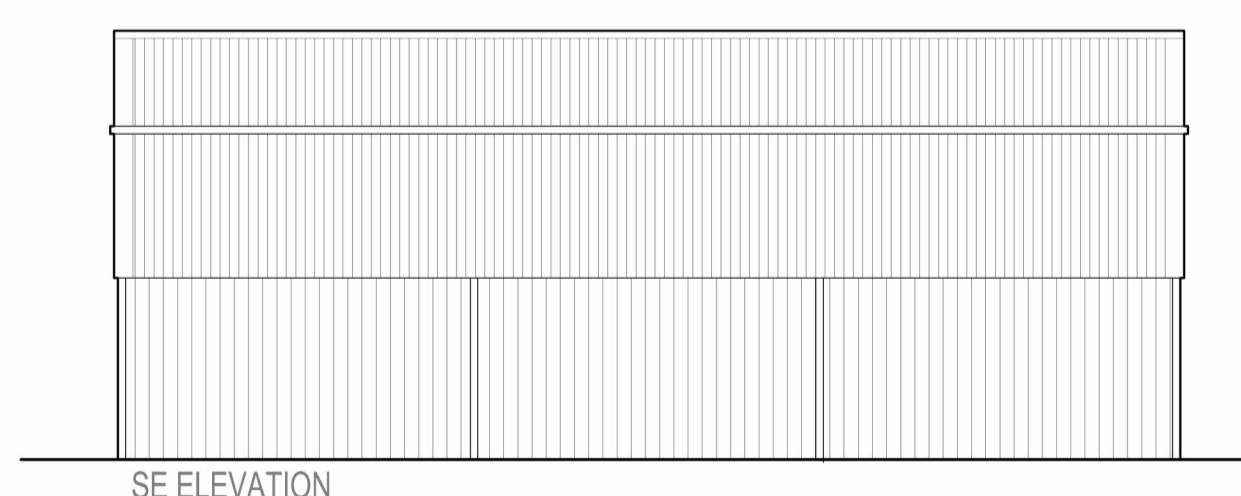


SW ELEVATION

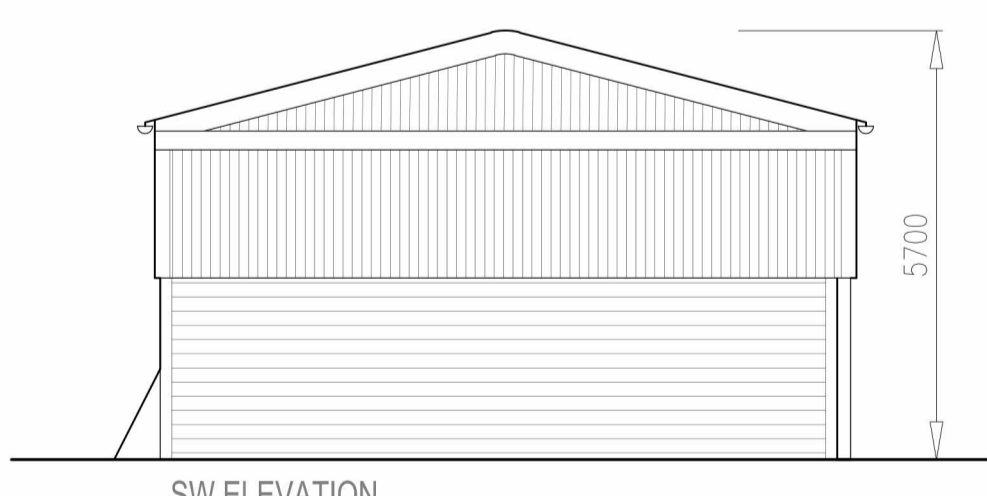


SECTION

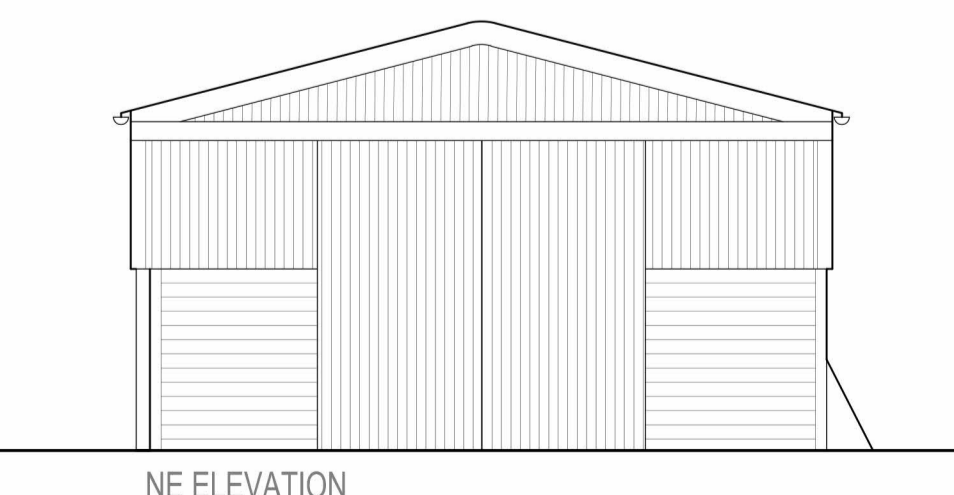
BARN 1 - EXISTING PLAN, SECTION & ELEVATIONS



SE ELEVATION



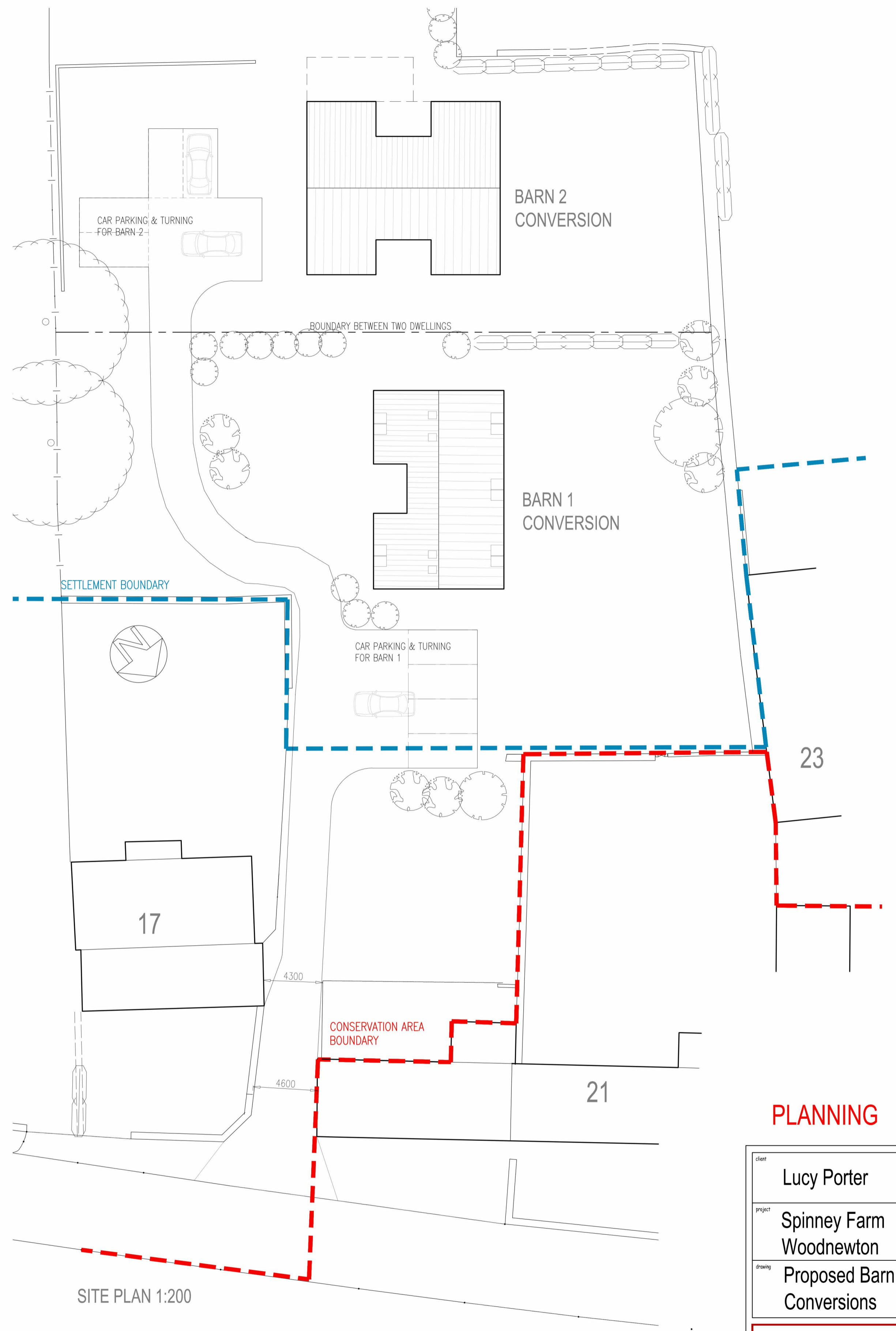
SW ELEVATION



NE ELEVATION

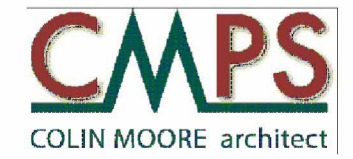


NW ELEVATION



SITE PLAN 1:200

PLANNING

client	Lucy Porter
project	Spinney Farm Woodnewton
drawing	Proposed Barn Conversions
 COLIN MOORE architect	
Lodge Barn Lindsey Close Woodnewton Peterborough PE8 5EW tel 01780 470636 cmpsarchitect@gmail.com	

scale 1:100 1:200 @ A1
 date 07.10.19. 17.06/25





APPENDIX B

Supplementary Site-Specific Trial Pit Logs



Trial Pit Log

Trialpit No

TP01

Sheet 1 of 1

Project Name:	Land South of Main Street, Woodnewton	Project No.	UK22.5787	Co-ords:	503549.01 - 294271.24	Date	25/01/2022
Location:	Woodnewton, Peterborough, PE8 5EB			Dimensions (m):	0.8	Scale	1:10
Client:	Quilla Ltd			Depth	0.60	Logged	TA

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend
	Depth	Type	Results			
				0.55		
				0.60		

Remarks: No physical evidence of contamination
NS: Northampton Sand Formation

Stability:





Trial Pit Log

Trialpit No

TP02

Sheet 1 of 1

Project Name:	Land South of Main Street, Woodnewton	Project No.	UK22.5787	Co-ords:	503554.61 - 294281.70	Date	25/01/2022
Location:	Woodnewton, Peterborough, PE8 5EB			Dimensions (m):	0.7	Scale	1:10
Client:	Quilla Ltd			Depth	0.60	Logged	TA

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend
	Depth	Type	Results			
				0.55		
				0.60		

Remarks: No physical evidence of contamination
NS: Northampton Sand Formation

Stability:





Trial Pit Log

Trialpit No

TP03

Sheet 1 of 1

Project Name:	Land South of Main Street, Woodnewton	Project No.	UK22.5787	Co-ords:	503560.24 - 294291.08	Date	25/01/2022
Location:	Woodnewton, Peterborough, PE8 5EB			Dimensions (m):	0.8	Scale	1:10
Client:	Quilla Ltd			Depth	0.80	Logged	TA

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend
	Depth	Type	Results			
				0.50		
				0.80		

Remarks: No physical evidence of contamination
NS: Northampton Sand Formation

Stability:





Trial Pit Log

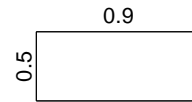
Trialpit No

TP04

Sheet 1 of 1

Project Name: Land South of Main Street,
WoodnewtonProject No.
UK22.5787Co-ords: 503565.74 - 294306.27
Level:Date
25/01/2022

Location: Woodnewton, Peterborough, PE8 5EB

Dimensions (m):
Depth 0.70Scale
1:10
Logged
TA

Client: Quilla Ltd

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend
	Depth	Type	Results			
				0.50		
				0.70		

Remarks: No physical evidence of contamination
NS: Northampton Sand Formation

Stability:





APPENDIX C

Laboratory Results –Environmental Supplementary Soil Samples

EPS Ltd
7B Caxton House
Broad Street
Cambourne
Cambridgeshire
CB23 6JN



Attention : Tom Androsiuk
Date : 2nd February, 2022
Your reference : UK22.5787
Our reference : Test Report 22/1107 Batch 1
Location : Land South of 17 Main Street, Woodnewton
Date samples received : 26th January, 2022
Status : Final Report
Issue : 1

Four samples were received for analysis on 26th January, 2022 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Hayley Prowse
Project Manager

Please include all sections of this report if it is reproduced

Client Name: EPS Ltd
Reference: UK22.5787
Location: Land South of 17 Main Street, Woodnewton
Contact: Tom Androsiuk

Note:
 Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation. Asbestos quantification to 0.001% dry fibre of dry mass of sample is accredited to ISO17025.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
22/1107	1	TP01 ES1	0.20-0.50	3	31/01/2022	General Description (Bulk Analysis)	Soil/Stones
					31/01/2022	Asbestos Fibres	NAD
					31/01/2022	Asbestos ACM	NAD
					31/01/2022	Asbestos Type	NAD
					31/01/2022	Asbestos Level Screen	NAD
22/1107	1	TP02 ES2	0.10-0.40	5	27/01/2022	General Description (Bulk Analysis)	Soil/Stones
					27/01/2022	Asbestos Fibres	NAD
					27/01/2022	Asbestos ACM	NAD
					27/01/2022	Asbestos Type	NAD
					27/01/2022	Asbestos Level Screen	NAD
22/1107	1	TP03 ES3	0.10-0.40	8	31/01/2022	General Description (Bulk Analysis)	Soil/Stones
					31/01/2022	Asbestos Fibres	NAD
					31/01/2022	Asbestos ACM	NAD
					31/01/2022	Asbestos Type	NAD
					31/01/2022	Asbestos Level Screen	NAD
22/1107	1	TP04 ES4	0.10-0.50	10	27/01/2022	General Description (Bulk Analysis)	soil
					27/01/2022	Asbestos Fibres	NAD
					27/01/2022	Asbestos ACM	NAD
					27/01/2022	Asbestos Type	NAD
					27/01/2022	Asbestos Level Screen	NAD

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/1107

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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	EU_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.

EMT Job No: 22/1107

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No

EMT Job No: 22/1107

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma –Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEPA 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) –Al anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes	Yes	AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) –Al anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.	Yes	Yes	AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	

EMT Job No: 22/1107

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes	Yes	AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes	Yes	AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes



APPENDIX D

Summary of Generic Screening Criteria

EPS Generic Quantitative Risk Assessment - Residential Land Use

Contaminant	Soil Targets		
	Human Health	Controlled Waters	
		Surface Water	Groundwater
Unit	mg/kg		
Arsenic	See C4SL	n/c	n/c
Cadmium	See C4SL	n/c	n/c
Chromium III	910	n/c	n/c
Chromium VI	See C4SL	n/c	n/c
Copper	2400	n/c	n/c
Mercury (elemental)	1.2	0.085	1.22
Nickel	180	n/c	n/c
Lead	See C4SL	n/c	n/c
Selenium	250	n/c	n/c
Zinc	3700	n/c	n/c
Benzene	See C4SL	0.064	0.0064
Toluene	130	1.33	12.6
Ethylbenzene	47	0.77	11.5
Xylene (para)	56	1.18	19.6
MTBE#	49	4.41	0.026
Benzo(a)Pyrene	See C4SL	n/c	n/c
Naphthalene	2.3	0.11	0.11
Aliphatic C5-C6	42	4.06	0.81
Aliphatic C6-C8	100	17.8	3.57
Aliphatic C8-C10	27	n/c	n/c
Aliphatic C10-C12	130(48)*	n/c	n/c
Aliphatic C12-C16	1100(8.48)**	n/c	n/c
Aliphatic C16-C35	65000 (8.48)**	n/c	n/c
Aromatic C8-C10	34	6.71	1.34
Aromatic C10-C12	74	10.6	2.13
Aromatic C12-C16	140	21.2	4.23
Aromatic C16-C21	260	n/c	n/c
Aromatic C21-C35	1100	n/c	n/c
Tetrachloroethene	See C4SL	0.24	0.24
Trichloroethene	See C4SL	0.13	0.13
cis-1,2 Dichloroethene		0.21	0.21
Vinyl Chloride	See C4SL	0.0012	0.0012

Human Health	Groundwater Targets	
	Controlled Waters	
	Surface Water	Groundwater
	µg/l	
n/c	50	10
n/c	2.5#	5
n/c	4.7	50
n/c	3.4	
n/c	93.1#	2000
1.1	1	1
n/c	14.8#	20
n/c	27.7#	10
n/c	10	10
n/c	373#	3000
210	10	1
230,000	74	700
10,000	20	300
9,900	30	500
83,000	2600	15
n/c	0.005 (0.00017)	0.01
220	2	2
1,900	50	10
1,500	50	10
57	50	10
37	50	10
n/c	50	10
n/c	50	10
1,900	50	10
6,800	50	10
39,000	50	10
n/c	50	10
n/c	50	10
34	10	10
5.7	10	10
130	50	50
0.62	0.5	0.5

Notes:

f = Oral, dermal and inhalation exposure compared with oral HCV N/C = Not Calculated

* = S4UL exceeds vapour saturation limit (in brackets)

** = S4UL exceeds solubility saturation limit (in brackets)

n/c = not calculated. Under normal conditions contaminant exhibits low solubility /volatility, therefore risks from leaching and or vapour pathways are considered low.

To establish suitable compliance criteria for Surface Water review of baseline groundwater quality in England and Wales was completed following research reported in Shand, P, Edmunds, W M, Lawrence, A R, Smedley, P L, and Burke, S, 2007. The natural (baseline) quality of groundwater in England and Wales. British Geological Survey Research Report No. RR/07/06. Where compliance criteria was found below the 97.7 percentile of baseline value, the latter was adopted as GAC.

Soil Targets

Targets for Human Health have been taken from S4ULs 'Suitable For Use Levels for Human Health Risk Assessment' – LQM and CIEH (2014) derived using standard sandy loam soil with 1% SOM, except (#) = EIC/AGS/CL/AIRE GAC 'Soil Generic Assessment Criteria' (2010). For sites where ground conditions differ significantly from sandy loam or site-specific SOM and pH are available, the generic human health targets may be revised.

Targets for Controlled waters have been derived using EA Remedial Targets Worksheet (v3.1) - using standard Sandy Loam ground conditions as described in Science Report SC050021/SR3, assuming no degradation for a 10m compliance distance with criteria of EQS or UKDWS for Surface Water and Groundwater respectively (see notes for GW targets).

Groundwater Targets

For Surface Water, targets have been taken as Freshwater EQS where available. For MTBE Predicted No Effect Concentration (European Risk Assessment Report, 2002) was used. For individual TPH fractions, in absence of UK EQS, a 5 times multiplier of UKDWS has been taken.

For Groundwater, targets have been taken as UKDWS where available. In the absence of UK targets internationally recognised criteria were adopted. For MTBE, WHO taste threshold has been adopted.

Targets for Human Health have been taken from Society of Brownfield Risk Assessment (SoBRA) 'Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater' - Version 1.0, February 2017, derived using sandy soil and 1%SOM. GAC were set up assuming source at 50cm below typical ground bearing slab of 15cm thickness. GAC were derived for vapour pathways only. For sites where ground conditions, or differ significantly from described above, the generic human health targets may be revised.



EPS Generic Quantitative Risk Assessment

Generic Screening Criteria (C4SLs) - All Land Uses

Contaminant	Soil Targets					
	Residential		Allotments	Commercial	Public Open Spaces	
	With Home Grown Produce	Without Home Grown Produce			Residential	Parks
Unit	mg/kg					
Arsenic	37	40	49	640	79	168
Benzene	0.87	3.3	0.18	98	140	230
Benzo(a)pyrene	5	5.3	5.7	76	10	21
Cadmium	26	149	4.9	410	220	880
Chromium (VI)	21	21	170	49	23	250
Lead	200	310	80	2330	630	1300
Chloroethene (Vinyl Chloride)	0.017	0.029	0.0058	2.2	7.8	19
Trichloroethene (TCE)	0.043	0.045	0.16	3.4	79	69
Tetrachloroethene (PCE)	1.6	1.6	11	130	3400	2500

Notes:

Targets for Human Health have been taken from the publicly available Category 4 Screening Levels (C4SLs) for assessment of land affected by contamination issued by DEFRA/CL:AIRE in December 2013 and May 2021.

Within the modelling for C4SLs, a Soil Organic Matter content of 6% has been used. Reference to site-specific data should be made where possible.

The C4SLs for the contaminant benzene along with the three chlorinated solvents are the most susceptible to changes in SOM.

May-23



APPENDIX E

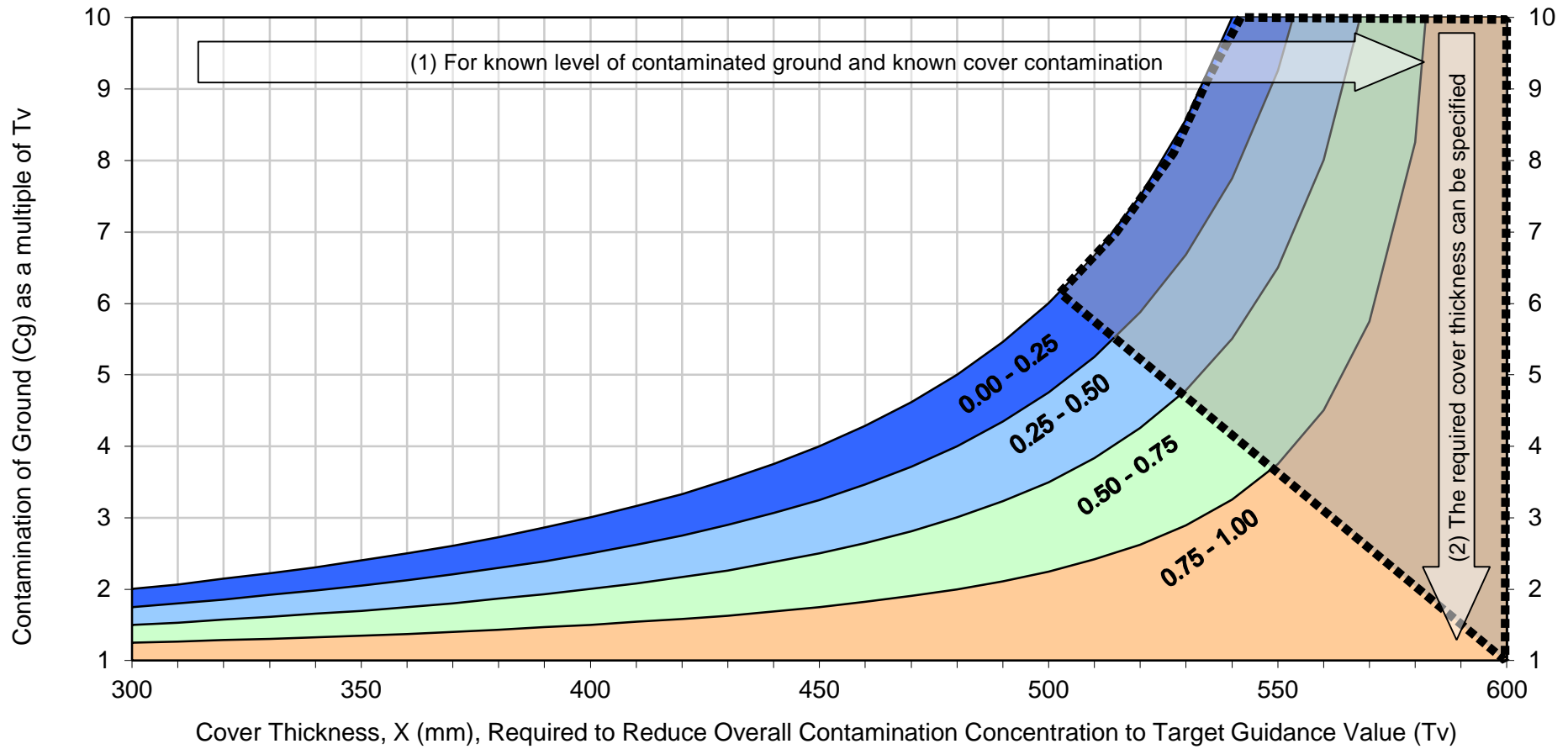
Revised Cover System Calculations

Contaminant	Site Data				Expressed as a Factor of Target Guideline Value				Cover Thickness Required for Compliance to Specified Target Guideline Value	
	Contamination of Ground (Cg)	Contamination of Cover (Cc)	Target Guideline Value 1	Target Guideline Value 2	Target Guideline Soil / Value 1	Target Guideline Cover / Value 1	Target Guideline Soil / Value 2	Target Guideline Cover / Value 2	Target Guideline Value 1	Target Guideline Value 2
	Units		Units		Fraction				(mm)	
Arsenic	41.30	10	37		1.1	0.3	No TV	No TV	82	No TV

Summary		
	Target Guideline Value 1	Target Guideline Value 2
Number of contaminants	1	1
Number of contaminants with no thickness calculation	0	1
Breakdown - Number for which no TV specified	0	1
Breakdown - Number for which no soil specified	0	0
Breakdown - Number for which no cover specified	0	0
Breakdown - Number for which cover > TV	0	0
Number of contaminants with thickness calculation	1	0
Breakdown - Number for which no cover required	0	0
Breakdown - Number for which cover required	1	0
Overall thickness of cover required	82	0

Design Chart

- $C_c = 0.00 - 0.25 \times$ Trigger levels
 - $C_c = 0.25 - 0.50 \times$ Trigger levels
 - $C_c = 0.50 - 0.75 \times$ Trigger levels
 - $C_c = 0.75 - 1.00 \times$ Trigger levels
 - ▲ Target Guideline Value 2
 - ▲ Target Guideline Value 1
- If site specific data falls in shaded area consideration should be given to the applicability of using a cover system





APPENDIX F

Invoice for Purchase of British Sugar Topsoil (23rd April 2023)

CO-PRODUCTS SALES INVOICE



Account No 2060653

LUCY HOLLOWAY
QUILLA
SUDBOROUGH MANOR
MAIN STREET
SUDBOROUGH
KETTERING
NN14 3BX

Invoice No: 51290072

CUSTOMER VAT REGISTRATION:

Customer Order No: Lucy Holloway

Sales Order No: 6094213

Product: Landscape 20 28202

Shipment Number	Despatch Date	Actual Haulier	Weight Ticket Number / Vehicle Registraion	Tare Weight	Loaded Weight	Shipped Qty	Price / Load	Value (ex VAT)
41594715	20/04/23	HOLBROOK	873385 FJ20ZVN	13880	31220	1.0000	719.4000	
41594715	20/04/23	HOLBROOK	873401 FN21EUR	14000	31560	1.0000	719.4000	
41594715	20/04/23	HOLBROOK	873440 FJ20ZVN	14040	31760	1.0000	719.4000	
41594715	20/04/23	HOLBROOK	873454 FN21EUR	13980	31720	1.0000	719.4000	
41594715	20/04/23	HOLBROOK	873455 FL66VUR	12680	31280	1.0000	719.4000	

Invoice Total
(Excl VAT)

VAT
20.00

Invoice Total

PAID WITH THANKS



APPENDIX G

Topsoil Supplier Analysis Report & Certification



Declaration of Compliance BS3882:2015

Soil source: British Sugar TOPSOIL

This declaration confirms that the topsoil represented by the attached Topsoil Analysis Report conforms to the requirements of the British Standard for Topsoil (BS3882:2015).

The sample was sampled and tested in accordance with the requirements of BS3882:2015

- Samples are taken for analysis every 8000 tonnes (5000 m³) of product
- Samples are taken from all TOPSOIL products ready for despatch
- All products are sampled after screening
- Analysis certificates are retained for a period of 5 years

- Laboratory analysis is undertaken at a **UKAS** and **MCERTS** accredited laboratory
- All laboratory methods are in accordance with BS3882:2015
- All British Sugar TOPSOIL products are produced to a **Quality Management System** approved by Lloyd's Register Quality Assurance to **ISO 9001:2008** standard

Signed

A black rectangular box redacting the signature of the person.

Andy Spetch
British Sugar TOPSOIL, National TOPSOIL Manager
Sugar Way, Peterborough, PE2 9AY

A black rectangular box redacting the contact information of the person.



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Andy Spetch
British Sugar plc Co-Products
Oundle Road
Peterborough
PE2 9QU

11th April 2023
Our Ref: TOHA/23/7871/SS
Your Ref:PO60219699

Dear Sirs

Topsoil Analysis Report: Landscape 20 Wissing' on

We have completed the analysis of the LANDSCAPE 20 TOPSOIL sample recently submitted, referenced *Wi-L20-Mar 23* and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the LANDSCAPE 20 TOPSOIL sample for general landscape purposes. In addition, this sample has been assessed to determine its compliance with the requirements of the **British Standard** for Topsoil (*BS3882:2015 - Specification for topsoil – Table 1, Multipurpose Topsoil*).

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the topsoil source. The report and results should therefore not be used by third parties as a means of verification or validation testing or waste designation purposes, especially after the topsoil has left the British Sugar factory.

SAMPLE EXAMINATION

The sample was described as a very dark greyish brown (Munsell Colour 10YR 3/2), slightly moist, friable, moderate calcareous SANDY LOAM with a weakly developed, very fine to medium granular and subangular blocky structure*. The sample was stone-free and no unusual odours, deleterious materials, roots or rhizomes or pernicious weeds were observed.

*This appraisal of soil structure was made from examination of a disturbed sample. Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

Tim O'Hare Associates LLP
Howbery Park Wallingford Oxfordshire OX10 8BA
T:01491 822653 E:info@toha.co.uk
www.toha.co.uk

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- particle size analysis;
- stone content (2-20mm, 20-50mm, >50mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, B, Ba, Be, Cd, Cr, Cu, Pb, Hg, Ni, Se, V, Zn);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below. The interpretation considers the use of the LANDSCAPE 20 TOPSOIL for general landscape purposes and its compliance/non-compliance with our general landscape specification.

RESULTS OF ANALYSIS

Particle Size Analysis and Stone Content

The sample fell into the *sandy loam* texture class, which is usually considered suitable for general landscape applications provided the soil's physical condition is satisfactory.

The sample was stone-free and, as such, should not restrict the use of the soil for general landscape purposes.

pH and Electrical Conductivity Values

The sample was alkaline in reaction (pH 7.8). This pH value would be considered suitable for general landscape purposes provided species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was moderate, which indicates that soluble salts should not be present at levels that would be harmful to plants.

The electrical conductivity value by CaSO₄ extract (BS3882 requirement) fell below the maximum specified value (3300 µS/cm) given in BS3882:2015 – Table 1.

Organic Matter and Fertility Status

The sample was well supplied with organic matter and all major plant nutrients.

The C:N ratio of the sample was acceptable for general landscape purposes.

Potential Contaminants

With reference to *BS3882:2015* – Table 1: Notes 3 and 4, there is a recommendation to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific criteria, the concentrations that affect human health have been compared with the residential with homegrown produce land use in the Suitable For Use Levels (S4UIs) presented in the *LOM/CIEH S4UIs for Human Health Risk Assessment* (2015) and the DEFRA SP1010: *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document* (2014). The concentration of barium has been compared with the residential land use given in the document *EIC/AGS/CL:AIRL Soil Generic Assessment Criteria for Human Health Risk Assessment* (2010).

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS3882:2015* – Table 1.

CONCLUSION

The purpose of the analysis was to determine the suitability of the LANDSCAPE 20 TOPSOIL sample for general landscape purposes. In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2015* – Specification for topsoil – Table 1, Multipurpose Topsoil).

From the soil examination and laboratory analysis, the sample was described as an alkaline, non-saline, moderately calcareous, stone-free sandy loam with a weakly developed structure. The sample was well supplied with organic matter and all major plant nutrients. Of the potential contaminants determined, none exceeded their respective guideline values.

To conclude, based on our findings, the topsoil represented by this sample would be considered suitable for general landscape purposes (trees, shrubs and community grass), provided species with a wide pH tolerance or those known to prefer alkaline soils are selected and the physical condition of the soil is satisfactory.

The topsoil was also fully compliant with the requirements of the British Standard for Topsoil (*BS3882:2015* – Specification for topsoil – Table 1, Multipurpose Topsoil).

RECOMMENDATIONS

Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, respreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is reasonably dry and non-plastic (friable) consistency.

It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

Further detail on soil handling are provided in Annex A of *BS3882:2015*.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

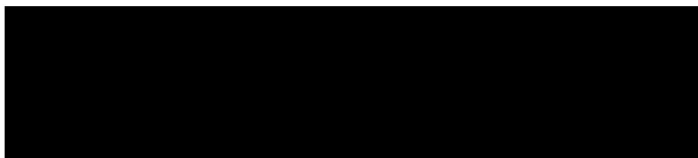
Yours sincerely



Ross Friar
MEnvSci
Graduate Soil Scientist

Rebecca Hollands
BSc MSc MlSoilSci
Senior Soil Scientist

For & on behalf of Tim O'Hare Associates LLP



Registered Number: 4330320

