CONTAMINATION REMEDIATION STATEMENT

FOR

COCKLEY HILL LANE

KIRKHEATON

ON BEHALF OF

GLEESON HOMES LTD

ARP GEOTECHNICAL LTD

CHARTERED CONSULTING ENGINEERS

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CLIENT: GLEESON HOMES LTD

JOB NUMBER: GHO/11

PROJECT: COCKLEY HILL LANE, KIRKHEATON

REPORT TYPE: CONTAMINATION REMEDIATION STATEMENT

REPORT REFERENCE: GHO/11rem1

	Name
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ISSUE	**DATE**	**STATUS**
1	29th OCTOBER 2025	V1 FINAL

1.0 Introduction

1.1 This document has been prepared to provide information for the Client and other interested parties, such as the regulatory authorities, outlining how contamination encountered on the site will be managed to ensure that the site is environmentally suitable for the intended residential use. The document should be agreed, prior to implementation, with the relevant regulatory authorities, usually the local planning authority and building control provider.

2.0 The Site

2.1 The ARP Geotechnical Ltd Stage 1/Stage 2 Geo-environmental Report, dated October 2025, under reference GHO/11r1, makes an assessment of contamination, along with other aspects.

2.2 The conceptual site model is for a residential development with private gardens.

2.3 The site is mainly a large sloping grassed agricultural field. In the eastern corner is a triangular shaped wooded area, separated from the field area by a gravel access road. In the southwestern corner is a cover of hardstanding, and sporadic young to mature trees. Ground levels slope downwards from northeast to southwest. The site is steeper in the northeast, and less steep in the southwest, with a maximum gradient of around 1 in 5.

2.4 Geological maps show the majority of the site to be underlain by undifferentiated strata of the Lower Coal Measures. Southwestern and northwestern areas of the site are shown to be underlain by Grenoside Sandstone. The Better Bed Coal seam outcrops on the site, roughly north to south, and a fault crosses the south of the site, from west to northeast.

2.5 The strata beneath the site are classed as a 'Secondary A' Aquifer. There are no sensitive groundwater abstractions within 1km of the site.

2.6 Any surface water run-off from the site is likely to be intercepted by the road drainage of Shop Lane, or adjoined residential side roads, probably eventually reaching Oxfield Beck approximately 800m to the southwest. There are no surface water abstractions within 1km of the site. The site is not at risk from river flooding.

2.7 Borehole monitoring has shown that CS2 gas protection measures are required for the proposed properties, comprising a membrane and ventilated sub floor void. Methane up to 1%, and carbon dioxide up to 7.4%, was detected. CS2 gas protection will also protect against radon.

2.8 Ordnance Survey Archive Maps show that the majority of site has remained undeveloped. A coal seam has been worked by opencasting, across the central portion, and a small portion of the southwest was quarried for sandstone, which later had a small building and associated car parking. A triangular area on the east once had cluster of small buildings. A well (and later trough) was present at or close to where the site abuts Shop Lane.

2.9 The majority of the site is generally underlain by up to 0.35m thickness of made ground, overlying natural residual soils derived from in situ weathering of solid strata. In the south-central area of the site, opencast backfill material is present (made ground of reworked natural material) to proven depths of up to 11.5m. In the southwest, a backfilled quarry is present, to depths of at least 3.2m, again generally infilled with reworked natural material.

2.10 Contamination testing showed the topsoil and made ground to be essentially uncontaminated and compatible with the proposed residential development. An exception was demolition rubble in the eastern triangle (WS7), which contained elevated copper at 5,032mg/kg, lead at 331mg/kg, and elevated PAH compounds, including benzo(a)pyrene at 8.3mg/kg. There was no significant leachability. There is a large ground slab at the southwestern boundary, which could not be penetrated during the investigations. This area is proposed for POS and any contamination beneath the slab is unlikely to present any significant contamination risk. However, if the slab is removed, the underlying material should be sampled and tested.

3.0 Remediation Strategy (Eastern Triangle Only)

3.1 The eastern triangle is proposed for POS. Therefore, where only turf is proposed, provision of clean topsoil of a minimum 0.3m thickness is likely to provide adequate protection. In any proposed planted areas, 0.6m thickness should be provided, and may include subsoil as well as topsoil. Alternatively, the made ground could be removed from site. It would be inadvisable to move the material to proposed residential plot areas, but if this was to occur, 0.6m cover would be required in the garden areas.

3.2 The proposed profile is provided on the table below. In areas of hardstanding or building footprints, the cover blanket or hard break layer are not required.

Proposed Profile in Turfed POS

Thickness (m)	Description
Minimum 0.3	Topsoil

Proposed Profile in Planted POS

Thickness (m)	Description
Minimum 0.3	Topsoil (full 0.6m thickness may be topsoil)
Minimum 0.3	Subsoil (if full 0.6m is not topsoil)

3.3 Any soils used in the cover blanket, whether imported or site-won, will need to be verified as suitable by inspection and testing, in accordance with guidance supplied in the document produced by the Yorkshire and Lincolnshire Pollution Advisory Group (YALPAG): "Guidance on the Verification Requirements for Cover Systems". The measures described below will be required to ensure compliance with the document.

3.4 If removal of made ground from site is required to achieve the cover soil thickness, the waste receiver may require Waste Acceptance Criteria Testing (WAC) and asbestos quantification.

4.0 Validation

4.1 Following placement of the cover soils in the eastern triangle, it will be necessary to confirm the required cover of uncontaminated soil has been placed, by excavating trial pits to 0.6m depth across these areas on the basis of a maximum 25m spacing. The trial pits will be photographed, to include a reference scale, and the photographs included within any report to enable the location on site to be identified.

4.2 If the contaminated made ground is removed from site to form an uncontaminated area or site, then the surface will need to be inspected by an Engineer, and sampled and tested on a maximum 25m spacing to confirm its uncontaminated status. The area will be photographed and all the details included within a Validation Letter Report. The disposal/transfer documents should be retained for inclusion in the Validation Report.

5.0 Laboratory Testing

5.1 If any imported subsoil and topsoil is to be used, the source will need to be confirmed, and the material tested for the attached suite of contaminants, to comply with the maximum screening values listed. The frequency of testing is given on the table below.

Material Type	**Number of Samples**
Topsoil or subsoil from greenfield / manufactured source	Minimum 3No. or 1 per 250m^3 (whichever is greater)
Topsoil or subsoil from brownfield / screened source.	Minimum 6No. or 1 per 100m^3 (whichever is greater)

5.2 When a potential source of soil is identified, the Client may provide ARP Geotechnical Ltd with supplier certificates, and we will comment on the apparent acceptability of the material. If no certificates are available, the Client may wish us to sample the material at source prior to import, or sample an example load delivered to site, to minimise potential for any problems later. The test results will be available approximately one week, or slightly more, after the site visit.

5.3 Provided the results of the above are acceptable, there are two options for validation:-

A. Import a stockpile of material to site sufficient to complete the required areas, and invite ARP to take sufficient further samples of the stockpile for testing to fully approve it as a source. The stockpile should be isolated from any other materials on the site (becoming a "Quarantined Stockpile"), fenced off to avoid any cross contamination, and must not be added to without further testing. The test results will be available approximately one week, or slightly more, after the site visit.

OR:

B. Import and place the material as and when required, and invite ARP to sample the material when in place, during the inspection pits noted in Section 4.1. The samples will be issued to the laboratory for contamination testing to confirm acceptability. The test results will be available approximately one week, or slightly more, after the site visit. Our letter report will be available a day or two later. Therefore, Clients should allow for receiving the final letter report two weeks after the site visit.

5.4 Any cross contamination of materials should be avoided, and further testing carried out where any cross contamination is suspected to have occurred.

5.5 The results of all the laboratory analysis, excavation logs, plans, photographs, and import documents will form part of the Remediation Validation Report for the group of plots.

6.0 Unexpected Contamination

6.1 Any unexpected contamination uncovered during the works (including below the concrete slab in the southwest, if this is to be removed) shall be inspected, sampled and analysed in laboratory for the suite of determinands appended to this Remediation Statement, and compared to the maximum concentration levels listed on the enclosure. Works on the affected materials shall cease until the appraisal is complete and, if necessary, a revised Remediation Statement is to be prepared and approved by the Planning Authority before work is recommenced.

7.0 Protection of Workers and the Public During Development Works

7.1 Damping down of the contaminated made ground must be implemented during dry periods, and timely placement of the contaminated material below barriers.

7.2 Washing facilities and a clean mess room should be provided.

7.3 Site fencing will be provided to exclude access to members of the public, and contaminated material will be contained within the site boundary and placed below barriers as soon as possible.

7.4 Workers will be educated to use adequate hygiene and PPE.

7.5 Movement of contamination off-site on vehicle wheels shall be minimised by cleaning of vehicle wheels and/or use of road sweeper, as required.

ARP GEOTECHNICAL LIMITED
IMPORTED SOIL CONTAMINANT SCREENING VALUES
RESIDENTIAL WITH HOME-GROWN PRODUCE

Determinand	S4UL (unless stated otherwise) (mg/kg)			C4SL (mg/kg)		
Arsenic	37			37		
Cadmium	11			22		
Chromium (trivalent) (MAFF)	400					
Chromium (hexavalent)	6			21		
Copper (MAFF)	80#					
Lead				200		
Inorganic Mercury	40			200		
Nickel (MAFF)	50#					
Selenium	250					
Zinc (MAFF)	200#					
Acidity (pH)	*Should be Greater Than 5			*Should be Greater Than 5		
	1% SOM	**2.5% SOM**	**6% SOM**	**1% SOM**	**2.5% SOM**	**6% SOM**
Naphthalene	2.3	5.6	13	15	36	85
Acenaphthylene	170	420	920			
Acenaphthene	210	510	1,100			
Fluorene	170	400	860			
Phenanthrene	95	220	440			
Anthracene	2,400	5,400	11,000			
Fluoranthene	280	560	890			
Pyrene	620	1,200	2,000			
Benzo(a)anthracene	7.2	11	13			
Chrysene	15	22	27			
Benzo(b)fluoranthene	2.6	3.3	3.7			
Benzo(k)fluoranthene	77	93	100			
Benzo(a)pyrene	2.2	2.7	3			5
Indeno(1,2,3-cd)pyrene	27	36	41			
Dibenzo(a,h)anthracene	0.24	0.28	0.30			
Benzo(g,h,I)perylene	320	340	350			
Phenols	120	200	380			
Total TPH	*Above 500, speciate and compare with values below:					
C5 to C6 Aliphatic	42	78	160			
C6 to C8 Aliphatic	100	230	530			
C8 to C10 Aliphatic	27	65	150			
C10 to C12 Aliphatic	130	330	760			
C12 to C16 Aliphatic	1100	2,400	4,300			
C16 to C35 Aliphatic	65,000	92,000	110,000			
C35 TO C44 Aliphatic	65,000	92,000	110,000			
C5 to C7 Aromatic (Benzene)	70	140	300			
C7 to C8 Aromatic (Toluene)	130	290	660			
C8 to C10 Aromatic	34	83	190			
C10 to C12 Aromatic	74	180	380			
C12 to C16 Aromatic	140	330	660			
C16 to C21 Aromatic	260	540	930			
C21 TO C35 Aromatic	1100	1,500	1,700			
C35 TO C44 Aromatic	1100	1,500	1,700			
Asbestos	*Should be None Detected			*Should be None Detected		

* In House Value/Approach S4UL = Suitable 4 Use Level, CIEH/LQM 2014 C4SL = Cat 4 Screening Level, DEFRA, 2014

Blank cell indicates no published value or in-house value. Some values presented are above saturation limits.

MAFF: Ministry of Agriculture, Fisheries and Food - "Code of Good Agricultural Practice for the Protection of Soil

#pH dependent. If exceeded, to be compared against appropriate MAFF value for the pH

ARP GEOTECHNICAL LIMITED
SOIL CONTAMINANT SCREENING VALUES
PUBLIC OPEN SPACE NEAR RESIDENTIAL

Determinand	S4UL (mg/kg)			C4SL (mg/kg)		
Arsenic	79			79		
Cadmium	120			220		
Chromium (trivalent)	1500					
Chromium (hexavalent)	7.7			21		
Copper	12000					
Lead				630		
Inorganic Mercury	120			610		
Nickel	230					
Selenium	1100					
Zinc	81000					
Acidity (pH)	*Should be Greater Than 5					
	1% SOM	**2.5% SOM**	**6% SOM**	**1% SOM**	**2.5% SOM**	**6% SOM**
Naphthalene**	4900	4900	4900	11,000	15,000	17,000
Acenaphthylene	15000	15000	15000			
Acenaphthene	15000	15000	15000			
Fluorene	9900	9900	9900			
Phenanthrene	3100	3100	3100			
Anthracene	74000	74000	74000			
Fluoranthene	3100	3100	3100			
Pyrene	7400	7400	7400			
Benzo(a)anthracene	29	29	29			
Chrysene	57	57	57			
Benzo(b)fluoranthene	7.1	7.2	7.2			
Benzo(k)fluoranthene	190	190	190			
Benzo(a)pyrene	5.7	5.7	5.7			10
Indeno(1,2,3-cd)pyrene	82	82	82			
Dibenzo(a,h)anthracene	0.57	0.57	0.57			
Benzo(g,h,I)perylene	640	640	640			
Phenols	440	690	1300			
Total TPH	*Above 3,800, speciate and compare with values below:					
C5 to C6 Aliphatic	570000	590000	600000			
C6 to C8 Aliphatic	600000	610000	620000			
C8 to C10 Aliphatic	13000	13000	13000			
C10 to C12 Aliphatic	13000	13000	13000			
C12 to C16 Aliphatic	13000	13000	13000			
C16 to C35 Aliphatic	250000	250000	250000			
C35 TO C44 Aliphatic	250000	250000	250000			
C5 to C7 Aromatic (Benzene)	56000	56000	56000			
C7 to C8 Aromatic (Toluene)	56000	56000	56000			
C8 to C10 Aromatic	5000	5000	5000			
C10 to C12 Aromatic	5000	5000	5000			
C12 to C16 Aromatic	5100	5100	5000			
C16 to C21 Aromatic	3800	3800	3800			
C21 TO C35 Aromatic	3800	3800	3800			
C35 TO C44 Aromatic	3800	3800	3800			
Asbestos	*Should be None Detected			*Should be None Detected		

* In House Value/Approach S4UL = Suitable 4 Use Level, CIEH/LQM 2014 C4SL = Cat 4 Screening Level, DEFRA, 2014

Blank cell indicates no published value or in-house value. Some values presented are above saturation limits.

** Exceeds the calculated soil saturation concentration. Where free phase is suspected risk from direct contact and vapour inhalation should be considered separately.