

Greenside Mills, Skelmanthorpe

Validation Report Eastern Pond Silts

Job Number: LKC241349

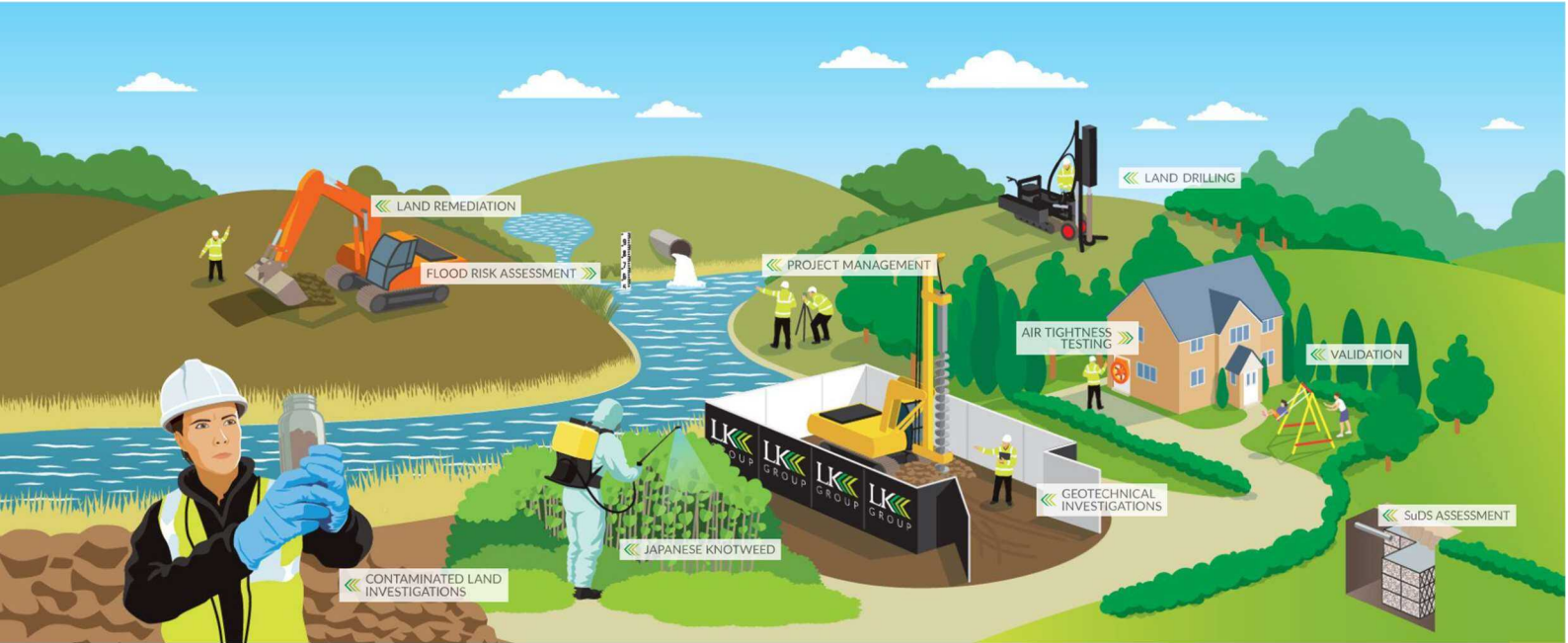
Date: November 2024

Client: Caldwell Construction Ltd



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FIGURES

Figure 1 – Site Location and Boundary Plan

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1. Introduction

1.1. Background

LK Consult Ltd (LKC) has been commissioned to carry out a Validation Report detailing the translocation of pond silts at Greenside Mills, Skelmanthorpe.

LKC have reviewed the following documents by Sirius Geotechnical:

- ‘Supplementary Contamination Assessment Letter Report’, ref. C9297/AEC/10326, dated 15th November 2023.
- ‘Strategy for Remedial and Preparatory Works’, ref. C9297/RS, dated November 2023).

These documents in turn reference several previous reports and investigations carried out by Sirius and others.

This document refers to the translocation of silts from the pond and around the surface water feature located at the eastern site boundary. The location of this former pond and surface water feature (hereafter referred to as the ‘eastern pond’) is illustrated on Sirius “Site Features Plan” ref. C9297/RS/02 and “Proposed Remediation Plan” ref. C9297/RS/04 reproduced in Appendix A.

LKC understand that Lovell Partnerships instructed Caldwell Construction Ltd to place these pond silts in the central area of Public Open Space (POS), located to the south of Plots 25-29. LKC have assumed that Lovell Partnerships have obtained suitable permits or exemptions for this activity. The location of the POS can be seen on Sten Architecture “Planning Layout” ref. 2156.01 Rev. N reproduced in Appendix A.

A summary of the site details is presented in Table 1-1. Figure 1 indicates the site location and boundary plan.

Location	North-east of Saville Road, Skelmanthorpe. National Grid Reference 423365E 410935N.
Area	1.86Ha.
Topography	140-155 metres above ordnance datum (AOD). Site slopes down to the north east.
Current Site Use	Construction site.
Proposed Development	46no. residential properties with private gardens and associated infrastructure, including areas of hardstanding, access roads and public open space (POS).

Table 1-1: Summary of site details.

This report details the remediation works carried out to the eastern pond silts and the subsequent validation of these remediation works.

2. Review of Existing Information

2.1. Site Investigation Information

The previous Sirius reports refer to investigation and risk assessment of the eastern pond silts and extracts from their reports are provided below:

Sirius collected 3 samples of the silt (ref. Pond TP, Sediment 1 and Sediment 2) and subjected the samples to testing for heavy metals, asbestos ID, pH, soluble sulphate, speciated PAH16 and a hydrocarbon suite (TPHCWH and BTEX). The sample locations can be seen on the Proposed Remediation Plan ref. C9297/RS/04 reproduced in Appendix A. Relevant certificates of analysis are provided in Appendix B.

Sirius carried out a generic risk assessment of the results and an extract from their report is presented in Plate 2-1.

Pond Sediment

Table 7.4 - Summary of Soil Analysis - Pond Sediment

Analyte	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (5% SOM) (mg/kg unless specified)*	No. of Samples >GAC	Samples Exceeding GAC (location and depth)
Metals and Metalloids					
Copper~	3	76 - 440	200~	1	Pond TP
Lead	3	100 - 260	200	1	Pond TP
Organics - Polycyclic Aromatic Hydrocarbons					
Naphthalene	3	<0.03 - 35*	4.6	1*	Pond TP
Benzo(a)pyrene	3	0.22 - 13*	2.2	1*	Pond TP
Other					
Asbestos	3	<0.001% Chrysotile present as fibre bundles	NAD	1	Sediment 1
Total Organic Carbon	3	3.1 - 11%	3.0%	3	Sediment 1, Sediment 2, Pond TP^
Water Soluble Sulphate	3	300 - 820mg/l	500mg/l	1	Sediment 1^

*Based on Sirius Stage 1 GAC for Residential with Gardens end use. ^Elevated TOC and water soluble sulphate are not considered in human health risk assessment. ~ Copper GAC value based on potential phytotoxic effect.
+Based on the original PAH result within the Pond-TP sample.

Plate 2-1: Extract from Sirius soil risk assessment.

The Pond TP sample was retested for PAH16. The above plate retains the original test result of 35mg/kg for naphthalene but does not include the original test result of 15mg/kg for benzo(a)pyrene.

Sirius also provided the following commentary (Plate 2-2).

Pond Sediments

A significantly elevated concentration of naphthalene (35mg/kg) was recorded within a sample of sediment, obtained from the eastern most pond. A re-test of the sample indicated a concentration below the relevant GAC, considered attributable to heterogeneity within the sample by the testing laboratory. It is recommended that additional testing of the pond sediment be undertaken as part of enabling works to confirm the characteristic PAH (including naphthalene and benzo(a)pyrene) concentration of the soils.

It should be assumed at this stage that the pond sediments are highly heterogeneous in nature, comprising both decomposing leaf and vegetation wastes as well as anthropogenic materials, such as waste woollen fabrics. It should be assumed that, without significant geotechnical improvement, the pond sediments are highly unlikely to be suitable for use as general fill. The variability within the chemical laboratory test results is also an indication of the possibility of the soils posing a risk to site end users and off site controlled waters, without appropriate remedial measures.

Plate 2-2: Extract from Sirius soil risk assessment.

The Remediation Strategy also provided details of a clean cover system for the site and an extract is provided in Plate 2-3.

8.1 Clean Cover System Thickness

Previous investigation works have identified chemically and texturally unsuitable made ground across the site. Made ground should be overlain by a suitable clean cover system in private gardens / areas of soft landscaping.

The makeup of the required clean cover system (capping layer) shall be as shown in Table 8.1.

Table 8.1 - Required Clean Cover Layer Makeup

	Minimum Thickness (mm)			
	Subsoil	Topsoil	Soil Thickness	Cover
				Additional 150mm Granular Hard Dig Layer or Geotextile Separator Required at Base?
Private Gardens (front and rear)	450	150	600	Only where asbestos impacted made ground is present at depths of <1m below finished ground levels.
Soft landscaped / POS areas	300	150	450	

Plate 2-3: Extract from Sirius Remediation Strategy.

2.2. LKC Soils Risk Assessment

LKC note that the assessment by Sirius was based upon a residential with homegrown produce end use.

The results may be contrasted to generic assessment criteria (GAC) for the Public Open Space – residential (POS_{resi}) generic land use, in line with the proposed destination for these soils of POS within a housing development. GACs are provided in Appendix C.

Assuming that benzo(a)pyrene may be used as a surrogate marker for other PAHs so the C4SL may be used, and due the minor consequence associated with the phytotoxic

effect to flora (i.e., loss of plants in a landscaping scheme), the human health GAC for copper may be applied.

Therefore, the benzo(a)pyrene remains elevated in the sample from Pond TP (15mg/kg vs the GAC of 10mg/kg and chrysotile asbestos was identified at <0.001% w/w in the sample from Sediment 1.

Therefore, considering the above, the eastern pond silt material may be suitable for relocation in the POS area below a 450mm clean cover layer. It is assumed that this is the basis of the instruction from Lovell Partnerships to Caldwell Construction Ltd.

3. Site Works

3.1. Remedial Excavations

Remedial excavations in the eastern pond area and translocation in the POS were carried out by Caldwell Construction Ltd between 22nd March 2024 and 5th July 2024.

During the works a visual and olfactory assessment of the excavated materials was carried out by UKATA trained operatives. The works were carried out under Caldwell Construction Ltd Construction Health and Safety plan which includes measures for control of potential dust and fibre release.

In considering the risk to site workers from potential fibre release LKC utilised the Joint Industry Working Group (JIWG) Decision Support Tool for receptor risk ranking of Asbestos Containing Materials (ACM) in the eastern pond silts for the remediation and excavation works. This model incorporates guidance from CL:AIRE CAR-SOIL¹ and CIRIA C733². The following assumptions have been incorporated into the model:

- Asbestos type, nature and concentrations as encountered during the site investigation and reported in laboratory data.
- Low respirable index was assumed based on the ACM identified onsite as per RIVM³.
- The assessment was carried out assuming 'low disturbance' based on ACM at a shallow depth.

The JIWG model output sheet is presented in Appendix D. The JIWG assessment is provided in Plate 3-1 below.

Stage 3	
Risk Assessment Outputs	
Probable Licensing Status	CAR do not apply
RPE*	None
Dust Suppression**	None
Hygiene/Decontamination***	None
*Where RPE has to be worn continuously for long periods (e.g. more than 1-hour), then powered RPE may be necessary. **Reduction in control measures possible if natural mitigation factors are present (e.g. raining, wet ground) ***Guide only; suitability of selected personal hygiene measures may be reviewed on a site/contamination-specific basis	

Plate 3-1: Extract JIWG Work Categories Assessment.

For added conservatism, the JIWG model does not consider moisture content, which can significantly reduce the potential for airborne fibre release from soil in a typical UK climate. Swartjes and Tromp (2008)⁴ based on work by Addison *et al.*⁵ note that the addition of 10% water to soil decreases the risk of potential fibre release by a factor of between 2 and 10.

The 1^{no.} moisture content result from the Sirius report (Pond TP sample) which was 53% - making fibre release highly unlikely. It should also be noted that subsequent testing of the silts in the POS area gave moisture contents of between 23.7% and 30.9%.

Data from Addison *et al.* shows that a sandy soil with Chrysotile fibre concentrations of 0.01%w/w (1 order of magnitude lower recorded) when agitated in a moderately

aggressive way, produced between 0.01fibres/ml and no recordable fibres at moisture contents of 5% and above.

Asbestos may affect site users in soft landscaping areas in localised areas of the site, via the inhalation of fibres. The probability is considered to be likely given limited asbestos encountered at shallow depth. With a medium consequence the risk as assumed to be moderate remediation is recommended in soft landscaped areas.

On this basis no specific control measures above those in the Construction Health and Safety plan were required.

Anoxic odours were reported, but no visible evidence of petroleum hydrocarbons or bulk pieces of suspected asbestos containing materials.

Plate 3-2 shows the progress of works from UAV photos and photographs showing the removal works down to natural clay strata are provided in Appendix E.

	January 2024. Standing water visible in eastern pond area (highlighted).
	July 2024 Eastern pond area reduced to brown clay superficial deposits with road layout commenced. Stockpiles present on central POS area (highlighted).

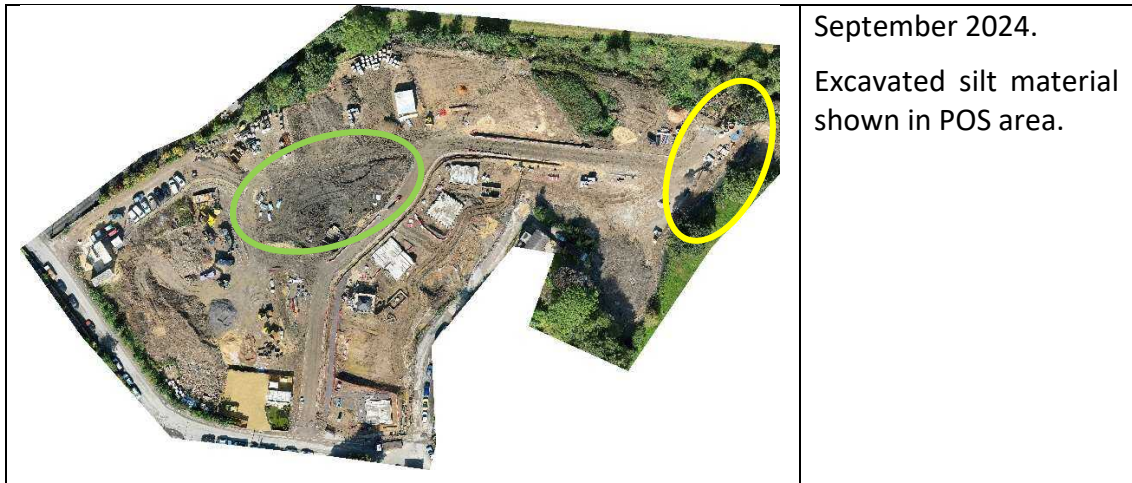


Plate 3-2: Progress of excavations and placement.

LKC understand approximately 4,980m³ of material was excavated and placed in the central POS area.

4. Validation Testing

4.1. Methodology

LKC attended site on 24th September 2024 to carry out validation testing.

Within the POS area 4 no. trial pits (ref. TP301-TP304) were excavated to 4m to the full depth of the placed eastern pond silts. In the southern area, an excavation face to a depth of 1.2m above pre-existing ground levels was present and this was taken as TP305. 5no. locations were selected to give samples at a nominal rate of 1 per 1,000m³ in the absence of any guidance in the Remediation Strategy. Within TP305 the material closer to the trench block appeared to have more anthropogenic inclusions so 2no. samples (with the same depth range but from opposing faces) were collected.

In addition, samples were collected from the base and eastern side of the excavation from where the pond silts were excavated and outside of the road box construction. These were referenced Base and East and samples were collected where the basal clay remained exposed.

The approximate sampling locations are shown in Plate 4-1 and photographs are provided in Appendix F.



Plate 4-1: Sampling Locations.

4.2. Ground Conditions

Within the POS area the trial pits encountered dark grey / black silt and occasional inclusions of soft brown clay were noted. Limited anthropogenic inclusions such as brick, rope, concrete were observed. A discernible anoxic and natural organic odour was noted. The silts had a soft consistency and trial pits were unstable.

Within the eastern area of the site, the silts were removed to a firm to stiff sandy brown clay.

4.3. Sampling Protocol

4.3.1. Soil Sampling (Contamination)

Standard sampling protocol and preservation of samples was undertaken as described in the EA guidance on site investigation⁶.

Soil samples of approximately 500g were recovered in amber jars and plastic tubs. All the samples were sent to DETS laboratory for chemical testing.

Many of the contamination tests are UKAS or MCERTS accredited and further details are given in the Certificate of Analysis presented in Appendix G. Table 4-1 shows the soil testing undertaken.

Testing	No. Samples	Justification
Metals / metalloids, pH, water soluble sulphate, cyanide suite, phenol, TPHCWG, BTEX, MTBE, speciated PAHs, SOM and asbestos screen.	8	Although no evidence of contamination identified, detailed suite undertaken to confirm the contamination concentrations.
Leaching Test Metals / metalloids, pH, sulphate, cyanide suite, phenol, TPHCWG, BTEX, MTBE, speciated PAHs, SOM and hardness.	4	Tests carried out on translocated silts to determine potential risk to controlled waters.

Table 4-1: Summary of Soil Testing.

Notes:

If asbestos present during screen identification and quantification will be undertaken.

Metal/metalloids=arsenic, cadmium, chromium, (total and hexavalent), copper, lead, mercury, nickel, selenium, vanadium, zinc, and boron; TPHCWG=carbon banded and aromatic/aliphatic split petroleum hydrocarbons; PAH=polycyclic aromatic hydrocarbons, BTEX=benzene, toluene, ethylbenzene, and xylenes; MTBE=Methyl tert-butyl ether, SOM=Soil Organic Matter.

5. Generic Risk Assessment

5.1. Introduction

Current good practice requires that the findings from a site investigation should be evaluated on a site-specific basis, using a risk-based approach. Risk assessment involves identification and evaluation of the hazards presented by the concentrations of contaminants measured followed by an evaluation of the risks which are associated with these hazards (LCRM⁷).

5.2. Soil Risk Assessment

5.2.1. Methodology

With regards to the soil risk assessment LKC will use the following hierarchy:

- Category 4 Screening Levels (C4SLs) ^{8, 9}.
- LQM Suitable 4 Use Levels (S4ULs) ^{10, 11, 12, 13}.
- ATRISK Soil Screening Values (SSVs) and CL:AIRE Generic Assessment Criteria (GACs)¹⁴.

The areas of the site assessed within this report comprise areas of Public Open Space within a housing development, therefore the assessment criteria for POS_{resi} has been used.

All criteria have been generated using the CLEA V1.06 model¹⁵ based either on 1%, 2.5% and 6% Soil Organic matter (SOM). Results will be compared to the nearest appropriate SOM.

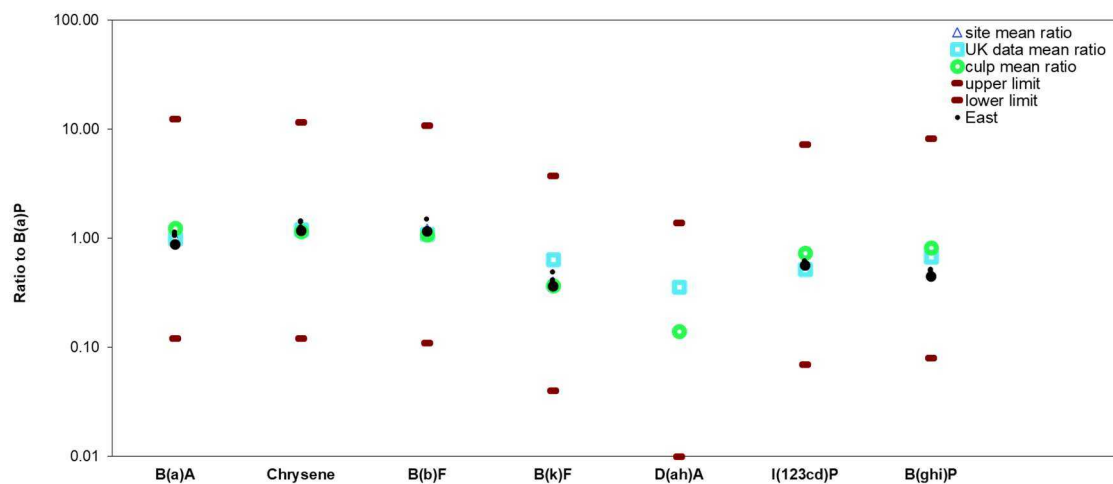
A summary of the generic assessment criteria used in this assessment is provided in Appendix C.

B(a)P as Surrogate Marker

LKC consider the main risk drivers for PAHs are benzo(a)pyrene (B(a)P) and naphthalene. This is due to B(a)P possibly being a carcinogen and most toxic of the PAHs^{16,17} and naphthalene the most volatile and soluble¹⁸. The C4SLs indicate B(a)P as a surrogate marker for carcinogenic PAHs, if it falls within appropriate limits, since the risk from other non-carcinogenic PAHs are considered negligible¹⁹. For B(a)P to be used as a surrogate marker it should follow the profile described by the HPA (2008)²⁰ and CL:AIRE (2013). Naphthalene will be treated separately using the LQM S4ULs.

LKC undertook an assessment of the PAH data for the site with regards to using B(a)P as a surrogate marker for carcinogenic PAHs as per HPA and CL:AIRE guidelines. The primary toxicological study related to Culp *et al.*²¹, which was based on coal tar mixtures (>80,000mg/kg of total PAHs) fed in food to mice over a two-year carcinogenicity study.

Graph 5-1 summarises the study site data with respect to how the ratios of carcinogenic PAHs relate to B(a)P, within the confidence limits provided in the HPA document.



Graph 5-1: The ratio of PAH to B(a)P in soil for all available data at the site based on 6 samples (where values were >LOD to allow the calculation of a ratio).

Notes:

B(a)P=Benzo(a)pyrene; D(ah)A=Dibenzo(ah)anthracene; B(a)A=Benzo(a)anthracene; B(b)F=Benzo(b)fluoranthene; B(k)F=Benzo(k)fluoranthene; I(123cd)P=Indeno(123cd)pyrene; B(ghi)P=Benzo(ghi)perylene.

All the data points that could be used to calculate ratios fall inside the upper or lower limits.

5.2.2. Soil Results Comparison against Assessment Criteria

LKC's results have been compared to the relevant assessment criteria and no elevated contaminants were identified.

5.2.3. Hazard Quotient

To examine the potential additivity of toxicological effects between the petroleum hydrocarbon fractions, a Hazard Index (HI) as described by the Environment Agency²² technical report should be calculated for the samples. As no significant concentrations of petroleum hydrocarbons were identified in any of the soil samples this has not been undertaken.

5.2.4. Direct Contact Risk – Human Health

At the concentrations identified, the contaminants are not considered to pose a potential risk to future site users of the POS areas. The principal pathways are the ingestion pathways (soil, dust, fibres) and dermal contact.

The probability of asbestos, PAH, TPH, BTEX and metal contamination affecting site users is unlikely. With a medium consequence, the risk is considered to be low, and on the basis of the results obtained by LKC remediation is not required. However, due recourse should be given to the results obtained by Sirius.

5.2.5. Risk from Inhalation of Vapours

No visual / olfactory evidence of volatile contaminants was identified during the investigation. Confirmatory soil analysis did not detect any volatile PAHs or TPH fractions above detection limits.

LKC therefore consider the probability of volatile contaminants affecting site users as unlikely. The consequence is expected to be medium, giving a low risk and on the basis of the results obtained by LKC no remediation is required.

5.3. Controlled Water Assessment

The central POS area is located above a Secondary A Aquifer with a watercourse at the eastern extent of the site.

LKC have compared results above Limits of Detection (LOD). Where relevant the review of priority substances takes precedence considering threshold values for groundwater cannot be used '*as part of site-specific investigations*'. The hierarchy is as follows:

- River Basin District Standards²³ and updated Water Framework Directive²⁴ for Annual Average / Maximum Allowable Concentration Environmental Quality Standards (AA-MAC-EQS) for priority substances (surface water risk).
- 2016 private water supply standards (UKDWS potable)²⁵.
- 2001 Environment Agency Values for Environmental Quality Standards (EQS) and UK Drinking Water Standard (UKDWS)²⁶.

With regards to hydrocarbon mixtures (TPHCWG) for UKDWS, LKC will use the CL:AIRE guidance on petroleum hydrocarbons in groundwater²⁷ based on WHO guidelines.

The leaching test is aggressive (de-ionised water) and is not in aqueous equilibrium (steady state) with the solid sample. This may cause rapid dissolution and overestimation of the aqueous phase concentrations compared to groundwater in contact with contaminated soils. Although dissolution may be reduced for highly hydrophobic contaminants²⁸ such as B(a)P, it is likely that the initial leaching will remove the most readily available hydrocarbons and subsequent flushing would reduce the leachable concentrations²⁹. Traditionally the leaching test was developed for inorganic constituents and the leaching of organics is poorly understood³⁰.

Analysis sheets are presented in Appendix G.

No elevated contaminant concentrations were identified in any of the leaching test samples. In particular PAH (as per UKDWS), TPH and BTEX were below limits of detection.

Based on the above, LKC considers the probability of contaminants in the translocated silts within the central POS area on site affecting the Secondary A Aquifer as unlikely.

Given the medium consequence, a low risk is anticipated and no remediation is required.

6. Summary Conclusions and Recommendations

6.1. Conclusions

Based upon the available information LKC conclude the following:

The removal of the silts in the eastern area has been successfully completed and no remnant contamination was noted in the residual natural clay strata.

Testing of the silts in situ in the central POS at an approximate sampling rate of 1 sample per 830m³ of material did not identify the presence of ACM or elevated naphthalene and lead as noted by Sirius in their testing. The LKC results indicate that the soil does not comprise an unacceptable risk to future site users from direct contact or inhalation. This suggests the Sirius test results are an anomaly or very localised. However, due recourse should be given to these results.

Leaching tests undertaken on the silts has not identified an unacceptable risk to the underlying Secondary A Aquifer.

LKC therefore conclude the remedial works of the eastern pond silts has been carried out appropriately. The moisture content will have reduced risk of any asbestos fibre release and the material is suitable for retention in the central POS area. Notwithstanding this, recourse should be given to the proposed landscaping of this material, the soft consistency of the material and the previous Sirius results.

6.2. Recommendations

The POS area has currently been left c. 450mm below finish levels in order to accommodate the capping layer as outlined in the Sirius Remediation Strategy. LKC consider that placing this capping layer would be a suitably conservative approach given the existing Sirius testing data.

Given the soft consistency of the silts the POS area and capping layer should be constructed to allow a suitably durable surface for future site users. This may include a geotextile or drainage layer on top of the existing silts to ensure that the integrity of the surface of the POS is maintained throughout its future use.

Suitable topsoil and subsoil shall be imported for use in the capping layer and validation of the imported soils and the depth and construction of the capping layer shall be carried out as per Section 8 of the Sirius Remediation Strategy.

Figures

Appendix A – Site Plans



1. Photo of pond within east of the site, looking southeast.



2. Photo of pond and surface water feature looking south.



3. Photo of stockpile within east of site, including wooden pole, with area of former infilling and pad beyond to the east.



4. Evidence of former brick lined mill pond and adjacent structures prior to backfilling / clearance.



5. Newly constructed overhead cables and wooden pole, located in close proximity to former AST and sub-station.



6. View of former AST, prior to demolition and clearance.

NOTES

- Site boundary
- Photo Location and Direction
- Existing pond and surface water feature
- Former brick lined mill pond
- Existing stockpile
- Former above ground storage tank

Topographical survey reproduced from Sirius Remediation Ltd, Post Demolition Survey, ref. SR4358-TS-001, dated October 2023

Notes

- This drawing should not be viewed in isolation from the accompanying report.
- The locations of services shown on this drawing are approximate and are based on utility plans provided by the client. Locations of services are given for the purposes of indicating constraints to the site investigation only. Reference should be made to original utility plans and HSG47 for locating of services within the site.
- All marked site features (including historical features, potential contaminant constraints, and any other potential constraint or feature of note) shown on this drawing are given for indicative purposes only. This drawing should not be underlaid in isolation to determine proposed development layouts. Reference should be made to the accompanying report for commentary on the potential location of these features including coordinates if available and any further works required to locate features if required.

REVISION		BY	DATE
0	For Information	MF	08/11/23
A	>>	>>	>>
B	>>	>>	>>
C	>>	>>	>>
D	>>	>>	>>

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CLIENT

Lovell Partnerships Ltd

SITE

Former Greenside Mills,
Skelmanthorpe

DRAWING TITLE

Site Features Plan

DRAWING NO. C9297/RS/02

REVISION NO. 0

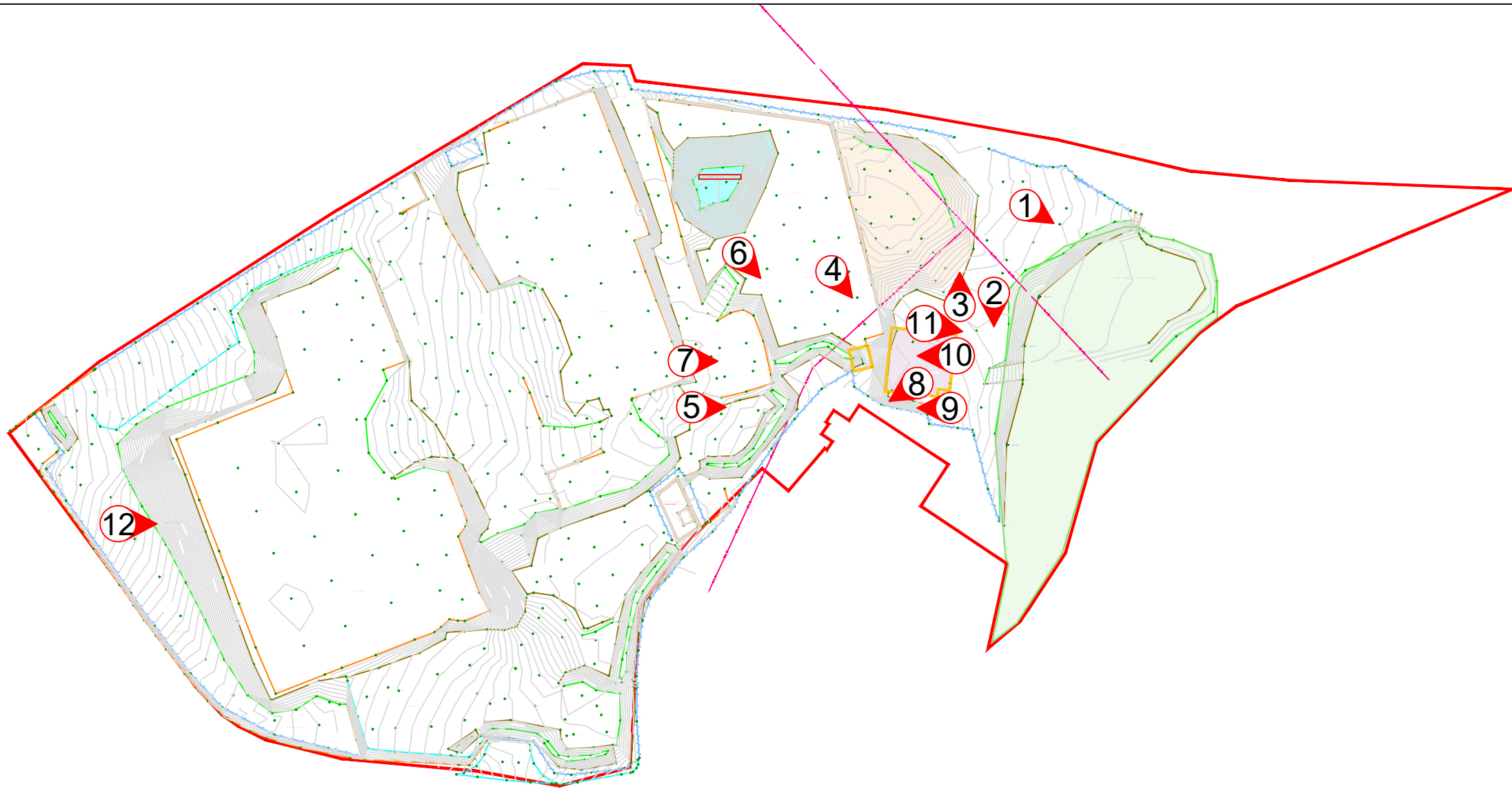
DRAWN BY MF

APPROVED BY GH

DATE November 2023

SCALE 1:1000

PAPER SIZE A2



7. View of former sub-station prior to demolition and clearance.



8. Surface water culvert located in southeast, with black oily substance noted.



9. View of surface water culvert with discarded containers.



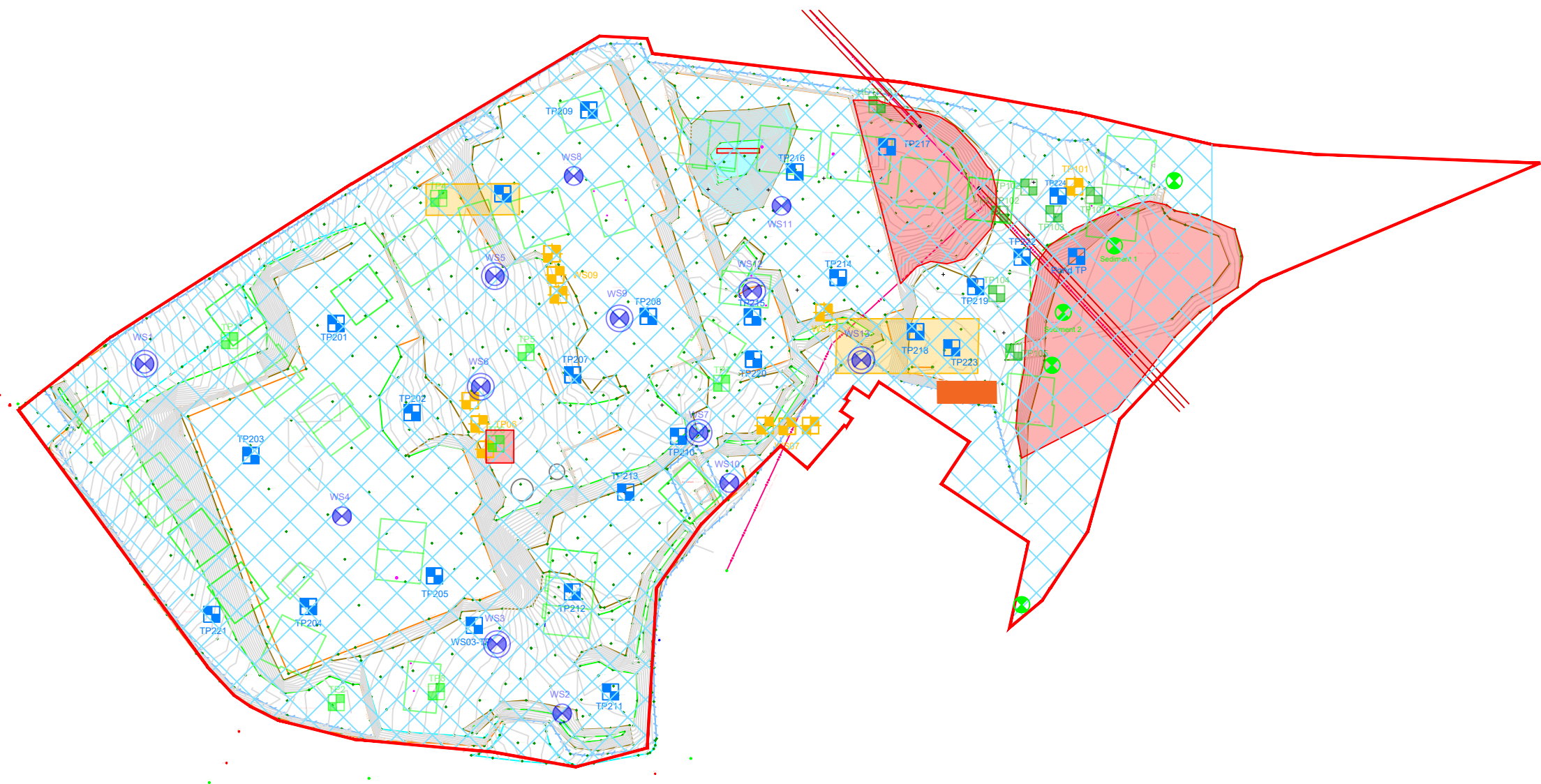
10. Evidence of hydrocarbon staining within backfilled mill pond (trial pit TP218).



11. View of black saturated pond sediments during trial pitting.



12. View of varying topography of the site, looking east.



NOTES

- Site boundary
- 2023 Site Investigation
- Trial Pits (TP200 series)
 - Hotspot Delineation Trial Pits
 - Pond Sediment Samples (2023)
 - Surface Water Samples (2023)
- 2021 Site Investigation
- Trial Pits (TP100 series)
- 2020 Site Investigation
- Window sample borehole location (WS01 series)
 - Trial pit location (TP01 series)
- Proposed Development Outline with Proposed FFLs
- Former building outlines (now demolished to slab level)
- Topographical survey reproduced from Stamford Geomatics Ltd survey ref. 2456 / 001 RevA, dated March 2021
- Asbestos impacted soils - to be placed below proposed hardstand where it won't later be disturbed, or below a clean cover. Geotechnical properties of the stockpile and pond sediment soils to be considered for their suitability for re-use.
- Hydrocarbon impacted soils - further investigation in areas of visual / olfactory evidence of hydrocarbons, with grossly impacted soils / perched waters to be treated for re-use and / or disposal off site. Further assessment and consideration of concentrations of naphthalene within pond sediments to be undertaken.
- Site wide made ground - to be placed below areas of proposed hardstand or clean cover.
- Surface water culvert - to be further assessed as part of enabling works

Gas Protection - Gas Protection measures with a minimum score of 3.5 points to be installed in all new builds and validated in accordance with BS8485:2019 to suit CS2 conditions

Topographical survey reproduced from Sirius Remediation Ltd, Post Demolition Survey, ref. SR4358-TS-001, dated October 2023

- Notes
- This drawing should not be viewed in isolation from the accompanying report.
 - All exploratory hole locations are approximate and based on handheld GPS coordinates unless stated otherwise on the exploratory hole logs.
 - The locations of services shown on this drawing are approximate and are based on utility plans provided by the client. Locations of services are given for the purposes of indicating constraints to the site investigation only. Reference should be made to original utility plans and HSG47 for locating of services within the site.
 - All marked site features shown on this drawing are given for indicative purposes only. This drawing should not be underlaid in isolation to determine proposed development layouts. Reference should be made to the accompanying report for commentary on the potential location of these features including coordinates if available and any further works required to locate features if required.

REVISION	BY	DATE
0	For Information	MF 27/10/23
A	>>	>> >>
B	>>	>> >>
C	>>	>> >>
D	>>	>> >>

SIRIUS
GEOTECHNICAL LTD
4245 Park Approach,
Thorpe Park,
Leeds
LS15 8GB
www.thesiriusgroup.com
TEL: 0113 264 9960
FAX: 0113 264 9962

CLIENT

Lovell Partnerships Ltd

SITE

**Former Greenside Mills,
Skelmanthorpe**

DRAWING TITLE

Proposed Remediation Plan

DRAWING NO. C9297/RS/04		REVISION NO. 0	
DRAWN BY MF		APPROVED BY GH	
DATE November 2023	SCALE 1:1000		PAPER SIZE A3

This drawing, design and concept are copyright of STEN Architecture

All Dimensions are to be verified on site before any work commences. If any discrepancies, errors or emissions are noted, these are to be reported to STEN Architecture immediately.

If any other drawings are referenced within this layout, please refer to the specific detailed drawing for design, materials and specific working practices.

PLANNING LAYOUT KEY:

Boundary treatments (see separate drawing for details)

- | | |
|---|---|
|  | Bin collection day only
(no collection day only) |
|  | Secure 6ft (length) x 2ft (width) x 4ft (height)
timber cycle store on 8no. 450sq.flags
(900mm x 1800mm).
Dwellings with garages to have bicycle hook
within for storage. |
|  | Bin storage area on 6no. 450sq.flags (900
x 1350mm) |
|  | Wall mounted - Mode 3, Type 2, 7kW Electric
Vehicle Charging Point |
|  | Post mounted - Mode 3, Type 2, 7kW Electric
Vehicle Charging Point |

N	Plot 09 moved east by 0.5m	BMS	21.06.22
M	'Puttenham' house type renamed as 'Newbury'	BMS	23.03.22
L	EV charging point locations added	BMS	15.03.22
K	Tweaks to bin and cycle store positions as per client mark up.	BMS	10.01.22
J	Cycle stores, bin store areas and patios added. Central path added between parking spaces.	BMS	06.01.22
H	'AS' and 'OP' notes added to blocks, 1747 type handing coded and side door added. Plot 1 amended to client's comments.	DS	08.11.22
G	Bin collection point serving plots 30-34 relocated closer to adoptable highway as per clients comments.	LS	20.07.22
F	Turning head serving plots 12-15 amended., positions of plots 12 and 14 amended to suit. Knee railing introduced to edge of turning head. All as per clients comments.	LS	01.07.22
E	Garage for plot 1 moved away from Saville Road. Plots 35-37 re-oriented to enable adjacent road to be reduced to private drive. Plots 33-34 moved forward to reduce height of retaining walls at rear. Other minor updates to Planning Officer comments.	BMS	17.06.22
D	Green walls moved back from footpath	BMS	31.03.22
C	Semi detached plots handed so entrance doors are on the high side	BMS	24.03.22
B	Plots to Saville Road amended to provide more rentage and opportunities for landscaping. Detached Osborne removed. Additional footpaths and visitor parking added	BMS	18.03.22
A	Parking arrangement amended for plot 45	BMS	25.11.22
REV:	DESCRIPTION:	BY:	DATE:

The logo for Sten Architecture features the word "STEN" in a large, bold, light blue sans-serif font. Below it, the word "ARCHITECTURE" is written in a smaller, white, all-caps sans-serif font. The background is a solid dark grey.

STEN
ARCHITECTURE

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The Studio
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Tel: 01924 950985

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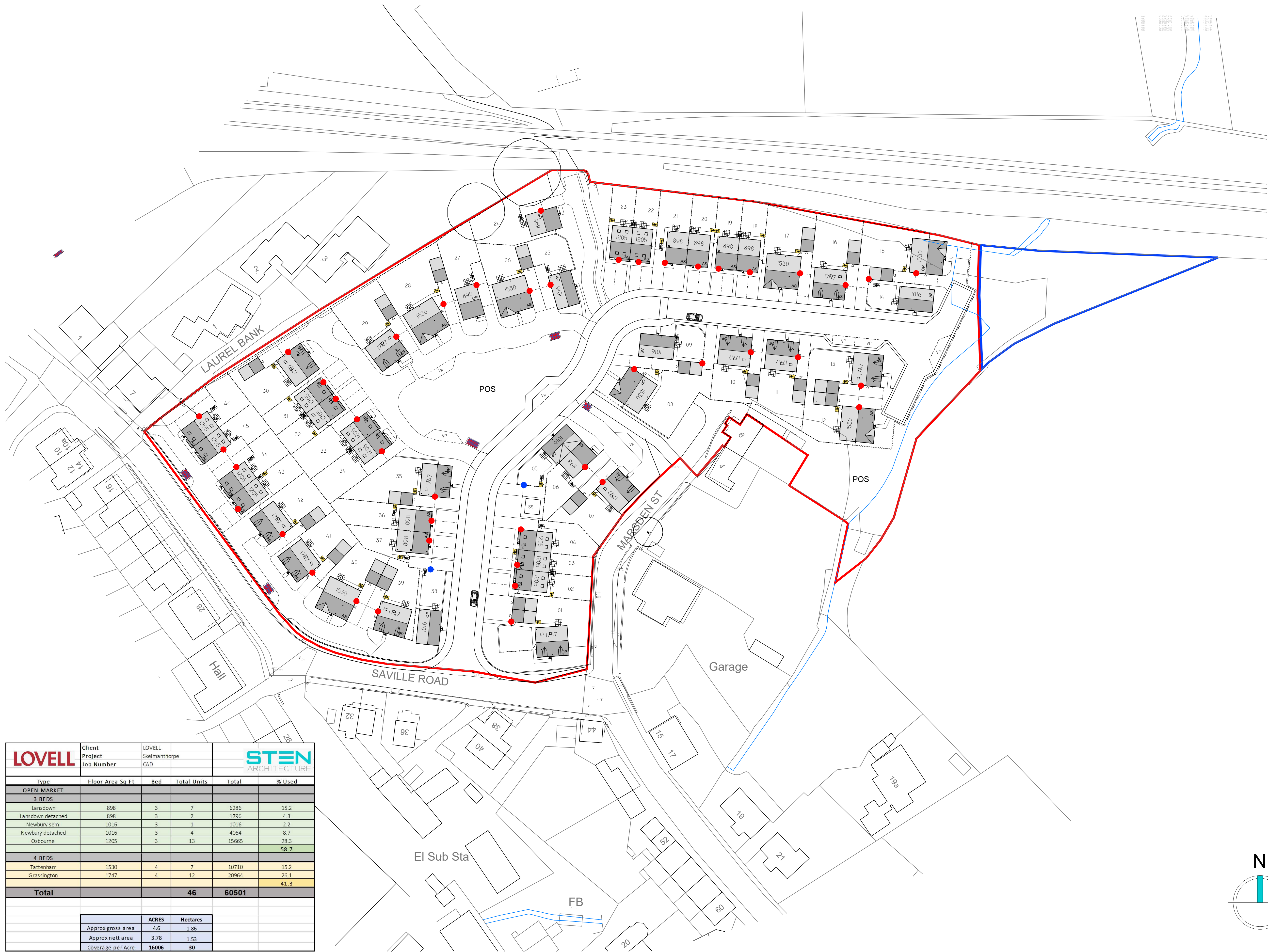
Linkedin: Sten Architecture

CLIENT: **LOVELL**
PARTNERSHIPS

SITE: Greenside Mills
Skelmanthorpe

TITLE: Planning Layout

SCALE AT A1: 1:500	DATE: 29.09.21	DRAWN: BMS	CHECKED: --
PROJECT NO: 2156	DRAWING NO: 2156.01		REVISION: N

[illegible]

Appendix B – Sirius Certificates of Analysis



Certificate of Analysis

Certificate Number 23-11341

Issued: 30-May-23

Client Sirius Geotechnical & Environmental
4245 Park Approach
Thorpe Park
Leeds
LS15 8GB

Our Reference 23-11341

Client Reference C9297

Order No 23430/C9297/GH

Contract Title Greenside Mills, Skelmanthorpe

Description 2 Soil samples.

Date Received 15-May-23

Date Started 15-May-23

Date Completed 30-May-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-11341

Client Ref C9297

Contract Title Greenside Mills, Skelmanthorpe

Lab No	2170984	2170985
Sample ID	Sediment 1	Sediment 2
Depth		
Other ID		
Sample Type	ES	ES
Sampling Date	12/05/2023	12/05/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	11	8.8
Cadmium	DETSC 2301#	0.1	mg/kg	0.9	1.3
Chromium	DETSC 2301#	0.15	mg/kg	120	120
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	97	76
Lead	DETSC 2301#	0.3	mg/kg	130	100
Mercury	DETSC 2325#	0.05	mg/kg	0.21	0.26
Nickel	DETSC 2301#	1	mg/kg	25	24
Selenium	DETSC 2301#	0.5	mg/kg	0.8	0.6
Zinc	DETSC 2301#	1	mg/kg	330	250
Inorganics					
pH	DETSC 2008#		pH	7.1	7.3
Total Organic Carbon	DETSC 2002	0.1	%	11	7.7
Sulphate Aqueous Extract as SO ₄ (2:1)	DETSC 2076#	10	mg/l	820	300
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.42	0.17
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	3.6	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	4.1	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01
PAHs					
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03

Summary of Chemical Analysis

Soil Samples

Our Ref 23-11341

Client Ref C9297

Contract Title Greenside Mills, Skelmanthorpe

Lab No	2170984	2170985
Sample ID	Sediment 1	Sediment 2
Depth		
Other ID		
Sample Type	ES	ES
Sampling Date	12/05/2023	12/05/2023
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.04	0.07
Fluorene	DETSC 3303	0.03	mg/kg	0.03	0.06
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.41	0.57
Anthracene	DETSC 3303	0.03	mg/kg	0.08	0.13
Fluoranthene	DETSC 3303#	0.03	mg/kg	1.1	1.4
Pyrene	DETSC 3303#	0.03	mg/kg	0.98	1.2
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.31	0.46
Chrysene	DETSC 3303	0.03	mg/kg	0.53	0.66
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.67	0.64
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.54	0.25
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.22	0.39
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.18	0.20
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.06
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.20	0.25
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	5.1	6.2
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	3.9	3.0

Summary of Asbestos Analysis Soil Samples

Our Ref 23-11341

Client Ref C9297

Contract Title Greenside Mills, Skelmanthorpe

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2170984	Sediment 1	SOIL	Chrysotile	Chrysotile present as fibre bundles	Robertas Ciparis
2170985	Sediment 2	SOIL	NAD	none	Robertas Ciparis

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-11341
 Client Ref C9297
 Contract Greenside Mills, Skelmanthorpe

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2170984	Sediment 1 SOIL	12/05/23	GJ 250ml, GJ 60ml, PT 1L		
2170985	Sediment 2 SOIL	12/05/23	GJ 250ml, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Certificate of Analysis

Certificate Number 23-12751

Issued: 05-Jun-23

Client Sirius Geotechnical & Environmental
4245 Park Approach
Thorpe Park
Leeds
LS15 8GB

Our Reference 23-12751

Client Reference C9297

Order No 23430/C9297/GH

Contract Title Greenside Mills, Skelmanthorpe

Description One Soil sample.

Date Received 15-May-23

Date Started 31-May-23

Date Completed 05-Jun-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



2139

Summary of Asbestos Analysis Samples

Our Ref 23-12751

Client Ref C9297

Contract Title Greenside Mills, Skelmanthorpe

Lab No	Sample ID	Sample Location	Material Type	Result	Comment*	Analyst
Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.						

Summary of Asbestos Quantification Analysis

Soil Samples

Our Ref 23-12751

Client Ref C9297

Contract Title Greenside Mills, Skelmanthorpe

Lab No	2178983
Sample ID	Sediment 1
Depth	
Other ID	
Sample Type	ES
Sampling Date	12/05/2023
Sampling Time	

Test	Method	Units	
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	< 0.001
Gravimetric Quantification (a)	DETSC 1102	Mass %	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	<0.001
Quantification by PCOM (c)	DETSC 1102	Mass %	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na

Breakdown of Gravimetric Analysis (a)

Mass of Sample		g	201.79
ACMs present*		type	
Mass of ACM in sample		g	
% ACM by mass		%	
% asbestos in ACM		%	
% asbestos in sample		%	

Breakdown of Detailed Gravimetric Analysis (b)

% Amphibole bundles in sample		Mass %	na
% Chrysotile bundles in sample		Mass %	<0.001

Breakdown of PCOM Analysis (c)

% Amphibole fibres in sample		Mass %	na
% Chrysotile fibres in sample		Mass %	na

Breakdown of Potentially Respirable Fibre Analysis (d)

Amphibole fibres		Fibres/g	na
Chrysotile fibres		Fibres/g	na

* Denotes test or material description outside of UKAS accreditation.
 % asbestos in Asbestos Containing Materials (ACMs) is determined by
 by reference to HSG 264.
 Recommended sample size for quantification is approximately 1kg
 # denotes deviating sample

Information in Support of the Analytical Results

Our Ref 23-12751
Client Ref C9297
Contract Greenside Mills, Skelmanthorpe

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Holding time exceeded for tests	Inappropriate container for tests
		Sampled	Containers Received		
2178983	Sediment 1 SOIL	12/05/23	GJ 250ml, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :- Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



Final Report

Report No.: 23-32249-1

Initial Date of Issue: 10-Oct-2023

Re-Issue Details:

Client Sirius Geotechnical Ltd

Client Address: 4250 (Downstairs)
Thorpe Park
Park Approach
Leeds
West Yorkshire
LS15 8GB

Contact(s): Gemma Halliday
Jack Clarke

Project C9297A Greenside Mills

Quotation No.: **Date Received:** 27-Sep-2023

Order No.: 23935/C9297A/GLH **Date Instructed:** 27-Sep-2023

No. of Samples: 34

Turnaround (Wkdays): 5 **Results Due:** 03-Oct-2023

Date Approved: 10-Oct-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: C9297A Greenside Mills

Client: Sirius Geotechnical Ltd	Chemtest Job No.:				23-32249	23-32249	23-32249	23-32249	23-32249	23-32249	23-32249	23-32249	23-32249
Quotation No.:	Chemtest Sample ID.:				1707918	1707919	1707920	1707921	1707922	1707923	1707924	1707925	1707927
	Client Sample ID.:				WS09-TPA	WS09-TPB	WS13-TP	TP101	TP06A	TP06B	TP06C	POND TP	TP210
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.00	0.20	0.30	0.40	0.10	0.10	0.10	0.50	0.50
	Date Sampled:				22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023
	Asbestos Lab:								DURHAM	DURHAM	DURHAM	DURHAM	
Determinand	Accred.	SOP	Units	LOD									
ACM Type	U	2192		N/A					-	-	-	-	
Asbestos Identification	U	2192		N/A					No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	
Asbestos by Gravimetry	U	2192	%	0.001									
Total Asbestos	U	2192	%	0.001									
Moisture	N	2030	%	0.020	15	22	12	10				53	
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones and Roots	Stones	Stones	Stones	Roots and	Stones and Roots
Soil Texture	N	2040		N/A	Clay	Loam	Clay	Clay	Clay	Loam	Clay	sludge	Loam
pH at 20C	M	2010		4.0								8.1	
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010								0.35	
Sulphate (Total)	U	2430	%	0.010								2.2	
Arsenic	M	2455	mg/kg	0.5								14	
Cadmium	M	2455	mg/kg	0.10								1.4	
Chromium	M	2455	mg/kg	0.5								91	
Copper	M	2455	mg/kg	0.50								440	
Mercury	M	2455	mg/kg	0.05								0.52	
Nickel	M	2455	mg/kg	0.50								28	
Lead	M	2455	mg/kg	0.50								260	
Selenium	M	2455	mg/kg	0.25								1.0	
Zinc	M	2455	mg/kg	0.50								240	
Chromium (Hexavalent)	N	2490	mg/kg	0.50								< 0.50	
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05				< 0.05	
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05				< 0.05	
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05				< 0.05	
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10				< 0.10	
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05				< 0.05	
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25				< 0.25	
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0				< 2.0	
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0				49	
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	< 2.0	12	< 2.0	< 2.0				210	
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	< 3.0	24	< 3.0	< 3.0				340	
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10				34	
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	< 5.0	36	< 5.0	< 5.0				610	
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	36	< 10	< 10				640	
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05				< 0.05	
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05				< 0.05	
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05				< 0.05	

Results - Soil

Project: C9297A Greenside Mills

Client: Sirius Geotechnical Ltd	Chemtest Job No.:				23-32249	23-32249	23-32249	23-32249	23-32249	23-32249	23-32249	23-32249
Quotation No.:	Chemtest Sample ID.:				1707918	1707919	1707920	1707921	1707922	1707923	1707924	1707925
	Client Sample ID.:				WS09-TPA	WS09-TPB	WS13-TP	TP101	TP06A	TP06B	TP06C	POND TP
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.00	0.20	0.30	0.40	0.10	0.10	0.10	0.50
	Date Sampled:				22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023
	Asbestos Lab:								DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD								
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25				< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0				< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0				38
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	14	21	14	65				160
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	150				330
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	13				38
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	15	21	14	210				530
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	15	21	14	230				570
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50				< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	15	58	14	210				1100
Total EPH >C10-C40	N	2690	mg/kg	10.00	15	58	14	230				1200
Total Organic Carbon	M	2625	%	0.20								8.2
Naphthalene	M	2700	mg/kg	0.10								35
Acenaphthylene	M	2700	mg/kg	0.10								11
Acenaphthene	M	2700	mg/kg	0.10								26
Fluorene	M	2700	mg/kg	0.10								41
Phenanthrene	M	2700	mg/kg	0.10								49
Anthracene	M	2700	mg/kg	0.10								23
Fluoranthene	M	2700	mg/kg	0.10								38
Pyrene	M	2700	mg/kg	0.10								45
Benzo[a]anthracene	M	2700	mg/kg	0.10								15
Chrysene	M	2700	mg/kg	0.10								18
Benzo[b]fluoranthene	M	2700	mg/kg	0.10								20
Benzo[k]fluoranthene	M	2700	mg/kg	0.10								9.1
Benzo[a]pyrene	M	2700	mg/kg	0.10								15
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10								8.8
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10								2.3
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10								12
Total Of 16 PAH's	M	2700	mg/kg	2.0								370
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0				< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0				< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0				< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0				< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0				< 1.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0				< 1.0
PCB 81	N	2815	mg/kg	0.010								
PCB 77	U	2815	mg/kg	0.010								
PCB 105	N	2815	mg/kg	0.010								
PCB 114	N	2815	mg/kg	0.010								

Results - Soil

Project: C9297A Greenside Mills

Client: Sirius Geotechnical Ltd	Chemtest Job No.:				23-32249	23-32249	23-32249	23-32249	23-32249	23-32249	23-32249	23-32249	23-32249
Quotation No.:	Chemtest Sample ID.:				1707918	1707919	1707920	1707921	1707922	1707923	1707924	1707925	1707927
	Client Sample ID.:				WS09-TPA	WS09-TPB	WS13-TP	TP101	TP06A	TP06B	TP06C	POND TP	TP210
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.00	0.20	0.30	0.40	0.10	0.10	0.10	0.50	0.50
	Date Sampled:				22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023	22-Sep-2023
	Asbestos Lab:								DURHAM	DURHAM	DURHAM	DURHAM	
Determinand	Accred.	SOP	Units	LOD									
PCB 118	N	2815	mg/kg	0.010									
PCB 123	N	2815	mg/kg	0.010									
PCB 126	N	2815	mg/kg	0.010									
PCB 156	N	2815	mg/kg	0.010									
PCB 157	N	2815	mg/kg	0.010									
PCB 167	N	2815	mg/kg	0.010									
PCB 169	N	2815	mg/kg	0.010									
PCB 189	N	2815	mg/kg	0.010									
Total PCBs (12 Congeners)	N	2815	mg/kg	0.12									
Total Phenols	M	2920	mg/kg	0.10								0.64	

Test Methods

SOP	Title	Parameters included	Method summary
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
2010	pH Value of Soils	pH at 20°C	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7, >C7–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2810	Polychlorinated Biphenyls (PCB) as Aroclors in Soils by GC-ECD	Polychlorinated Biphenyls expressed as an Aroclor (normally reported as *Aroclor 1242)	Extraction of a soil sample, as received, into hexane/acetone (50:50) followed by gas chromatography (GC) using mass spectrometric (MS) detection for identification of polychlorinated biphenyls and electron capture detection (ECD) for quantitation if present.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
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SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

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Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

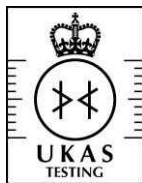
All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

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If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



2183

Final Report

Report No.: 23-35727-1

Initial Date of Issue: 02-Nov-2023

Re-Issue Details:

Client Sirius Geotechnical Ltd

Client Address: 4250 (Downstairs)
Thorpe Park
Park Approach
Leeds
West Yorkshire
LS15 8GB

Contact(s): Gemma Halliday
Jack Clarke

Project C9297A Greenside Mills

Quotation No.: **Date Received:** 25-Oct-2023

Order No.: 24037/C9297A/GLH **Date Instructed:** 25-Oct-2023

No. of Samples: 1

Turnaround (Wkdays): 5 **Results Due:** 31-Oct-2023

Date Approved: 02-Nov-2023

Approved By:



Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: C9297A Greenside Mills

Client: Sirius Geotechnical Ltd	Chemtest Job No.:		23-35727		
Quotation No.:	Chemtest Sample ID.:		1721840		
	Client Sample ID.:		Retest sample 1707925		
	Sample Location:		POND TP		
	Sample Type:		SOIL		
	Date Sampled:		22-Sep-2023		
Determinand	Accred.	SOP	Units	LOD	
Moisture	N	2030	%	0.020	53
Naphthalene	U	2700	mg/kg	0.10	[B] 1.6
Acenaphthylene	U	2700	mg/kg	0.10	[B] 1.9
Acenaphthene	U	2700	mg/kg	0.10	[B] 3.5
Fluorene	U	2700	mg/kg	0.10	[B] 5.6
Phenanthrene	U	2700	mg/kg	0.10	[B] 20
Anthracene	U	2700	mg/kg	0.10	[B] 8.3
Fluoranthene	U	2700	mg/kg	0.10	[B] 21
Pyrene	U	2700	mg/kg	0.10	[B] 26
Benzo[a]anthracene	U	2700	mg/kg	0.10	[B] 12
Chrysene	U	2700	mg/kg	0.10	[B] 14
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	[B] 17
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	[B] 6.4
Benzo[a]pyrene	U	2700	mg/kg	0.10	[B] 13
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	[B] 8.1
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	[B] 2.2
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	[B] 11
Total Of 16 PAH's	U	2700	mg/kg	2.0	[B] 170

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1721840		Retest sample 1707925	POND TP	22-Sep-2023	B	Amber Glass 250ml
1721840		Retest sample 1707925	POND TP	22-Sep-2023	B	Amber Glass 60ml
1721840		Retest sample 1707925	POND TP	22-Sep-2023	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)

Report Information

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I/S	Insufficient Sample
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SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

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All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

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Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

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Appendix C – Generic Assessment Criteria Values

Generic Assessment Criteria Values

Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS ^{resi}	POS ^{park}	Source
Metals	Inorganic Arsenic	N/A	37	40	49	640	79	168	DEFRA C4SL
	Beryllium	N/A	1.7	1.7	35	12	2.2	63	LQM S4UL
	Boron	N/A	290	11,000	45	240,000	21,000	46,000	LQM S4UL
	Cadmium	N/A	26	149	4.9	410	220	880	DEFRA C4SL
	Chromium (III)	N/A	910	910	18,000	8,600	1,500	33,000	LQM S4UL
	Chromium (VI)	N/A	21.0	21.0	170.0	49	23.0	250	DEFRA C4SL
	Copper	N/A	2,400	7,100	520	68,000	12,000	44,000	LQM S4UL
	Lead	N/A	200	310	80	2,330	630	1,300	DEFRA C4SL
	Elemental Mercury	N/A	1.2	1.2	21	58 (25.8) ^{vap}	16	30 (25.8) ^{vap}	LQM S4UL
	Inorganic Mercury	N/A	40	56	19	1,100	120	240	LQM S4UL
	Methylmercury	N/A	11	15	6.0	320	40	68	LQM S4UL
	Nickel (2015 update)	N/A	130	180	53	980	230	800	LQM S4UL
	Selenium	N/A	250	430	88	12,000	1,100	1,800	LQM S4UL
	Vanadium	N/A	410	1,200	91	9,000	2,000	5,000	LQM S4UL
Zinc	N/A	3,700	40,000	620	730,000	81,000	170,000	LQM S4UL	
Polycyclic Aromatic Hydrocarbons (PAHs)	Acenaphthene	1%	210	3,000 (57.1) ^{sol}	34	84,000 (57.0) ^{sol}	15,000	29,000	LQM S4UL
		2.5%	510	4,700 (141) ^{sol}	85	97,000 (141) ^{sol}	15,000	30,000	LQM S4UL
		6%	1,100	6,000 (336) ^{sol}	200	100,000	15,000	30,000	LQM S4UL
	Acenaphthylene	1%	170	2,900 (86.1) ^{sol}	28	83,000 (86.1) ^{sol}	15,000	29,000	LQM S4UL
		2.5%	420	4,600 (212) ^{sol}	69	97,000 (212) ^{sol}	15,000	30,000	LQM S4UL
		6%	920	6,000 (506) ^{sol}	160	100,000	15,000	30,000	LQM S4UL
	Anthracene	1%	2,400	31,000 (1.17) ^{vap}	380	520,000	74,000	150,000	LQM S4UL
		2.5%	5,400	35,000	950	540,000	74,000	150,000	LQM S4UL
		6%	11,000	37,000	2,200	540,000	74,000	150,000	LQM S4UL
	Benz(a)anthracene	1%	7.2	11	2.9	170	29	49	LQM S4UL
		2.5%	11	14	6.5	170	29	56	LQM S4UL
		6%	13	15	13	180	29	62	LQM S4UL
	Benzo(a)pyrene (only)	1%	5.0	5.3	5.70	77	10.0	21	DEFRA C4SL
		2.5%	5.0	5.3	5.70	77	10.0	21	DEFRA C4SL
		6%	5.0	5.3	5.70	77	10.0	21	DEFRA C4SL
	Benzo(a)pyrene (surrogate marker Coal Tar)	1%	0.8	1.2	0.32	15	2.2	4	LQM S4UL
		2.5%	1.0	1.2	0.67	15	2.2	5	LQM S4UL
		6%	1.1	1.2	1.20	15	2.2	5	LQM S4UL
	Benzo(b)fluoranthene	1%	2.6	3.9	0.99	44	7.1	13	LQM S4UL
		2.5%	3.3	4.0	2.1	44	7.2	15	LQM S4UL
		6%	3.7	4.0	3.9	45	7.2	16	LQM S4UL
	Benzo(ghi)perylene	1%	320	360	290	3,900	640	1,400	LQM S4UL
		2.5%	340	360	470	4,000	640	1,500	LQM S4UL
		6%	350	360	640	4,000	640	1,600	LQM S4UL
	Benzo(k)fluoranthene	1%	77	110	37	1,200	190	370	LQM S4UL
		2.5%	93	110	75	1,200	190	410	LQM S4UL
		6%	100	110	130	1,200	190	440	LQM S4UL
	Chrysene	1%	15	30	4.1	350	57	93	LQM S4UL
		2.5%	22	31	9.4	350	57	110	LQM S4UL
		6%	27	32	19	350	57	120	LQM S4UL
	Dibenzo(ah)anthracene	1%	0.24	0.31	0.14	3.5	0.57	1.1	LQM S4UL
		2.5%	0.28	0.32	0.27	3.6	0.58	1.3	LQM S4UL
		6%	0.3	0.32	0.43	3.6	0.58	1.4	LQM S4UL
	Fluoranthene	1%	280	1,500	52	23,000	3,100	6,300	LQM S4UL
		2.5%	560	1,600	130	23,000	3,100	6,300	LQM S4UL
		6%	890	1,600	290	23,000	3,100	6,400	LQM S4UL
	Fluorene	1%	170	2,800 (36.0) ^{sol}	27	63,000 (30.9) ^{sol}	9,900	20,000	LQM S4UL
		2.5%	400	3,800 (76.5) ^{sol}	67	68,000	9,900	20,000	LQM S4UL
		6%	860	4,500 (183) ^{sol}	160	71,000	9,900	20,000	LQM S4UL
	Indeno(123-cd)pyrene	1%	27	45	9.5	500	82	150	LQM S4UL
		2.5%	36	46	21	510	82	170	LQM S4UL
		6%	41	46	39	510	82	180	LQM S4UL
	Naphthalene	1%	15	15	65	1,600*	11,000*	8,400*	DEFRA C4SL
		2.5%	36	36	130	3,700*	15,000*	17,00*	DEFRA C4SL
		6%	85	85	200	8,400*	1,200*	1,900*	DEFRA C4SL
	Phenanthrene	1%	95	1,300 (36.0) ^{sol}	15	22,000	3,100	6,200	LQM S4UL
		2.5%	220	1,500	38	22,000	3,100	6,200	LQM S4UL
		6%	440	1,500	90	22,000	3,100	6,300	LQM S4UL
	Pyrene	1%	620	3,700	110	54,000	7,400	15,000	LQM S4UL
		2.5%	1,200	3,800	270	54,000	7,400	15,000	LQM S4UL
		6%	2,000	3,800	620	54,000	7,400	15,000	LQM S4UL
	Coal Tar (B(a)P as surrogate marker)	1%	0.79	1.2	0.32	15	2.2	4.4	LQM S4UL
		2.5%	0.98	1.2	0.67	15	2.2	4.7	LQM S4UL
		6%	1.1	1.2	1.2	15	2.2	4.8	LQM S4UL

Generic Assessment Criteria Values

Contaminant		SOM	Res +	Res -	Allot.	Comm.	Pos ^{resi}	Pos ^{park}	Source
BTEX Compounds	Benzene	1%	0.87	0.38	0.017	27	72	90	LQM S4UL
		2.5%	0.17	0.70	0.034	47	72	100	LQM S4UL
		6%	0.37	1.4	0.075	90	73	110	LQM S4UL
	Toluene	1%	130	880 (869) ^{vap}	22	56,000 (869) ^{vap}	56,000	87,000 (869) ^{vap}	LQM S4UL
		2.5%	290	1,900	51	110,000 (1,920) ^{vap}	56,000	95,000 (1,920) ^{vap}	LQM S4UL
		6%	660	3,900	120	180,000 (4,360) ^{vap}	56,000	100,000 (4,360)	LQM S4UL
	Ethylbenzene	1%	47	83	16	5,700 (518) ^{vap}	24,000	17,000 (518) ^{vap}	LQM S4UL
		2.5%	110	190	39	13,000 (1,220) ^{vap}	24,000	22,000 (1,220) ^{vap}	LQM S4UL
		6%	260	440	91	27,000 (2,840) ^{vap}	25,000	27,000 (2,840) ^{vap}	LQM S4UL
	o-xylene	1%	60	88	28	6,600 (478) ^{sol}	41,000	17,000 (478) ^{sol}	LQM S4UL
		2.5%	140	210	67	15,000 (1,120) ^{sol}	42,000	24,000 (1,120) ^{sol}	LQM S4UL
		6%	330	480	160	33,000 (2,620) ^{sol}	43,000	33,000 (2,620) ^{sol}	LQM S4UL
	m-xylene	1%	59	82	31	6,200 (625) ^{vap}	41,000	17,000 (625) ^{vap}	LQM S4UL
		2.5%	140	190	74	14,000 (1,470) ^{vap}	42,000	24,000 (1,470) ^{vap}	LQM S4UL
		6%	320	450	170	31,000 (3,460) ^{vap}	43,000	32,000 (3,460) ^{vap}	LQM S4UL
	p-xylene	1%	56	79	29	5,900 (576) ^{sol}	41,000	17,000 (576) ^{sol}	LQM S4UL
		2.5%	130	180	69	14,000 (1,350) ^{sol}	42,000	23,000 (1,350) ^{sol}	LQM S4UL
		6%	310	430	160	30,000 (3,170) ^{sol}	43,000	31,000 (3,170) ^{sol}	LQM S4UL
Aliphatic									
EC 5-6	1%	42	42	730	3,200 (304) ^{sol}	570,000(304) ^{sol}	95,000 (304) ^{sol}	LQM S4UL	
EC>6-8	1%	100	100	2,300	7,800 (144) ^{sol}	600,000	150,000 (144) ^{sol}	LQM S4UL	
EC>8-10	1%	27	27	320	2,000 (78) ^{sol}	13,000	14,000 (78) ^{vap}	LQM S4UL	
EC>10-12	1%	130 (48) ^{vap}	130 (48) ^{vap}	2,200	9,700 (48) ^{sol}	13,000	21,000 (48) ^{vap}	LQM S4UL	
EC>12-16	1%	1,100 (24) ^{sol}	1,100 (24) ^{sol}	11,000	59,000 (24) ^{sol}	13,000	25,000 (24) ^{sol}	LQM S4UL	
EC>16-35	1%	65,000 (8.48)	65,000 (8.48) ^{f, sol}	260,000 ^f	160,000 ^f	250,000 ^f	450,000 ^f	LQM S4UL	
EC>35-44	1%	65,000 (8.48)	65,000 (8.48) ^{f, sol}	260,000 ^f	160,000 ^f	250,000 ^f	450,000 ^f	LQM S4UL	
Aliphatic									
EC 5-6	2.5%	78	78	1,700	5,900 (558) ^{sol}	590,000	130,000 (558) ^{sol}	LQM S4UL	
EC>6-8	2.5%	230	230	5,600	17,000 (322) ^{sol}	610,000	220,000 (322) ^{sol}	LQM S4UL	
EC>8-10	2.5%	65	65	770	4,800 (190) ^{vap}	13,000	18,000 (190) ^{vap}	LQM S4UL	
EC>10-12	2.5%	330 (118) ^{vap}	330 (118) ^{vap}	4,400	23,000 (118) ^{vap}	13,000	23,000 (118) ^{vap}	LQM S4UL	
EC>12-16	2.5%	2,400 (59) ^{sol}	2,400 (59) ^{sol}	13,000	82,000 (59) ^{sol}	13,000	25,000 (59) ^{sol}	LQM S4UL	
EC>16-35	2.5%	92,000 (21)	92,000 (21) ^{f, sol}	270,000 ^f	1,700,000 ^f	250,000 ^f	480,000 ^f	LQM S4UL	
EC>35-44	2.5%	92,000 (21)	92,000 (21) ^{f, sol}	270,000 ^f	1,700,000 ^f	250,000 ^f	480,000 ^f	LQM S4UL	
Aliphatic									
EC 5-6	6%	160	160	3,900	12,000 (1,150) ^{sol}	600,000	180,000 (1,150)	LQM S4UL	
EC>6-8	6%	530	530	13,000	40,000 (736) ^{sol}	620,000	320,000 (736) ^{sol}	LQM S4UL	
EC>8-10	6%	150	150	1,700	11,000 (451) ^{vap}	13,000	21,000 (451) ^{vap}	LQM S4UL	
EC>10-12	6%	760 (283) ^{vap}	760 (283) ^{vap}	7,300	47,000 (283) ^{vap}	13,000	24,000 (283) ^{vap}	LQM S4UL	
EC>12-16	6%	4,300 (142) ^{sol}	4,400 (142) ^{sol}	13,000	90,000 (142) ^{sol}	13,000	26,000 (142) ^{sol}	LQM S4UL	
EC>16-35	6%	110,000 ^f	110,000 ^f	270,000 ^f	1,800,000 ^f	250,000 ^f	490,000 ^f	LQM S4UL	
EC>35-44	6%	110,000 ^f	110,000 ^f	270,000 ^f	1,800,000 ^f	250,000 ^f	490,000 ^f	LQM S4UL	
Aromatic									
EC5-7(benzene as non-	1%	70	370	13	26,000 (1,220) ^{sol}	56,000	76,000 (1,220) ^{sol}	LQM S4UL	
EC>7-8(toluene)	1%	130	860	22	56,000 (869) ^{vap}	56,000	87,000 (869) ^{vap}	LQM S4UL	
EC>8-10	1%	34	47	8.6	3,500 (613) ^{vap}	5,000	7,200 (613) ^{vap}	LQM S4UL	
EC>10-12	1%	74	250	13	16,000 (364) ^{sol}	5,000	9,200 (364) ^{sol}	LQM S4UL	
EC>12-16	1%	140	1,800	23	36,000 (169) ^{sol}	5,100	10,000	LQM S4UL	
EC>16-21	1%	260 ^f	1,900 ^f	46 ^f	28,000 ^f	3,800 ^f	7,600 ^f	LQM S4UL	
EC>21-35	1%	1,100 ^f	1,900 ^f	370 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
EC>35-44	1%	1,100 ^f	1,900 ^f	370 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
Aromatic									
EC5-7(benzene as non-	2.5%	140	690	27	46,000 (2,260) ^{sol}	56,000	84,000 (2,260) ^{sol}	LQM S4UL	
EC>7-8(toluene)	2.5%	290	1,800	51	110,000 (1,920) ^{sol}	56,000	95,000 (1,920) ^{sol}	LQM S4UL	
EC>8-10	2.5%	83	110	21	8,100 (1,500) ^{vap}	5,000	8,500 (1,500) ^{vap}	LQM S4UL	
EC>10-12	2.5%	180	590	31	28,000 (899) ^{sol}	5,000	9,700 (899) ^{sol}	LQM S4UL	
EC>12-16	2.5%	330	2,300 (419) ^{sol}	57	37,000	5,100	10,000	LQM S4UL	
EC>16-21	2.5%	540 ^f	1,900 ^f	110 ^f	28,000 ^f	3,800 ^f	7,700 ^f	LQM S4UL	
EC>21-35	2.5%	1,500 ^f	1,900 ^f	820 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
EC>35-44	2.5%	1,500 ^f	1,900 ^f	820 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
Aromatic									
EC5-7(benzene as non-	6%	300	1,400	57	86,000 (4,710) ^{sol}	56,000	92,000 (4,710) ^{sol}	LQM S4UL	
EC>7-8(toluene)	6%	660	3,900	120	180,000 (4,360) ^{vap}	56,000	100,000 (4,360)	LQM S4UL	
EC>8-10	6%	190	270	51	17,000 (3,580) ^{vap}	5,000	9,300 (3,580) ^{vap}	LQM S4UL	
EC>10-12	6%	380	1,200	4	34,000 (2,150) ^{sol}	5,000	10,000	LQM S4UL	
EC>12-16	6%	660	2,500	130	38,000	5,100	10,000	LQM S4UL	
EC>16-21	6%	930 ^f	1,900 ^f	260 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
EC>21-35	6%	1,700 ^f	1,900 ^f	1,600 ^f	28,000 ^f	3,800 ^f	7,900 ^f	LQM S4UL	
EC>35-44	6%	1,700 ^f	1,900 ^f	1,600 ^f	28,000 ^f	3,800 ^f	7,900 ^f	LQM S4UL	
Aliphatic +Aromatic >EC44	1%	1,600 ^f	1,900 ^f	1,200 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
	2.5%	1,800 ^f	1,900 ^f	2,100 ^f	28,000 ^f	3,800 ^f	7,800 ^f	LQM S4UL	
	6%	1,900 ^f	1,900 ^f	3,000 ^f	28,000 ^f	3,800 ^f	7,900 ^f	LQM S4UL	

Generic Assessment Criteria Values

Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS ^{res} i	POS ^{res} park	Source
Chloroalkanes and Alkenes & Explosives	1,2 Dichloroethane (DCA)	1%	0.0071	0.0092	0.0046	0.67	29	21	LQM S4UL
		2.5%	0.0110	0.0130	0.0083	0.97	29	24	LQM S4UL
		6%	0.0190	0.0230	0.0160	1.7	29	28	LQM S4UL
	1,1,1 Trichloroethane (TCA)	1%	8.8	9.0	48	660	140,000	57,000 (1,425) ^{vap}	LQM S4UL
		2.5%	18	18	110	1,300	140,000	76,000 (2,915) ^{vap}	LQM S4UL
		6%	39	40	240	3,000	140,000	100,000 (6,392)	LQM S4UL
	1,1,2,2-Tetrachloroethanes (PCA)	1%	1.6	3.9	0.41	270	1,400	1,800	LQM S4UL
		2.5%	3.4	8.0	0.89	550	1,400	2,100	LQM S4UL
		6%	7.5	17	2.0	1,100	1,400	2,300	LQM S4UL
	1,1,1,2-Tetrachloroethanes (PCA)	1%	1.2	1.5	0.79	110	1,400	1,500	LQM S4UL
		2.5%	2.8	3.5	1.9	250	1,400	1,800	LQM S4UL
		6%	6.4	8.2	4.4	560	1,400	2,100	LQM S4UL
	Tetrachloroethene (PCE)	1%	0.31	0.32	2.00	24	3,200	1400	DEFRA C4SL
		2.5%	0.70	0.71	4.8	55	3,300	1900	DEFRA C4SL
		6%	1.60	1.60	11.0	130	3,400	2,500	DEFRA C4SL
	Tetrachloromethane (carbon tetrachloride)	1%	0.03	0.03	0.45	2.9	890	190	LQM S4UL
		2.5%	0.06	0.06	1.0	6.3	920	270	LQM S4UL
		6%	0.13	0.13	2.4	14	950	400	LQM S4UL
	Trichloroethene (TCE)	1%	0.009	0.010	0.032	0.7	76.0	41.0	DEFRA C4SL
		2.5%	0.020	0.020	0.072	1.5	78.0	51.0	DEFRA C4SL
		6%	0.043	0.045	0.160	3.4	79.0	69.0	DEFRA C4SL
	cis 1,2-dichloroethene	1%	0.46	0.50	0.890	38	3,800	2,000	DEFRA C4SL
		2.5%	0.78	0.84	1.70	64	3,800	2,400	DEFRA C4SL
		6%	1.50	1.60	3.60	120	3,900	3,100	DEFRA C4SL
	Trichloromethane (chloroform)	1%	0.91	1.2	0.42	99	2,500	2,600	LQM S4UL
		2.5%	1.7	2.1	0.83	170	2,500	2,800	LQM S4UL
		6%	3.4	4.2	1.7	350	2,500	3,100	LQM S4UL
	Trans-1,2 Dichloroethene	1%	0.9	0.9	3.7	69	13,000	5,600	DEFRA C4SL
		2.5%	1.6	1.7	7.5	120	13,000	7,000	DEFRA C4SL
		6%	3.3	3.4	16.0	260	13,000	9,100	DEFRA C4SL
	Chloroethene (vinyl chloride)	1%	0.006	0.015	0.0017	1.1E+00	7.8	18.0	DEFRA C4SL
		2.5%	0.010	0.019	0.0031	1.4E+00	7.8	19.0	DEFRA C4SL
		6%	0.017	0.029	0.0058	2.20	7.8	19.0	DEFRA C4SL
	2,4,6-Trinitrotoluene (TNT)	1%	1.6	65	0.24	1,000	130	260	LQM S4UL
		2.5%	3.7	66	0.58	1,000	130	270	LQM S4UL
		6%	8.1	66	1.4	1,000	130	270	LQM S4UL
	RDX	1%	120	13,000	17	210,000	26,000	49,000 (18.7) ^{sol}	LQM S4UL
		2.5%	250	13,000	38	210,000	26,000	51,000	LQM S4UL
		6%	540	13,000	85	210,000	27,000	53,000	LQM S4UL
	HMX	1%	5.7	6,700	0.86	110,000	13,000	23,000 (0.35) ^{vap}	LQM S4UL
		2.5%	13	6,700	1.9	110,000	13,000	23,000 (0.39) ^{vap}	LQM S4UL
		6%	26	6,700	3.9	110,000	13,000	24,000 (0.48) ^{vap}	LQM S4UL
Pesticides	Aldrin	1%	5.7	7.3	3.2	170	18	30	LQM S4UL
		2.5%	6.6	7.4	6.1	170	18	31	LQM S4UL
		6%	7.1	7.5	9.8	170	18	31	LQM S4UL
	Dieldrin	1%	0.97	7.0	0.17	170	18	30	LQM S4UL
		2.5%	2.0	7.3	0.41	170	18	30	LQM S4UL
		6%	3.5	7.4	0.96	170	18	31	LQM S4UL
	Atrazine	1%	3.3	610	0.5	9,300	1,200	2,300	LQM S4UL
		2.5%	7.8	620	1.2	9,400	1,200	2,400	LQM S4UL
		6%	17.4	620	2.7	9,400	1,200	2,400	LQM S4UL
	Dichlorvos	1%	3.2E-02	6.4	4.9E-03	140	16	26	LQM S4UL
		2.5%	6.6E-02	6.5	1.0E-02	140	16	26	LQM S4UL
		6%	0.14	6.6	2.2E-02	140	16	27	LQM S4UL
	Endosulfans (2 isomers)	1%	7.4	160 (3.0E-03) ^{vap}	1.2	5,600 (3.0E-03) ^{vap}	1,200	2,300	LQM S4UL
		2.5%	18	280 (7.0E-03) ^{vap}	2.9	7,400 (7.0E-03) ^{vap}	1,200	2,400	LQM S4UL
		6%	41	410 (1.6E-02) ^{vap}	6.8	8,400 (1.6E-02) ^{vap}	1,200	2,500	LQM S4UL
	Hexachlorocyclohexane (3 isomers), inc Lindane	1%	8.5E-02	3.7	1.3E-02	65	8.1	15	LQM S4UL
		2.5%	0.2	3.8	3.2E-02	65	8.1	15	LQM S4UL
		6%	0.46	3.8	7.7E-02	65	8.1	16	LQM S4UL
Chlorobenzenes	Chlorobenzene	1%	0.46	0.46	5.9	56	11,000	1,300 (675) ^{sol}	LQM S4UL
		2.5%	1.0	1.0	14	130	13,000	2,000 (1,520) ^{sol}	LQM S4UL
		6%	2.4	2.4	32	290	14,000	2,900	LQM S4UL
	Dichlorobenzenes (3 isomers)	1%	23	24	94	2,000 (571) ^{sol}	90,000	24,000 (571) ^{sol}	LQM S4UL
		2.5%	55	57	230	4,800 (1,370) ^{sol}	95,000	36,000 (1,370) ^{sol}	LQM S4UL
		6%	130	130	540	11,000 (3,240) ^{sol}	98,000	51,000 (3,270) ^{sol}	LQM S4UL
	Trichlorobenzenes (3 isomers)	1%	2.6	2.6	55	220	15,000	1,700 (318) ^{vap}	LQM S4UL
		2.5%	6.4	6.4	140	530	17,000	2,600 (786) ^{vap}	LQM S4UL
		6%	15	15	320	1,300	19,000	4,000 (1,880) ^{vap}	LQM S4UL
	Tetrachlorobenzenes (3 isomers)	1%	0.66	0.75	0.38	49 (39.4) ^{vap}	78	110 (39) ^{vap}	LQM S4UL
		2.5%	1.6	1.9	0.90	120 (98.1) ^{vap}	79	120	LQM S4UL
		6%	3.7	4.3	2.2	240 (235) ^{vap}	79	130	LQM S4UL
	Pentachlorobenzene	1%	5.8	19	1.2	640 (43.0) ^{sol}	100	190	LQM S4UL
		2.5%	12	30	3.1	770 (107) ^{sol}	100	190	LQM S4UL
		6%	22	38	7.0	830	100	190	LQM S4UL
	Hexachlorobenzene	1%	1.8 (0.20) ^{vap}	4.1 (0.20) ^{vap}	0.47	110 (0.20) ^{vap}	16	30	LQM S4UL
		2.5%	3.3 (0.50) ^{vap}	5.7 (0.50) ^{vap}	1.1	120	16	30	LQM S4UL
		6%	4.9	6.7 (1.2) ^{vap}	2.5	120	16	30	LQM S4UL

Generic Assessment Criteria Values

Contaminant		SOM	Res +	Res -	Allot.	Comm.	^{POS} resi	^{POS} park	Source
Chlorophenol	Chlorophenols (4 congeners)	1%	0.87 ^B	94	0.13 ^B	3,500	620	1,100	LQM S4UL
		2.5%	2.0	150	0.30	4,000	620	1,100	LQM S4UL
		6%	4.5	210	0.70	4,300	620	1,100	LQM S4UL
	Pentachlorophenol	1%	0.22	27 (16.4) ^{vap}	3.0E-02	400	60	110	LQM S4UL
		2.5%	0.52	29	8.0E-02	400	60	120	LQM S4UL
		6%	1.2	31	0.19	400	60	120	LQM S4UL
Others	Carbon Disulphide	1%	0.14	0.14	4.8	11	11,000	1,300	LQM S4UL
		2.5%	0.29	0.29	10	22	11,000	1,900	LQM S4UL
		6%	0.62	0.62	23	47	11,000	2,700	LQM S4UL
	Hexachlorobutadiene	1%	0.29	0.32	0.25	31	25	48	LQM S4UL
		2.5%	0.7	0.78	0.61	66	25	50	LQM S4UL
		6%	1.6	1.8	1.4	120	25	51	LQM S4UL
	Phenol	1%	120	440 (460)	23	440 ^{dir} (26,000)	440 ^{dir} (10,000)	440 ^{dir} (7,600)	LQM S4UL
		2.5%	200	690	42	690 ^{dir} (30,000)	690 ^{dir} (10,000)	690 ^{dir} (8,300)	LQM S4UL
		6%	380	1,200	83	1,300 ^{dir} (34,000)	1,300 ^{dir} (10,000)	1,300 ^{dir} (9,300)	LQM S4UL

sol/vap = solubility/vapour limit (potentially use if free product identified, although highly conservative)

*=naphthalene C4SL exceeds the CLEA calculated soil saturation concentration (76 mg kg⁻¹ for 1% SOM, 183 mg kg⁻¹ for 2.5% SOM and 432 mg kg⁻¹ for 6% SOM)

f = oral, dermal and inhalation exposures compared to oral HCV

dir = S4ULs based on threshold protective of direct skin contact with phenol)brackets long term exposure for illustration purposes)

g = derived based on 2,3,4-tetrachlorophenol

Appendix D – JIWG Output Sheets



Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Project Reference	LKC241349
Site Name	Greenside Mills, Skelmanthorpe
Client	Caldwell Construction Ltd
Run by	CC
Date	18-Apr-24
Scenario details	Excavation of eastern pond silts

Decision Support Tool for CAR2012 Work Categories

Stage 1

Hazard Factors

Select ACM type (run model for each type to generate 'Worst Case' output)
Extent of degradation of ACMs at outset of work
Friability and degree of bonding by matrix (ACM matrix, not ground materials)
Distribution of Visible Asbestos Across Affected Area
Amount of asbestos fibre in selected ACM/fibre type as % of host material

Free dispersed fibres/fibre bundles	2
Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
No visible ACMs/fibre bundles	0
Trace quantities - <0.0001 to 0.001 %wt/wt	0

Score

Sub-total

0

Note: the asbestos licensing regime is unaffected by the type of asbestos fibre present in ACMs

Hazard ranking

Negligible

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.

It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.



Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Stage 2

Exposure Factors

Score

Anticipated airborne fibre concentration - Control Limit or SALI?

<0.01 fibres/ml

1

Anticipated duration of exposure to asbestos

> 2 hours in a 7 day period and Up to 10 hours in a day (e.g. full time occupational exposure)

4

Activity type and effect on deterioration of ACMs during work

Sampling, manual or mechanical (significant deterioration expected)

2

Best description of primary host material matrix (soil/made ground)

Fine Silt and/or Clay

1

Respirable fibre index for ACM - RIVM report 711701034 (2003)

Low

2

Sub-total

10

Exposure ranking

Low

Combined hazard and exposure ranking

10

Very Low

Stage 3

Risk Assessment Outputs

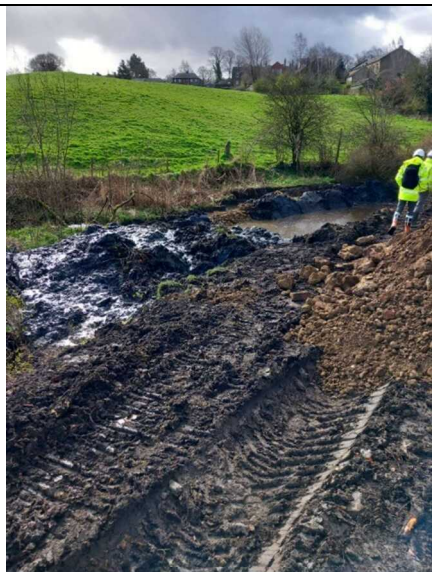
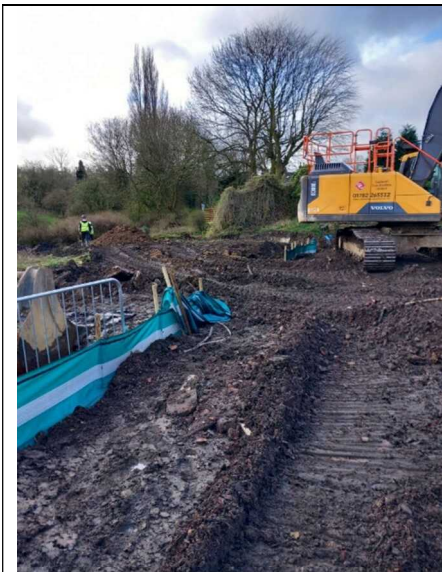
Probable Licensing Status	CAR do not apply
RPE*	None
Dust Suppression**	None
Hygiene/Decontamination***	None

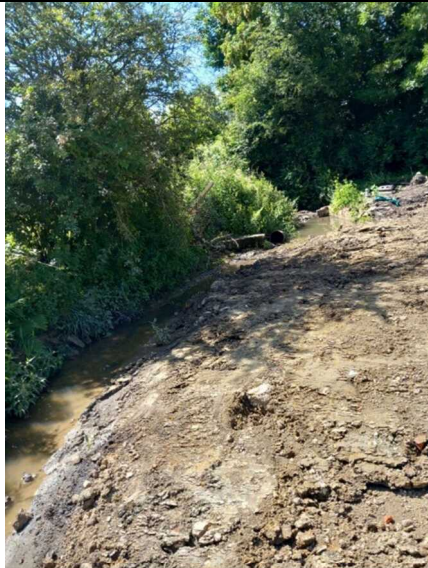
*Where RPE has to be worn continuously for long periods (e.g. more than 1-hour), then powered RPE may be necessary.

**Reduction in control measures possible if natural mitigation factors are present (e.g. raining, wet ground)

***Guide only; suitability of selected personal hygiene measures may be reviewed on a site/contamination-specific basis

Appendix E – Photographs of Remedial Works





Appendix F – Photographs of Validation Works

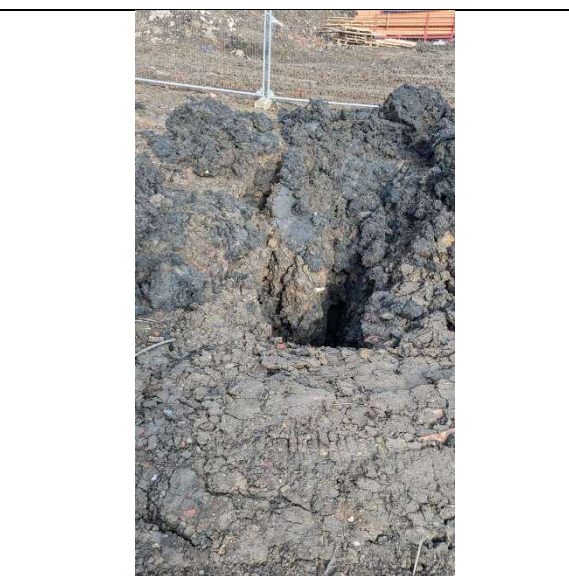


Photographs of eastern part of the site reduced to natural clay strata.



POS Area left c. 450mm below finish levels





Validation Sampling in POS Area

Appendix G – LKC Certificates of Analysis



Colin Crompton
LK Consult Limited
Unit 29 Eton Business Park
Eton Hill Road
Manchester
M26 2ZS

Normec DETS Limited
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 24-11405

Site Reference: Greenside Mills, Skelmanthorpe

Project / Job Ref: LKC241349

Order No: PO-C000411

Sample Receipt Date: 26/09/2024

Sample Scheduled Date: 26/09/2024

Report Issue Number: 1

Reporting Date: 03/10/2024

Authorised by:

Steve Knight
Customer Support Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.



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Soil Analysis Certificate						
DETS Report No: 24-11405	~Date Sampled	24/09/24	24/09/24	24/09/24	24/09/24	24/09/24
LK Consult Limited	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	TP301	TP301	TP302	TP302	TP303
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: PO-C000411	~Depth (m)	0.00 - 2.20	0.00 - 2.20	0.00 - 4.00	0.00 - 4.00	0.00 - 4.00
Reporting Date: 03/10/2024	DETS Sample No	740306	740307	740308	740309	740310

Determinand	Unit	RL	Accreditation				
Asbestos Screen ⁽⁵⁾	N/a	N/a	ISO17025	Not Detected		Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	7.4		7.5	7.5
Total Cyanide	mg/kg	< 1	NONE	< 1		< 1	< 1
Free Cyanide	mg/kg	< 1	NONE	< 1		< 1	< 1
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	603		327	376
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.60		0.33	0.38
Organic Matter (SOM)	%	< 0.1	MCERTS	7.3		7.5	7
Arsenic (As)	mg/kg	< 2	MCERTS	12		12	12
W/S Boron	mg/kg	< 1	NONE	1.3		1.2	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.6		0.5	0.5
Chromium (Cr)	mg/kg	< 2	MCERTS	58		70	54
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2		< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	104		82	85
Lead (Pb)	mg/kg	< 3	MCERTS	332		130	114
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1		< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	28		29	27
Selenium (Se)	mg/kg	< 2	MCERTS	< 2		< 2	< 2
Vanadium (V)	mg/kg	< 1	MCERTS	30		30	29
Zinc (Zn)	mg/kg	< 3	MCERTS	169		153	161
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2		< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion

Subcontracted analysis (5)

~Sample details provided by customer and can affect the validity of results

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



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Soil Analysis Certificate						
DETS Report No: 24-11405	~Date Sampled	24/09/24	24/09/24	24/09/24	24/09/24	24/09/24
LK Consult Limited	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	TP303	TP304	TP304	TP305	TP305
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: PO-C000411	~Depth (m)	0.00 - 4.00	0.00 - 4.00	0.00 - 4.00	0.00 - 1.50	0.00 - 1.50
Reporting Date: 03/10/2024	DETS Sample No	740311	740312	740313	740314	740315

Determinand	Unit	RL	Accreditation	(n)			
Asbestos Screen ⁽⁵⁾	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	7.4	7.7	7.9	
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	657	1220	1070	
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.66	1.22	1.07	
Organic Matter (SOM)	%	< 0.1	MCERTS	8.4	7.5	6.9	
Arsenic (As)	mg/kg	< 2	MCERTS	13	12	12	
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	1.6	0.6	0.6	
Chromium (Cr)	mg/kg	< 2	MCERTS	73	56	62	
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	112	98	85	
Lead (Pb)	mg/kg	< 3	MCERTS	139	291	110	
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	28	29	28	
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Vanadium (V)	mg/kg	< 1	MCERTS	32	31	32	
Zinc (Zn)	mg/kg	< 3	MCERTS	188	171	156	
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion

Subcontracted analysis (5)

~Sample details provided by customer and can affect the validity of results



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Soil Analysis Certificate - Speciated PAHs

DETS Report No: 24-11405	~Date Sampled	24/09/24	24/09/24	24/09/24	24/09/24	24/09/24
LK Consult Limited	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	TP301	TP302	TP303	TP304	TP305
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: PO-C000411	~Depth (m)	0.00 - 2.20	0.00 - 4.00	0.00 - 4.00	0.00 - 4.00	0.00 - 1.50
Reporting Date: 03/10/2024	DETS Sample No	740306	740308	740310	740312	740314

Determinand	Unit	RL	Accreditation	(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	0.14	0.13	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	0.48	0.66	0.79	0.74	0.56
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.17	0.17	0.16	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	1.22	1.39	1.77	1.64	1.19
Pyrene	mg/kg	< 0.1	MCERTS	1.06	1.21	1.52	1.40	1.08
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.39	0.47	0.57	0.52	0.42
Chrysene	mg/kg	< 0.1	MCERTS	0.53	0.62	0.71	0.69	0.58
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.43	0.64	0.58	0.59	0.54
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.15	0.21	0.18	0.19	0.19
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.37	0.43	0.50	0.49	0.46
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.23	0.25	0.28	0.26	0.25
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.19	0.22	0.21	0.23	0.23
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	5	6.4	7.4	6.9	5.5

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Soil Analysis Certificate - Speciated PAHs

DETS Report No: 24-11405	~Date Sampled	24/09/24				
LK Consult Limited	~Time Sampled	None Supplied				
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	TP305				
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied				
~Order No: PO-C000411	~Depth (m)	0.00 - 1.50				
Reporting Date: 03/10/2024	DETS Sample No	740315				

Determinand	Unit	RL	Accreditation				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	0.68			
Anthracene	mg/kg	< 0.1	MCERTS	0.14			
Fluoranthene	mg/kg	< 0.1	MCERTS	1.47			
Pyrene	mg/kg	< 0.1	MCERTS	1.31			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.51			
Chrysene	mg/kg	< 0.1	MCERTS	0.68			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.67			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.21			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.58			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.33			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.26			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	6.8			

~Sample details provided by customer and can affect the validity of results



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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 24-11405	~Date Sampled	24/09/24	24/09/24	24/09/24	24/09/24	24/09/24
LK Consult Limited	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	TP301	TP301	TP302	TP302	TP303
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: PO-C000411	~Depth (m)	0.00 - 2.20	0.00 - 2.20	0.00 - 4.00	0.00 - 4.00	0.00 - 4.00
Reporting Date: 03/10/2024	DETS Sample No	740306	740307	740308	740309	740310

Determinand	Unit	RL	Accreditation				
Aliphatic >C5 - C6 : HS 1D MS AL	mg/kg	< 0.01	NONE	< 0.01		< 0.01	< 0.01
Aliphatic >C6 - C8 : HS 1D MS AL	mg/kg	< 0.05	NONE	< 0.05		< 0.05	< 0.05
Aliphatic >C8 - C10 : EH CU 1D AL	mg/kg	< 2	MCERTS	< 2		< 2	< 2
Aliphatic >C10 - C12 : EH CU 1D AL	mg/kg	< 2	MCERTS	< 2		< 2	< 2
Aliphatic >C12 - C16 : EH CU 1D AL	mg/kg	< 3	MCERTS	< 3		< 3	< 3
Aliphatic >C16 - C21 : EH CU 1D AL	mg/kg	< 3	MCERTS	< 3		< 3	< 3
Aliphatic >C21 - C34 : EH CU 1D AL	mg/kg	< 10	MCERTS	< 10		< 10	< 10
Aliphatic >C34 - C44 : EH CU 1D AL	mg/kg	< 10	NONE	< 10		< 10	< 10
Aliphatic (C5 - C44) : HS 1D MS+EH CU 1D AL	mg/kg	< 21	NONE	< 21		< 21	< 21
Aromatic >C5 - C7 : HS 1D MS AR	mg/kg	< 0.01	NONE	< 0.01		< 0.01	< 0.01
Aromatic >C7 - C8 : HS 1D MS AR	mg/kg	< 0.05	NONE	< 0.05		< 0.05	< 0.05
Aromatic >C8 - C10 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2		< 2	< 2
Aromatic >C10 - C12 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2		< 2	< 2
Aromatic >C12 - C16 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2		< 2	< 2
Aromatic >C16 - C21 : EH CU 1D AR	mg/kg	< 3	MCERTS	3		15	6
Aromatic >C21 - C35 : EH CU 1D AR	mg/kg	< 10	MCERTS	< 10		17	< 10
Aromatic >C35 - C44 : EH CU 1D AR	mg/kg	< 10	NONE	< 10		< 10	< 10
Aromatic (C5 - C44) : HS 1D MS+EH CU 1D AR	mg/kg	< 21	NONE	< 21		32	< 21
Total >C5 - C44 : HS 1D MS+EH CU 1D Tot al	mg/kg	< 42	NONE	< 42		< 42	< 42

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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 24-11405	~Date Sampled	24/09/24	24/09/24	24/09/24	24/09/24	24/09/24
LK Consult Limited	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	TP303	TP304	TP304	TP305	TP305
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: PO-C000411	~Depth (m)	0.00 - 4.00	0.00 - 4.00	0.00 - 4.00	0.00 - 1.50	0.00 - 1.50
Reporting Date: 03/10/2024	DETS Sample No	740311	740312	740313	740314	740315

Determinand	Unit	RL	Accreditation	(n)			
Aliphatic >C5 - C6 : HS 1D MS AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8 : HS 1D MS AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10 : EH CU 1D AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12 : EH CU 1D AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16 : EH CU 1D AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21 : EH CU 1D AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34 : EH CU 1D AL	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10
Aliphatic >C34 - C44 : EH CU 1D AL	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10
Aliphatic (C5 - C44) : HS 1D MS+EH CU 1D AL	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21
Aromatic >C5 - C7 : HS 1D MS AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8 : HS 1D MS AR	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Aromatic >C10 - C12 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Aromatic >C12 - C16 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Aromatic >C16 - C21 : EH CU 1D AR	mg/kg	< 3	MCERTS	9	9	7	7
Aromatic >C21 - C35 : EH CU 1D AR	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10
Aromatic >C35 - C44 : EH CU 1D AR	mg/kg	< 10	NONE	< 10	< 10	< 10	< 10
Aromatic (C5 - C44) : HS 1D MS+EH CU 1D AR	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21
Total >C5 - C44 : HS 1D MS+EH CU 1D Total	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42

~Sample details provided by customer and can affect the validity of results



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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-11405	~Date Sampled	24/09/24	24/09/24	24/09/24	24/09/24	24/09/24
LK Consult Limited	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	TP301	TP302	TP303	TP304	TP305
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: PO-C000411	~Depth (m)	0.00 - 2.20	0.00 - 4.00	0.00 - 4.00	0.00 - 4.00	0.00 - 1.50
Reporting Date: 03/10/2024	DETS Sample No	740306	740308	740310	740312	740314

Determinand	Unit	RL	Accreditation	(n)				
Benzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

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Soil Analysis Certificate - BTEX / MTBE

DETS Report No: 24-11405	~Date Sampled	24/09/24				
LK Consult Limited	~Time Sampled	None Supplied				
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	TP305				
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied				
~Order No: PO-C000411	~Depth (m)	0.00 - 1.50				
Reporting Date: 03/10/2024	DETS Sample No	740315				

Determinand	Unit	RL	Accreditation				
Benzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2			
Toluene : HS 1D MS	ug/kg	< 5	MCERTS	< 5			
Ethylbenzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2			
p & m-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2			
o-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2			
MTBE : HS 1D MS	ug/kg	< 5	MCERTS	< 5			

~Sample details provided by customer and can affect the validity of results



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Lenham Heath
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Leachate Analysis Certificate						
DETS Report No: 24-11405	~Date Sampled	24/09/24	24/09/24	24/09/24	24/09/24	24/09/24
LK Consult Limited	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	TP301	TP301	TP302	TP302	TP303
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: PO-C000411	~Depth (m)	0.00 - 2.20	0.00 - 2.20	0.00 - 4.00	0.00 - 4.00	0.00 - 4.00
Reporting Date: 03/10/2024	DETS Sample No	740306	740307	740308	740309	740310

Determinand	Unit	RL	Accreditation			
pH	pH Units	N/a	ISO17025		8.2	7.3
Total Cyanide	ug/l	< 5	ISO17025		< 5	< 5
Free Cyanide	ug/l	< 5	NONE		< 5	< 5
Sulphate as SO ₄	mg/l	< 1	ISO17025		56	51
Dissolved Organic Carbon (DOC)	mg/l	< 1.0	ISO17025		13.8	12.7
Hardness - Total	mgCaCO ₃ /l	< 0.25	NONE		129	126
Arsenic	ug/l	< 0.2	ISO17025		2.8	3.6
Boron	ug/l	< 1	ISO17025		31	33
Cadmium	ug/l	< 0.2	ISO17025		< 0.2	< 0.2
Chromium	ug/l	< 0.2	ISO17025		0.3	0.6
Chromium (hexavalent)	ug/l	< 20	NONE		< 20	< 20
Copper	ug/l	< 0.2	ISO17025		10.8	10.0
Lead	ug/l	< 0.2	ISO17025		0.5	1.0
Mercury	ug/l	< 0.04	ISO17025		< 0.04	< 0.04
Nickel	ug/l	< 0.2	ISO17025		1.0	1.5
Selenium	ug/l	< 0.2	ISO17025		0.4	0.4
Vanadium	ug/l	< 0.2	ISO17025		1.6	2.3
Zinc	ug/l	< 1	ISO17025		14	16
Calcium	mg/l	< 0.1	ISO17025		35.6	34.9
Total Phenols (monohydric)	ug/l	< 10	ISO17025		< 10	< 10

Subcontracted analysis⁽⁵⁾

~Sample details provided by customer and can affect the validity of results

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



Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
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Maidstone
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Tel : 01622 850410



Leachate Analysis Certificate						
DETS Report No: 24-11405	~Date Sampled	24/09/24	24/09/24	24/09/24	24/09/24	24/09/24
LK Consult Limited	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	TP303	TP304	TP304	TP305	TP305
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: PO-C000411	~Depth (m)	0.00 - 4.00	0.00 - 4.00	0.00 - 4.00	0.00 - 1.50	0.00 - 1.50
Reporting Date: 03/10/2024	DETS Sample No	740311	740312	740313	740314	740315

Determinand	Unit	RL	Accreditation	(n)			
pH	pH Units	N/a	ISO17025	8.2		7.9	
Total Cyanide	ug/l	< 5	ISO17025	< 5		< 5	
Free Cyanide	ug/l	< 5	NONE	< 5		< 5	
Sulphate as SO ₄	mg/l	< 1	ISO17025	50		73	
Dissolved Organic Carbon (DOC)	mg/l	< 1.0	ISO17025	12.5		14.1	
Hardness - Total	mgCaCO ₃ /l	< 0.25	NONE	124		149	
Arsenic	ug/l	< 0.2	ISO17025	3.6		3.5	
Boron	ug/l	< 1	ISO17025	32		33	
Cadmium	ug/l	< 0.2	ISO17025	< 0.2		< 0.2	
Chromium	ug/l	< 0.2	ISO17025	0.5		0.5	
Chromium (hexavalent)	ug/l	< 20	NONE	< 20		< 20	
Copper	ug/l	< 0.2	ISO17025	10.0		10.5	
Lead	ug/l	< 0.2	ISO17025	1.0		0.6	
Mercury	ug/l	< 0.04	ISO17025	< 0.04		< 0.04	
Nickel	ug/l	< 0.2	ISO17025	1.1		1.8	
Selenium	ug/l	< 0.2	ISO17025	0.4		0.5	
Vanadium	ug/l	< 0.2	ISO17025	2.8		1.9	
Zinc	ug/l	< 1	ISO17025	12		13	
Calcium	mg/l	< 0.1	ISO17025	33.2		41.9	
Total Phenols (monohydric)	ug/l	< 10	ISO17025	< 10		< 10	

Subcontracted analysis⁽⁵⁾

~Sample details provided by customer and can affect the validity of results



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Leachate Analysis Certificate - Speciated PAH						
DETS Report No: 24-11405	~Date Sampled	24/09/24	24/09/24	24/09/24	24/09/24	
LK Consult Limited	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	TP301	TP302	TP303	TP304	
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
~Order No: PO-C000411	~Depth (m)	0.00 - 2.20	0.00 - 4.00	0.00 - 4.00	0.00 - 4.00	
Reporting Date: 03/10/2024	DETS Sample No	740307	740309	740311	740313	

Determinand	Unit	RL	Accreditation					
Naphthalene	ug/l	< 0.01	NONE	0.03	0.05	0.02	0.03	
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthene	ug/l	< 0.01	NONE	0.04	0.06	0.03	0.05	
Fluorene	ug/l	< 0.01	NONE	0.03	0.03	< 0.01	0.03	
Phenanthrene	ug/l	< 0.01	NONE	0.09	0.03	< 0.01	0.03	
Anthracene	ug/l	< 0.01	NONE	0.03	< 0.01	< 0.01	0.02	
Fluoranthene	ug/l	< 0.01	NONE	0.07	< 0.01	0.04	0.08	
Pyrene	ug/l	< 0.01	NONE	0.05	0.07	0.03	0.07	
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Chrysene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(ghi)perylene	ug/l	< 0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	
Total EPA-16 PAHs	ug/l	< 0.16	NONE	0.34	0.24	< 0.16	0.31	



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Leachate Analysis Certificate - TPH CWG Banded						
DETS Report No: 24-11405	~Date Sampled	24/09/24	24/09/24	24/09/24	24/09/24	
LK Consult Limited	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	TP301	TP302	TP303	TP304	
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
~Order No: PO-C000411	~Depth (m)	0.00 - 2.20	0.00 - 4.00	0.00 - 4.00	0.00 - 4.00	
Reporting Date: 03/10/2024	DETS Sample No	740307	740309	740311	740313	

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6 : HS 1D MS AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic >C6 - C8 : HS 1D MS AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic >C8 - C10 : EH CU 1D AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic >C10 - C12 : EH CU 1D AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic >C12 - C16 : EH CU 1D AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic >C16 - C21 : EH CU 1D AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic >C21 - C34 : EH CU 1D AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aromatic >C5 - C7 : HS 1D MS AR	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aromatic >C7 - C8 : HS 1D MS AR	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aromatic >C8 - C10 : EH CU 1D AR	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aromatic >C10 - C12 : EH CU 1D AR	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aromatic >C12 - C16 : EH CU 1D AR	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aromatic >C16 - C21 : EH CU 1D AR	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aromatic >C21 - C35 : EH CU 1D AR	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	

~Sample details provided by customer and can affect the validity of results



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Leachate Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-11405	~Date Sampled	24/09/24	24/09/24	24/09/24	24/09/24	
LK Consult Limited	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	TP301	TP302	TP303	TP304	
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
~Order No: PO-C000411	~Depth (m)	0.00 - 2.20	0.00 - 4.00	0.00 - 4.00	0.00 - 4.00	
Reporting Date: 03/10/2024	DETS Sample No	740307	740309	740311	740313	

Determinand	Unit	RL	Accreditation				
Benzene : HS 1D MS	ug/l	< 1	ISO17025	< 1	< 1	< 1	< 1
Toluene : HS 1D MS	ug/l	< 5	ISO17025	< 5	< 5	7	9
Ethylbenzene : HS 1D MS	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5
p & m-xylene : HS 1D MS	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10
o-xylene : HS 1D MS	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5
MTBE : HS 1D MS	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10

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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 24-11405	
LK Consult Limited	
~Site Reference: Greenside Mills, Skelmanthorpe	
~Project / Job Ref: LKC241349	
~Order No: PO-C000411	
Reporting Date: 03/10/2024	

DETS Sample No	~TP / BH No	~Additional Refs	~Depth (m)	Moisture Content (%)	Sample Matrix Description
740306	TP301	None Supplied	0.00 - 2.20	24.8	Brown loamy sand with stones
740308	TP302	None Supplied	0.00 - 4.00	22.9	Brown loamy sand with stones and vegetation
740310	TP303	None Supplied	0.00 - 4.00	24.3	Brown loamy sand with stones and vegetation
740312	TP304	None Supplied	0.00 - 4.00	27	Brown loamy sand with stones and vegetation
740314	TP305	None Supplied	0.00 - 1.50	30.9	Brown clay with vegetation
740315	TP305	None Supplied	0.00 - 1.50	23.7	Brown sandy clay with stones

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{u/s}

Unsuitable Sample ^{u/s}

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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-11405

LK Consult Limited

~Site Reference: Greenside Mills, Skelmanthorpe

~Project / Job Ref: LKC241349

~Order No: PO-C000411

Reporting Date: 03/10/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried

AR As Received

~Sample details provided by customer and can affect the validity of results



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Water Analysis Certificate - Methodology & Miscellaneous Information	
DETS Report No: 24-11405	
LK Consult Limited	
~Site Reference: Greenside Mills, Skelmanthorpe	
~Project / Job Ref: LKC241349	
~Order No: PO-C000411	
Reporting Date: 03/10/2024	

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	F	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	UF	Biological Oxygen Demand (BOD)	Determination using BOD sensors measuring the change of pressure	E133
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCS	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered

~Sample details provided by customer and can affect the validity of results



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List of HWOL Acronyms and Operators

DETS Report No: 24-11405

LK Consult Limited

~Site Reference: Greenside Mills, Skelmanthorpe

~Project / Job Ref: LKC241349

~Order No: PO-C000411

Reporting Date: 03/10/2024

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH 2D Total but with humics mathematically subtracted
#2	EH 2D Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS Total or EH CU+HS Total
~	Sample details provided by customer and can affect the validity of results

Benzene - HS 1D MS
Ethylbenzene - HS 1D MS
MTBE - HS 1D MS
TPH - Aliphatic >C34 - C44 - raw data - EH CU 1D AL
TPH CWG - Aliphatic >C10 - C12 - EH CU 1D AL
TPH CWG - Aliphatic >C12 - C16 - EH CU 1D AL
TPH CWG - Aliphatic >C16 - C21 - EH CU 1D AL
TPH CWG - Aliphatic >C21 - C34 - EH CU 1D AL
TPH CWG - Aliphatic >C34 - C44 - EH CU 1D AL
TPH CWG - Aliphatic >C5 - C44 - HS 1D MS+EH CU 1D AL
TPH CWG - Aliphatic >C5 - C6 - HS 1D MS AL
TPH CWG - Aliphatic >C6 - C8 - HS 1D MS AL
TPH CWG - Aliphatic >C8 - C10 - EH CU 1D AL
TPH CWG - Aromatic >C10 - C12 - EH CU 1D AR
TPH CWG - Aromatic >C12 - C16 - EH CU 1D AR
TPH CWG - Aromatic >C16 - C21 - EH CU 1D AR
TPH CWG - Aromatic >C21 - C35 - EH CU 1D AR
TPH CWG - Aromatic >C35 - C44 - EH CU 1D AR
TPH CWG - Aromatic >C5 - C44 - HS 1D MS+EH CU 1D AR
TPH CWG - Aromatic >C5 - C7 - HS 1D MS AR
TPH CWG - Aromatic >C7 - C8 - HS 1D MS AR
TPH CWG - Aromatic >C8 - C10 - EH CU 1D AR
TPH CWG - Total >C5 - C44 - HS 1D MS+EH CU 1D Total
Toluene - HS 1D MS
m & p-xylene - HS 1D MS
o-Xylene - HS 1D MS



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DETS Report No: 24-11406

Site Reference: Greenside Mills, Skelmanthorpe

Project / Job Ref: LKC241349

Order No: PO-C000411

Sample Receipt Date: 26/09/2024

Sample Scheduled Date: 26/09/2024

Report Issue Number: 1

Reporting Date: 02/10/2024

Authorised by:

Steve Knight
Customer Support Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.



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Soil Analysis Certificate						
DETS Report No: 24-11406	~Date Sampled	24/09/24	24/09/24			
LK Consult Limited	~Time Sampled	None Supplied	None Supplied			
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	East	Base			
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied			
~Order No: PO-C000411	~Depth (m)	None Supplied	None Supplied			
Reporting Date: 02/10/2024	DETS Sample No	740316	740317			

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected			
pH	pH Units	N/a	MCERTS	6.3	6.6			
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1			
Free Cyanide	mg/kg	< 1	NONE	< 1	< 1			
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	44	27			
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.04	0.03			
Organic Matter (SOM)	%	< 0.1	MCERTS	1	2.3			
Arsenic (As)	mg/kg	< 2	MCERTS	7	6			
W/S Boron	mg/kg	< 1	NONE	< 1	< 1			
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	0.2			
Chromium (Cr)	mg/kg	< 2	MCERTS	32	50			
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2			
Copper (Cu)	mg/kg	< 4	MCERTS	41	37			
Lead (Pb)	mg/kg	< 3	MCERTS	29	40			
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1			
Nickel (Ni)	mg/kg	< 3	MCERTS	35	32			
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2			
Vanadium (V)	mg/kg	< 1	MCERTS	24	23			
Zinc (Zn)	mg/kg	< 3	MCERTS	88	106			
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion

Subcontracted analysis (S)

~Sample details provided by customer and can affect the validity of results



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Soil Analysis Certificate - Speciated PAHs

DETS Report No: 24-11406	~Date Sampled	24/09/24	24/09/24			
LK Consult Limited	~Time Sampled	None Supplied	None Supplied			
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	East	Base			
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied			
~Order No: PO-C000411	~Depth (m)	None Supplied	None Supplied			
Reporting Date: 02/10/2024	DETS Sample No	740316	740317			

Determinand	Unit	RL	Accreditation				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6		

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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 24-11406	~Date Sampled	24/09/24	24/09/24		
LK Consult Limited	~Time Sampled	None Supplied	None Supplied		
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	East	Base		
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied		
~Order No: PO-C000411	~Depth (m)	None Supplied	None Supplied		
Reporting Date: 02/10/2024	DETS Sample No	740316	740317		

Determinand	Unit	RL	Accreditation				
Aliphatic >C5 - C6 : HS 1D MS AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01		
Aliphatic >C6 - C8 : HS 1D MS AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05		
Aliphatic >C8 - C10 : EH CU 1D AL	mg/kg	< 2	MCERTS	< 2	< 2		
Aliphatic >C10 - C12 : EH CU 1D AL	mg/kg	< 2	MCERTS	< 2	< 2		
Aliphatic >C12 - C16 : EH CU 1D AL	mg/kg	< 3	MCERTS	< 3	< 3		
Aliphatic >C16 - C21 : EH CU 1D AL	mg/kg	< 3	MCERTS	< 3	< 3		
Aliphatic >C21 - C34 : EH CU 1D AL	mg/kg	< 10	MCERTS	< 10	< 10		
Aliphatic >C34 - C44 : EH CU 1D AL	mg/kg	< 10	NONE	< 10	< 10		
Aliphatic (C5 - C44) : HS 1D MS+EH CU 1D AL	mg/kg	< 21	NONE	< 21	< 21		
Aromatic >C5 - C7 : HS 1D MS AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01		
Aromatic >C7 - C8 : HS 1D MS AR	mg/kg	< 0.05	NONE	< 0.05	< 0.05		
Aromatic >C8 - C10 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2	< 2		
Aromatic >C10 - C12 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2	< 2		
Aromatic >C12 - C16 : EH CU 1D AR	mg/kg	< 2	MCERTS	< 2	< 2		
Aromatic >C16 - C21 : EH CU 1D AR	mg/kg	< 3	MCERTS	< 3	< 3		
Aromatic >C21 - C35 : EH CU 1D AR	mg/kg	< 10	MCERTS	< 10	< 10		
Aromatic >C35 - C44 : EH CU 1D AR	mg/kg	< 10	NONE	< 10	< 10		
Aromatic (C5 - C44) : HS 1D MS+EH CU 1D AR	mg/kg	< 21	NONE	< 21	< 21		
Total >C5 - C44 : HS 1D_MS+EH_CU_1D_Tot	mg/kg	< 42	NONE	< 42	< 42		

~Sample details provided by customer and can affect the validity of results



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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-11406	~Date Sampled	24/09/24	24/09/24			
LK Consult Limited	~Time Sampled	None Supplied	None Supplied			
~Site Reference: Greenside Mills, Skelmanthorpe	~TP / BH No	East	Base			
~Project / Job Ref: LKC241349	~Additional Refs	None Supplied	None Supplied			
~Order No: PO-C000411	~Depth (m)	None Supplied	None Supplied			
Reporting Date: 02/10/2024	DETS Sample No	740316	740317			

Determinand	Unit	RL	Accreditation				
Benzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2		
Toluene : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5		
Ethylbenzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2		
p & m-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2		
o-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2		
MTBE : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5		

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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 24-11406	
LK Consult Limited	
~Site Reference: Greenside Mills, Skelmanthorpe	
~Project / Job Ref: LKC241349	
~Order No: PO-C000411	
Reporting Date: 02/10/2024	

DETS Sample No	~TP / BH No	~Additional Refs	~Depth (m)	Moisture Content (%)	Sample Matrix Description
740316	East	None Supplied	None Supplied	9	Brown sandy clay
740317	Base	None Supplied	None Supplied	11.2	Brown sandy clay

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{1/s}

Unsuitable Sample ^{u/s}

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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-11406

LK Consult Limited

~Site Reference: Greenside Mills, Skelmanthorpe

~Project / Job Ref: LKC241349

~Order No: PO-C000411

Reporting Date: 02/10/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried

AR As Received

~Sample details provided by customer and can affect the validity of results



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List of HWOL Acronyms and Operators

DETS Report No: 24-11406

LK Consult Limited

~Site Reference: Greenside Mills, Skelmanthorpe

~Project / Job Ref: LKC241349

~Order No: PO-C000411

Reporting Date: 02/10/2024

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH 2D Total but with humics mathematically subtracted
#2	EH 2D Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS Total or EH CU+HS Total
~	Sample details provided by customer and can affect the validity of results

Benzene - HS 1D MS
Ethylbenzene - HS 1D MS
MTBE - HS 1D MS
TPH - Aliphatic >C34 - C44 - raw data - EH CU 1D AL
TPH CWG - Aliphatic >C10 - C12 - EH CU 1D AL
TPH CWG - Aliphatic >C12 - C16 - EH CU 1D AL
TPH CWG - Aliphatic >C16 - C21 - EH CU 1D AL
TPH CWG - Aliphatic >C21 - C34 - EH CU 1D AL
TPH CWG - Aliphatic >C34 - C44 - EH CU 1D AL
TPH CWG - Aliphatic >C5 - C44 - HS 1D MS+EH CU 1D AL
TPH CWG - Aliphatic >C5 - C6 - HS 1D MS AL
TPH CWG - Aliphatic >C6 - C8 - HS 1D MS AL
TPH CWG - Aliphatic >C8 - C10 - EH CU 1D AL
TPH CWG - Aromatic >C10 - C12 - EH CU 1D AR
TPH CWG - Aromatic >C12 - C16 - EH CU 1D AR
TPH CWG - Aromatic >C16 - C21 - EH CU 1D AR
TPH CWG - Aromatic >C21 - C35 - EH CU 1D AR
TPH CWG - Aromatic >C35 - C44 - EH CU 1D AR
TPH CWG - Aromatic >C5 - C44 - HS 1D MS+EH CU 1D AR
TPH CWG - Aromatic >C5 - C7 - HS 1D MS AR
TPH CWG - Aromatic >C7 - C8 - HS 1D MS AR
TPH CWG - Aromatic >C8 - C10 - EH CU 1D AR
TPH CWG - Total >C5 - C44 - HS 1D MS+EH CU 1D Total
Toluene - HS 1D MS
m & p-xylene - HS 1D MS
o-Xylene - HS 1D MS

Appendix H – References

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- ²² Environment Agency, February 2005, "The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils", Science Report P5-080/TR3.
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