GEO Environmental Engineering

PHASE 3: REMEDIATION STRATEGY

PROPOSED RESIDENTIAL DEVELOPMENT

LAND ADJACENT TO BARFS ROAD

DISTINGTON

CUMBRIA

CA14 5TG

FOR

THOMAS ARMSTRONG (CONSTRUCTION) LIMITED

GEO Environmental Engineering

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DOCUMENT CONTROL SHEET

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1.0 Introduction

1.1 Brief

Geo Environmental Engineering Ltd (GEO) have been commissioned by Thomas Armstrong (Construction) Limited ('the client'), acting on behalf of Homes Group, to compile a Phase 3 Remediation Strategy to facilitate a planning application for a parcel of previously developed land located at Barfs Road in the Cumbrian village of Distington. The National Grid Reference for the centre of the site is 422563, 601960, and a site location plan of the site can be seen in Appendix I.

This Remediation Strategy (RS) is suitable for submission to the Local Authority, as part of a planning application and to aid the discharge of any planning conditions applied to the site / proposed development.

1.2 Proposed Development

Based on the proposed development plans provided to GEO, it is understood that the client is proposing to redevelop the site with 61 no. new semi-detached residential dwellings with areas of carparking and private gardens. The remaining areas of the site will comprise soft landscaping to meet BNG requirements. A copy of the proposed development plan can be seen in Appendix I. Further details relating to the proposed development can be obtained from the Design Team / Consultant.

1.3 Other Reports/Studies

This Remediation Strategy (RS) should be read in conjunction with the following reports.

- Phase II Ground Investigation Report, Report Ref. GEO2026-7213, v1 dated July 2026, prepared by GEO
- Phase 1 Desk Top Study (Preliminary Environmental Risk Assessment) report (DTS), Report Ref. 2025-7005, v1 dated December 2025, prepared by GEO

The findings contained within the above reports have been used to aid the design and scope of the Remediation Strategy compiled by GEO.

2.0 Remediation Strategy Reporting

2.1 Remediation Strategy Aims and Objectives

Following the findings of the ground contamination investigation works recently completed by GEO, the purpose of the RS is to assist with the remediation of impacted soils (hot spots).

The overall objective of this Remediation Strategy is to provide information relating to the following.

- Identify the most appropriate remediation option(s) for the site based on the findings of the investigation works and Human Health risk assessments to remediate three hot spots of impacted soils with Copper, Lead and PAHs, such that any identified unacceptable risks can be satisfactorily mitigated
- Provide a methodology for the design team and developer / main contractor on how to implement the remedial works into the overall development design and construction works in accordance with the RS, such that the remedial works do not cause harm to Human Health or the environment
- Identify the validation requirements to verify the remediation works have been successfully completed in accordance with the RS, and to ensure that there is an accurate final record of the land quality

The RS must be submitted to and approved by Cumberland Council (the Local Planning Authority (LPA)), and any other relevant parties, such that any outstanding planning conditions can be discharged prior to the development or remediation commencing on site.

A Remediation Strategy is also required for the design and construction of Full Radon protection measures to be implemented within the new proposed residential dwellings, and this will be compiled within a separate standalone report.

2.2 Guidelines, Codes of Practice and Third-Party Accreditations

This GIR has been completed in general accordance with the following documents.

- Land Contamination Risk Management Stages 1 to 4 (LCRM – www.gov.uk) – June 2025
- BS10175:2026: Investigation of Potentially Contaminated Sites - Code of Practice

This RS has been prepared in general accordance with the most up to date GOV.UK / Environment Agency guidance 'Land contamination risk management' (LCRM); published October 2020 and updated June 2025, and the technical content is based on the principals of CLR11: Model procedures for the management of land contamination, which was archived in 2016.

2.3 Remediation Strategy Limitations of Use

The information contained in this RS is limited to the area of the site as shown on the existing and proposed development layout plans attached in Appendix I. When considering the scope of works completed for the development proposals, any features or issues not specifically mentioned cannot be assumed to have been covered.

Although every effort is made to ensure that a full and comprehensive investigation is completed, it should always be borne in mind that ground conditions have the potential to vary between exploratory hole locations and it is recommended that the developer adopts a "watching brief" during any future development works to ensure that any potential variations encountered are identified and dealt with in an appropriate manner.

The conclusions and recommendations presented within this report are considered reasonable based on the available information. However, these cannot be guaranteed to gain regulatory approval.

Therefore, the report should be passed to the appropriate regulatory authorities and/or other key stakeholders, including warranty providers in order to seek their approval of the findings prior to undertaking any development works.

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3.0 Options Appraisal

3.1 Impacted Soil Deposits

Following the results of the human health contamination risk assessment, generally the majority of the topsoil deposits present across the site can remain on site without representing a risk towards future end-users. However, three hot spots of elevated Copper, Lead and individual PAH congeners (Benzo(a)pyrene, Benzo(b)fluoranthene and Dibenz(ah)anthracene) was recorded within the initial shallow topsoil deposits at the locations of WS11, WS02 & WS12 respectively, which exceeded their respective critical concentration values adopted for the proposed end-use (residential with homegrown produce, based on 6% SOM for organic congeners).

Based on the levels recorded, the initial topsoil deposits at these locations will pose an unacceptable risk towards future site end-users where exposure pathways will be available post completion of the residential development, for example where present within areas of private gardens and soft landscaping. Therefore, remedial measures will be required to break the pollutant linkage in the source pathway-receptor model. As such, an RS has been recommended to be compiled in order to detail the necessary works to be undertaken to make the site safe for future development.

Typical remedial measures for this type of contamination can take the form of either removal of all the impacted soil deposits from below areas of gardens / soft landscaping, although this is dependent on the thickness of the impacted soil deposits and finished ground levels, or alternatively implement the provision of clean (inert) soil within all areas of gardens / soft landscaping, to make the development safe for future occupation. Where impacted soil deposits lie below buildings and permanent hardcover there would be no requirement for protection.

When considering the thickness of the impacted deposits encountered at the investigation locations (up to 0.40m thick), the decision has been taken by the client to undertake full and complete removal of all the impacted deposits. Where the option of removal is adopted, then once the impacted soils are removed from site there will be no sources of contamination left and the site can be considered safe for development.

The actual extent of the three ‘hot spots’ of Copper, Lead and PAHs at the locations of WS11, WS02 and WS12 has not yet been proven by the ground investigation works completed to date. Therefore, as part of the remediation works proposed for this site, it will be necessary for supplementary investigation works to be undertaken to fully delineate the lateral extent of the Copper, Lead and PAH contamination / hot spots identified within the initial topsoil deposits present at the locations of WS11, WS02 & WS12. This will need to be undertaken before any development / groundworks commence.

When considering the proposed remediation required for this site, there will be no requirement for long term monitoring and maintenance or post-remediation monitoring and maintenance for further verification.

4.0 Remediation Strategy

If deemed necessary, the design team, developer and / or main contractor should consult with GEO prior to the development and remediation works commencing to determine that the principals, methodology and requirements of the RS are understood and to avoid any remediation and validation requirements being missed.

The following methodology for the removal of the 'hot spots' should be adhered to when completing the remedial site works.

- The extent of the delineated and impacted soils should be surveyed / marked onsite by GEO so that the area of impacted soils requiring excavation and removal can be accurately determined
- The removal of the elevated levels of Copper, Lead and PAHs within the topsoil at the three locations should be undertaken by excavating in layers (c.150mm – c.200mm thick) using a dedicated mechanical excavator (i.e. Backhoe Excavator or 360º Tracked Excavator) down to depths of up to 0.40m below current ground levels and extended to the recorded delineated extent (to be determined)
- The excavated soils should either be loaded directly into waiting wagons or stockpiled in a quarantined area of the site and laid on a plastic membrane to prevent cross-contamination of uncontaminated soils. The stockpile should also be covered with a plastic membrane to prevent washing away and the generation of dust
- Samples from the completed excavation(s) will be taken to allow validation laboratory testing to be undertaken. The results should be compared to appropriate and current Level 1 Risk Assessment Values for a Residential end-use, and at least 7 workings days should be allowed between samples being taken and confirmation being provide by the validating consultant that the remediation works have been satisfactorily completed, prior to excavations being backfilled (if necessary)
- During all the remedial works, care should be taken to avoid any potential cross-contamination. Consequently, plant should be cleaned following contact with impacted materials (i.e. buckets), with care taken to ensure plant does not 'track' through any areas where the impacted materials are brought to surface
- Validation works will comprise site attendance, photographic records and validation sampling to confirm that all contamination which potentially poses a significant risk has been removed from site, with these works and the results compiled within a Validation Report following the completion of these works

5.0 Verification Requirements of Remedial Works

To ensure that all elements of the RS are properly implemented, the following validation works should be undertaken and documented within a validation report, confirming that each element of the remediation works has been completed.

5.1 Validation of Hot Spots

Validation works will comprise site attendance during the excavation of the hot spots to ensure the delineated material has been satisfactorily removed. The excavated impacted soil deposits should be removed and disposed of off-site to a suitable waste disposal / management facility, and the provision of duty of care waste transfer / disposal notes should be provided to GEO for inclusion within the final validation report.

Validation sampling from the base and sides of the completed excavations should be undertaken to confirm that impacted deposits which potentially pose a risk have been removed, and to verify that residual materials do not represent a potential risk to Human Health. Validation samples should be analysed for Copper, Lead and Speciated PAHs at their respective locations, with the results compared to appropriate and current Level 1 Risk Assessment Values for a Residential end use. The results will be compiled within a validation report.

5.2 Validation Report

Following completion of the required remediation works, validation reports for the hot spot remediation will need to be submitted to Cumberland Council confirming all the remediation works have been undertaken, and that verification of the remediation & validation strategy has met all the requirements for the safe development of this site.

The production of the validation report will also allow Cumberland Council to discharge any outstanding planning conditions associated with land contamination on this site.

6.0 General Comments

Consideration must be made for variations to occur in the ground conditions between the exploratory hole locations for which GEO holds no responsibility and areas where limited access was available. It is therefore recommended that a “watching brief” and “observational technique” be applied to this site to ensure that if ground conditions appear to vary from those identified within this investigation report then advice should be sought from a suitably qualified and experienced Engineering Geologist, Geotechnical or Geo-Environmental Engineer.

The recommendations and opinions expressed in this report are based on the strata observed within the exploratory holes, in addition to the results of the site and laboratory tests commissioned by GEO. Consequently, GEO takes no responsibility for conditions that have not been revealed or which occur between them. GEO takes no responsibility for the accuracy of third-party information provided by sub-contract drillers or laboratories.

The conclusions and recommendations presented within this report are considered reasonable based on the available information. However, these cannot be guaranteed to gain regulatory approval. Therefore, the report should be passed to the appropriate regulatory authorities and/ or other key stakeholders including warranty providers in order to seek their approval of the findings prior to undertaking any works on site.

End of Report

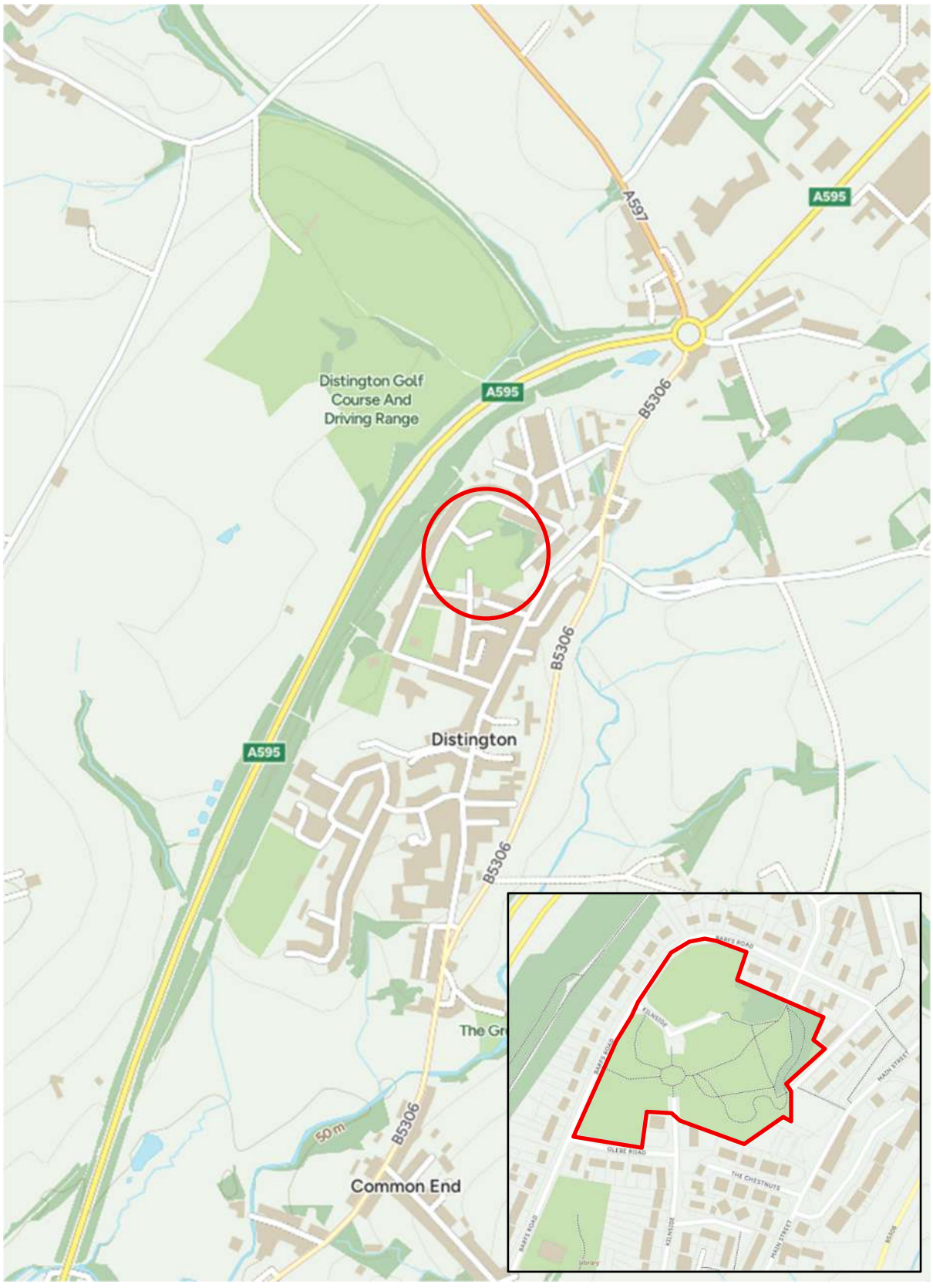
Appendix I

- Site Location Plan
- Proposed Development Layout Plan

GEO Environmental Engineering

GEO2026-7324: Barfs Road, Distington, Workington, Cumbria

Site Location Plan



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Architects PLUS

House Type	Count	Floor Area
HT-A 2 bed 3 person bungalow	9	61m2
HT-B 2 bed 3 person house	14	70.3m2
HT-C 3 Bed 5 Person House	30	94.1m2
HT-D 4 Bed 6 Person House	8	107.44m2

Demolition

Root Protection Area

Note
This drawing must be printed in colour.

Revision	Description	Drawn	Approved	Date
A	Additional trees to be demolished. Patio extended.	TP	BG	28/07/26

Proposed Site Plan

Distington, Barf's Road

0m 10m 20m 30m 40m 50m

VISUAL SCALE 1:500 @ A1

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Drawing: Proposed Site Plan

Status: PL - Planning

Project: Distington, Barf's Road

Client name: Thomas Armstrong (Construction) Ltd

RIBA stage: 3 - Spatial Coordination

Date: 15/05/2026

Drawn by: TP

Scale @ A1: As indicated

Drawing number: 25030-PL004A

Revision: A

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