



SOLUTIONS LIMITED

REMEDIATION STRATEGY
FOR
71 WOODHEAD ROAD, HONLEY
FOR
MR P MITCHELL

Report Reference: GES-RS 1623-21 (Issue 01, September 2026)

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LIST OF ACRONYMS

Acronym	Meaning
BGS	British Geological Survey
BH	Borehole
CDM	Construction Design and Management
CL:AIRE	Contaminated Land: Applications In Real Environments
CLR	Contaminated Land Report
COSHH	Control Of Substances Hazardous to Health
CSM	Conceptual Site Model
DCP	Dynamic Cone Penetrometer
DEFRA	Department for Environment Foods and Rural Affairs
DoE	Department of Environment
DP	Dynamic Probe
DWS	Drinking Water Standard
EA	Environment Agency
EQS	Environmental Quality Standard
GAC	Generic Acceptance Criteria
HA	Hand Auger
HP	Hand Pit
LPA	Local Planning Authority
LQM	Land Quality Management
mbgl	Metres Below Ground Level
MP	Mackintosh Probe
NGR	National Grid Reference
NPPF	National Planning Policy Framework
OS	Ordnance Survey
SGV	Soil Guideline Value
SPOSH	Significant Possibility of Significant Harm
SPT	Standard Penetration Test
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SSV	Soil Screening Value
TP	Trial Pit
TT	Trial Trench
WS	Windowless Sample / Window Sample
WSV	Water Screening Value

1. INTRODUCTION

1.1 BACKGROUND AND INSTRUCTION

Following a ground investigation undertaken by ourselves (GES Report GES-PII 1623-21, Phase II and Updated Risk Assessment, Issue 04, March 2026), contamination was identified within the Made Ground at the site comprising asbestos (crocidolite, loose insulation) together with concentrations of lead, benzo(a)pyrene, benzo(b)fluoranthene and dibenz(a,h)anthracene above the relevant generic assessment criteria in borehole WS02 at 0.30 mbgl. The Made Ground across the site, which is considered to be associated with a historical refuse tip, was also assessed as unsuitable for re-use as a growing medium within gardens and soft landscaped areas.

Whilst the Phase II report concluded that a site-specific Remediation Strategy was not required, it also recommended a number of measures necessary to make the site suitable for its proposed residential end use. Kirklees Council Environmental Health (Pollution & Noise Control) has advised (consultation response ref. WK202629498, dated 23rd September 2026) that these measures constitute remediation and that a site-specific Remediation Strategy is required to satisfy Condition 7 of planning permission 2024/92297.

GeoEnviro Solutions Ltd (GES) were instructed by Paul Matthews Architectural Ltd, on behalf of Mr P Mitchell (the Client), to prepare a Remediation Strategy for the site at Land adjacent to 71 Woodhead Road, Honley, Holmfirth, HD9 2RJ.

A site location plan is presented as Drawing No. 1623-21/01 in **Appendix 1**, together with the borehole location plan (Drawing No. 1623/02), the proposed site plan and an indicative remediation zone plan (Drawing No. GES 1623-21/RS01).

1.2 PROPOSED DEVELOPMENT

We understand current plans for the development of the site include the erection of two detached two-storey residential dwellings with associated parking and private gardens.

An outline development drawing for the site as drawn by Paul Matthews Architectural Ltd, referenced 20/313/03g (Proposed Site Plan), and dated February 2020, can be reviewed within **Appendix 1**. The drawing shows the two dwellings with driveway/parking to the Woodhead Road frontage, planting around the retained trees along the road frontage and turfed rear gardens to the east of each dwelling.

The risk assessment undertaken, and subsequent Remediation Strategy proposed in this report is therefore based on the proposed development as outlined here, i.e. 'residential with homegrown produce'. Any variation from this may require a re-assessment and the Conceptual Site Model updating accordingly.

1.3 PARTIES TO THE PROPOSED WORKS

The principal parties to the remediation and engineering works include:

- Mr P Mitchell: Client and Developer of the site.
- Paul Matthews Architectural Ltd: Architect and planning agent.
- GeoEnviro Solutions Ltd (GES): Geoenvironmental Consultant and independent verifier of the remedial works.
- Groundworks / remediation contractor: to be appointed by the Client (referred to herein as 'the Contractor').

- Asbestos specialist / licensed asbestos contractor and UKAS-accredited asbestos analyst: to be appointed by the Contractor for works within Zone A (see Section 7).
- Kirklees Council: Local Planning Authority (LPA), advised by Environmental Health (Pollution & Noise Control).
- Warranty provider / Building Control: to be confirmed by the Client.

1.4 PLANNING CONDITION

Planning permission (ref: 2024/92297) has been granted by Kirklees Council for the erection of two detached dwellings on the site. Application 2026/90952 seeks the discharge of the details reserved by Condition 5 (Phase I), Condition 6 (Phase II) and Conditions 7 to 9 (Remediation).

Condition 7 requires the submission and approval of a site-specific Remediation Strategy where any remediation measures are required. This report is submitted to discharge Condition 7. It also provides the agreed framework against which the implementation of the remedial works (and notification of their commencement) and the subsequent Verification (Validation) Report, understood to be required under Conditions 8 and 9, can be assessed and verified. The exact wording of Conditions 8 and 9 on the decision notice shall take precedence over any summary given here.

The Environmental Health consultation responses of 24th June 2026 (WK202615728), 17th August 2026 (WK202621663) and 23rd September 2026 (WK202629498) identified the measures that the Strategy must address. Table 1.1 summarises how each has been addressed within this report. A copy of the 23rd September 2026 response is included in **Appendix 7**.

Table 1.1: Response to Kirklees Council Environmental Health Comments

Environmental Health requirement	How addressed in this Remediation Strategy
Remediation of asbestos-contaminated Made Ground	Removal of the asbestos hotspot (Zone A) during the groundworks; controlled excavation and off-site disposal of asbestos-impacted soils from any area of soft landscaping; asbestos-impacted soils retained only beneath buildings/hardstanding..
Replacement or isolation of unsuitable Made Ground within soft landscaped areas	All Made Ground within soft landscaped areas (Zone B) to be excavated to a minimum of 600 mm below finished ground level, removed off-site (or placed beneath buildings/hardstanding where suitable and agreed) and isolated from the cover by a high-visibility geotextile marker layer.
Provision of a minimum 600 mm clean cover system	Minimum 600 mm clean cover (minimum 450 mm BS 8601 subsoil beneath minimum 150 mm BS 3882 topsoil) in all soft landscaped areas, with thickness verified by hand-dug pits at a defined frequency. Material imported in September 2022 to be verified in-situ and made good where deficient.
Validation of imported materials	Pre-import approval of source and certification by GES, plus independent sampling and testing of all cover materials at the frequencies in Table 9.1 against the target concentrations in Table 4.1.
An agreed framework against which implementation can be assessed or verified	Defined remediation zones, sequence of works, verification hold points, acceptance criteria, contingency actions, LPA notification and the content of the Verification Report required prior to occupation.

1.5 PREVIOUS INVESTIGATIONS

Previous assessments conducted at the site comprise the following:

- GES, September 2021. Phase I: Desktop Study & Risk Assessment Report, Woodhead Road, Honley. Ref: GES 1623-21 PI.
- GES, November 2021 (Issue 04, March 2026). Phase II & Updated Risk Assessment Report for Woodhead Road, Honley. Ref: GES-PII 1623-21. Issue 02 (January 2022) incorporated the results of the ground gas and groundwater monitoring.

It is recommended that the above reports are read in conjunction with this report and that the appointed Contractor familiarise themselves with the reports and comply with all relevant recommendations contained therein.

2. SITE SETTING

2.1 SITE INFORMATION

Location

The site is located at land adjacent to 71 Woodhead Road, Honley, Holmfirth, at approximate National Grid Reference NGR: 414265:411700 (centre of the site).

Topography

The site is generally flat but set on two distinct levels, approximately 4.0 m apart. The upper level is at Woodhead Road level along the western frontage and is retained by a retaining wall approximately 4 m high located 4 to 5 m into the site from the entrance. The lower level extends eastwards towards the River Holme, where the ground falls away towards the river.

Access

The site is accessed from the west, off Woodhead Road, at road level. The lower level is accessed via the property adjacent to the north of the site.

Site Description

The site is an irregular shaped piece of land with an approximate area of 0.1 Ha.

At the time of the investigation (September/October 2021) the site was partially cleared in the early stages of preparation for construction. Partially installed services protruded from the retaining wall and planters had been formed around existing trees on the upper level. The southern area was rough grassland and the northern area was occupied by pallets and stockpiles of building stone with small stockpiles of general rubble in various locations. Approximately 60% of the site was soft ground and 40% hardstanding.

GES has been provided with an invoice dated 1st September 2022 ([Appendix 8](#)) for the removal of spoil from the site and the importation of clean inert soil/garden material and walling stone. No details of the depth or extent of spoil removed, or the source, certification or placement of the imported material, have been provided.

2.2 SITE HISTORY

The Phase I Desk Study identified the potential for historical Made Ground associated with past demolition activities and uncontrolled infilling (a historical refuse tip) on the site. Off-site potential sources within influencing distance comprised historical landfilling, a dye works, a gas works and a candle works. Contaminants of potential concern were identified as heavy metals and metalloids, inorganics (including cyanide), PAH, asbestos and hazardous ground gases.

2.3 RECORDED GEOLOGY

The British Geological Survey records no artificial deposits beneath the site, although Made Ground associated with the historical infilling was anticipated. The superficial deposits are recorded as Alluvium (clay, silt, sand and gravel), underlain by bedrock of the Rough Rock Sandstone Formation of Carboniferous age.

2.4 HYDROLOGY AND HYDROGEOLOGY

The nearest surface watercourse is the River Holme, located approximately 21 m from the site, which flows along the eastern side of the site and around its north-eastern corner. The

superficial deposits and the bedrock are both designated Secondary A aquifers, and the groundwater vulnerability in the vicinity of the site is classified as Low.

Given the proximity of the River Holme, particular care is required to prevent silt-laden or contaminated run-off from the works reaching the watercourse (Section 7.3).

3. GROUND CONDITIONS

3.1 PREVIOUS GROUND INVESTIGATION

GES undertook an intrusive investigation between 13th and 15th October 2021, comprising four windowless sample boreholes (WS01 to WS04) to depths of between 4.00 and 9.00 mbgl, with combined gas and groundwater monitoring standpipes installed in all four boreholes. Samples collected from the boreholes were submitted to UKAS/MCERTS accredited laboratories for chemical and geotechnical testing. Ground gas and groundwater monitoring was subsequently undertaken on six occasions between October and December 2021.

WS01 was drilled on the upper level behind the retaining wall. WS02 and WS03 targeted the proposed building footprints on the lower level and WS04 was drilled within the proposed garden areas. The borehole logs are included in [Appendix 2](#).

3.2 PROVEN GROUND CONDITIONS

A generalised summary of the ground conditions encountered is presented in Table 3.1 below.

Table 3.1: Summary of Ground Conditions (from GES-PII 1623-21)

Stratum	Depth to top (mbgl)	Depth to base (mbgl)	Thickness (m)	Locations
Made Ground	0.00	3.00 – 8.60	3.00 – 8.60	All locations
Gravelly clayey SAND (weathered Rough Rock Sandstone / natural)	3.00	4.00 (refusal)	1.00	WS01
Sandy gravelly CLAY / sandy CLAY (Alluvium)	6.00 – 8.60	≥ 6.00 – 9.00	≥ 0.40	WS02, WS03

Made Ground was encountered in all locations from ground level to depths of between 3.00 m (WS01, upper level) and 8.60 m (WS03, lower level). It comprised granular and cohesive materials, generally dark brown slightly sandy gravelly clay or clayey gravelly sand, with gravel of brick, concrete, slag, clinker, bitumen, sandstone and coal. The Made Ground on the lower level is considered to represent the historical refuse tip/infilling and is of low density (SPT N values as low as 2).

No visual or olfactory evidence of contamination was recorded during the investigation. Asbestos was not visually identified on site but was detected by the laboratory in the sample from WS02 at 0.30 mbgl. No obstructions were encountered. Groundwater was generally not encountered during drilling; the monitoring records are presented in [Appendix 5](#).

The investigation comprised four exploratory positions only across the site and, as with any point-specific investigation, localised areas of contamination may exist between the exploratory positions.

3.3 WORKS UNDERTAKEN SINCE THE PHASE II INVESTIGATION

The invoice at [Appendix 8](#) records that, in September 2022, spoil was removed from the site and clean inert soil/garden material was imported.

4. RISK ASSESSMENT AND TARGET CONCENTRATIONS

4.1 CONTAMINATED SOIL

Contamination on site is identified as:

- Lead (301.7 mg/kg), benzo(a)pyrene (4.01 mg/kg), benzo(b)fluoranthene (4.24 mg/kg) and dibenz(a,h)anthracene (0.52 mg/kg) above the generic assessment criteria for a residential with homegrown produce end use in the Made Ground at WS02 at 0.30 mbgl.
- Asbestos (crocidolite, as loose insulation) detected in the Made Ground at WS02 at 0.30 mbgl, in excess of 0.001% (see Section 4.2).
- Made Ground across the whole site derived from historical infilling/refuse tipping, containing slag, clinker, bitumen and coal, which is considered unsuitable for use as garden soil or as a growing medium irrespective of individual test results.

There is one known area of significant contamination (WS02), shown as Zone A on Drawing No. GES 1623-21/RS01 in [Appendix 1](#). The WS02 location falls within the footprint of a proposed dwelling; however, its lateral extent has not been determined. As site investigations are undertaken using a point specific approach there is always the potential to encounter further, as yet unidentified but localised 'hot-spots' of contamination.

Contaminated soils are not considered suitable for treatment on-site given the small size of the site, the nature of the contaminants (asbestos, metals and heavy-end PAH) and the relatively small volumes involved. Soils requiring remediation will therefore be excavated and disposed of off-site to a suitably permitted facility, or, where chemically suitable and agreed in the Materials Management Plan, placed beneath buildings and hardstanding.

No concentrations of TPH, BTEX, cyanide, phenols or other metals above the screening criteria were recorded, and no gross contamination was observed.

The laboratory results are presented in [Appendix 3](#) and the chemical screening criteria in [Appendix 4](#).

4.2 ASBESTOS

Asbestos in the form of crocidolite (blue asbestos) loose insulation was identified in the sample from WS02 at 0.30 mbgl, at a concentration in excess of 0.001% w/w. Crocidolite is an amphibole asbestos type, and loose insulation is a friable form with a high potential to release fibres when disturbed. The Phase II report concluded, with reference to CIRIA C733, that remediation is required with respect to asbestos.

The sample was screened for asbestos presence and type only.

The asbestos poses a risk primarily via the inhalation of airborne fibres to construction workers during groundworks and, if left at or near the surface of gardens and soft landscaping, to future residents. Beneath buildings and hardstanding the pathway to end users is broken.

4.3 TARGET CONCENTRATIONS

The screening values assume a 'residential with homegrown produce' end-use and are presented in [Appendix 4](#). They comprise the LQM/CIEH Suitable 4 Use Levels (S4UL, 2015), the EIC/AGS/CL:AIRE GAC where no S4UL exists, and the DEFRA Category 4 Screening Level (C4SL) for lead.

For the purposes of this Strategy the following target concentrations apply to all soils placed within the cover system (Zone B), whether imported or already in place, and to verification samples. For organic contaminants, the criterion for 1% soil organic matter (SOM) shall be used unless the measured SOM of the material being assessed supports the use of the 2.5% or 6% value. Determinands not listed in Table 4.1 shall be assessed against the residential with homegrown produce values in **Appendix 4**.

Table 4.1: Target Concentrations for Cover System Soils (Residential with Homegrown Produce)

Determinand	Target concentration (mg/kg unless stated)	Source
Arsenic	37	LQM/CIEH S4UL
Cadmium	11	LQM/CIEH S4UL
Chromium (III) / Chromium (VI)	910 / 6	LQM/CIEH S4UL
Copper	2,400	LQM/CIEH S4UL
Lead	200	DEFRA C4SL
Mercury (inorganic)	40	LQM/CIEH S4UL
Nickel	180	LQM/CIEH S4UL (as Appendix 4)
Selenium	250	LQM/CIEH S4UL
Zinc	3,700	LQM/CIEH S4UL
Benzo(a)pyrene (1% / 2.5% / 6% SOM)	2.2 / 2.7 / 3.0	LQM/CIEH S4UL
Benzo(a)anthracene (1% / 2.5% / 6% SOM)	7.2 / 11 / 13	LQM/CIEH S4UL
Benzo(b)fluoranthene (1% / 2.5% / 6% SOM)	2.6 / 3.3 / 3.7	LQM/CIEH S4UL
Dibenz(a,h)anthracene (1% / 2.5% / 6% SOM)	0.24 / 0.28 / 0.30	LQM/CIEH S4UL
Chrysene (1% / 2.5% / 6% SOM)	15 / 22 / 27	LQM/CIEH S4UL
Indeno(1,2,3-cd)pyrene (1% / 2.5% / 6% SOM)	27 / 36 / 41	LQM/CIEH S4UL
Naphthalene (1% / 2.5% / 6% SOM)	2.3 / 5.6 / 13	LQM/CIEH S4UL
TPH CWG aliphatic / aromatic bands, BTEX	As Appendix 4	LQM/CIEH S4UL
Asbestos	No asbestos detected	YALPAG / GES

Where any material fails to meet the target concentrations it shall be rejected, or, where a marginal exceedance occurs, a statistical assessment (CIEH/CL:AIRE 2020 'Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration') may be proposed to the LPA for agreement before the material is accepted. Where subsequent revisions to the published criteria result in a lower value, the lower value will be adopted.

4.4 HAZARDOUS GROUND GASES

Ground gas monitoring was undertaken on six occasions. Maximum concentrations of 0.1% methane and 4.1% carbon dioxide were recorded with a maximum flow rate of 0.1 l/hr, giving a maximum Gas Screening Value of 0.0041 l/hr. No carbon monoxide or hydrogen sulphide was detected. The site was classified as Characteristic Situation 1 (CS1), very low risk, in accordance with CIRIA C665 and BS 8485:2015+A1:2019.

For CS1 conditions gas protection measures are not required. Should the land use or proposed building type(s) change from those assumed herein, then re-evaluation of the conclusions and recommendations will be required.

Radon was not assessed within the Phase II report. The requirement for radon protective measures should be confirmed by the Client/Architect with reference to the UKHSA/BGS radon data and BRE Report BR 211, as part of the Building Regulations approval.

4.5 UPDATED CONCEPTUAL SITE MODEL AND RISK ASSESSMENT

The Conceptual Site Model has been re-formulated based upon the results from the site investigation in accordance with BS10175: 2011+A2:2017. It aims to provide information regarding the sources of contamination and the pathways in which contamination can migrate to a vulnerable receptor, all of which need to be present for there to be a risk. This is in relation to the proposed end use being classified as 'residential with homegrown produce'. The pollutant linkages identified in the Phase II report are reproduced in Table 4.2, overleaf, together with the remedial measure proposed to break each linkage requiring action and the residual risk following remediation. A summary of the risk assessment protocols, and subsequent risk assessment matrix, is provided in **Appendix 6**.

Table 4.2: Updated Conceptual Site Model (from GES-PII 1623-21) with Proposed Remedial Measures

Contaminant Source	Pathways	Receptor	Pollutant Linkage	Probability of Risk	Classification of Consequence	Level of Risk (pre-remediation)	Justification	Remedial measure / residual risk
On Site: Made Ground soils possibly containing elevated metals, PAH, TPH, phenols, VOC and SVOCs	Ingestion, dermal contact, inhalation of dusts/vapours	Future end users and site visitors	Considered Possible	Likely	Mild	Moderate to Low	Lead and PAH above GAC at WS02; Made Ground unsuitable as garden soil.	Zone A removal from soft landscaping; 600 mm clean cover with marker layer in Zone B; buildings/hardstanding in Zone C. Residual: Very Low.
		Construction workers	Considered Possible	Likely	Medium	Moderate	Contaminants identified in the site soils.	PPE, hygiene, dust control and HSG66 measures. Residual: Low.
	Leaching through soils and migration via groundwater or soil pore moisture	Controlled waters (River Holme, Secondary A aquifers)	Considered Possible	Low Likelihood	Mild	Low	Proximity of river; contaminants in soils but no significant leachable contamination identified.	No soakaways in Made Ground; run-off and silt controls; hardstanding/cover reduce infiltration. Residual: Low.
	Permeation of water pipes	Construction materials, future end users	Considered Possible	Low Likelihood	Minor	Very Low	No significantly elevated hydrocarbons encountered.	Water company pipe specification (UKWIR 2011). Residual: Very Low.
	Uptake	Plants and wildlife	Considered Unlikely	Unlikely	Minor	Very Low	No elevated phytotoxic contaminants identified.	Clean cover provides growing medium. Residual: Very Low.
On Site: Asbestos at/near ground surface in Made Ground soils	Inhalation of fibres in airborne dust	Future end users and site visitors	Considered Possible	Likely	Medium	Moderate	Crocidolite (loose insulation) at WS02 in excess of 0.001%.	Delineation; removal from soft landscaping; retained only beneath buildings/hardstanding; 600 mm cover and marker. Residual: Very Low.
		Construction workers and neighbours	Considered Possible	Likely	Medium	Moderate	Crocidolite (loose insulation) at WS02 in excess of 0.001%.	CAR 2012 controls, licensed contractor where required, damping, RPE and air monitoring. Residual: Low.

Contaminant Source	Pathways	Receptor	Pollutant Linkage	Probability of Risk	Classification of Consequence	Level of Risk (pre-remediation)	Justification	Remedial measure / residual risk
On Site: Ground gases (CH ₄ , CO ₂) from Made Ground	Gas migration and build-up within buildings	Future end users and building structures	Considered Unlikely	Unlikely	Minor	Very Low	Site classified as CS1 – very low risk.	None required. Residual: Very Low.
Off Site: Ground gases (CH ₄ , CO ₂ , H ₂ S) from historical landfilling	Gas migration and build-up within buildings	Future end users and building structures	Considered Unlikely	Unlikely	Minor	Very Low	Site classified as CS1 – very low risk.	None required. Residual: Very Low.

5. REMEDIATION STRATEGY (GENERAL)

The objectives of this remediation strategy are:

- Resolve the identified and potential contamination issues in order to protect human health and environmental receptors and render the site suitable for the proposed residential development with respect to the National Planning Policy Framework (NPPF).
- To satisfy the Local Planning Authority (LPA), principally the Environmental Health department, that the remedial works provide a site suitable for the proposed development.
- Render the site as unlikely to be defined as Contaminated Land under Part 2A of the Environmental Protection Act 1990.
- To minimise the impact to the environment, neighbouring residents and human health whilst undertaking the works, with particular regard to asbestos fibre release and the River Holme.
- To discharge Condition 7 of planning permission 2024/92297 and provide the framework for the implementation and verification of the works under Conditions 8 and 9.
- Outline the proposed verification strategy, acceptance criteria and hold points for agreement by the LPA.

5.1 SUMMARY OF REMEDIAL MEASURES

The site has been divided into three remediation zones, shown indicatively on Drawing No. GES 1623-21/RS01 (**Appendix 1**):

- **Zone A – WS02 asbestos/lead/PAH hotspot:** the area of asbestos-impacted Made Ground around WS02, the extent of which will be confirmed by delineation prior to groundworks removal.
- **Zone B – soft landscaped areas:** all proposed private gardens, front planting beds, verges and any other soft landscaping.
- **Zone C – building footprints and hardstanding:** the footprints of the two dwellings, driveways, parking areas, paths and patios.

The remedial measures comprise:

- Controlled excavation, under CAR 2012 controls, of asbestos-impacted Made Ground from Zone A, and off-site disposal to a suitably permitted facility. Asbestos-impacted soils within Zone C may remain beneath the building slabs and hardstanding, which will break the pollutant linkage.
- Excavation of Made Ground (and of any unverified 2022 imported material that does not meet the specification) in Zone B to a minimum depth of 600 mm below proposed finished ground level, and its replacement with a clean cover system comprising a high-visibility geotextile marker layer overlain by a minimum 450 mm of clean subsoil and a minimum 150 mm of clean topsoil (minimum 600 mm in total).
- Pre-import approval, independent testing and verification of all cover system materials against the target concentrations in Table 4.1.
- A watching brief and discovery strategy for previously unidentified contamination.

- Provision of chemically resistant potable water supply pipes, and no soakaways within the Made Ground.
- Verification of the works by GES and submission of a Verification Report to the LPA prior to occupation of the dwellings.

No gas protection measures are required (CS1). Hardstanding or building footprints, and Made Ground beneath them, require no remediation other than the management of arisings and the asbestos controls during construction.

The remediation may be required to be undertaken under a CL:AIRE Development Industry Code of Practice Materials Management Plan (MMP) if any excavated materials are to be re-used on site; the MMP must be declared to CL:AIRE prior to commencement of earthworks. Otherwise, all surplus excavated Made Ground will be classified and removed off-site as waste.

6. OPTIONS APPRAISAL

The remediation options have been appraised with regard to the Environment Agency's Land Contamination: Risk Management (LCRM) guidance, taking account of effectiveness, practicability, durability, sustainability, cost and time, and the constraints of this small, two-level residential site.

From the Phase II assessment, the metals, PAH and TPH within the site soils are not considered to pose a significant risk to controlled waters or to the building structures, and ground gas does not require mitigation. The remediation drivers are therefore the direct contact, ingestion and inhalation (including asbestos fibre) pathways to future residents in gardens, and the protection of construction workers and neighbours during the works.

Table 6.1: Options Appraisal

Option	Advantages	Disadvantages	Conclusion
Hotspot removal (Zone A) from gardens with off-site disposal	Removes the asbestos/lead/PAH source from areas of residential access; proven and quick; readily verifiable.	Generates hazardous or asbestos-containing waste; requires CAR 2012 controls and air monitoring.	Selected for any part of Zone A within soft landscaping.
Retention beneath buildings and hardstanding (Zone C)	Pathway broken by slab/hardstanding; minimises waste and disturbance.	Requires construction-phase asbestos controls; future disturbance possible during maintenance.	Selected for Zone C.
Clean cover system with marker layer (Zone B)	Breaks direct contact and plant uptake pathways; BRE 465 and YALPAG compliant; marker layer warns future occupiers; readily verifiable.	Requires excavation of 600 mm of Made Ground and import of clean soils.	Selected for Zone B.

On the basis of the above appraisal, the recommended remediation comprises a combination of removal of the asbestos hotspot from any area of soft landscaping, retention of Made Ground beneath the proposed buildings and hardstanding, and a minimum 600 mm clean cover system with a marker layer across all soft landscaped areas. This approach is proportionate, practicable within the site constraints, and consistent with the measures identified by Environmental Health.

6.1 OTHER CONSIDERATIONS

The Phase II report recommended driven pre-cast concrete piles for the foundations, owing to the depth and low density of the Made Ground. Driven piles produce little or no spoil and therefore minimise the generation of contaminated and asbestos-containing arisings, and are considered to present a low risk of creating preferential pathways for contaminant migration given the absence of significant leachable contamination. Should a replacement (bored/CFA) piling method be adopted, a Foundation Works Risk Assessment in accordance with the Environment Agency guidance on piling in land affected by contamination shall be undertaken and the handling of the arisings addressed in the MMP.

Excavations adjacent to the 4 m retaining wall and to neighbouring property boundaries must be designed and supervised by a suitably qualified engineer to prevent undermining.

7. REMEDIATION STRATEGY (DETAILED)

This section details the works summarised in Section 5 and should be read in conjunction with Drawing No. GES 1623-21/RS01.

7.1 PRE-COMMENCEMENT REQUIREMENTS

- The Client shall notify the LPA (Environmental Health) in writing at least 10 working days before the commencement of the remedial works and shall confirm the name of the Contractor and the verifying consultant.
- The Contractor shall prepare, and issue to GES before starting, method statements for the remedial works, an asbestos risk assessment and plan of work (see Section 7.5), a Construction Phase Plan, a dust and water management plan, and details of the proposed waste carriers and receiving facilities.
- The Contractor shall identify the proposed sources of cover system materials and obtain GES approval prior to importing any material (Section 7.6).
- The final layout and landscaping drawings shall be provided to GES so that the extents of Zones B and C can be confirmed. Any change to the layout shall be notified to GES and the LPA.

7.2 CONSTRUCTION ACTIVITIES

All site personnel shall undergo a site-specific health and safety induction, including an asbestos awareness briefing specific to the WS02 findings, prior to commencement of work on site.

Site cabins and welfare facilities are to be established at a location to be agreed with the Client. All welfare facilities must be established in accordance with the relevant health & safety statutory requirements. All visitors to site must register at the site office.

During the construction works, especially the groundworks, construction workers will be subject to an elevated level of risk. As such, all personnel on site will comply with guidance provided in the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Development of Contaminated Land" (HSG66). In summary, the following should be provided by the appointed contractor:

- All staff to be suitably trained and competent, including asbestos awareness training (and, for Zone A works, training appropriate to the category of asbestos work determined under Section 7.5).
- Protective clothing, footwear, glasses, suitable respiratory protective equipment and gloves. Personnel should be instructed in why and how they are to be used.
- Hand washing, eye washing and boot washing facilities, with a decontamination facility for Zone A works.
- Damping down of all exposed soils on site.
- Eating, drinking and smoking limited to designated welfare areas.

If at any time during the works personnel begin to feel unwell, they are to inform the site manager, who will determine appropriate action. Access into excavations must be controlled and undertaken in accordance with the CDM Regulations 2015 to mitigate the risk of collapse.

7.3 MANAGEMENT OF WATER

Groundwater is not expected to be encountered within the shallow remedial excavations. Arrangements shall be made to prevent ponding in excavations; any water collected in excavations shall be pumped to a settlement facility (e.g. a silt bag or settlement tank) and shall not be discharged to the River Holme, to land draining to the river, or to the public sewer without the appropriate consent. Water from Zone A excavations shall be treated as potentially asbestos-contaminated and managed accordingly.

Stockpiles shall be located on hardstanding or polythene sheeting, away from the eastern site boundary and the river, and covered to prevent run-off and dust. Silt fences shall be installed along the eastern boundary where soils are exposed. Any evidence of silt-laden run-off leaving the site shall result in works being suspended until controls are improved.

7.4 ASBESTOS DELINEATION (ZONE A)

Prior to bulk groundworks, a delineation exercise around WS02 comprising, as a minimum:

- Five hand-dug or machine-excavated trial pits: one at WS02 and one at approximately 5 m from WS02 in each of the four compass directions (or at the boundary of the dwelling footprint/garden interface, whichever is closer), extended outward in a further step where asbestos is detected at the outer positions.
- Pits to a minimum depth of 1.0 m below the proposed finished ground level or to the base of any visible ACM/insulation, whichever is deeper.
- Samples at 0.0–0.3 m, 0.3–0.6 m and 0.6–1.0 m in each pit (and from any visibly different material), analysed by a UKAS-accredited laboratory for asbestos identification and, where detected, quantification (gravimetric and PCOM fibre count), together with metals (including lead) and speciated PAH.
- Visual inspection and photographic record of each pit for ACM fragments or loose insulation.

The delineation shall be undertaken with appropriate asbestos controls (damping, RPE, minimal disturbance, air monitoring where required). The results shall be, with a plan confirming the extent of Zone A, prior to bulk excavation. Should the delineation identify asbestos significantly more extensive than anticipated, the approach will be reviewed with the LPA.

7.5 ACM IN CONTAMINATED SOILS

Asbestos in the form of crocidolite loose insulation has been identified in the Made Ground at WS02. All works which disturb soils within Zone A shall be undertaken in accordance with the Control of Asbestos Regulations 2012, HSE Approved Code of Practice L143 and the CAR-SOIL industry guidance (CL:AIRE, 2016).

Before works commence in Zone A, the Contractor shall obtain an assessment from a competent asbestos specialist, informed by the delineation results, of whether the work is licensable, notifiable non-licensed (NNLW) or non-licensed. Given that loose crocidolite insulation has been identified, where any visible loose insulation or other friable ACM debris is encountered its removal shall be undertaken by an HSE-licensed asbestos contractor.

Within Zone A the following measures shall apply:

- Zone A shall be demarcated with barriers and signage; access restricted to trained personnel wearing appropriate RPE and disposable coveralls, with decontamination facilities at the exit.

- Soils shall be kept damp during excavation, loading and handling, with no dry sweeping or dropping of soils from height.
- Visible ACM fragments and insulation shall be hand-picked, double-bagged and disposed of as hazardous asbestos waste.
- Asbestos-impacted soils within any part of Zone A that lies within Zone B (soft landscaping) shall be excavated to a minimum of 600 mm below finished ground level, loaded directly into sheeted vehicles or lined, covered skips, and removed off-site. Verification samples shall be taken from the base and sides of the excavation (Section 9.4).
- Where asbestos is still detected at the base of the excavation, excavation shall continue in 300 mm increments to a maximum of 1.0 m below finished ground level. If asbestos remains at that depth, excavation shall stop, the LPA shall be informed, and, subject to the LPA's agreement, the high-visibility geotextile marker layer and a minimum 600 mm clean cover shall be placed over it.
- Asbestos-impacted soils within Zone C may remain in-situ beneath the building slabs and hardstanding. They shall not be excavated and re-used in Zone B under any circumstances. Arisings from foundations, drainage and service trenches in Zone A shall be removed off-site as asbestos-containing waste.
- Static (perimeter) air monitoring shall be undertaken by a UKAS-accredited analyst during all disturbance of Zone A soils, at the site boundary nearest to occupied properties and downwind of the works. Should any result exceed 0.01 f/ml, works shall stop and controls shall be reviewed before recommencing. Personal monitoring shall be undertaken as required by the Contractor's risk assessment.

7.6 CONTAMINATED SOILS – CLEAN COVER SYSTEM (ZONE B)

In areas of the site where buildings and hardstanding are proposed the Made Ground can be left in-situ, as the buildings and hardstanding will break the pollutant linkage and remove the pathway for contamination to come into contact with the end users.

Remedial measures are required in all soft landscaped areas (Zone B), comprising the private rear gardens, the front planting areas and any other soft landscaping shown on the approved landscaping drawings. In accordance with BRE 465 'Cover Systems for Land Regeneration' (2004) and the YALPAG 'Verification Requirements for Cover Systems' (Version 4.1, June 2021), the following cover system shall be provided:

- Excavation of the Made Ground (and of any non-compliant 2022 imported material, see Section 7.7) to a minimum depth of 600 mm below the proposed finished ground level across the whole of Zone B. Where the Made Ground is less than 600 mm thick, only the Made Ground requires removal.
- Inspection of the formation by GES, with photographs, before the marker layer is placed.
- Placement of a high-visibility (orange or similar), permeable, non-woven geotextile marker layer across the full formation, lapped a minimum of 300 mm and turned up against foundations and edgings, to warn future occupiers of the underlying Made Ground.
- Placement of a minimum of 450 mm of clean subsoil complying with BS 8601:2013 'Specification for subsoil and requirements for use', overlain by a minimum of 150 mm of clean topsoil complying with BS 3882:2015 'Specification for topsoil', giving a

minimum total clean cover thickness of 600 mm above the marker layer. Soils shall be placed in layers and lightly firmed to avoid settlement below the specified thickness.

- Both the subsoil and topsoil shall be chemically suitable in accordance with the target concentrations in Table 4.1 and free from asbestos, and shall be approved and tested as set out in Section 9.2.

Excavated Made Ground from Zone B shall not be re-used within Zone B. Where chemically and geotechnically suitable, and where not derived from Zone A, it may be placed beneath buildings or hardstanding in Zone C under the MMP; otherwise it shall be removed off-site as waste.

Where the proposed levels allow, the required cover thickness may be partly achieved by raising ground levels rather than excavating, provided that the resulting levels are acceptable in planning, drainage and structural terms (having regard to the retaining wall and the River Holme) and the marker layer is placed at the Made Ground surface.

Where soft landscaping lies within the root protection area of a retained tree and excavation to 600 mm would harm the tree, an alternative arrangement (e.g. localised hard surfacing, a raised planter or a 'no-dig' cover) shall be utilised.

Excavations should not be left open for longer than necessary, should be safely battered back or supported, and should be securely cordoned-off using 2.00 m high safety fencing, with appropriate warning signs, whenever excavation works are suspended.

absence of a marker layer beneath it. Where it is chemically suitable but less than 600 mm thick, the Made Ground beneath shall be removed as necessary (or levels raised) and the material may be carefully set aside and re-placed over a marker layer to achieve the full specification. Where it is chemically unsuitable, it shall be removed off-site and replaced in accordance with Section 7.6.

7.7 BUILDING FOOTPRINTS AND HARDSTANDING (ZONE C)

No remediation of the Made Ground is required beneath the dwellings, driveways, parking and hard surfaced areas. The Contractor shall ensure that the full construction of the hardstanding (sub-base and surfacing) is completed over any Made Ground, and that no soft landscaped strips, planting pockets or tree pits are formed within Zone C without the cover system specified in Section 7.6.

7.8 REMOVAL OF BELOW GROUND OBSTRUCTIONS

No obstructions were encountered during the investigation; however, obstructions associated with the historical infilling may be found during groundworks. Where relict structures or buried materials are found to contain fluid contaminants, asbestos or other suspected contamination, GES shall be notified and the procedure in Section 7.12 followed. Deep excavations for the removal of obstructions may be unstable in the short term and side support may be necessary.

7.9 EXPORT TO LANDFILL

Excavation arisings that are unsuitable for retention and re-use on site shall be placed in temporary stockpiles on hardstanding or polythene sheeting and be suitably covered to minimise the potential for dust nuisance and prevent surface water run-off. Given the proximity of existing housing, stockpiles shall be exported from site as soon as practicable, and asbestos-impacted soils shall be loaded directly to sheeted vehicles or lined, covered skips wherever possible.

Any material exported from the site to landfill shall be hauled by a registered waste carrier in accordance with the Duty of Care requirements of the Environmental Protection Act 1990 and

the Waste (England and Wales) Regulations 2011, and, for hazardous waste, the Hazardous Waste (England and Wales) Regulations 2005. A waste transfer or hazardous waste consignment note shall be completed, signed and retained by the parties involved, including the volume/tonnage of waste, the nature of the material and its chemical composition, details of the source and destination sites, and details of the haulier.

All waste shall be classified in accordance with the Environment Agency Technical Guidance WM3 and the List of Wastes (European Waste Catalogue) codes. Soils containing identifiable pieces of ACM, or free asbestos fibres at 0.1% w/w or greater, shall be classified as hazardous waste. Soils with free fibres below 0.1% w/w shall be disposed of as asbestos-containing non-hazardous waste to a facility permitted to accept it. Waste Acceptance Criteria (WAC) testing may also be required, and the results of the waste classification and WAC testing (if appropriate) shall be presented to the landfill operator for confirmation of the waste category.

In order to protect the general public from dust emissions, vehicles used for the haulage of contaminated material from the site must be sheeted, and the Contractor must ensure that no fluids or soils escape from vehicles. Wheel cleaning shall be provided to prevent soil being carried onto Woodhead Road.

7.10 DUST CONTROL

At all times during the excavation works, Best Practicable Means shall be employed to minimise dust generation and its emission off site. Measures shall include damping down of excavations, haul routes and stockpiles (using a water supply available at all times), covering of stockpiles, limiting drop heights, suspending dusty operations during high winds, and daily visual monitoring of dust at the site boundary recorded in the site diary. Additional measures for Zone A are set out in Section 7.5.

7.11 PREVIOUSLY UNIDENTIFIED CONTAMINANTS

A watching brief shall be maintained by the Contractor at all times during the groundworks. Should any suspected contaminated materials other than those detailed in this and previous reports be encountered (for example oils, soils with an unusual colour or odour, fibrous materials, ACM fragments, buried drums or tanks), the following procedure shall be implemented:

- Work shall cease in that area to prevent exposure to ground workers and the spread of potential contaminants.
- GES shall be notified and shall attend site to inspect and sample the material. The material shall be excavated and stockpiled separately on an impermeable surface, covered, and tested for an appropriate range of determinands.
- The LPA (Environmental Health) shall be notified in writing within 2 working days.
- Depending on the results, the material shall either be placed beneath buildings or hardstanding in Zone C (if suitable and agreed under the MMP) or disposed of off-site to a suitably licensed facility.

Should any visual or olfactory evidence of gross contamination be identified, works shall be suspended in that area and the LPA advised. A decision will be made as to whether this can be dealt with by a variation to this Remediation Strategy or whether a new or amended Remediation Strategy is required for approval by the LPA. All such occurrences shall be recorded in the Verification Report.

7.12 SERVICES INSTALLATION

It is recommended that statutory undertakers are consulted at an early stage with respect to the ground conditions within which they will lay services. All services, and in particular potable water supply pipework, should comprise material that is resistant to attack and degradation by chemical contaminants. The water supply company (Yorkshire Water) should be consulted regarding the specification of pipework with reference to the UKWIR guidance 'Selection of Water Supply Pipes to be Used in Brownfield Sites' (2011).

All drainage and service trenches are anticipated to encounter Made Ground. Arisings from trenches in Zone A shall be removed off-site as asbestos-containing waste. Other arisings, if not returned to the original excavation below 600 mm depth, must be placed beneath proposed hardstanding (Zone C) or disposed of off-site. Where trenches cross Zone B, the upper 600 mm shall be reinstated with approved clean cover materials and the marker layer reinstated at the base of the cover.

7.13 SOAKAWAY DRAINAGE

Soakaways shall not be placed within Made Ground, thereby preventing the potential for leachate generation and mobilisation of contaminants towards the River Holme.

7.14 GROUND GAS PROTECTION MEASURES

The site has been classified as CS1 in accordance with CIRIA C665 and BS 8485:2015+A1:2019, and ground gas protection measures are not required. Should the proposed development or building construction change, this should be re-assessed.

7.15 BOREHOLE DECOMMISSIONING

Prior to the development of the site, it is recommended that all the monitoring standpipes installed by GES are located and decommissioned in line with the Environment Agency guidance document 'Good Practice for Decommissioning Redundant Boreholes and Wells' (October 2012). The WS02 standpipe lies within Zone A and shall be decommissioned with the asbestos controls described in Section 7.5.

7.16 MATERIALS MANAGEMENT PLAN

Should any excavated materials be re-used on site, a Materials Management Plan (MMP) under the CL:AIRE Definition of Waste: Development Industry Code of Practice shall be prepared and declared prior to commencement. The MMP should allow for the remediation of the soils in the soft landscaped areas during the appropriate phase of the works and should also refer to this Strategy in respect of:

- Materials arising from Zone A (which shall not be re-used within soft landscaping).
- Materials arising from the encountering of previously unidentified contamination.
- Materials arising from the removal of below ground obstructions.
- Control of water.
- Contamination related health and safety issues, including dust and asbestos fibre control.

GES does not prepare Materials Management Plans; expert advice should be sought from a suitably experienced consultant (a CL:AIRE Qualified Person).

8. GENERAL SITE REQUIREMENTS

The Contractor shall comply at all times with this Strategy, the Conditions of Contract and all relevant health and safety requirements. Site works will be supervised by a suitably qualified person appointed by the Client, and the remedial works will be inspected and verified by GES.

The Contractor shall prepare and submit a programme for the works to the Client and GES prior to the commencement on site, identifying the hold points in Table 5.1 so that GES attendance can be arranged with a minimum of 2 working days' notice.

Prior to commencement of works, the Contractor shall establish the boundaries of the site and working areas and shall make adequate provision to secure the site boundary and prevent unauthorised access to the site during the works. No fires shall be permitted on site.

Details of all monitoring (dust, asbestos air monitoring and any other monitoring) will be retained on site by the Contractor and made available to the Local Authority Environmental Health Department on request.

8.1 SERVICES

The Client shall be responsible for obtaining all relevant service records for the site and undertaking any consultation with the statutory undertakers in relation to identifying the location of live services, including those serving adjacent properties and the partially installed services protruding from the retaining wall. The Client shall ensure the safe disconnection of all existing services entering the site, except for those which are to remain operational.

8.2 HEALTH AND SAFETY

The remediation shall be undertaken in accordance with all relevant legislation including, but not limited to:

- The Health and Safety at Work etc. Act 1974.
- The Construction (Design and Management) Regulations 2015.
- The Control of Substances Hazardous to Health Regulations 2002 (as amended).
- The Control of Asbestos Regulations 2012, and HSE Approved Code of Practice L143.

Contaminated materials, including asbestos, are locally present on the site. During the remediation and construction, it will be necessary to protect the health and safety of site personnel and the public. General guidance on these matters is given in the Health and Safety Executive (HSE) document 'Protection of Workers and the General Public during the Development of Contaminated Land' (HSG66) and in CIRIA C733 'Asbestos in soil and made ground: a guide to understanding and managing risks' (2014). In summary, the following measures are required as a minimum where potential for exposure to contaminated materials exists:

- All ground workers should be issued with safety glasses, protective footwear and impermeable heavy-duty gloves, and, within Zone A, RPE and disposable coveralls. Personnel should be instructed in their correct use.
- Hand washing and boot cleaning facilities shall be provided.
- No eating, drinking or smoking on site other than in designated welfare areas.
- Good practices relating to personal hygiene shall be adopted.

Before site operations are commenced, the necessary COSHH and asbestos risk assessments, plans of work, method statements and Construction Phase Plan should be

completed and issued by the Contractor in accordance with the CDM Regulations 2015. The Contractor shall provide details of emergency procedures.

If an excavation meets the definition of a 'confined space' within the Confined Spaces Regulations 1997, entry must be undertaken in accordance with the HSE Approved Code of Practice L101 'Safe Work in Confined Spaces'.

8.3 OFF-SITE DISPOSAL

Materials for off-site disposal shall be sampled and analysed by the Contractor at a frequency sufficient to allow the material to be adequately classified. Removal of any materials from the site should be undertaken in accordance with current Duty of Care requirements and EA Technical Guidance WM3 'Guidance on the Classification and Assessment of Waste'. The waste may also be subject to Waste Acceptance Criteria (WAC) testing, and it is recommended that discussion with landfill operators takes place at an early stage. Waste transfer notes shall be retained by the Contractor for a period of at least two years (three years for hazardous waste consignment notes), and copies provided to GES for inclusion in the Verification Report.

9. VALIDATION TESTING AND REPORT

9.1 VERIFICATION INSPECTIONS

GES shall attend site to inspect and record the remedial works at each of the hold points in Table 5.1. As a minimum, visits will comprise: the Zone A delineation; inspection of Zone A excavations and collection of verification samples; inspection of the Zone B formation and marker layer prior to cover placement; sampling of imported and in-situ cover soils; and the cover thickness verification pits. Each visit will be recorded with photographs, notes and sketch plans.

9.2 SOIL VALIDATION

Prior to import, the Contractor shall provide GES with the name and address of the supplier and the source site of each material, a description of the material, confirmation of compliance with BS 3882:2015 (topsoil) or BS 8601:2013 (subsoil), and an in-date chemical test certificate (typically not more than three months old) from a UKAS/MCERTS accredited laboratory. No material shall be imported until GES has approved the source in writing (Hold Point 3). Materials from brownfield or waste sources shall only be accepted where accompanied by the appropriate environmental permit, exemption or CL:AIRE DoWCoP declaration.

Irrespective of the above, all materials to be used within the cover system, irrespective of source, shall be independently sampled by GES and tested for chemical composition. Imported materials shall be stockpiled separately on hardstanding or sheeting on delivery and sampled before placement. Delivery tickets shall be retained to reconcile the volumes imported.

GES has adopted the approach identified in the YALPAG 'Verification Requirements for Cover Systems: Technical Guidance for Developers, Landowners and Consultants', Version 4.1, June 2021. The minimum analysis to be undertaken on materials for use within the cover system is detailed in Table 9.1 below. Results shall be assessed against the target concentrations in Table 4.1.

Table 9.1: Proposed Testing Frequency and Analysis

Soil Source	Testing Frequency	Minimum	Analysis suite
Material imported in 2022 (unknown source, in-situ)	3 per garden and not less than 1 per 50 m ³	6	Heavy metals/metalloids and inorganics, speciated PAH (16 USEPA), TPH CWG, asbestos screen (quantification if detected), SOM, pH.
Imported soils: brownfield / unknown source	Between 1 sample per 50 m ³ and 1 sample per 100 m ³	6	Heavy metals/metalloids and inorganics, speciated PAH, TPH CWG, asbestos screen, SOM, pH.
Imported soils: greenfield / manufactured soil source	Between 1 sample per 50 m ³ and 1 sample per 250 m ³	3	Heavy metals/metalloids and inorganics, speciated PAH, TPH CWG, asbestos screen, SOM, pH.
Crushed hardcore, stone, brick (excluding asphalt) – Zone C only	Minimum 1 per 500 m ³	1	Standard metals/metalloids, speciated PAH, asbestos, total TPH, plus analysis dependent on the history of the donor site.
Virgin quarried material	1 or 2 depending on the type of stone	1	Standard metals/metalloids (as a minimum As, Cd, Cr, CrVI, Cu, Hg, Ni, Pb, Se, Zn).

Where any material is deemed to be unsuitable for use in the cover system, either by GES or the LPA, the Contractor shall make provision for the costs of sampling, testing and removal of said unacceptable materials and for delays associated with material testing and classification prior to disposal.

9.3 COVER THICKNESS VERIFICATION

Depth verification of the cover system will be required within all soft landscaped areas. The verification will comprise hand-dug pits at a density of not less than one pit per 25 m² of soft landscaping, with a minimum of three pits in each rear garden and one pit in each separate front planting area. In each pit the thickness of topsoil and subsoil, and the presence and depth of the marker layer, will be measured and photographed against a measuring staff. Pits will be reinstated in the original sequence. Where a pit shows less than 600 mm of clean cover, additional pits will be excavated to define the deficient area, which shall be made good and re-verified.

9.4 ASBESTOS VERIFICATION

Following the excavation of any part of Zone A within soft landscaping, verification samples shall be collected from the base of the excavation (at least one sample per 10 m² of base, minimum of three) and from each side wall (at least one per side wall, and not less than one per 5 m of wall length), and analysed for asbestos identification and, where detected, quantification, together with lead and speciated PAH. The acceptance criteria are: no asbestos detected, and lead and PAH below the target concentrations in Table 4.1. Where these are not met, the contingency actions in Section 7.5 apply.

The results of the perimeter air monitoring shall be included in the Verification Report.

9.5 VERIFICATION REPORT

On completion of the works, and prior to occupation of either dwelling, a Verification (Validation) Report shall be prepared by GES and submitted to the LPA for approval. The report should include the following:

- This Remediation Strategy and copies of confirmation from the LPA agreeing it, and a copy of the notification of commencement.
- The Zone A delineation results and plan, and details of any agreed variation to this Strategy.
- Photographic evidence of the excavation and removal of material from site, and of the formation, marker layer and cover placement.
- Detailed drawings of the excavated areas (Zone A and Zone B) showing the extent of the material removal operation, and as-built extents of Zones B and C.
- Details of the provenance of the subsoil and topsoil, supplier certification and delivery tickets (to be provided by the Contractor).
- The in-situ assessment of the 2022 imported material.
- Copies of waste transfer/consignment notes relating to the movement of wastes to a licensed waste management facility, with a reconciliation of volumes.
- Laboratory analysis of verification soil samples and assessment of suitability for use against Table 4.1.
- Asbestos verification results and air monitoring records.
- Logs indicating the thickness of cover soils within each verification pit, and a drawing indicating the location of verification pits and all sampling locations.
- Photographic evidence of the verification pits.
- Details of any variation from the adopted strategy due to unforeseen circumstances, any previously unidentified contamination encountered and the action taken.
- A statement confirming that the site is suitable for the proposed residential end use.

10. RELIANCE AND LIMITATIONS

This report has been prepared using published information and information provided by the Client and their professional advisers which has been made available to GES at the time of writing only. GES accepts no liability for any changes resulting from new information which has become available since this time.

This report is provided for the sole use of the client and their professional advisors and is confidential to them unless agreed otherwise in writing. This report may only be used and relied on once the work has been paid for in full. GES owes no duty of care and has no liability to any third party who is not authorised by GES to use this report. Any unauthorised third parties using information contained in this report do so at their own risk.

This Remediation Strategy is based upon the findings of the GES Phase II investigation (GES-P11 1623-21) and the information listed herein. The strategy has been prepared to address the pollutant linkages identified in that investigation and the comments of the Local Planning Authority.

This assessment has been carried out to determine the potential risks posed to future end users, along with other key receptors, resulting from potential contamination at the site, based on the proposed development. Should any revisions in the development proposals result in a change to any assessment parameters detailed in this report, a re-assessment of the risk should be carried out.

Whilst this report may reference observations made regarding the presence of features/issues such as invasive species, ACM, site drainage and evidence of structural abnormalities, this

report does not constitute specialist surveys on these matters. Should further specialist surveys be carried out in this regard, the findings of these should be reported to GES so that we may determine if this has any impact on the findings of this report.

The conclusions and recommendations in this report are limited to those which can be made based on the findings of the investigation and information provided by third parties. GES assumes all third party data to be true and correct. No responsibility can be accepted by GES for inaccuracies in the information provided by any other party, including the information relating to the works undertaken on site in September 2022.

This report is written in the context of an agreed scope of works and should not be used in a different context. Furthermore, new information, improved practices, and changes in legislation may require the reinterpretation of the report in whole or in part after its original issue. GES reserve the right to alter their conclusions and recommendations in the light of further information that may become available.

Ground conditions can be variable and change rapidly, especially in areas of Made Ground, however it is assumed that the ground conditions encountered and observed are typical and representative of the site as a whole. The ground conditions have been determined from a limited number of exploratory holes formed across the site, therefore only a small percentage of the total area of the site has been investigated. GES cannot accept responsibility for any situations resulting from locally unforeseen ground conditions occurring between exploratory holes; the discovery strategy in Section 7.12 is intended to address such conditions.

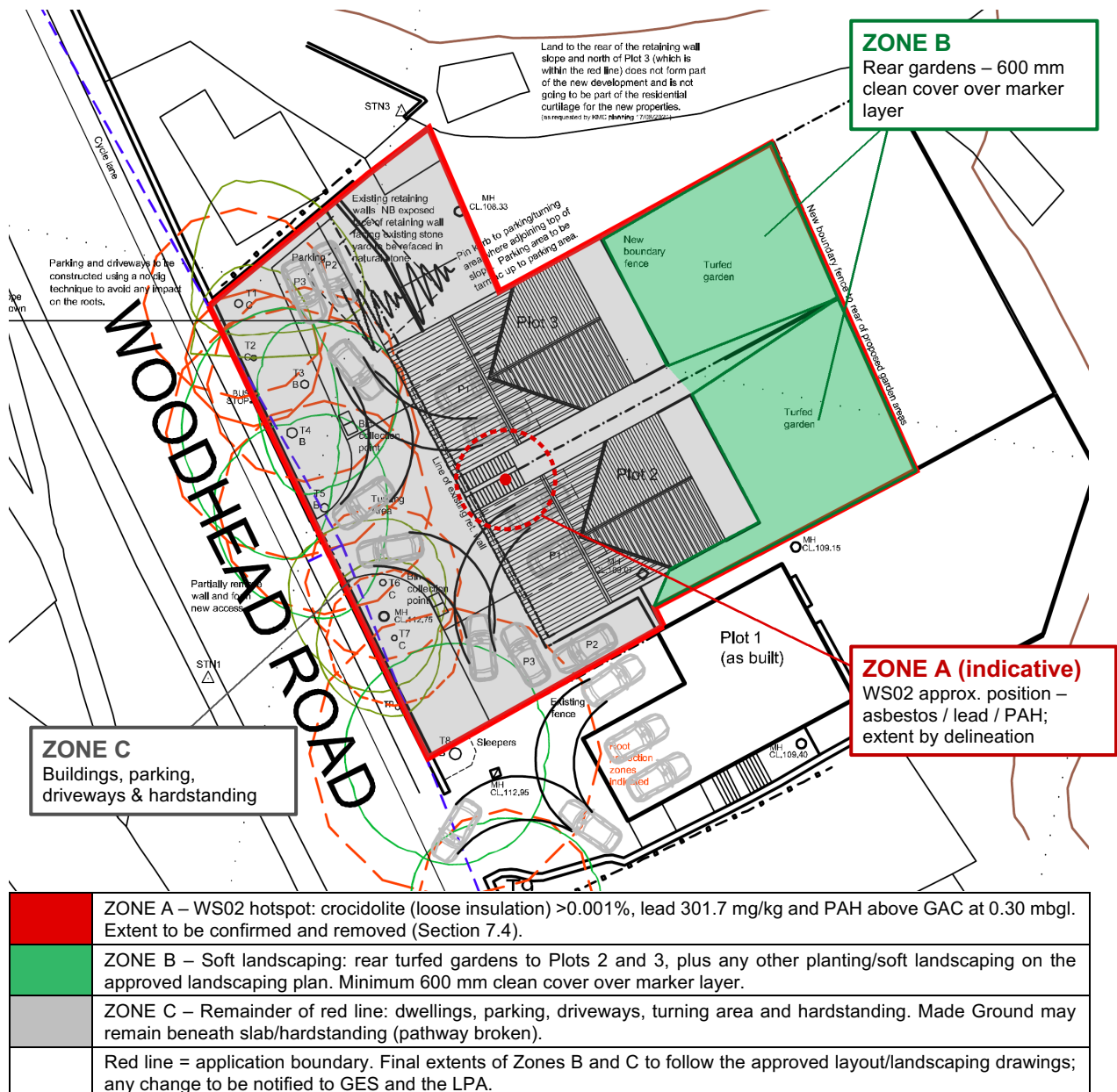
In addition, subsurface conditions including contaminant concentrations and groundwater levels may vary spatially with time. This factor should be given due consideration in the event that the information contained within this report is used after any significant period of time has elapsed.

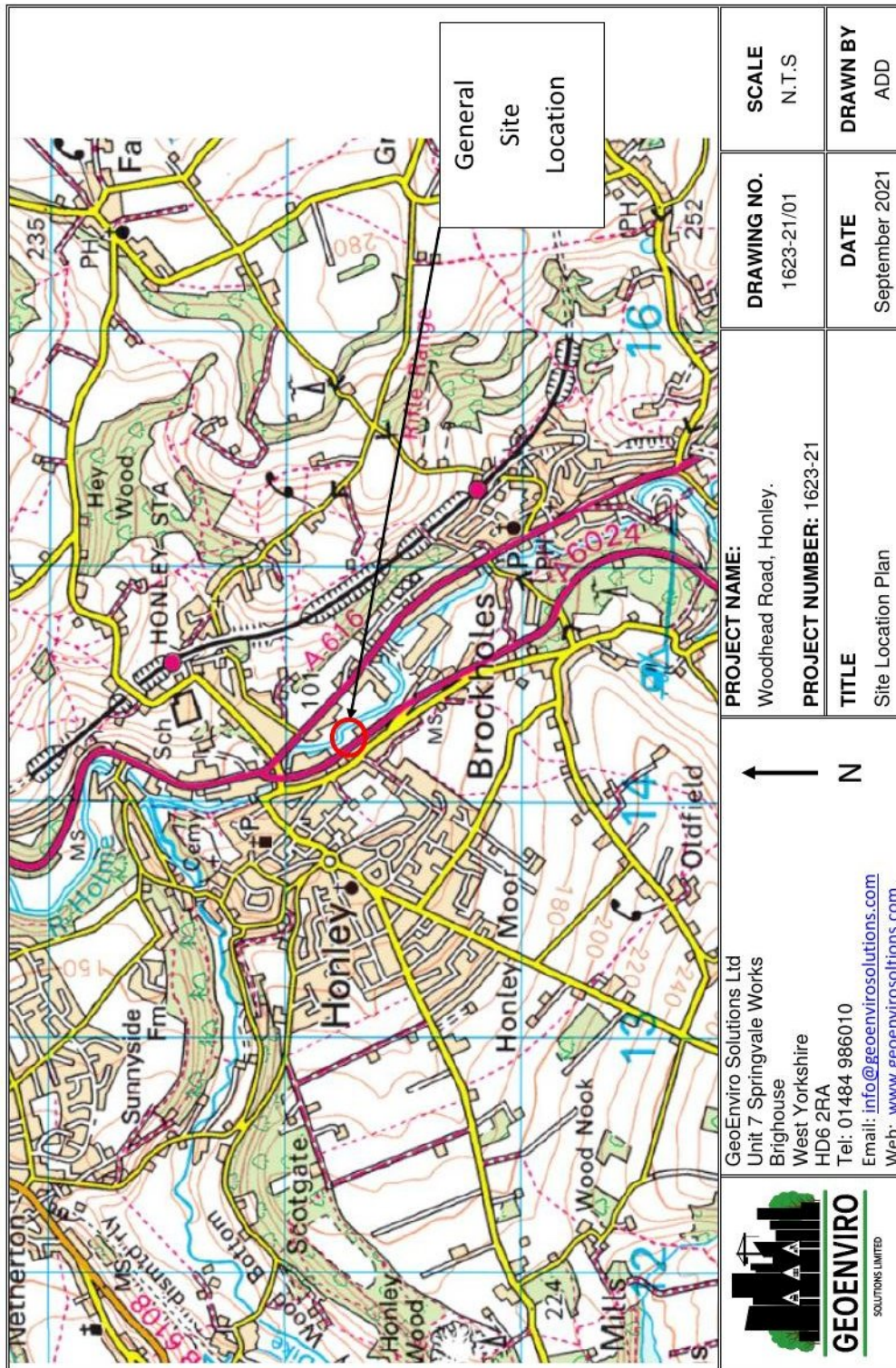
APPENDIX 1

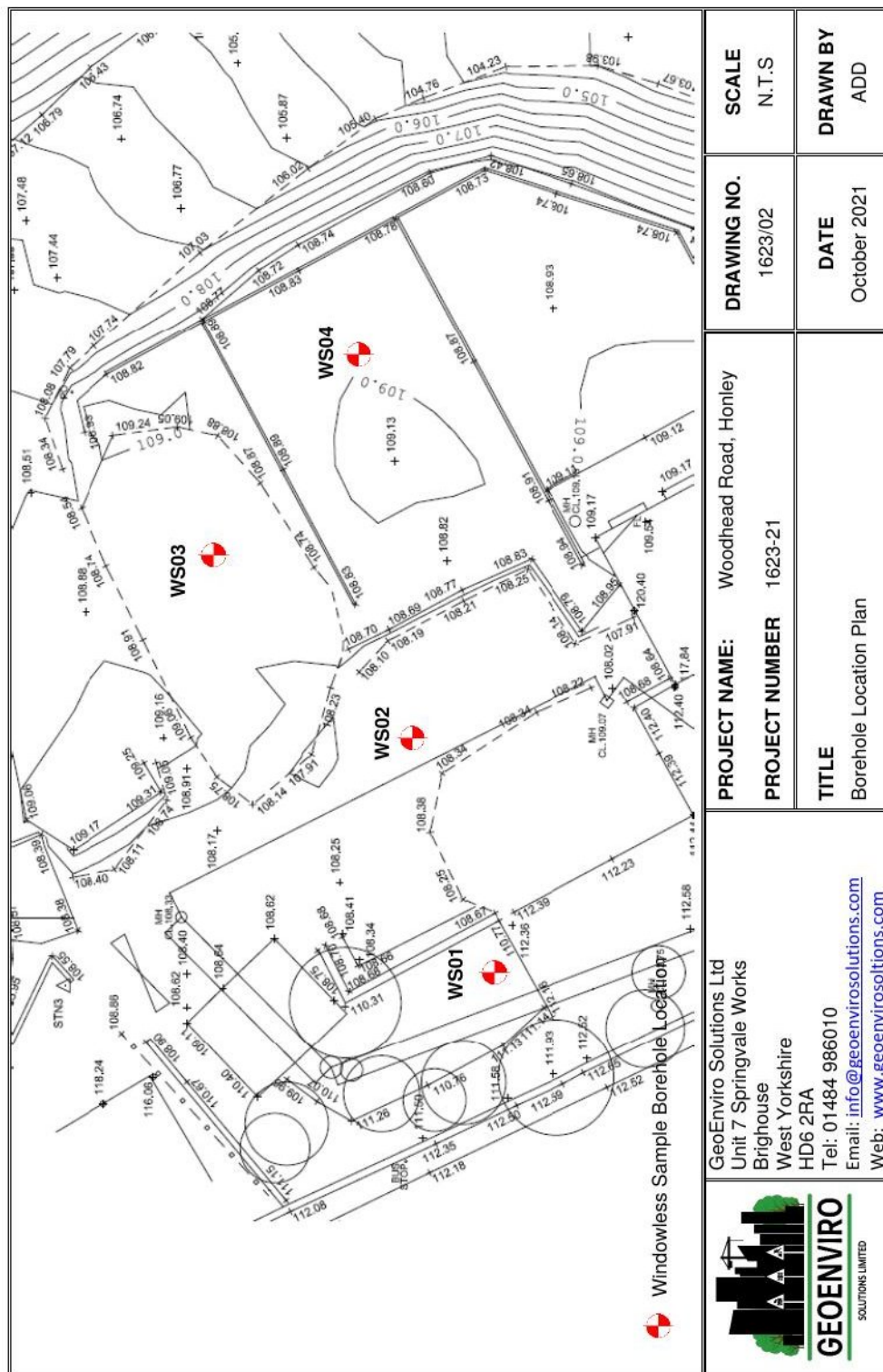
DRAWINGS AND PLANS

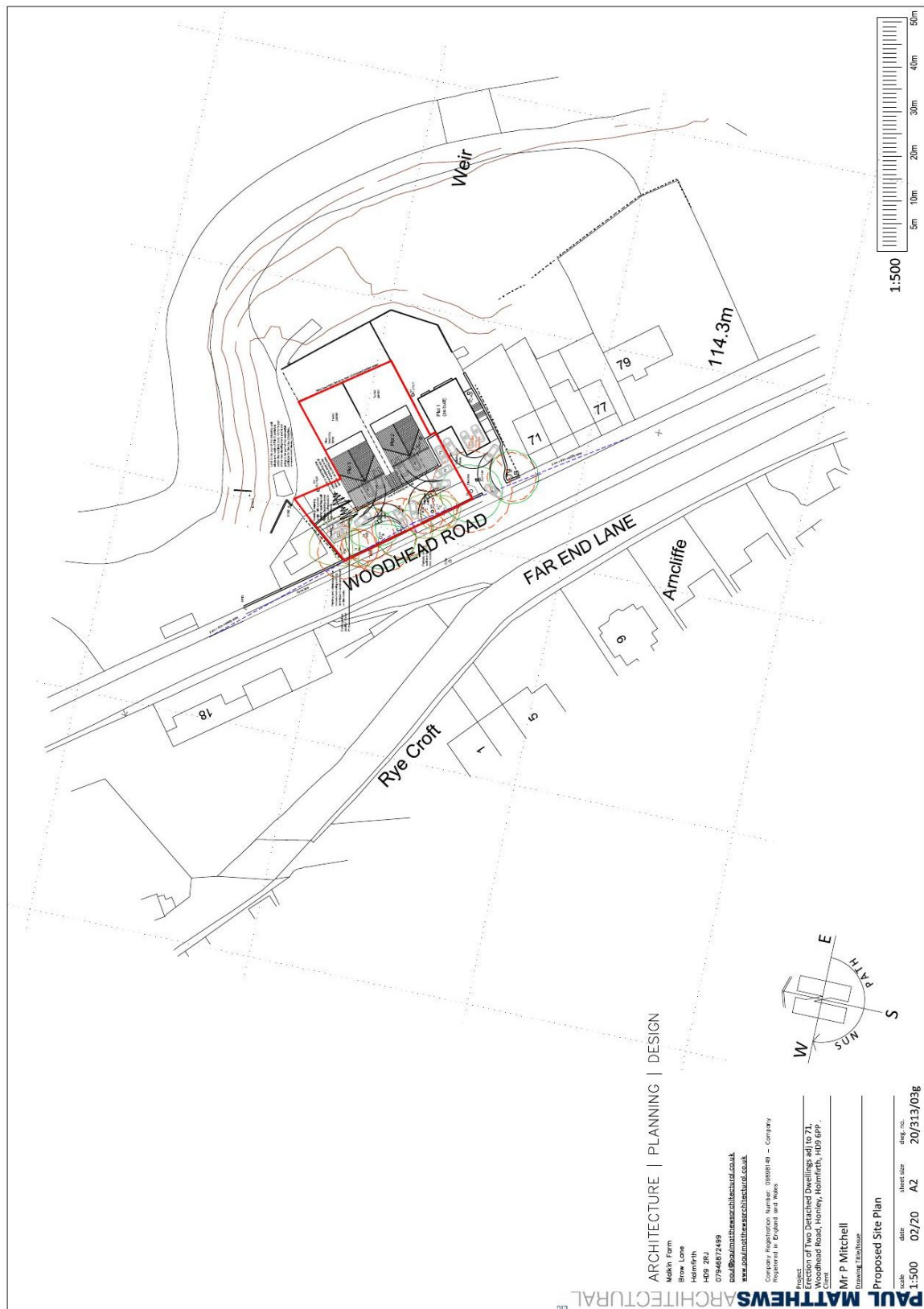
GES 1623-21/RS01 – REMEDIATION ZONES (Rev A, September 2026)

Base: Paul Matthews Architectural Proposed Site Plan 20/313/03g (1:500 at A2, enlarged – not to scale). WS02 transferred approximately from GES Dwg 1623/02.









APPENDIX 2

WINDOWLESS SAMPLE BOREHOLE LOGS

BOREHOLE SOLUTIONS LIMITED NORTH		Percussion Drilling Log									
Project Name: Woodhead Road, Honley				Client: Paul Matthews Architectural				Date: 13/10/2021			
Location:				Contractor:							
Project No. : 1623-21				Crew Name:				Drilling Equipment:			
Borehole Number WS01		Hole Type WLS		Level		Logged By JF		Scale 1:50		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
					0.20			MADE GROUND: Loose dark brown slightly gravelly clayey fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to medium brick, slag and clinker and sandstone.			
		1.00	SPT	N=14 (10,3/2,4,4,4)				MADE GROUND: Medium dense brown very sandy clayey sub-angular to sub-rounded fine to coarse GRAVEL of brick, slag and clinker and sandstone. Sand is fine to coarse.	1		
		2.00	SPT	N=20 (7,5/5,5,5,5)	1.60			MADE GROUND: Medium dense dark brown slightly gravelly clayey fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse brick and sandstone.	2		
		3.00	SPT	N=31 (9,9/6,7,8,10)	3.00			Dense light yellowish brown slightly gravelly clayey fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse sandstone.	3		
		4.00	SPT	50 (20 for 75mm/50 for 225mm)	4.00			End of Borehole at 4.000m	4		
									5		
									6		
									7		
									8		
									9		
									10		
Hole Diameter		Casing Diameter		Chiselling		Inclination and Orientation					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
Remarks											

BOREHOLE SOLUTIONS LIMITED NORTH		Percussion Drilling Log									
Project Name: Woodhead Road, Honley				Client: Paul Matthews Architectural				Date: 13/10/2021			
Location:				Contractor:							
Project No. : 1623-21				Crew Name:				Drilling Equipment:			
Borehole Number WS02		Hole Type WLS		Level		Logged By JF		Scale 1:50		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
					0.20			MADE GROUND: Soft dark brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse brick, slag, clinker, bitumen, concrete and sandstone.			
		1.00	SPT	N=3 (1,1/2,0,0,1)				MADE GROUND: Loose sandy slightly clayey sub-angular to sub-rounded fine to coarse GRAVEL of brick, slag, clinker, bitumen, concrete and sandstone.	1		
		2.00	SPT	N=2 (1,0/1,0,1,0)					2		
					2.40			MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse brick and sandstone.			
		3.00	SPT	N=3 (1,0/1,1,0,1)				<u>Sandstone cobble.</u>	3		
		4.00	SPT	N=3 (1,1/1,1,0,1)					4		
		5.00	SPT	N=12 (4,4/5,2,2,3)					5		
					6.00			Tending to light brown sandy CLAY. Sand is fine to coarse. End of Borehole at 6.000m	6		
									7		
									8		
									9		
									10		
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
Remarks											

BOREHOLE SOLUTIONS LIMITED NORTH		Percussion Drilling Log									
Project Name: Woodhead Road, Honley				Client: Paul Matthews Architectural				Date: 15/10/2021			
Location:				Contractor:							
Project No. : 1623-21				Crew Name:				Drilling Equipment:			
Borehole Number WS03		Hole Type WLS		Level		Logged By JF		Scale 1:50		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		1.00	SPT	N=13 (6,3/3,3,4,3)				MADE GROUND: Medium dense dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse brick, concrete slag, clinker and sandstone.	1		
		2.00	SPT	N=12 (4,3/3,3,3,3)	2.00			MADE GROUND: Medium dense dark reddish brown slightly gravelly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse brick, concrete, sandstone and coal.	2		
		3.00	SPT	N=14 (4,3/4,3,3,4)					3		
		4.00	SPT	N=16 (2,3/5,4,3,4)					4		
		5.00	SPT	N=13 (3,3/2,4,3,4)					5		
		6.00	SPT	N=10 (3,2/2,3,2,3)					6		
		7.00	SPT	N=13 (4,3/4,3,3,3)					7		
		8.00	SPT	N=16 (5,5/5,4,3,4)	7.75 8.00 8.60 9.00			MADE GROUND: Soft to firm dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse brick and sandstone MADE GROUND: Medium dense to dense dark reddish brown slightly gravelly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse brick, concrete, sandstone and coal. Firm dark brown tending to light creamish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse sandstone. End of Borehole at 9.000m	8 9 10		
Hole Diameter		Casing Diameter		Chiselling		Inclination and Orientation					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
Remarks											

BOREHOLE SOLUTIONS LIMITED NORTH		Percussion Drilling Log									
Project Name: Woodhead Road, Honley				Client: Paul Matthews Architectural				Date: 15/10/2021			
Location:				Contractor:							
Project No. : 1623-21				Crew Name:				Drilling Equipment:			
Borehole Number WS04		Hole Type WLS		Level		Logged By JF		Scale 1:50		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		1.00	SPT	N=6 (2,3/2,1,2,1)			 MADE GROUND: Soft to firm dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse brick, concrete, slag, clinker and sandstone.	1			
		2.00	SPT	N=33 (3,4/5,6,12,10)				2			
		3.00	SPT	N=6 (1,2/1,2,1,2)	2.60			 MADE GROUND: Soft to firm light yellowish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse brick and sandstone.	3		
		4.00	SPT	N=2 (1,0/1,0,1,0)	3.70			 MADE GROUND: Soft to firm dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse brick, sandstone and coal.	4		
		5.00	SPT	N=5 (1,1/1,2,1,1)	4.40			 MADE GROUND: Loose dark reddish brown slightly gravelly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse brick, concrete and coal.	5		
		6.00	SPT	N=8 (2,1/2,2,2,2)	6.00		End of Borehole at 6.000m	6			
								7			
								8			
								9			
								10			

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
 

APPENDIX 3

CHEMICAL TESTING RESULTS



Certificate of Analysis

Client: GeoEnviro Solutions Ltd

Project: 21101609

Quote: BEC211023000 V1.1

Project Ref: GeoEnviro Solutions Ltd

Site: Woodhead Road, Honley

Contact: Rob Lewis

Address: Unit 7
Springvale Works
Brookfoot Lane
Brighouse
HD6 2RA

No. Samples Received: 8

Date Received: 22/10/2021

Analysis Date: 03/11/2021

Date Issued: 03/11/2021

Job Status: Complete

Report Type: Final Version 01

This report supercedes any versions previously issued by the laboratory

Account Manager
Mandy Fitzer

Authorised by the Operations Manager
Becky Batham

SOCOTEC UK, Ashby Road, Bretby, Burton-on-Trent, UK, DE15 0YZ

Page 1 of 21



Client: GeoEnviro Solutions Ltd
Project Name: GeoEnviro Solutions Ltd
Project No: 21101609
Date Issued: 03/11/2021

Samples Analysed

<u>Sample Reference</u>	<u>Text ID</u>	<u>Sample Date</u>	<u>Sample Type</u>
WS01-0-ES-0.40	21101609-001	19/10/2021 00:00:00	SOLID
WS02-0-ES-0.30	21101609-002	19/10/2021 00:00:00	SOLID
WS03-0-ES-0.30	21101609-003	19/10/2021 00:00:00	SOLID
WS04-0-ES-0.80	21101609-004	19/10/2021 00:00:00	SOLID WATER Ground Water



Client: GeoEnviro Solutions Ltd
Project Name: Woodhead Road, Honley
Project No: 21101609
Date Issued: 03/11/2021



Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID			
					Customer ID			
					Sample Type	Sampling Date	Sample ID	Sample ID
>C6-C8 Aliphatic HS_10_AL	GROHSABTEXHSA	0.2	mg/kg*	UM	SOLID	19/10/2021	WS01-0-ES-0.40	WS01-0-ES-0.40
>C7-C8 Aromatic HS_10_AR	GROHSABTEXHSA	0.01	mg/kg*	UM	SOLID	19/10/2021	WS02-0-ES-0.30	WS02-0-ES-0.30
>C8-C10 Aliphatic HS_10_AL	GROHSABTEXHSA	0.2	mg/kg*	UM	SOLID	19/10/2021	WS03-0-ES-0.30	WS03-0-ES-0.30
>C8-C10 Aromatic HS_10_AR	GROHSABTEXHSA	0.04	mg/kg*	UM	SOLID	19/10/2021	WS04-0-ES-0.80	WS04-0-ES-0.80
C6-C8 Aliphatic HS_10_AL	GROHSABTEXHSA	0.2	mg/kg*	UM	SOLID	19/10/2021	WS05-0-ES-0.30	WS05-0-ES-0.30
C6-C7 Aromatic HS_10_AR	GROHSABTEXHSA	0.01	mg/kg*	UM	SOLID	19/10/2021	WS06-0-ES-0.30	WS06-0-ES-0.30
Total GRO C6-C10 HS_10_Total	GROHSABTEXHSA	0.2	mg/kg*	UM	SOLID	19/10/2021	WS07-0-ES-0.30	WS07-0-ES-0.30
>C6-C8 Aliphatic HS_10_AL	GROHSABTEXHSA	0.1	mg/l	N	SOLID	19/10/2021	WS08-0-ES-0.30	WS08-0-ES-0.30
>C7-C8 Aromatic HS_10_AR	GROHSABTEXHSA	0.005	mg/l	U	SOLID	19/10/2021	WS09-0-ES-0.30	WS09-0-ES-0.30
>C8-C10 Aliphatic HS_10_AL	GROHSABTEXHSA	0.1	mg/l	N	SOLID	19/10/2021	WS10-0-ES-0.30	WS10-0-ES-0.30
>C8-C10 Aromatic HS_10_AR	GROHSABTEXHSA	0.02	mg/l	U	SOLID	19/10/2021	WS11-0-ES-0.30	WS11-0-ES-0.30
C6-C8 Aliphatic HS_10_AL	GROHSABTEXHSA	0.1	mg/l	N	SOLID	19/10/2021	WS12-0-ES-0.30	WS12-0-ES-0.30
C6-C7 Aromatic HS_10_AR	GROHSABTEXHSA	0.005	mg/l	U	SOLID	19/10/2021	WS13-0-ES-0.30	WS13-0-ES-0.30
Total GRO C6-C10 HS_10_Total	GROHSABTEXHSA	0.1	mg/l	U	SOLID	19/10/2021	WS14-0-ES-0.30	WS14-0-ES-0.30
Conductivity at 25°C	PHCONDW	100	µS/cm	U	SOLID	19/10/2021	WS15-0-ES-0.30	WS15-0-ES-0.30
pH	PHCONDW	1	pH units	U	SOLID	19/10/2021	WS16-0-ES-0.30	WS16-0-ES-0.30
pH (2.5:1 extraction)	PHSOIL	1	pH units	UM	SOLID	19/10/2021	WS17-0-ES-0.30	WS17-0-ES-0.30
Chromium (VI) as Cr	KOMENS	0.1	mg/kg*	N	SOLID	19/10/2021	WS18-0-ES-0.30	WS18-0-ES-0.30
Phenol Index	SFAP1	0.5	mg/kg*	U	SOLID	19/10/2021	WS19-0-ES-0.30	WS19-0-ES-0.30



Client: GeoEnviro Solutions Ltd
 Project Name: Woodhead Road, Honley
 Project No: 21101609
 Date Issued: 03/11/2021



Analysis Results

Sample ID		Customer ID		Sample Type		Sampling Date		Units		Accred.	
Analysis		Method Code		MDL		Units		Accred.		Sample ID	
>C8-C8 Aromatic HS_10_AL		GROSAIBTEXHSA		0.2		mg/kg ^a	UM				
>C7-C8 Aromatic HS_10_AR		GROSAIBTEXHSA		0.01		mg/kg ^a	UM				
>C8-C10 Aliphatic HS_10_AL		GROSAIBTEXHSA		0.2		mg/kg ^a	UM				
>C8-C10 Aromatic HS_10_AR		GROSAIBTEXHSA		0.04		mg/kg ^a	UM				
C5-C8 Aliphatic HS_10_AL		GROSAIBTEXHSA		0.2		mg/kg ^a	UM				
C5-C7 Aromatic HS_10_AR		GROSAIBTEXHSA		0.01		mg/kg ^a	UM				
Total GRO C5-C10 HS_10_Total		GROSAIBTEXHSA		0.2		mg/kg ^a	UM				
>C8-C8 Aliphatic HS_10_AL		GROSAIBTEXHSA		0.1		mg/l	N				
>C7-C8 Aromatic HS_10_AR		GROSAIBTEXHSA		0.005		mg/l	U				
>C8-C10 Aliphatic HS_10_AL		GROSAIBTEXHSA		0.1		mg/l	N				
>C8-C10 Aromatic HS_10_AR		GROSAIBTEXHSA		0.02		mg/l	U				
C5-C8 Aliphatic HS_10_AL		GROSAIBTEXHSA		0.1		mg/l	N				
C5-C7 Aromatic HS_10_AR		GROSAIBTEXHSA		0.005		mg/l	U				
Total GRO C5-C10 HS_10_Total		GROSAIBTEXHSA		0.1		mg/l	U				
Conductivity at 25°C		PHCONDW		100		µS/cm	U				
pH		PHCONDW		1		pH units	U				
pH (2.5:1 extraction)		PHSOIL		1		pH units	UM				
Chromium (VI) as Cr		KONENS		0.1		mg/kg ^a	N				
Phenol Index		SIFAPI		0.5		mg/kg ^a	U				



Client: GeoEnviro Solutions Ltd
Project Name: Woodhead Road, Honley
Project No: 21101609
Date Issued: 03/11/2021



Analysis Results

Analysis	Method Code	MDL	Units	Sample ID			
				Customer ID			
				001	002	003	004
Phenol Index	SFAP1	0.05	mg/l	WS01-0-ES-0.40	WS02-0-ES-0.30	WS03-0-ES-0.30	WS04-0-ES-0.80
Total Cyanide	SFAP1	0.5	mg/kg*	<0.6	<0.6	<0.6	<0.6
Total Cyanide	SFAP1	0.02	mg/l				
Soil Organic Matter	WSLM69	0.04	% m/m*	1.41	12.2	4.05	3.40
Total Organic Carbon	WSLM13	0.2	mg/l				
Arsenic as As	ICPMS	0.3	mg/kg*	8.3	21.4	9.3	9.9
Cadmium as Cd	ICPMS	0.2	mg/kg*	0.4	0.6	0.3	0.2
Copper as Cu	ICPMS	1.0	mg/kg*	42.3	52.7	36.7	40.0
Lead as Pb	ICPMS	0.7	mg/kg*	35.0	301.7	83.9	55.7
Mercury as Hg	ICPMS	0.5	mg/kg*	<0.5	<0.5	<0.5	<0.5
Nickel as Ni	ICPMS	2	mg/kg*	16.1	31.5	24.6	46.9
Selenium as Se	ICPMS	0.5	mg/kg*	<0.5	<0.5	<0.5	<0.5
Total Chromium as Cr	ICPMS	1.2	mg/kg*	26.9	43.8	38.6	42.2
Zinc as Zn	ICPMS	16	mg/kg*	91.8	99.9	131.7	90.2
Water Soluble Sulphate as SO4 by Mass	ICPMS	20	mg/kg*	24	92	215	144
Arsenic as As	ICPMSW (Dissolved)	0.001	mg/l				
Cadmium as Cd	ICPMSW (Dissolved)	0.00002	mg/l				
Total Chromium as Cr	ICPMSW (Dissolved)	0.001	mg/l				
Copper as Cu	ICPMSW (Dissolved)	0.001	mg/l				



Client: GeoEnviro Solutions Ltd
 Project Name: Woodhead Road, Honley
 Project No: 21101609
 Date Issued: 03/11/2021



Analysis Results

Sample ID				Customer ID				Sample Type				Sampling Date				Units				Accred.			
Analysis				Method Code				MDL				Units				Accred.				Sample ID			
Phenol Index				SFAP1				0.05				mg/l				U							
Total Cyanide				SFAP1				0.5				mg/kg*				UM							
Total Cyanide				SFAP1				0.02				mg/l				U							
Soil Organic Matter				WSLM59				0.04				% m/m*				U							
Total Organic Carbon				WSLM13				0.2				mg/l				U							
Arsenic as As				ICPMSS				0.3				mg/kg*				UM							
Cadmium as Cd				ICPMSS				0.2				mg/kg*				UM							
Copper as Cu				ICPMSS				1.6				mg/kg*				UM							
Lead as Pb				ICPMSS				0.7				mg/kg*				UM							
Mercury as Hg				ICPMSS				0.5				mg/kg*				UM							
Nickel as Ni				ICPMSS				2				mg/kg*				UM							
Selenium as Se				ICPMSS				0.5				mg/kg*				UM							
Total Chromium as Cr				ICPMSS				1.2				mg/kg*				UM							
Zinc as Zn				ICPMSS				16				mg/kg*				UM							
Water Soluble Sulphate as SO4 by Mass				ICPMSS				20				mg/kg*				UM							
Arsenic as As				ICPMSSW (Dissolved)				0.001				mg/l				U							
Cadmium as Cd				ICPMSSW (Dissolved)				0.00002				mg/l				U							
Total Chromium as Cr				ICPMSSW (Dissolved)				0.001				mg/l				U							
Copper as Cu				ICPMSSW (Dissolved)				0.001				mg/l				U							



Client: GeoEnviro Solutions Ltd
Project Name: Woodhead Road, Honley
Project No: 21101609
Date Issued: 03/11/2021



Analysis Results

Sample ID	Customer ID							
	WS01-0-ES-0.40							
	001		002		003		004	
	WS01-0-ES-0.40		WS02-0-ES-0.30		WS03-0-ES-0.30		WS04-0-ES-0.80	
Sample Type								
SOLID								
19/10/2021								
19/10/2021								
19/10/2021								
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Client: GeoEnviro Solutions Ltd
 Project Name: Woodhead Road, Honley
 Project No: 21101609
 Date Issued: 03/11/2021



Analysis Results

Sample ID				Customer ID				Sample Type				Sampling Date			
Analysis				Method Code				MDL				Units			
Lead as Pb				ICPMSW (Dissolved)				0.001				mg/l			U
Mercury as Hg				ICPMSW (Dissolved)				0.00003				mg/l			U
Nickel as Ni				ICPMSW (Dissolved)				0.001				mg/l			U
Selenium as Se				ICPMSW (Dissolved)				0.001				mg/l			U
Zinc as Zn				ICPMSW (Dissolved)				0.002				mg/l			U
Barium as Ba				ICPWATYAR (Dissolved)				0.01				mg/l			U
Beryllium as Be				ICPWATYAR (Dissolved)				0.01				mg/l			N
Boron as B				ICPWATYAR (Dissolved)				0.01				mg/l			U
Total Sulphur as SO ₄				ICPWATYAR (Dissolved)				3				mg/l			U
Total Hardness as CaCO ₃				ICPWATYAR (Dissolved)				8.6				mg/l			U
MTBE				BTEXHSA				20				µg/kg ^a			U
MTBE				BTEXHSA				10				µg/l			U
Benzene HS_10_AR				BTEXHSA				10				µg/kg ^a			UM
Ethylbenzene HS_10_AR				BTEXHSA				10				µg/kg ^a			UM
m,p-Xylene HS_10_AR				BTEXHSA				20				µg/kg ^a			UM
o-Xylene HS_10_AR				BTEXHSA				10				µg/kg ^a			UM
Toluene HS_10_AR				BTEXHSA				10				µg/kg ^a			UM
Benzene HS_10_AR				BTEXHSA				5				µg/l			U
Ethylbenzene HS_10_AR				BTEXHSA				5				µg/l			U



Client: GeoEnviro Solutions Ltd
Project Name: Woodhead Road, Honley
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Analysis Results

Analysis	Method Code	MDL	Units	Sample ID			
				Customer ID			
				Sample Type			
				Sampling Date			
				001	002	003	004
m,p-Xylene HS 10_AR	BTEXHSA	10	µg/l	U	WS02-0-ES-0.30	WS03-0-ES-0.30	WS04-0-ES-0.80
o-Xylene HS 10_AR	BTEXHSA	5	µg/l	U			
Toluene HS 10_AR	BTEXHSA	5	µg/l	U			
Acenaphthene	PAHMSUS	0.08	mg/kg*	0.25	0.32	0.16	0.25
Acenaphthylene	PAHMSUS	0.08	mg/kg*	0.12* a	0.18* a	0.20* a	<0.09* a
Anthracene	PAHMSUS	0.08	mg/kg*	0.75	0.88	0.62	0.63
Benzo[a]anthracene	PAHMSUS	0.08	mg/kg*	1.82	2.97	1.94	1.51
Benzo[b]pyrene	PAHMSUS	0.08	mg/kg*	2.48	4.01	2.47	1.63
Benzo[k]fluoranthene	PAHMSUS	0.08	mg/kg*	2.57	4.24	2.59	1.74
Benzo[a,h]perylene	PAHMSUS	0.08	mg/kg*	1.18	2.22	1.32	0.71
Benzo[e]fluoranthene	PAHMSUS	0.08	mg/kg*	1.04	1.62	1.05	0.76
Chrysene	PAHMSUS	0.08	mg/kg*	1.96	3.12	2.06	1.72
Dibenz[a,h]anthracene	PAHMSUS	0.08	mg/kg*	0.29	0.52	0.31	0.19
Fluoranthene	PAHMSUS	0.08	mg/kg*	3.99	5.68	3.96	3.69
Fluorene	PAHMSUS	0.08	mg/kg*	0.16	0.22	0.17	0.20
Indeno[1,2,3-cd]pyrene	PAHMSUS	0.08	mg/kg*	1.32	2.34	1.37	0.80
Naphthalene	PAHMSUS	0.08	mg/kg*	0.21	0.22	0.12	0.13
Phenanthrene	PAHMSUS	0.08	mg/kg*	1.94	2.43	1.57	2.16
Pyrene	PAHMSUS	0.08	mg/kg*	3.68	5.35	3.67	3.15

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Client: GeoEnviro Solutions Ltd
 Project Name: Woodhead Road, Honley
 Project No: 21101609
 Date Issued: 03/11/2021



Analysis Results

Analysis		Method Code	MDL	Units	Accred.	Sample ID
m,p-Xylene HS_10_AR		BTEXISA	10	µg/l	U	
o-Xylene HS_10_AR		BTEXISA	5	µg/l	U	
Toluene HS_10_AR		BTEXISA	5	µg/l	U	
Acenaphthene		PAHMSUS	0.08	mg/kg*	UM	
Acenaphthylene		PAHMSUS	0.08	mg/kg*	U	
Anthracene		PAHMSUS	0.08	mg/kg*	U	
Benzo[a]anthracene		PAHMSUS	0.08	mg/kg*	UM	
Benzo[a]pyrene		PAHMSUS	0.08	mg/kg*	UM	
Benzo[b]fluoranthene		PAHMSUS	0.08	mg/kg*	UM	
Benzo[k]fluoranthene		PAHMSUS	0.08	mg/kg*	UM	
Chrysene		PAHMSUS	0.08	mg/kg*	UM	
Dibenz[a,h]anthracene		PAHMSUS	0.08	mg/kg*	UM	
Fluoranthene		PAHMSUS	0.08	mg/kg*	UM	
Fluorene		PAHMSUS	0.08	mg/kg*	UM	
Indeno[1,2,3-cd]pyrene		PAHMSUS	0.08	mg/kg*	UM	
Naphthalene		PAHMSUS	0.08	mg/kg*	UM	
Phenanthrene		PAHMSUS	0.08	mg/kg*	UM	
Pyrene		PAHMSUS	0.08	mg/kg*	UM	



Client: GeoEnviro Solutions Ltd
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 Date Issued: 03/11/2021



Analysis Results

Analysis	Method Code	MDL	Units	Sample ID			
				Customer ID			
				001	002	003	004
				WS01-0-ES-0.40	WS02-0-ES-0.30	WS03-0-ES-0.30	WS04-0-ES-0.80
Sample Type				SOLID	SOLID	SOLID	SOLID
Sampling Date				19/10/2021	19/10/2021	19/10/2021	19/10/2021
Accred.							
Total PAH 16	PAHMSUS	1.28	mg/kg*	23.8	36.3	23.6	19.4
Acenaphthene	PAHMSW	0.01	µg/l				
Acenaphthylene	PAHMSW	0.01	µg/l				
Anthracene	PAHMSW	0.01	µg/l				
Benzo[a]anthracene	PAHMSW	0.01	µg/l				
Benzo[a]pyrene	PAHMSW	0.01	µg/l				
Benzo[b]fluoranthene	PAHMSW	0.01	µg/l				
Benzo[g,h,i]perylene	PAHMSW	0.01	µg/l				
Benzo[k]fluoranthene	PAHMSW	0.01	µg/l				
Chrysene	PAHMSW	0.01	µg/l				
Dibenz[a,h]anthracene	PAHMSW	0.01	µg/l				
Fluoranthene	PAHMSW	0.01	µg/l				
Fluorene	PAHMSW	0.01	µg/l				
Indeno[1,2,3-cd]pyrene	PAHMSW	0.01	µg/l				
Naphthalene	PAHMSW	0.01	µg/l				
Phenanthrene	PAHMSW	0.01	µg/l				
Pyrene	PAHMSW	0.01	µg/l				
Total PAH 16	PAHMSW	0.16	µg/l				
>C10-C12 (Aliphatic) B1, C1, 10, AL	TPHFIDUS (Aliphatic)	4	mg/kg*	<4.55	<4.73	<4.71	<4.73



Client: GeoEnviro Solutions Ltd
 Project Name: Woodhead Road, Honley
 Project No: 21101609
 Date Issued: 03/11/2021



Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID
Total PAH 16	PAHMSUS	1.28	mg/kg ⁺	U	Customer ID
Acenaphthene	PAHMSW	0.01	µg/l	U	Sample Type
Acenaphthylene	PAHMSW	0.01	µg/l	U	Sampling Date
Anthracene	PAHMSW	0.01	µg/l	U	
Benzo[a]anthracene	PAHMSW	0.01	µg/l	U	
Benzo[a]pyrene	PAHMSW	0.01	µg/l	U	
Benzo[b]fluoranthene	PAHMSW	0.01	µg/l	U	
Benzo[k]fluoranthene	PAHMSW	0.01	µg/l	U	
Chrysene	PAHMSW	0.01	µg/l	U	
Dibenz[a,h]anthracene	PAHMSW	0.01	µg/l	U	
Fluoranthene	PAHMSW	0.01	µg/l	U	
Fluorene	PAHMSW	0.01	µg/l	U	
Indene[1,2,3-cd]pyrene	PAHMSW	0.01	µg/l	U	
Naphthalene	PAHMSW	0.01	µg/l	U	
Phenanthrene	PAHMSW	0.01	µg/l	U	
Pyrene	PAHMSW	0.01	µg/l	U	
Total PAH 16	PAHMSW	0.16	µg/l	U	
>C10-C12 (Aliphatic) Et ₄ Cu ₁₀ AL	TPHFIDUS (Aliphatic)	4	mg/kg ⁺	U	



Client: GeoEnviro Solutions Ltd
Project Name: Woodhead Road, Honley
Project No: 21101609
Date Issued: 03/11/2021



Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID			
					Customer ID			
					Sample Type			
					Sampling Date			
>C12-C16 (Aliphatic) BH, CU, 10, AL	TPHFIDUS (Aliphatic)	4	mg/kg*	U	001 WS01-0-ES-0.40	002 WS02-0-ES-0.30	003 WS03-0-ES-0.30	004 WS04-0-ES-0.80
>C16-C21 (Aliphatic) BH, CU, 10, AL	TPHFIDUS (Aliphatic)	4	mg/kg*	U	SOLID 19/10/2021	SOLID 19/10/2021	SOLID 19/10/2021	SOLID 19/10/2021
>C21-C26 (Aliphatic) BH, CU, 10, AL	TPHFIDUS (Aliphatic)	10	mg/kg*	U				
>C35-C41 (Aliphatic) BH, CU, 10, AL	TPHFIDUS (Aliphatic)	6	mg/kg*	N				
Total TPH >C8-C40 (Aliphatic) BH, CU, 10, AL	TPHFIDUS (Aliphatic)	20	mg/kg*	U				
>C10-C12 (Aliphatic) BH, CU, 10, AL	TPHFID (Aliphatic)	0.01	mg/l	U				
>C12-C16 (Aliphatic) BH, CU, 10, AL	TPHFID (Aliphatic)	0.01	mg/l	U				
>C16-C21 (Aliphatic) BH, CU, 10, AL	TPHFID (Aliphatic)	0.01	mg/l	U				
>C21-C26 (Aliphatic) BH, CU, 10, AL	TPHFID (Aliphatic)	0.01	mg/l	U				
>C35-C41 (Aliphatic) BH, CU, 10, AL	TPHFID (Aliphatic)	0.01	mg/l	N				
Total TPH >C8-C40 (Aliphatic) BH, CU, 10, AL	TPHFID (Aliphatic)	0.01	mg/l	U				
>C10-C12 (Aromatic) BH, CU, 10, AR	TPHFIDUS (Aromatic)	4	mg/kg*	U				
>C12-C16 (Aromatic) BH, CU, 10, AR	TPHFIDUS (Aromatic)	4	mg/kg*	U				
>C16-C21 (Aromatic) BH, CU, 10, AR	TPHFIDUS (Aromatic)	4	mg/kg*	U				
>C21-C26 (Aromatic) BH, CU, 10, AR	TPHFIDUS (Aromatic)	10	mg/kg*	U				
>C35-C41 (Aromatic) BH, CU, 10, AR	TPHFIDUS (Aromatic)	6	mg/kg*	N				
Total TPH >C8-C40 (Aromatic) BH, CU, 10, AR	TPHFIDUS (Aromatic)	20	mg/kg*	U				
>C10-C12 (Aromatic) BH, CU, 10, AR	TPHFID (Aromatic)	0.01	mg/l	U				
>C12-C16 (Aromatic) BH, CU, 10, AR	TPHFID (Aromatic)	0.01	mg/l	U				



Client: GeoEnviro Solutions Ltd
 Project Name: Woodhead Road, Honley
 Project No: 21101609
 Date Issued: 03/11/2021



Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID
>C12-C18 (Aliphatic) EH, CU, TO, AL	TPHFIDUS (Aliphatic)	4	mg/kg ^a	U	Customer ID
>C16-C21 (Aliphatic) EH, CU, TO, AL	TPHFIDUS (Aliphatic)	4	mg/kg ^a	U	Sample Type
>C21-C35 (Aliphatic) EH, CU, TO, AL	TPHFIDUS (Aliphatic)	10	mg/kg ^a	U	Sampling Date
>C35-C44 (Aliphatic) EH, CU, TO, AL	TPHFIDUS (Aliphatic)	6	mg/kg ^a	N	
Total TPH >C8-C40 (Aliphatic) EH, CU, TO, AL	TPHFIDUS (Aliphatic)	20	mg/kg ^a	U	
>C10-C12 (Aliphatic) EH, CU, TO, AL	TPHFID (Aliphatic)	0.01	mg/l	U	
>C12-C16 (Aliphatic) EH, CU, TO, AL	TPHFID (Aliphatic)	0.01	mg/l	U	
>C16-C21 (Aliphatic) EH, CU, TO, AL	TPHFID (Aliphatic)	0.01	mg/l	U	
>C21-C35 (Aliphatic) EH, CU, TO, AL	TPHFID (Aliphatic)	0.01	mg/l	U	
>C35-C44 (Aliphatic) EH, CU, TO, AL	TPHFID (Aliphatic)	0.01	mg/l	N	
Total TPH >C8-C40 (Aliphatic) EH, CU, TO, AL	TPHFID (Aliphatic)	0.01	mg/l	U	
>C10-C12 (Aromatic) EH, CU, TO, AR	TPHFIDUS (Aromatic)	4	mg/kg ^a	U	
>C12-C16 (Aromatic) EH, CU, TO, AR	TPHFIDUS (Aromatic)	4	mg/kg ^a	U	
>C16-C21 (Aromatic) EH, CU, TO, AR	TPHFIDUS (Aromatic)	4	mg/kg ^a	U	
>C21-C35 (Aromatic) EH, CU, TO, AR	TPHFIDUS (Aromatic)	10	mg/kg ^a	U	
>C35-C44 (Aromatic) EH, CU, TO, AR	TPHFIDUS (Aromatic)	6	mg/kg ^a	N	
Total TPH >C8-C40 (Aromatic) EH, CU, TO, AR	TPHFIDUS (Aromatic)	20	mg/kg ^a	U	
>C10-C12 (Aromatic) EH, CU, TO, AR	TPHFID (Aromatic)	0.01	mg/l	U	
>C12-C16 (Aromatic) EH, CU, TO, AR	TPHFID (Aromatic)	0.01	mg/l	U	



Client: GeoEnviro Solutions Ltd
Project Name: Woodhead Road, Honley
Project No: 21101609
Date Issued: 03/11/2021



Analysis Results

Analysis	Sample ID							
	Customer ID				Sample ID			
	Sample Type				Sample Type			
	Sampling Date				Sampling Date			
Method Code	MDL	Units		Accred.	001	002	003	004
		mg/l	U					
>C16-C21 (Automatic) BH, CU, 10 JA	TPHFID (Automatic)	0.01	mg/l	U				
>C21-C35 (Automatic) BH, CU, 10 JA	TPHFID (Automatic)	0.01	mg/l	U				
>C36-C44 (Automatic) BH, CU, 10 JA	TPHFID (Automatic)	0.01	mg/l	N				
Total TPH >C8-C40 (Automatic) BH, CU, 10 JA	TPHFID (Automatic)	0.01	mg/l	U				
Total Moisture at 105°C	TMSS	0.1	%	U	12.1	15.4	15.1	15.5
Total Moisture at 35°C	CLANDPREP	0.1	%	N	6.1	9.7	7.9	13.5
Colour of Material	CLANDPREP		-	N	Brown/Grey	Brown/Grey	Brown/Grey	Brown/Grey
Major Constituents	CLANDPREP		-	N	MADE GROUND	MADE GROUND	SILT	CLAY
Minor Constituents	CLANDPREP		-	N	None	None	Clay	Silt
Miscellaneous Constituents	CLANDPREP		-	N	na	na	Sandstone	Sandstone
Asbestos Identification	SUB020		-	N	NAIS	CR	NAIS	NAIS



Client: GeoEnviro Solutions Ltd
 Project Name: Woodhead Road, Honley
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 Date Issued: 03/11/2021



Analysis Results

Sample ID		Customer ID		Sample Type		Sampling Date		Units		Accred.	
Analysis		Method Code		MDL		Units		Accred.			
>C16-C21 (Aromatic) En_Cu_to_AR		TPHFID (Aromatic)		0.01		mg/l		U			
>C21-C35 (Aromatic) En_Cu_to_AR		TPHFID (Aromatic)		0.01		mg/l		U			
>C36-C41 (Aromatic) En_Cu_to_AR		TPHFID (Aromatic)		0.01		mg/l		N			
Total TPH >C8-C40 (Aromatic) En_Cu_to_AR		TPHFID (Aromatic)		0.01		mg/l		U			
Total Moisture at 105°C		TMSS		0.1		%		U			
Total Moisture at 35°C		CLANDPREP		0.1		%		N			
Colour of Material		CLANDPREP				-		N			
Major Constituents		CLANDPREP				-		N			
Minor Constituents		CLANDPREP				-		N			
Miscellaneous Constituents		CLANDPREP				-		N			
Asbestos Identification		SUB020				-		N			



CERTIFICATE OF ANALYSIS

ANALYSIS REQUESTED BY: SOCOTEC UK Ltd
Environmental Chemistry
PO Box 100
Burton upon Trent
Staffordshire
DE15 0XD

CONTRACT NO: S21638-1

DATE OF ISSUE: 03.11.21

DATE SAMPLES RECEIVED: 27.10.21

DATE ANALYSIS COMPLETED: 03.11.21

DESCRIPTION: Seven soil/loose aggregate samples.

ANALYSIS REQUESTED: Qualitative analysis of samples for determination of presence/type of asbestos.

METHODS:

Our method involves initial examination of the samples followed by detailed analysis of representative sub-samples. The sub-samples are analysed qualitatively for asbestos by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248.

RESULTS:

Initial Screening

Asbestos was detected in one of the soil samples by stereo-binocular and polarised light microscopy.

A summary of the results is given in Table 1.

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IOM CONSULTING LIMITED registered in Scotland No. SC205670

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CONTRACT NO: S21638-1
DATE OF ISSUE: 03.11.21

RESULTS: (cont.)

Table 1: Qualitative Results

SOCOTEC Job I.D: 21101609

IOM sample number	SOCOTEC Sample ID	Client Sample ID	ACM type detected	PLM result
S85757	21101609-001-12	WS01-0-ES-0.40	-	No Asbestos Detected
S85758	21101609-002-12	WS02-0-ES-0.30	Loose Insulation ²	Crocidolite
S85759	21101609-003-12	WS03-0-ES-0.30	-	No Asbestos Detected
S85760	21101609-004-12	WS04-0-ES-0.80	-	No Asbestos Detected
S85761	21101609-005-12	HP01-0-ES-0.30	-	No Asbestos Detected
S85762	21101609-006-12	HP02-0-ES-0.40	-	No Asbestos Detected
S85763	21101609-007-12	HP03-0-ES-0.30	-	No Asbestos Detected

Our detection limit for this method is 0.001%.

COMMENTS:

¹ ACM was visible during initial examination of the sample.

² ACM was detected during microscopic examination of the sample.

IOM Consulting cannot accept responsibility for samples that have been incorrectly collected or despatched by external clients.

Any opinions and interpretations expressed herein are out with the scope of our UKAS accreditation.

AUTHORISED BY:
K Parsons-Hewes
 Senior Scientific Technician



Client: GeoEnviro Solutions Ltd
 Project Name: Woodhead Road, Honley
 Project No: 21101609
 Date Issued: 03/11/2021

<u>Deviating Sample Report</u>			Incorrect Container	Incorrect Label	Headspace	Incorrect/No Preservative	No Sampling Date	Holding Time
Sample Reference	Text ID	Reported Name						

Analysis Method

<u>Analysis</u>	<u>Analysis Type</u>	<u>Analysis Method</u>
BTEXHSA	ORGANIC	Unfiltered
CLANDPREP	PHYS	As Received
GROHSA	ORGANIC	As Received
GROHSA/BTEXHSA	ORGANIC	As Received
ICPMSS	METALS	Air Dried & Ground
ICPMSW (Dissolved)	METALS	Unfiltered
ICPWATVAR (Dissolved)	METALS	Filtered
ICPWSS	METALS	Air Dried & Ground
KONENS	INORGANIC	Air Dried & Ground
PAHMSUS	ORGANIC	As Received
PAHMSW	ORGANIC	Unfiltered
PHCONDW	INORGANIC	Unfiltered
PHSOIL	INORGANIC	As Received
SFAPI	INORGANIC	As Received
SUB020	SUBCON	
TMSS	PHYS	As Received
TPHFID (Aliphatic)	ORGANIC	Unfiltered
TPHFID (Aromatic)	ORGANIC	Unfiltered
TPHFIDUS (Aliphatic)	ORGANIC	As Received
TPHFIDUS (Aromatic)	ORGANIC	As Received
WSLM13	INORGANIC	Unfiltered
WSLM59	INORGANIC	Air Dried & Ground



Client: GeoEnviro Solutions Ltd
 Project Name: Woodhead Road, Honley
 Project No: 21101609
 Date Issued: 03/11/2021

Result Report Notes

Letters alongside results signify that the result has associated report notes.
 The report notes are as follows:

<u>Letter</u>	<u>Note</u>
A	Due to the matrix of the sample the laboratory has had to deviate from our standard protocols to be able to process the sample and provide a result. Where applicable the accreditation has been removed and this should be taken into consideration when utilising the data.
B	The QC associated with this result has not wholly met the QMS requirements, the accreditation has therefore been removed. However, the Laboratory has confidence in the performance of the method as a whole and that the integrity of the data has not been significantly compromised.
C	Due to matrix interference the internal standard and/or surrogate has not met the QMS requirements. This should be taken into consideration when utilising the data.
D	A non-standard volume or mass has been used for this test which has resulted in a raised detection limit.
E	Due to recoveries beyond our calibration range and following the maximum size of dilution allowed, the result cannot be quantified and as such the result will appear as a greater than symbol (>) with the accreditation removed. This data should be used for indicative purposes only.
F	Based on the sample history, appearance and smell a dilution was applied prior to testing. Unfortunately, the result is either above (>) or below (<) our calibration range. Results above our calibration range have accreditation removed. The data should be used for indicative purposes only.
G	The day 5 oxygen reading was below the capability of the instrument to detect, and therefore the calculated BOD has been reported unaccredited for guidance purposes only.

HWOL Acronym Key

<u>Acronym</u>	<u>Description</u>
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e everything extracted by the solvent(s)
CU	Clean up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
+	Operator to indicate cumulative e.g. EH_CU+HS_1D_Total



Client: GeoEnviro Solutions Ltd
Project Name: Woodhead Road, Honley
Project No: 21101609
Date Issued: 03/11/2021

Additional Information

This report refers to samples as received, and SOCOTEC UK Ltd takes no responsibility for accuracy or competence of sampling by others.

Results within this report relate only to the samples tested.

In the accreditation column of analysis report the codes are as follows:

U = UKAS accredited analysis
M = MCERT accredited analysis
N = Unaccredited analysis

Any units marked with ^ signify results are reported on a dry weight basis of 105° c.

All Air Dried and Ground Samples (ADG) are oven dried at less than 35° c.

This report shall not be reproduced except in full and with approval from the laboratory.

Opinions and interpretations given are outside the scope of our UKAS accreditation.

Any samples marked with * are not covered by our scope of UKAS accreditation. If applicable, further report notes have been added.

Any solid samples where the Major Constituents are not one of the following (Sand, Silt, Clay, Made Ground) are not one of our accredited matrix types.

Any samples marked with ‡ have had MCERTS accreditation removed for this result

Any samples marked with a tick in the deviant table is deviant for the specific reason.

Any samples reported as IS, NA, ND mean the following:

IS = Insufficient Sample to complete analysis
NA = Sample is not amenable for the required analysis
ND = Results cannot be determined

Our deviating sample report does not include deviancy information for Subcontracted analysis. Please see the report from the Subcontracted lab for information regarding any deviancies for this analysis.

End of Certificate of Analysis

APPENDIX 4

CHEMICAL SCREENING CRITERIA

Parameter	Residential with homegrown produce (mg/kg, unless otherwise stated)			Residential without homegrown produce (mg/kg, unless otherwise stated)			Allotment (mg/kg, unless otherwise stated)			Commercial / Industrial (mg/kg, unless otherwise stated)			Public Open Space near Residential (mg/kg, unless otherwise stated)			Public Open Space - Park (mg/kg, unless otherwise stated)			Source
	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
SOM																			
Metals/metalloids																			
Arsenic	37			40			43			640			79			170			LQM (2014)
Beryllium	1.7			1.7			35			12			2.2			63			LQM (2014)
Boron	290			11000			45			240000			21000			46000			LQM (2014)
Cadmium	11			85			1.9			190			120			532			LQM (2014)
Chromium III	910			910			18000			8600			1500			33000			LQM (2014)
Chromium VI	6			6			1.8			33			7.7			220			LQM (2014)
Copper	2400			7100			520			68000			12000			44000			LQM (2014)
Lead	200			310			80			2330			630			1300			C4SL
Mercury (elemental)	1.2			1.2			21			58 (25.8)			16			30 (25.8)			LQM (2014)
Mercury (inorganic)	40			56			19			1100			120			240			LQM (2014)
Methylmercury	11			15			6			320			40			68			LQM (2014)
Nickel	180			180			230			980			230			3400			LQM (2014)
Selenium	250			430			88			12000			1100			1800			LQM (2014)
Vanadium	410			1200			91			9000			2000			5000			LQM (2014)
Zinc	3700			40000			620			730000			81000			170000			LQM (2014)
Other																			
Total Sulphate	2,400			2,400			2,400			2,400			2,400			2,400			BRE (2005)
Water Soluble Sulphate (g/l)	0.5			0.5			0.5			0.5			0.5			0.5			BRE (2005)

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	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
SOM																			
PAHs																			
Acenaphthene	210	510	1100	3000 (57)	4700(141)	6000 (336)	34	85	200	84000 (57)	97000 (141)	100000	15000	15000	15000	29000	30000	30000	LQM (2014)
Acenaphthylene	170	420	920	2900 (86.1)	4600 (212)	6000 (506)	28	69	160	8300 (86.1)	97000 (212)	100000	15000	15000	15000	29000	30000	30000	LQM (2014)
Anthracene	2400	5400	11000	31000 (1.17)	35000	37000	380	950	2200	520000	540000	540000	74000	74000	74000	150000	150000	150000	LQM (2014)
Benzo(a)anthracene	7.2	11	13	11	14	15	2.9	6.5	13	170	170	180	29	29	29	49	56	62	LQM (2014)
Benzo(a)pyrene	2.2	2.7	3	3.2	3.2	3.2	0.97	2	3.5	35	35	36	5.7	5.7	5.7	11	12	13	LQM (2014)
Benzo(b)fluoranthene	2.6	3.3	3.7	3.9	4	4	0.99	2.1	3.9	44	44	45	7.1	7.1	7.1	13	15	16	LQM (2014)
Benzo(g,h,i)perylene	320	340	350	360	360	360	290	470	640	3900	4000	4000	640	640	640	1400	1500	1600	LQM (2014)
Benzo(k)fluoranthene	77	93	100	110	110	110	37	75	130	1200	1200	1200	190	190	190	370	410	440	LQM (2014)
Chrysene	15	22	27	30	31	32	4.1	9.4	19	350	350	350	57	57	57	93	110	120	LQM (2014)
Dibenz(a,h)anthracene	0.24	0.28	0.3	0.31	0.32	0.32	0.14	0.27	0.61	3.5	3.6	3.6	0.57	0.57	0.58	1.1	1.3	1.4	LQM (2014)
Fluoranthene	280	560	890	1500	1600	1600	52	130	290	23000	23000	23000	3100	3100	3100	63	6300	6400	LQM (2014)
Fluorene	170	400	860	2800 (30.9)	3800 (76.5)	4500 (183)	27	67	160	63000 (30.9)	68000	71000	9900	9900	9900	20000	20000	20000	LQM (2014)
Indeno(1,2,3-cd)pyrene	27	36	41	45	46	46	9.5	21	39	500	510	510	82	82	82	150	170	180	LQM (2014)

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	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
SOM																			
Naphthalene	2.3	5.6	13	2.3	5.6	13	4.1	10	24	190 (76.4)	460 (183)	1100 (432)	4900	4900	4900	1200 (76.4)	1900 (183)	3000	LQM (2014)
Phenanthrene	95	220	440	1300 (36)	1500	1500	15	38	90	22000	22000	23000	3100	3100	3100	6200	6200	6300	LQM (2014)
Pyrene	620	1200	2000	3700	3800	3800	110	270	620	54000	54000	54000	7400	7400	7400	15000	15000	15000	LQM (2014)
Coal Tar (BaP as surrogate marker)	0.79	0.98	1.1	1.2	1.2	1.2	0.32	0.67	1.2	15	15	15	2.2	2.2	2.2	4.4	4.7	4.8	LQM (2014)
BTEX and TPH																			
Benzene	0.087	0.17	0.37	0.38	0.7	1.4	0.017	0.034	0.075	27	47	90	72	72	73	90	100	110	LQM (2014)
Toluene	130	290	660	880 vap (869)	1900	3900	22	51	120	56000 (869)	110000 (1920)	180000 (4360)	56000	56000	56000	87000 (869)	95000 (1920)	100000 (4360)	LQM (2014)
Ethylbenzene	47	110	260	83	190	440	16	39	91	5700 (518)	13000 (1220)	27000 (2840)	24000	24000	25000	17000 (518)	22000 (1220)	27000 (2840)	LQM (2014)
Xylene - o	60	140	330	88	210	480	28	67	160	6600 (478)	15000 (1120)	33000 (2820)	41000	42000	43000	17000 (478)	24000 (1120)	33000 (2820)	LQM (2014)
Xylene - m	59	140	320	82	190	450	31	74	170	6200 (625)	14000 (1470)	31000 (3460)	41000	42000	43000	17000 (625)	24000 (1470)	32000 (3460)	LQM (2014)
Xylene - p	56	130	310	79	180	430	29	69	160	5900 (576)	14000 (1350)	30000 (3170)	41000	42000	43000	17000 (576)	23000 (1350)	31000 (3170)	LQM (2014)
Aliphatic EC 5-6	42	78	160	42	78	160	730	1700	3900	3200 (304)	5900 (558)	12000 (1150)	570000 (304)	590000	600000	95000 (304)	130000 (558)	180000 (1150)	LQM (2014)
Aliphatic EC >6-8	100	230	530	100	230	530	2300	5600	13000	7800 (144)	17000 (322)	40000 (736)	600000	610000	620000	150000 (144)	220000 (322)	320000 (736)	LQM (2014)

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	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
SOM																			
Aliphatic EC >8-10	27	65	150	27	65	150	320	770	1700	2000	4800	11000	13000	13000	13000	14000	18000	21000	LQM (2014)
Aliphatic EC >10-12	130	330	760	130	330	760	2200	4400	7300	9700	23000	47000	13000	13000	13000	21000	23000	24000/283	LQM (2014)
Aliphatic EC >12-16	1100	2400	4300	1100	2400	4300	11000	13000	13000	59000	82000	90000	13000	13000	13000	25000	25000	26000	LQM (2014)
Aliphatic EC >16-35	65000	92000	110000	65000	92000	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000	LQM (2014)
Aliphatic EC >35-44	65000	92000	110000	65000	92000	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000	LQM (2014)
Aromatic EC 5-7	70	140	300	370	690	1400	13	27	57	26000	46000	86000	56000	56000	56000	76000	84000	92000	LQM (2014)
Aromatic EC >7-8	130	290	660	860	1800	3900	22	51	120	56000	110000	180000	56000	56000	56000	87000	95000	100000	LQM (2014)
Aromatic EC >8-10	34	83	190	47	110	270	8.6	21	51	3500	8100	17000	5000	5000	5000	7200	8500	9300	LQM (2014)
Aromatic EC >10-12	74	180	380	250	590	1200	13	31	74	16000	28000	34000	5000	5000	5000	9200	9700	10000	LQM (2014)
Aromatic EC >12-16	140	330	660	1800	2300	419	23	27	130	36000	37000	38000	5100	5100	5000	10000	10000	10000	LQM (2014)
Aromatic EC >16-21	260	540	930	1900	1900	1900	46	110	260	28000	28000	28000	3800	3800	3800	7600	7700	7800	LQM (2014)
Aromatic EC >21-35	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	LQM (2014)

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	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
SOM																			
Aromatic EC >35-44	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	LQM (2014)
Aromatic EC >44-75	1600	1800	1900	1900	1900	1900	1200	2100	3000	28000	28000	28000	3800	3800	3800	7800	7800	7900	LQM (2014)
VOCs																			
1,2-dichloroethane (1,2-DCA)	0.0071	0.011	0.019	0.0092	0.013	0.023	0.0046	0.0083	0.016	0.67	0.97	1.7	29	29	29	21	24	28	LQM (2014)
1,1,1-trichloroethane	8.8	18	39	9	18	40	48	110	240	660	1300	3000	140000	140000	140000	57000 (1425)	76000 (2915)	100000 (6392)	LQM (2014)
1,1,2,2-tetrachloroethane	1.6	3.4	7.5	3.9	8	17	0.41	0.89	2	270	550	1100	1400	1400	1400	1800	2100	2300	LQM (2014)
tetrachloroethene	0.18	0.39	0.9	0.18	0.4	0.92	0.65	1.5	3.6	19	45	95	1400	1400	1400	810 (424)	1100 (951)	1500	LQM (2014)
tetrachloromethane (Carbon tetrachloride)	0.026	0.056	0.13	0.026	0.056	0.13	0.45	1	2.4	2.9	6.3	14	890	920	950	190	270	400	LQM (2014)
Trichloroethene	0.016	0.034	0.075	0.017	0.036	0.08	0.041	0.091	0.21	1.2	2.6	5.7	120	120	120	70	91	120	LQM (2014)
Trichloromethane (chloroform)	0.91	1.7	3.4	1.2	2.1	4.2	0.42	0.83	1.7	99	170	350	2500	2500	2500	2600	2800	3100	LQM (2014)
Chloroethene (Vinyl chloride)	0.00064	0.00087	0.0014	0.00077	0.001	0.0015	0.00055	0.001	0.0018	0.059	0.077	0.12	3.5	3.5	3.5	4.8	5	5.4	LQM (2014)
2,4,6-Trinitrotoluene (TNT)	1.6	3.7	8.1	65	66	66	0.24	0.58	1.4	1000	1000	1000	130	130	130	260	270	270	LQM (2014)

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	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
SOM																			
RDX	120	250	540	13000	13000	13000	17	38	85	210000	210000	210000	26000	26000	27000	49000 (18.7)	51000	53000	LQM (2014)
HMX	5.7	13	26	6700	6700	6700	0.86	1.9	3.9	110000	110000	110000	13000	13000	13000	23000 (0.35)	23000 (0.39)	24000 (0.48)	LQM (2014)
Aldrin	5.7	6.6	7.1	7.3	7.4	7.5	3.2	6.1	9.6	170	170	170	18	18	18	30	31	31	LQM (2014)
Dieldrin	0.97	2	3.5	7	7.3	7.4	0.17	0.41	0.96	170	170	170	18	18	18	30	30	31	LQM (2014)
Atrazine	3.3	7.6	17.4	610	620	620	0.5	1.2	2.7	9300	9400	9400	1200	1200	1200	2300	2400	2400	LQM (2014)
Dichlorvos	0.032	0.066	0.014	6.4	6.5	6.6	0.0049	0.01	0.022	140	140	140	16	16	16	26	26	27	LQM (2014)
Alpha-Endosulfan	7.4	18	41	160 (0.003)	280 (0.007)	410 (0.016)	1.2	2.9	6.8	5600 (0.003)	7400 (0.007)	8400 (0.016)	1200	1200	1200	2400	2400	2500	LQM (2014)
alpha-hexachlorocyclohexane	0.23	0.55	1.2	6.9	9.2	11	0.035	0.087	0.21	170	180	180	24	24	24	47	48	48	LQM (2014)
beta-hexachlorocyclohexanes																			
gamma-hexachlorocyclohexanes	0.06	0.14	0.33	2.9	3.3	3.5	0.0092	0.023	0.054	67	69	70	8.2	8.2	8.2	14	15	15	LQM (2014)
Chlorobenzene	0.46	1	2.4	0.46	1	2.4	5.9	14	32	56	130	290	11000	13000	14000	1300 (675)	2000 (1520)	2900	LQM (2014)
1,2-Dichlorobenzene	23	55	130	24	57	130	94	230	540	2000 (571)	4800 (1370)	11000 (3240)	90000	95000	98000	24000 (571)	36000 (1370)	51000 (3240)	LQM (2014)
1,3-Dichlorobenzene	0.4	1	2.3	0.44	1.1	2.5	0.25	0.6	1.5	30	73	170	300	300	300	390	440	470	LQM (2014)

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	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
SOM																			
1,4-Dichlorobenzene	61	150	350	61	150	350	15	37	88	4400 (224)	10000 (540)	25000 (1280)	17000	17000	17000	36000 (1224)	36000 (540)	36000 (1280)	LQM (2014)
VOCs Continued																			
1,2,3-Trichlorobenzene	1.5	3.6	8.6	1.5	3.7	8.8	4.7	12	28	102	250	590	1800	1800	1800	770 (134)	1100 (330)	1600 (789)	LQM (2014)
1,2,4-Trichlorobenzene	2.6	6.4	15	2.6	6.4	15	55	140	320	220	530	1300	15000	17000	19000	1700 (318)	2600 (786)	4000 (1880)	LQM (2014)
1,3,5-Trichlorobenzene	0.33	0.81	1.9	0.33	0.81	1.9	4.7	12	28	23	55	130	1700	1700	1800	380 (36.7)	580 (90.8)	860 (217)	LQM (2014)
1,2,3,4-Tetrachlorobenzenes	15	36	78	24	56	120	4.4	11	26	1700 (122)	3080 (304)	4400 (728)	830	830	830	1500 (122)	1600	1600	LQM (2014)
1,2,3,5-Tetrachlorobenzenes	0.66	1.6	3.7	0.75	1.9	4.3	0.38	0.9	2.2	49 (39.4)	120 (98.1)	240 (235)	78	79	79	110 (39)	120	130	LQM (2014)
1,2,4,5-Tetrachlorobenzenes	0.33	0.77	1.6	0.73	1.7	3.5	0.06	0.16	0.37	42 (19.7)	72 (49.1)	96	13	13	13	25	26	26	LQM (2014)
Pentachlorobenzenes	5.8	12	22	19	30	38	1.2	3.1	7	640 (43)	770 (107)	830	100	100	100	190	190	190	LQM (2014)
Hexachlorobenzenes	1.8 (0.2)	3.3 (0.5)	4.9	4.1 (0.2)	5.7 (0.5)	6.7 (1.2)	0.47	1.1	2.5	110 (0.2)	120	120	16	16	16	30	30	30	LQM (2014)
Phenol	280	550	1100	750	1300	2300	66	140	280	760 air (31000)	1500 air (35000)	3200 air (37000)	760 air (31000)	1500 air (35000)	3200 air (37000)	760 air (31000)	1500 air (35000)	3200 air (37000)	LQM (2014)

Parameter	Residential with homegrown produce (mg/kg, unless otherwise stated)			Residential without homegrown produce (mg/kg, unless otherwise stated)			Allotment (mg/kg, unless otherwise stated)			Commercial / Industrial (mg/kg, unless otherwise stated)			Public Open Space near Residential (mg/kg, unless otherwise stated)			Public Open Space - Park (mg/kg, unless otherwise stated)			Source
	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
SOM																			
Chlorophenols (excluding pentachlorophenol)	0.87 (g)	2	4.5	94	150	210	0.13 (g)	0.3	0.7	3500	4000	4300	620	620	620	1100	1100	1100	LQM (2014)
Pentachlorophenol	0.22	0.52	1.2	27 (16.4)	29	31	0.03	0.08	0.19	400	400	400	60	60	60	110	120	120	LQM (2014)
Carbon Disulphide	0.14	0.29	0.62	0.14	0.29	0.62	4.8	10	23	11	22	47	11000	11000	12000	1300	1900	2700	LQM (2014)
Hexachlorobutadiene	0.29	0.7	1.6	0.32	0.78	1.8	0.25	0.61	1.4	31	66	120	25	25	25	48	50	51	LQM (2014)

(g) derived based on 2,3,4,6-tetrachlorophenol; dir - based on a threshold protective of direct skin contact with phenol (guideline in brackets based on health effects following long term exposure provided for illustration only); (vap) calculated for vapour phase only. SOM - Soil Organic Matter; (4.5) solubility.

APPENDIX 5

GAS AND GROUNDWATER MONITORING RESULTS



Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

JOB DETAILS:
Client: Fuel Doctor
Site: Woodhead Road Honley
Date: 17/12/2021

Job No: 1623-21
Visit No: 5 of 6
Operator:

Project Manager: 0

[illegible]

NB:

ND = not applicable
Where no flow (ND) recorded, GSVs are calculated using equipment limit of detection (0.10/hr). Where negative flows recorded, these are converted to positive values for calculation of GSVs.

METEOROLOGICAL AND SITE INFORMATION:

FOR FURTHER STUDY AND OBSERVATIONS: ☐ Dry ☐ Moist ☐ Wet ☐ (various patterns work better as an initial pattern, and approximately)

state or ground:	dry	x	twists
Wind:	Calm		Light
Cloud cover:	x		Slight
Precipitation:	None		x
Time monitoring performed:	None		Slight
Barometric pressure (mbar):			15:00 Start
Pressure trend (Daily):			1028 Start
Source:	Wunderground		Falling
Air Temperature (Deg. C):			6 Before

Ground Gas and Groundwater Monitoring Record Sheet

**JOB DETAILS:**

Client: Fuel Doctor
Site: Woodhead Road Honley
Date: 10/01/2022

Job No: 1623-21
Visit No: 6 of 6
Operator:

Project Manager: 0

[illegible]

NB:

NA = Non applicable
Where no flow (ND) recorded, GS's are calculated using equipment limit of detection (0.1 l/hr). Where negative flows recorded, these are converted to positive values for calculation of GS's.

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

	Moist	Wet	Snow	Frozen
x				

State of ground:	Dry x	Moist x
Wind:	Caln x	Light x
Cloud cover:	None	Slight x
Precipitation:		Slight x
Time monitoring performed:		08:35 Start
Barometric pressure (mbars):		1001 Start
Pressure trend (Daily):		Falling
Source:	Wunderground	
Air temperature (Des. Ct):		6 Before

APPENDIX 6

RISK ASSESSMENT MATRIX

Preliminary Risk Assessment Methodology (After NHBC Guidance for the Safe Development of Housing on Land Affected by Contamination (2008))

NHBC Guidance for the Safe Development of Housing on Land Affected by Contamination (2008) sets out a methodology for the estimation of risk.

At Phase I the risk estimation will take the form of a qualitative risk assessment, which will be entirely based on the conceptual model for each potential end-use of the site. Comments on level of uncertainty will also need to be included for each source-pathway-target linkage to allow the confidence in the assessed risks to be understood. The results of the qualitative risk assessment will allow the risk evaluation to be concisely described in the following chapters.

The methodology for risk evaluation is a qualitative method for interpreting the output for the risk estimation stage of the assessment. It involves the classification of the:

The magnitude of probability (i.e. likelihood).

[takes into account both the presence of the hazard and receptor and the integrity of the pathway]

The magnitude of the potential consequence (i.e. severity).

[takes into account both the potential severity of the hazard and the sensitivity of the receptor]

Classification of Probability

Classification	Definition	Examples
High likelihood (Hi)	There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable in the long term, or there is evidence at the receptor or harm or pollution.	<i>Elevated concentrations of toxic contaminants are present in soils in the top 0.5m in a residential garden.</i> <i>Ground/groundwater contamination could be present from chemical works, containing a number of USTs, having been in operation on the same site for over 50 years</i>
Likely (Li)	There is a pollutant 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.	<i>Elevated concentrations of toxic contaminants are present in soils at depths of 0.5-1.0m in a residential garden, or the top 0.5m in public open space.</i> <i>Ground/groundwater contamination could be present from an industrial site containing a UST present between 1970 and 1990. The tank is known to be single skin. There is no evidence of leakage although there are no records of integrity tests.</i>
Low likelihood (Lw)	There is a pollutant 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.	<i>Elevated concentrations of toxic contaminants are present in soils at depths >1m in a residential garden, or 0.5-1.0m in public open space.</i> <i>Ground/groundwater contamination could be present on a light industrial unit constructed in the 1990s containing a UST in operation over the last 10 years – the tank is double skinned but there is no integrity testing or evidence of leakage.</i>
Unlikely (Ui)	There is a pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long term.	<i>Elevated concentrations of toxic contaminants are present below hardstanding.</i> <i>Light industrial unit <10 yrs old containing a double skinned UST with annual integrity testing results available.</i>

Preliminary Risk Assessment Methodology (After NHBC Guidance for the Safe Development of Housing on Land Affected by Contamination (2008))

Classification of Consequence

	Definition	Examples
Severe (Sv)	Highly elevated concentrations likely to result in "significant harm" to human health as defined by the EPA 1990, Part 2A, if exposure occurs. A Category 1: Human Health risk is present. Equivalent to EA Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point major impact on amenity value or major damage to agriculture or commerce. Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long - term maintenance of the population. Catastrophic damage to crops, buildings or property.	<i>Significant harm to humans is defined in circular 01/2006 as death, disease*, serious injury, genetic mutation, birth defects or the impairment of reproductive functions.</i> <i>Major fish kill in surface water from large spillage of contaminants from site.</i> <i>Highly elevated concentrations of List 1 and substances present in groundwater close to small potable abstraction (high sensitivity).</i> <i>Explosion, causing building collapse (can also equate to immediate human health risk if buildings are occupied).</i>
Medium (Md)	Elevated concentrations which could result in "significant harm" to human health as defined by the EPA 1990, Part 2A if exposure occurs. A Category 2: Human Health risk is present. Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce. Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population. Significant damage to crops, buildings or property.	<i>Significant harm to humans is defined in circular 01/2006 as death, disease* serious injury, genetic mutation, birth defects or the impairment of reproductive functions.</i> <i>Damage to building rendering it unsafe to occupy e.g. foundation damage resulting in instability.</i> <i>Ingress of contaminants through plastic potable water pipes.</i>
Mild (Ml)	Exposure to human health unlikely to lead to "significant harm". A Category 3 Human Health risk is present. Equivalent to EA Category 3 pollution incident including minimal or short lived effect on water quality; marginal effect on amenity value, agriculture or commerce Minor or short lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long-term maintenance of the population Minor damage to crops, buildings or property.	<i>Exposure could lead to slight short - term effects (e.g. mild skin rash).</i> <i>Surface spalling of concrete.</i>
Minor (Mr)	No measurable effect on humans. A Category 4: Human Health risk is present. Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems. Repairable effects of damage to buildings, structures and services.	<i>The presence of contaminants at such concentrations that protective equipment is required during site works.</i> <i>The loss of plants in a landscaping scheme.</i> <i>Discolouration of concrete.</i>

* For these purposes, disease is to be taken to mean an unhealthy condition of the body or a part of it and can include, for example, cancer, liver dysfunction or extensive skin ailments. Mental dysfunction is included only insofar as it is attributable to the effects of a pollutant on the body of the person concerned.

The classification of consequence does not take into account the probability of the consequence being realized. Therefore, there may be more than one consequence for a particular pollutant linkage. Both a severe and medium classification can result in death. Severe relates to short term (acute) risk while medium relates to long

Preliminary Risk Assessment Methodology (After NHBC Guidance for the Safe Development of Housing on Land Affected by Contamination (2008))

term (chronic) risk. Mild relates to significant harm but to less sensitive receptors. Minor classification relates to harm which is not significant but could have a financial cost.

The classification gives a guide as to the severity and consequence of identified risk when compared with other risk presented on the site. It should be noted that if a risk is identified it cannot be classified as "no risk" but as "very low risk". Differing stakeholders may have a different view on the acceptability of a risk.

Risk Evaluation Matrix

		Consequence			
		Severe (Sv)	Medium (Md)	Mild (Mi)	Minor (Mr)
Probability	High likelihood (Hi)	Very high risk (VH)	High Risk (H)	Moderate Risk (M)	Mod/low risk (M/L)
	Likely (Li)	High risk (H)	Moderate risk (M)	Mod/low risk (M/L)	Low risk (L)
	Low likelihood (Lw)	Moderate risk (M)	Mod/low risk (M/L)	Low risk (L)	Very low risk (VL)
	Unlikely (Ui)	Mod/low risk (M/L)	Low risk (L)	Very low risk (VL)	Very low risk (VL)

Risk Categorizations

Very high risk (VH)	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 realized, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High risk (H)	Harm is likely to arise to a designated receptor from an identified hazard. Realization 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 longer-term.
Moderate risk (M)	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either 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 risk (L)	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realized, would at worst normally be mild.
Very low risk (VL)	There is a low possibility that harm could arise to a receptor. In the event of such harm being realized it is not likely to be severe.

Reference

Rudland, D J, Lancefield, R M, Mayell, P N; 2001; Contaminated land Risk Assessment. A guide to Good Practice; CIRIA Report C552.

The NHBC (National House-Building Council) the Environment Agency and the Chartered Institute of Environmental Health, 2008, Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66.

APPENDIX 7

KIRKLEES COUNCIL ENVIRONMENTAL HEALTH CONSULTATION RESPONSE (WK202629498)



Consultation Response from: KC Environmental Health (Pollution & Noise Control)		
2026/90952 Adjacent to, 71, Woodhead Road, Honley, Holmfirth, HD9 2RJ		
Discharge of details reserved by conditions 5, (Phase I), 6 (Phase II), 7-9 (Remediation) on previous permission 2024/92297 for erection of two detached dwellings		
Responding Date: 23/09/2026	Responding Officer: KB	Responding Ref: WK202629498
We have considered the email from GES dated 27th August 2026 in relation to the application to discharge conditions 7-9 (Remediation) of previous application 2026/90952. In our response dated 17th August 2026 (WK202621663), we acknowledged the conclusion of the submitted GES Phase II Report (GES-PII 1623-21 Issue 04) that "no site-specific remediation strategy was required", however it was also noted that the same report identified contamination and recommended measures necessary to make the site suitable for its proposed residential end use. These measures include remediation of asbestos-contaminated made ground, replacement or isolation of unsuitable made ground within soft landscaped areas, provision of a minimum 600mm clean cover system and validation of imported materials. Condition 7 requires the submission and approval of a site-specific Remediation Strategy where any remediation measures are required. This was specified in our original response dated 24th June 2026 (WK202615728). In the absence of an approved Remediation Strategy, we have no agreed framework against which the implementation of remediation works can be assessed or verified. Recommendation Environmental Health considers that there is insufficient information to demonstrate compliance with Condition 7 and we therefore recommend that the condition remains at this time.		



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APPENDIX 8

SUPPLEMENTARY INFORMATION – INVOICE FOR 2022 SPOIL REMOVAL AND SOIL IMPORT



INVOICE

BILL TO
Mr Peter Mitchell
Upper Woodroyd Barn
Holmfirth
HD9 7TE

Invoice Date: Sept 01, 2022
Invoice No: 2367

Items

Removal of spoil from site adjacent to 71 Woodhead Road, Honley and importation of clean inert soil/garden material and supply of walling stone to be backed off.

Abacus Stone Sales Ltd
Haggwood Quarry
Woodhead Road, Honley
West Yorkshire
HD9 6PW

Email: info@abacusstonesales.co.uk
Allan: 07725 810975
Shauna: 07801 667800
Chris/Quarry: 07711 957026
www.abacusstonesales.co.uk

Please make cheques payable to: Abacus Stone Sales
Bank details: Lloyds
Sort code: 30-94-43
Account no: 46504168

Abacus Stone Sales Ltd. V.A.T No. 118 2804 34.
By paying this invoice you are agreeing to our terms and conditions, a copy of which can be found on our invoice.

Goods remain the property of Abacus Stone Sales Ltd until full payment has been received. Please note that natural and reclaimed stone is subject to natural formation, characteristics and variations in colour and texture. Abacus Stone Sales Ltd are not liable for any stone imperfections whatsoever, however caused.