



GEO-ENVIRONMENTAL CONSULTING ENGINEERS

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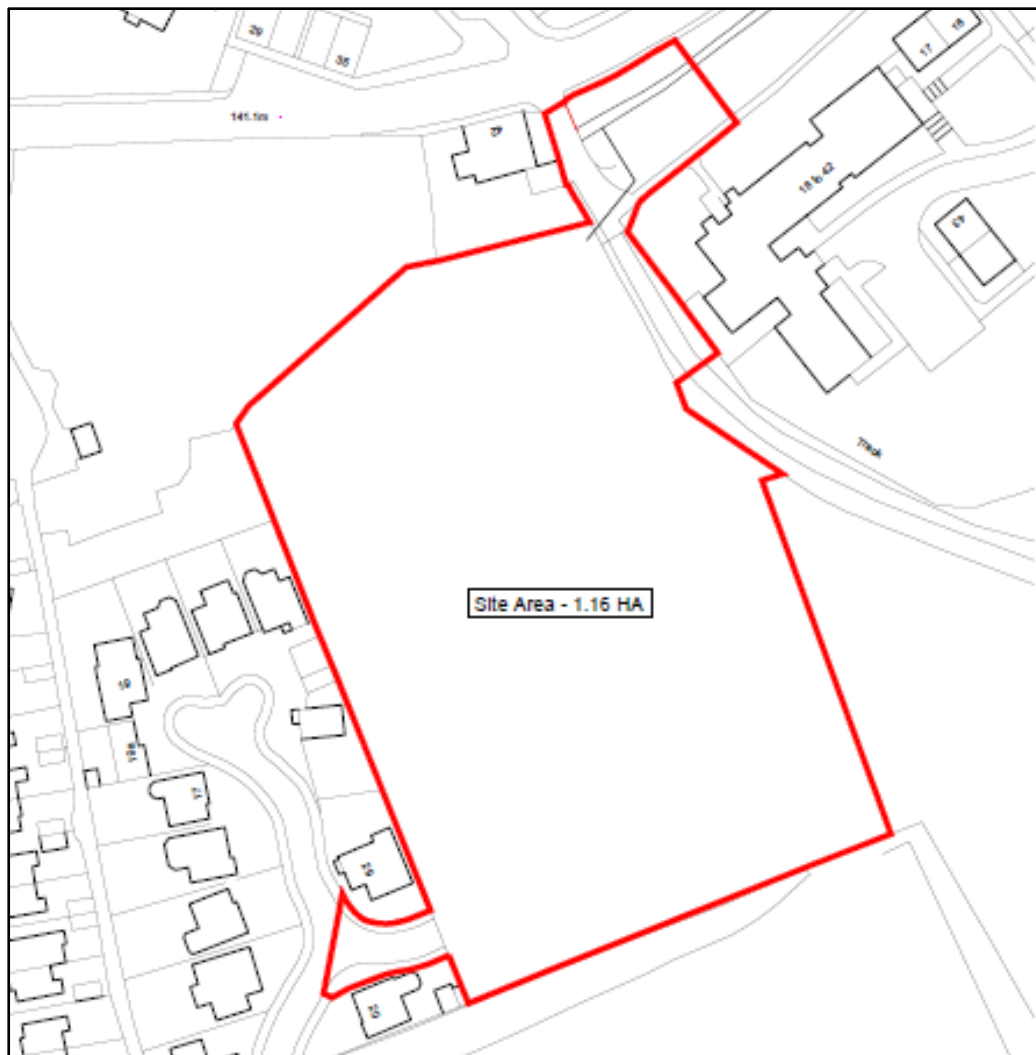
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LAND AT CROMPTON AVENUE, ROCHDALE

Site Investigation & Ground Assessment



Prepared for:



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Project Quality Assurance Information Sheet

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PROJECT NO: 22081
REPORT REF: BEK-22081-2 Rev C
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REVISION STATUS / HISTORY

Rev	Date	Issue / Comment	Prepared	Checked
A	13/03/23	Updated Planning Layout	MLM	MB
B	03/04/23	Minor Amendments	AM	MB
C	18/04/23	Minow Mods to Development Layout	AM	MB

GENERAL REPORT LIMITATIONS

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Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by BEK for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

No part of this report may be copied or duplicated without the express permission of BEK and the party for whom it was prepared. Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

Unless explicitly agreed otherwise, in writing, this report has been prepared under BEK's limited standard Terms and Conditions as included within our proposal to the Client.

The report needs to be considered in the light of the BEK proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

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1. INTRODUCTION

1.1 Appointment

1.1.1 BEK Enviro (BEK) has been commissioned by Lancet Homes to carry out site investigation at an area of land located off Crompton Avenue, Rochdale (hereafter referred to as 'the site'). The investigation will inform a quantitative risk assessment with respect to contamination at the site to support the proposed residential development, and provide recommendations for foundation design.

1.1.2 A Phase 1 Preliminary Risk Assessment (PRA) for the site (Report Ref BEK-22081-1 Rev B, dated April 2023) has previously been prepared by BEK.

1.2 Site Location & Description

1.2.1 The site is located immediately east of Crompton Avenue, Rochdale, at postcode OL16 4PB. The site is approximately 1.5 km south-east of Rochdale town centre. The National Grid Reference for the centre of the site is 390679, 411276.

1.2.2 The site is occupied by a roughly rectangular shaped plot of land of approximately 1.02 ha. The site is a field covered with grass, rough vegetation, and some shrubs and trees around the perimeter. The site slopes gently downwards towards the north. Access is via a gate from Crompton Avenue. Some waste materials and made ground were observed in this area, including the relict footings of a garage or outhouse.

1.2.3 Historically, the site has been a field with no previous development.

1.2.4 The site location and layout is illustrated on BEK Drawing No 22081-1 Rev A and a site layout plan is illustrated on BEK Drawing No 22081-2 Rev A, both of which are presented in Appendix E.

1.3 Proposed Development

1.3.1 The proposed development is for 18 two-storey houses with private gardens. The proposed site layout is presented on MPSL Planning & Design Ltd. drawing entitled "Planning Layout" (Ref: 20109/01 Rev E). A copy of the proposed site layout drawing is presented in Appendix E.

1.4 Objective & Scope of Work

1.4.1 The site investigation was undertaken by BEK during June 2022, in accordance with the recommendations detailed in the PRA.

- 1.4.2 This report has been prepared to provide a summary of the site details and ground conditions encountered, as well as a quantitative assessment of the potential pollutant linkages identified within the PRA. The PRA should be read in conjunction with this report.

1.5 Limitations

- 1.5.1 The conclusions and recommendations presented in this report are the result of our professional interpretation of the information currently available. BEK reserve the right to amend the conclusions and recommendations if further information becomes available.
- 1.5.2 However, it should be noted that much of the information has been derived from reports written by others and BEK takes no responsibility for the accuracy of that information. Notwithstanding the above, the reports reviewed have all been written by professional environmental consultants with a duty of care to provide relevant and accurate information.
- 1.5.3 The comments given in this report and the opinions expressed are based on review of reports provided to BEK, ground conditions encountered during site works and the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigations and therefore could not be taken into account

2. PRELIMINARY RISK ASSESSMENT

2.0.1 This section provides an overview of the findings and recommendations presented in the PRA.

2.1 Site History

2.1.1 The earliest available historical maps dating from 1851 show the site to be a field with a footpath running east-west across the northern part. The site has remained a field until the present day. During the site walkover, some made ground and waste was observed close to the gate from Crompton Avenue.

2.1.2 The surrounding area has historically been fields and farmland, with the development of surrounding residential areas over time. The historic pond to the east of the site appears to have been infilled, and historic pits and heaps have been identified close to the site. Historic mills have been located nearby. Sheltered housing and a hospice have been built to the north-east and east. The M62 motorway has been constructed 700 m to the south. Electricity substations have been identified in the vicinity.

2.2 Environmental Setting

Superficial Geology

2.2.1 The site is underlain 'Hummocky Glacial Deposits, Devensian – Diamicton' (Boulder Clay). These strata generally have a low permeability. Peat deposits are also recorded some 375 m to the north-east.

Bedrock

2.2.2 The site is underlain at depth by solid geology of the 'Pennine Lower Coal Measures Formation – mudstone, siltstone and sandstone' and the 'Old Lawrence Rock – Sandstone'.

2.2.3 The Pennine Lower Coal Measures generally comprise 'Interbedded grey mudstone, siltstone and pale grey sandstone, commonly with mudstones containing marine fossils in the lower part, and more numerous and thicker coal seams in the upper part'. The Old Lawrence Rock is part of the Pennine Lower Coal Measures. The bedrock can have high permeability through fracture flow.

2.2.4 A linear feature, identified as a normal fault, is recorded as being located on site.

Mining & Ground Stability

- 2.2.5 The site is located within a coal mining area as defined by the Coal Authority. However, the site is not located within a 'Development High Risk Area'. Moreover, there are no coal mining features recorded within 250 m of the site.
- 2.2.6 Nine possible historic surface ground workings within 250 m of the site were identified. These relate to historic ponds, reservoirs, an unspecified pit (and an unspecified heap), which may or may not have been infilled.
- 2.2.7 Risks from natural ground hazards at the site were identified as follows:
- | | |
|--------------------------------------|------------|
| Shrink-Swell Clay: | Low |
| Landslides: | Very Low |
| Ground Dissolution of Soluble Rocks: | Negligible |
| Compressible Deposits: | Negligible |
| Collapsible Deposits: | Very Low |
| Running Sands: | Very Low |

Hydrogeology

- 2.2.8 The underlying superficial strata are classified as a 'Secondary A Aquifer', which are described as 'Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers'. The superficial aquifer is classed as being of high vulnerability.
- 2.2.9 The underlying bedrock is also classified by the EA as a 'Secondary A Aquifer'. The bedrock aquifer is classed as being of low vulnerability.
- 2.2.10 No groundwater abstraction licenses were identified within 500 m of the site and the site is not located within a Source Protection Zone. The site is at a low risk from groundwater flooding.

Hydrology

- 2.2.11 Nine surface water features were identified within 250 m of the site, the closest of which is 'Sudden Brook' located some 100 m to the west.
- 2.2.12 There are no surface water abstractions within 500 m of the site and no records of licensed discharges to controlled waters situated within 250 m of the site.
- 2.2.13 The site is located within Flood Zone 1, which is the lowest level of flood risk from river and sea flooding.

Contaminated Land & Landfill Activities

- 2.2.14 No records of historic landfilling were identified within 500 m of the site and there are no licensed waste operations within 500 m of the site.
- 2.2.15 There are no EA recorded pollution incidents or NIHHS or COMAH sites located on/within 250 m of the site.
- 2.2.16 There are no Part A(1), Part A(2), Part B or IPC Authorised Activities located within 500m of the site.
- 2.2.17 There are no licensed pollutant releases located within 500 m of the site.
- 2.2.18 There are eight potentially contaminative industrial sites located within 250 m of the site. The closest record refers to 'Diamond Packaging', located 110m to the south-west. Other current industrial uses include electricity substations, construction services, a breakdown and recovery business, and vehicle repair, testing and servicing. These operations have the potential to pose a contaminative risk to the site.

Sensitive Land Uses

- 2.2.19 The site is located within a SSSI Impact Risk Zone. However, it is not affected by any other of the ecological systems identified as a statutory receptor in the DETR Circular 01/2006.

Radon

- 2.2.20 The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level. Therefore, no radon protective measures are necessary.

UXO Risk

- 2.2.21 Zetica online UXO risk mapping indicates that the UXO risk is low.

2.3 Potential Contaminants of Concern

- 2.3.1 The historic use of the surrounding area for some light industrial and commercial purposes may pose a risk of contamination of the shallow soils underlying the site. Key contaminants of concern may include metals, hydrocarbons from fuels, lubricating oils and greases, metals, asbestos, sulphates, phenols and cyanide.
- 2.3.2 Made ground is likely to be present at or close to the site, associated with the historical activity/development which has taken place in the surrounding area. The nature and source of any made ground is currently unknown and it could contain contaminants of concern.

2.4 Potentially Significant Pollutant Linkages

- 2.4.1 A number of possible 'significant pollutant linkages' have been identified associated with the site.

Link 1: There is the possibility that direct contact with contaminated soils could lead to dermal contact/inhalation/ingestion by people on site.

Link 2: There is the possibility of windblown particulates released during earthworks could be inhaled by people both on site and off site.

Link 3: Human health could be at risk by the inhalation of volatile contamination migrating into properties on and off site.

Link 4: Property (including structures and services) could be affected by direct contact with high concentrations of contaminants of concern.

Link 5: Dissolution or suspension (leaching) of contaminants from site soils leading to lateral migration within perched permeable layers within the made ground/natural strata, affecting underground services and piles/foundations.

Link 6: Dissolution or suspension (leaching) of contaminants from site soils leading to impact on the underlying aquifers.

- 2.4.2 Site investigation works are recommended to quantify the potential risks identified.

3. SITE INVESTIGATION

3.1 General

3.1.1 This section provides a summary of the site investigation works undertaken by BEK during June 2022.

3.1.2 The site investigation was designed to provide indicative information for the ground conditions across the site, to provide a quantitative assessment of potential risks associated with contamination, and to provide recommendations with respect to foundation design.

3.1.3 All exploratory locations were set out by the site engineer, and these locations are illustrated on BEK Drawing No 22081-3 Rev A presented in Appendix E.

3.2 Fieldworks

3.2.1 The extent and scope of the site investigation works were prepared by BEK based on the information presented in the PRA, and based on observations made at the site.

3.2.2 The site investigation was carried out on 15th June 2022 and consisted of the following:

- Eight machine excavated trial pits (TP1 to TP8) to depths of up to 4.0 m bgl, using a JCB 3CX, to provide information on the site wide ground conditions and to target potential areas of potential contamination.
- The recovery of representative soil samples from the trial pits for laboratory chemical analysis, to assess potential contamination levels.
- Infiltration tests undertaken in two trial pits, to assess the permeability of the shallow ground to assist soakaway design.

3.2.3 The ground conditions were recorded and copies of the trial pit records are presented in Appendix A.

3.2.4 All exploratory locations are illustrated on BEK Drawing No 22081-3 Rev A presented in Appendix E.

3.2.5 A series of photographs showing the excavated trial pits are shown in Appendix D.

3.3 Laboratory Chemical Testing

- 3.3.1 Chemical laboratory testing was undertaken by Envirolab, a UKAS accredited laboratory. All testing was undertaken to MCERTS standard (where available). The following samples were submitted for chemical analysis:

Soil Chemical Testing

- 3.3.2 Eight soil samples were tested for the standard BEK soil suite which includes:

Arsenic (Total), Cadmium (Total), Copper (Total), Lead (Total), Nickel (Total), Zinc (Total), Chromium (Total), Selenium (Total), Mercury (Total), Boron (Soluble), Hexavalent Chromium, Cyanide (Total), pH, 16 EPA Poly-Aromatic Hydrocarbons (PAH), Total Phenols, Total Sulphate, Sulphate 2:1 extract, Soil Organic Matter, Speciated Total Petroleum Hydrocarbons.

Three samples were selected for asbestos identification.

Three samples were selected for Waste Acceptance Criteria (WAC) testing.

Furthermore, 2 samples of made ground and 1 sample of topsoil were submitted for an Asbestos Screen.

- 3.3.3 Copies of the chemical test results are provided within Appendix B.

3.4 Ground Conditions

- 3.4.1 Made Ground was encountered in two locations. Trial Pit No TP1 encountered grass over brown slightly silty slightly gravelly fine to medium SAND (Gravel is fine to coarse subangular to subrounded of mixed lithologies. Rare brick fragments) to a depth of 0.6 m bgl. Trial Pit No TP8 encountered relict brick footings at the surface (near the access gate) with made ground described as compact grey-black sandy fine to coarse angular gravel of mixed lithologies to a depth of 0.15 m bgl.
- 3.4.2 The site investigation encountered topsoil at surface at all other exploratory locations, to a maximum depth of 0.4 m bgl. The topsoil comprises grass over brown slightly silty slightly gravelly fine to medium SAND (Gravel is fine to coarse subangular to subrounded of mixed lithologies).
- 3.4.3 The natural superficial strata were encountered beneath the made ground or topsoil in all locations, and comprised grey silty very gravelly cobbly fine to coarse SAND (Gravel and cobbles are fine to coarse subrounded of sandstone) in Trial Pit No TP1 only, and orange-brown gravelly fine to medium SAND (Gravel is fine to coarse subrounded of sandstone) in all other locations.
- 3.4.4 Bedrock was not encountered during the investigation.

- 3.4.5 Groundwater observations were noted within Trial Pit No TP1 to TP3. The ground was noted to be damp at depths of 1 m to 2.2 m bgl in the northern part of the site. Trial pits in the southern part of the site were dry to the depths excavated.

Visual & Olfactory Evidence of Contamination

- 3.4.6 No visual or olfactory evidence of contamination was observed during the site investigation.

3.5 Infiltration Tests

- 3.5.1 BEK undertook infiltration tests in Trial Pit No TP1 and TP2, to assist with soakaway design. The work was required to support a drainage design scheme.
- 3.5.2 The details and results of this testing are reported separately in BEK letter report ref. BEK/22081/220622/ACL dated 22nd June 2022.

4. QUANTITATIVE RISK ASSESSMENT

4.1 Potentially Significant Pollutant Linkages

4.1.1 Potentially significant pollutant linkages have been identified in the PRA as listed below:

- (i) Human Health – risks to groundworkers and end users associated with contamination in the soils: risk via ingestion (soil), inhalation (soil or dust) or direct contact
- (ii) Human Health – risks to groundworkers associated with the inhalation of asbestos fibres during the re-development works
- (iii) Controlled Waters - risks associated with contamination in the made ground and/or natural strata affecting water quality in nearby watercourses, the superficial Secondary A Aquifer and the bedrock Secondary A Aquifer. Risk are associated with dissolution of contamination into perched water/leachate and lateral/vertical migration to water receptors
- (iv) Property (including services and flora) – risks associated contamination affecting concrete, service pipes and flora

4.2 Risk Assessment: Human Health Risks from Exposure to Contaminated Soil

4.2.1 The risks to human health have been assessed by the testing of shallow soils for the presence of elevated contaminants based on the expected contaminant findings detailed in the conceptual model, and by completion of a quantitative risk assessment.

4.2.2 The soil contamination concentrations have initially been compared to a range of generic assessment criteria. These include the use of the Land Quality Management and Chartered Institute of Environmental Health assessment criteria (S4ULs), Category 4 Screening Levels (C4SLs) and the Contaminated Land: Applications in Real Environments assessment criteria (CL:AIRE).

4.2.3 These assessment criteria have been derived using the CLEA model and fully justified input parameters. The proposed land use is residential with gardens. The derivation of the assessment criteria assumes an end use of residential with home grown produce, as this is the most conservative land use for the proposed development. The initial assessment assumes a soil organic matter (SOM) of 1% for all soils which is considered the most conservative approach.

4.2.4 The following table summarises the concentrations of contaminants recorded within the soil samples, as well as the relevant assessment criteria.

4.2.5 Note that only determinands with a concentration above the laboratory limit of detection are listed. Exceedances are highlighted in yellow:

Determinands	Range of Concentrations	Assessment Criteria	Samples Fail
Arsenic	<1 - 12	37 ¹	---
Boron (water soluble)	<1 - 1.1	290 ¹	---
Cadmium	<0.5 - 1.1	11 ¹	---
Copper	3 - 39	2400 ¹	---
Lead	3 - 106	200 ²	---
Mercury	<0.17 - 0.94	1.2 ¹	---
Nickel	4 - 24	130 ¹	---
Zinc	11 - 89	3700 ¹	---
Acenaphthene	<0.01 - 0.21	210 ¹	---
Acenaphthylene	<0.01 - 0.01	170 ¹	---
Anthracene	<0.02 - 0.55	2400 ¹	---
Benzo(a)anthracene	<0.04 - 1.72	7.2 ¹	---
Benzo(a)pyrene	<0.04 - 3.16	2.2 ¹	TP8 (0.2 m)
Benzo(b)fluoranthene	<0.05 - 3.36	2.6 ¹	TP8 (0.2 m)
Benzo(ghi)perylene	<0.05 - 2.15	320 ¹	---
Benzo(k)fluoranthene	<0.07 - 1.22	77 ¹	---
Chrysene	<0.06 - 2.58	15 ¹	---
Dibenz(ah)anthracene	<0.0 - 0.64	0.24 ¹	TP8 (0.2 m)
Fluoranthene	<0.08 - 3.6	280 ¹	---
Fluorene	<0.01 - 0.15	170 ¹	---
Indeno(123-cd)pyrene	<0.03 - 2.57	27 ¹	---
Phenanthrene	<0.03 - 1.42	95 ¹	---
Pyrene	<0.07 - 3.31	620 ¹	---
Aliphatic HCs >C21-C35	<1 - 840	65000 ¹	---
Aromatic HCs >C16-C21	<1 - 53	260 ¹	---
Aromatic HCs >C21-C35	<1 - 506	1100 ¹	---
Asbestos ID	0 of 3 samples	N.A.D	---

Table 1: Summary of Contamination Assessment – Human Health

¹CIEH/LQM Derived Assessment Criteria (S4ULs based on 1% SOM)

²Category 4 Screening Level (C4SL)

4.2.6 It can be seen from the above table that there are only three slightly elevated concentrations of Poly-Aromatic Hydrocarbons(PAHs) were detected. These were detected in a single soil sample from Trial Pit No TP8 at 0.2 m bgl, immediately below the made ground and relict garage footings encountered near the site access gate.

4.2.7 None of the samples tested proved positive for the presence of asbestos.

4.3 Risk Assessment: Controlled Waters

- 4.3.1 Potential risks to the quality of surface & groundwater were identified in the preliminary conceptual model.
- 4.3.2 The soil contaminant levels detected (as discussed in Section 4.2) were generally below stringent residential end use thresholds, and mostly at natural background concentrations or at/close to the limit of detection.
- 4.3.3 It is therefore considered that the risks to controlled waters from the site are negligible.

4.4 Risk Assessment: Buildings

- 4.4.1 Risks to buildings include the assessment of the aggressive nature of the shallow ground with respect to concrete, the risks to the degradation of water pipes and flora due to contamination.

Risk to Concrete

- 4.4.2 To assess the potential risks to concrete, BEK has compared the chemical test results to assessment criteria presented in the BRE Special Digest 1: Concrete in Aggressive Ground.
- 4.4.3 With consideration to the characteristic pH and sulphate values from the soil chemical test results, the concrete classification suitable for the site is DS-1 AC-1.

Risks to Services

- 4.4.4 Potable water supply pipes can be at risk from degradation if the shallow ground contains specific organic contamination. Guidance published by UKWIR includes a methodology for site investigation and risk assessment to determine pipe specification.
- 4.4.5 For brownfield sites, site investigation may be required along the intended route of the water pipeline and samples recovered from specific depths and tested for specific contaminants of concern.
- 4.4.6 Concentrations of Total Petroleum Hydrocarbons (TPH) fractions C21 – C35 in the soil sample from Trial Pit No TP8 at 0.2 m were found to be elevated above the UKWIR guidelines for PE pipes. However, this is one isolated location immediately below made ground on the perimeter of the site, and it is unlikely that this would be the route of the new potable supply pipe. Additionally, if this limited area of made ground and underlying soil is removed from site, the risk should be removed.

- 4.4.7 On the basis of the ground conditions encountered and soil chemical test results, risks to water supply pipelines are considered to be low. However, it is recommended that consultation is undertaken with the water service supplier to confirm this. A copy of the completed UKWIR report is provided within Appendix C.

Risks to Flora

- 4.4.8 Copper, nickel and zinc are toxic to plants. The effects of copper, nickel and zinc are often regarded as additive. The assessment criteria used for copper, nickel and zinc, are 'pseudo total concentrations' and are derived from BS3882:2007 as follows:

Phytotoxic Contaminant	pH Range		
	<6.0	6.0 to 7.0	>7.0
Zinc (nitric acid extractable)	<200	<200	<300
Copper (nitric acid extractable)	<100	<135	<200
Nickel (nitric acid extractable)	<60	<75	<110

Table 2: Limits for Phytotoxic Contaminants (Units mg/kg)

- 4.4.9 By comparing the soil chemical test results (Appendix B) to the concentrations in the above table, it can be seen that there are no elevated concentrations of phytotoxic contaminants above the assessment criteria for copper, nickel and zinc.
- 4.4.10 Based on the above assessment, the soils at the site (with the exception of the made ground at Trail Pit No TP1 and TP8 previously discussed) will be suitable for re-use near surface in the proposed garden areas.

Waste Acceptance Criteria (WAC) Testing

- 4.4.11 Three soil samples were selected for Waste Acceptance Criteria (WAC) testing. The results of the testing indicate that soil from the site would generally be regarded as 'inert waste' for disposal purposes, with the exception of elevated concentrations of total organic carbon in made ground and soil from Trial Pit No TP1 and TP8.
- 4.4.12 If the offsite disposal of soils from the site is required, copies of the chemical and WAC testing certificates should be made available to the proposed receiving facility.

4.5 Risk Assessment: Conclusions

- 4.5.1 The site investigation encountered made ground in two locations. In Trial Pit No TP1 this comprised grass over brown slightly silty slightly gravelly fine to medium SAND to a depth of 0.6 m bgl.

- 4.5.2 In Trial Pit No TP8, where relict brick footings were observed near the access gate, the Made Ground comprised compact grey-black sandy fine to coarse angular gravel of mixed lithologies to a depth of 0.15 m bgl.
- 4.5.3 The site investigation encountered topsoil at all other exploratory locations, to a maximum depth of 0.4 m bgl. The topsoil comprises grass over brown slightly silty slightly gravelly fine to medium SAND. The natural superficial strata was encountered beneath the made ground or topsoil in all locations, and comprised grey silty very gravelly cobbly fine to coarse SAND in Trial Pit No TP1 only, and orange-brown gravelly fine to medium SAND in all other locations.
- 4.5.4 Bedrock was not encountered during the investigation.
- 4.5.5 Groundwater observations were noted within Trial Pit No TP1 to TP3. The ground was noted to be damp at depths of 1 m to 2.2m bgl in the northern part of the site.
- 4.5.6 No visual or olfactory evidence of contamination was observed.
- 4.5.7 The samples recovered from site investigation have been tested for a wide range of contaminants in accordance with the recommendations outlined within the PRA and based on the observations made during the site investigation.
- 4.5.8 The chemical test results have been compared to relevant generic assessment criteria to identify potential contaminants of concern. Based on the contamination assessment herein, and with respect to the change of use to residential with gardens, there are minimal risks to human health, minimal risk to potable water supply pipes, and no risk to controlled waters or flora from the site. The potential risks to human health and water supply pipes identified are summarised within Table 3.

Receptor	Contaminant Of Concern	Location	Pathway
Human health	PAHs	TP8 Made Ground and underlying soil	Direct contact, ingestion, inhalation
PE Potable Water Pipes	TPH	TP8 Made Ground and underlying soil	Direct contact

Table 3: Summary of Active Risk Pathways

- 4.5.9 Potential risk to service pipes are considered to be low but advice should be sought from the water supply provider.
- 4.5.10 Risks to concrete are not present and concrete classification of DS-1 AC-1 will be suitable.

5. GEOTECHNICAL ASSESSMENT

5.1 General

5.1.1 The proposed development consists of the construction of 22 large detached domestic dwelling houses and associated garages. It is presumed that the dwellings will be of two storey height, constructed with traditional masonry and tiled trussed rafter roofs, with timber suspended upper floors and concrete ground floors. The guidance given herein will therefore need to be reviewed in terms of the building types to be adopted, by a suitably qualified and experienced engineer.

5.1.2 Made ground was encountered in two locations. In Trial Pit No TP1 this comprised grass over brown slightly silty slightly gravelly fine to medium SAND to a depth of 0.6 m bgl. In Trial Pit No TP8, where relict brick footings were observed near the access gate, the Made Ground comprised compact grey-black sandy fine to coarse angular gravel of mixed lithologies to a depth of 0.15 m bgl. The remainder of the site is overlain by relatively shallow depths of topsoil to a maximum depth of 0.4 m. The made ground/topsoil was underlain by 'gravelly fine to medium sands, with occasional rare cobbles' found at depth. The excavations within the sands started to become unstable at depths of between 2.8 m and 4.0 m, at which point the excavation they were terminated. Standard Penetration Tests to the sands have not been undertaken.

5.1.3 Groundwater was not encountered in any of the trial pits, however, the sands were found to be damp at various levels, as noted within Table 4.

Trial Pit Number	Moisture Depth (m)	Trench Instability Depth (m)
TP1	1.0	3.7
TP2	2.2	3.2
TP3	2.3	4.0
TP4	Remained Dry	2.8
TP5	Remained Dry	3.4
TP6	Remained Dry	3.3
TP7	Remained Dry	3.2
TP8	Remained Dry	2.8

Table 4. Trial Pit Results

5.1.4 As cohesive soils have not been encountered, plasticity testing was not required. Clay heave potential need not be considered as part of the foundation design and must be appraised in accordance with NHBC Ch.4.2 requirements.

5.2 Assessment and Conclusions

- 5.2.1 The underlying soils, were found to be blended sands with gravel. The stability of the excavations until damp soils were encountered at depth indicate that the soils will be suitable to sustain bearing capacities of 65kN/sq.m.
- 5.2.2 We understand that the proposed building will be formed from traditional masonry, with timber upper floors and roofs. Allowing for suspended concrete ground floors, foundation loading of up to 50-60kN/m can be expected. These will be reduced to 35kN/m for single storey garages. Based upon these loads, we would expect that strip footings can be adopted. The foundation designer should consider reinforcement being added to the strips to structures to ensure that any potential issues relating to localised soft areas within the underlying sands have been mitigated.
- 5.2.3 As suitable bearing materials have generally been found within the top 600mm of ground, it will be feasible to construct ground floor slabs as ground bearing. The design of ground bearing slabs must be considered to accord with requirements regarding the proximity of nearby trees.
- 5.2.4 All foundation designs must be reviewed and designed by a suitably qualified design engineer. The above advice is based upon the ground condition information obtained during the survey. The design engineer must satisfy themselves that the information meets with their design requirements.

6. RECOMMENDATIONS

- 6.1 This report provides an assessment of the ground conditions based on the assessment of available site investigation information. The assessment quantifies the potential risks associated with contamination and provides recommendations for foundation design considering the redevelopment proposals.

Contamination Assessment

- 6.2 Based on the contamination assessment herein and with respect to the redevelopment of the site for residential use, there are only minor risks to human health identified, in the form of slightly elevated PAHs in made ground at Trial Pit No TP8.
- 6.3 There are risks to PE potable water supply pipes at Trial Pit No TP8 due to slightly elevated TPH.
- 6.4 No risks to buildings, flora or controlled waters have been identified.
- 6.5 The results of WAC testing indicate that made ground and soils at the site would generally be regarded as inert for offsite disposal purposes.
- 6.6 To mitigate the potential risks identified, the following works are recommended:
- i) The thin layer of Made Ground and immediately underlying soils encountered in the vicinity of Trial Pit No TP8 should be removed from site. As this area features relict brick footings, it is likely that 'grubbing out' will be required in any case.
 - ii) All ground workers adopt suitable PPE when working on the site and consider the requirements of site-specific risk assessments and working method statements.

- 6.7 The ground conditions should be as anticipated during all excavations. Advice should be sought if ground conditions are significantly different or if visual/olfactory evidence of contamination is encountered.

Geotechnical Assessment

- 6.8 The underlying soils, were found to be blended sands with gravel. The stability of the excavations until damp soils were encountered at depth indicate that the soils will be suitable to sustain bearing capacities of 65kN/sq.m.

- 6.9 We understand that the proposed building will be formed from traditional masonry, with timber upper floors and roofs. Allowing for suspended concrete ground floors, foundation loading of up to 50-60kN/m can be expected. These will be reduced to 35kN/m for single storey garages. Based upon these loads, we would expect that strip footings can be adopted. The foundation designer should consider reinforcement being added to the strips to structures to ensure that any potential issues relating to localised soft areas within the underlying sands have been mitigated.
- 6.10 As suitable bearing materials have generally been found within the top 600mm of ground, it will be feasible to construct ground floor slabs as ground bearing. The design of ground bearing slabs must be considered to accord with requirements regarding the proximity of nearby trees.
- 6.11 All foundation designs must be reviewed and designed by a suitably qualified design engineer. The above advice is based upon the ground condition information obtained during the survey. The design engineer must satisfy themselves that the information meets with their design requirements.

Waste Soil Management

- 6.12 Careful management of soils during any excavation works will ensure optimum utilisation of soil resources.
- 6.13 Excavated soils which require off-site disposal are anticipated to be classified in accordance with the following document: Guidance on the Disposal of "Contaminated Soils" Version 3 (April 2001); produced by the Environment Agency. On this basis it is considered likely that soils from the majority of the site would classify as "Non-hazardous"/"Inert" for disposal; however this is subject to confirmation of the potential landfill use.
- 6.14 In all cases where excess soils require off-site disposal, the materials needs to be managed under the appropriate legislation and consideration given to any remedial techniques that could be used to improve the soil.
- 6.15 If waste soils are to be re-used on site then a suitable permit exemption should be put in place (if appropriate) or a Material Management Plan should be prepared as part of compliance with the CL:AIRE Definition of Waste:Code of Practice.

Water Pipe Specification

- 6.16 Consideration should be given to the requirements of the water supply provider. They are likely to require the UKWIR risk assessment to be completed to determine the specification for the water pipes. It is recommended that the water supply provider is contacted and enquiries made.

APPENDIX A

Exploratory Logs



GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING ENGINEERS

PROJECT NUMBER 22081 PROJ. NAME Crompton Avenue, Rochdale CLIENT Brookhouse Group	DATE 15th June 2022 EXCAVATION METHOD Trial Pit TRIAL PIT NO TP1 SHEET 1/1
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COMPLETION

COMMENTS Damp from 1 m bgl. Infiltration test undertaken within pit at 1 m depth, pit extended to 3.7 m following test. Collapsing from 3.7 m bgl.

Depth (m)	Depth (m)	Samples/ Test	Field Records	Water	Graphic Log	Material Description	Additional Observations	Elevation (m)
0.2						MG: Grass over brown slightly silty slightly gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of mixed lithologies. Rare brick fragments.		0.2
0.4	0.5	D=0.5 m						0.4
0.6						Grey silty very gravelly cobbly fine to coarse SAND. Gravel and cobbles are fine to coarse subrounded of sandstone.		0.6
0.8								0.8
1								1
1.2								1.2
1.4								1.4
1.6								1.6
1.8								1.8
2								2
2.2								2.2
2.4								2.4
2.6								2.6
2.8								2.8
3								3
3.2								3.2
3.4								3.4
3.6								3.6
3.8						Termination Depth at: 3.7 m		3.8
4								4
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8



GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING ENGINEERS

PROJECT NUMBER 22081 PROJ. NAME Crompton Avenue, Rochdale CLIENT Brookhouse Group	DATE 15th June 2022 EXCAVATION METHOD Trial Pit TRIAL PIT NO TP2 SHEET 1/1
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COMPLETION

COMMENTS Damp from 2.2 m bgl. Infiltration test undertaken within pit at 1.5 m depth, pit extended to 3.2 m following test. Collapsing from 3.2 m bgl.

Depth (m)	Depth (m)	Samples/ Test	Field Records	Water	Graphic Log	Material Description	Additional Observations	Elevation (m)
0.2						Grass over brown slightly silty slightly gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of mixed lithologies.		0.2
0.4	0.5	D=0.5 m				Orange-brown gravelly fine to medium SAND. Gravel is fine to coarse subrounded of sandstone.		0.4
0.6								0.6
0.8								0.8
1								1
1.2								1.2
1.4								1.4
1.6								1.6
1.8								1.8
2								2
2.2								2.2
2.4								2.4
2.6								2.6
2.8								2.8
3								3
3.2						Termination Depth at: 3.2 m		3.2
3.4								3.4
3.6								3.6
3.8								3.8
4								4
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8



GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING ENGINEERS

PROJECT NUMBER 22081 PROJ. NAME Crompton Avenue, Rochdale CLIENT Brookhouse Group	DATE 15th June 2022 EXCAVATION METHOD Trial Pit TRIAL PIT NO TP3 SHEET 1/1
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COMPLETION

COMMENTS Damp from 2.3 m bgl. Collapsing from 4.0 m bgl.

Depth (m)	Depth (m)	Samples/ Test	Field Records	Water	Graphic Log	Material Description	Additional Observations	Elevation (m)
0.2						Grass over brown slightly silty slightly gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of mixed lithologies.		0.2
0.4						Orange-brown gravelly fine to medium SAND. Gravel is fine to coarse subrounded of sandstone		0.4
0.6								0.6
0.8								0.8
1.0	1.0	D=1.0 m						1.0
1.2								1.2
1.4								1.4
1.6								1.6
1.8								1.8
2.0								2.0
2.2								2.2
2.4								2.4
2.6								2.6
2.8								2.8
3.0								3.0
3.2								3.2
3.4								3.4
3.6								3.6
3.8								3.8
4.0						Termination Depth at: 3.7 m		4.0
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8



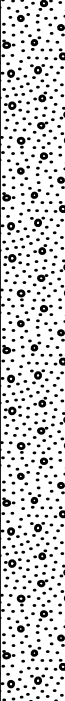
GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING ENGINEERS

PROJECT NUMBER 22081 PROJ. NAME Crompton Avenue, Rochdale CLIENT Brookhouse Group	DATE 15th June 2022 EXCAVATION METHOD Trial Pit TRIAL PIT NO TP4 SHEET 1/1
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COMPLETION

COMMENTS Dry. Collapsing from 2.8 m bgl.

Depth (m)	Depth (m)	Samples/ Test	Field Records	Water	Graphic Log	Material Description	Additional Observations	Elevation (m)
0.2						Grass over brown slightly silty slightly gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of mixed lithologies		0.2
0.4	0.5	D=0.5m				Orange-brown gravelly fine to medium SAND. Gravel is fine to coarse subrounded of sandstone.		0.4
0.6								0.6
0.8								0.8
1								1
1.2								1.2
1.4								1.4
1.6								1.6
1.8								1.8
2								2
2.2								2.2
2.4								2.4
2.6								2.6
2.8						Termination Depth at: 2.8 m		2.8
3								3
3.2								3.2
3.4								3.4
3.6								3.6
3.8								3.8
4								4
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8

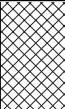
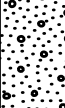
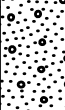
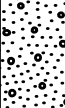
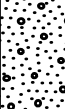
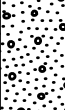
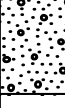


GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING ENGINEERS

PROJECT NUMBER 22081 PROJ. NAME Crompton Avenue, Rochdale CLIENT Brookhouse Group	DATE 15th June 2022 EXCAVATION METHOD Trial Pit TRIAL PIT NO TP5 SHEET 1/1
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COMPLETION
COMMENTS Dry. Collapsing from 3.4 m bgl.

Depth (m)	Depth (m)	Samples/ Test	Field Records	Water	Graphic Log	Material Description	Additional Observations	Elevation (m)
0.2						Grass over brown slightly silty slightly gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of mixed lithologies.		0.2
0.4						Orange-brown gravelly fine to medium SAND. Gravel is fine to coarse subrounded of sandstone. Rare rounded cobbles of sandstone.		0.4
0.6								0.6
0.8								0.8
1.0	1.0	D=1.0 m						1.0
1.2								1.2
1.4								1.4
1.6								1.6
1.8								1.8
2.0								2.0
2.2								2.2
2.4								2.4
2.6								2.6
2.8								2.8
3.0								3.0
3.2								3.2
3.4						Termination Depth at: 3.4 m		3.4
3.6								3.6
3.8								3.8
4.0								4.0
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8



GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING ENGINEERS

PROJECT NUMBER 22081 PROJ. NAME Crompton Avenue, Rochdale CLIENT Brookhouse Group	DATE 15th June 2022 EXCAVATION METHOD Trial Pit TRIAL PIT NO TP6 SHEET 1/1
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COMPLETION

COMMENTS Dry. Collapsing from 3.3 m bgl.

Depth (m)	Depth (m)	Samples/ Test	Field Records	Water	Graphic Log	Material Description	Additional Observations	Elevation (m)
0.2	0.2	D=0.2 m				Grass over brown slightly silty slightly gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of mixed lithologies.		0.2
0.4						Orange-brown very gravelly fine to medium SAND. Gravel is fine to coarse subrounded of sandstone. Rare rounded cobbles of sandstone.		0.4
0.6								0.6
0.8								0.8
1								1
1.2								1.2
1.4								1.4
1.6								1.6
1.8								1.8
2								2
2.2								2.2
2.4								2.4
2.6								2.6
2.8								2.8
3								3
3.2								3.2
3.4						Termination Depth at: 3.3 m		3.4
3.6								3.6
3.8								3.8
4								4
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8



GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING ENGINEERS

PROJECT NUMBER 22081 PROJ. NAME Crompton Avenue, Rochdale CLIENT Brookhouse Group	DATE 15th June 2022 EXCAVATION METHOD Trial Pit TRIAL PIT NO TP7 SHEET 1/1
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COMPLETION
COMMENTS Dry. Collapsing from 3.2 m bgl.

Depth (m)	Depth (m)	Samples/ Test	Field Records	Water	Graphic Log	Material Description	Additional Observations	Elevation (m)
0.2						Grass over brown slightly silty slightly gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of mixed lithologies.		0.2
0.4	0.5	D=0.5 m				Orange-brown very gravelly fine to medium SAND. Gravel is fine to coarse subrounded of sandstone. Rare rounded cobbles of sandstone.		0.4
0.6								0.6
0.8								0.8
1								1
1.2								1.2
1.4								1.4
1.6								1.6
1.8								1.8
2								2
2.2								2.2
2.4								2.4
2.6								2.6
2.8								2.8
3								3
3.2						Termination Depth at: 3.2 m		3.2
3.4								3.4
3.6								3.6
3.8								3.8
4								4
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8



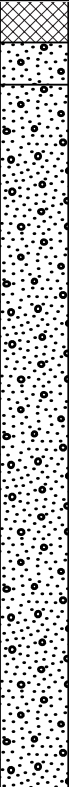
GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING ENGINEERS

PROJECT NUMBER 22081 PROJ. NAME Crompton Avenue, Rochdale CLIENT Brookhouse Group	DATE 15th June 2022 EXCAVATION METHOD Trial Pit TRIAL PIT NO TP8 SHEET 1/1
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COMPLETION

COMMENTS Dry. Collapsing from 2.8 m bgl.

Depth (m)	Depth (m)	Samples/ Test	Field Records	Water	Graphic Log	Material Description	Additional Observations	Elevation (m)
0.2	0.2	D=0.2 m				MG: Compact grey-black sandy fine to coarse angular gravel of mixed lithologies Brown slightly silty slightly gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of mixed lithologies Orange-brown very gravelly fine to medium SAND. Gravel is fine to coarse subrounded of sandstone. Rare rounded cobbles of sandstone		0.2
0.4								0.4
0.6								0.6
0.8								0.8
1								1
1.2								1.2
1.4								1.4
1.6								1.6
1.8								1.8
2								2
2.2								2.2
2.4								2.4
2.6								2.6
2.8						Termination Depth at: 2.8 m		2.8
3								3
3.2								3.2
3.4								3.4
3.6								3.6
3.8								3.8
4								4
4.2								4.2
4.4								4.4
4.6								4.6
4.8								4.8

APPENDIX B

Chemical Test Results

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 22/05878

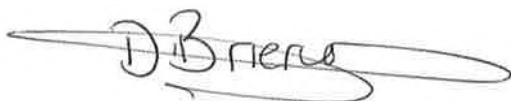
Issue Number: 1

Date: 27 June, 2022

Client: BEK Enviro Ltd
Suite One
No 3 Mitton Road Business Park
Mitton Road
Whalley
Lancashire
BB7 9YE

Project Manager: Mick Buckley
Project Name: Crompton Avenue
Project Ref: Not specified
Order No: 7499-22081-M
Date Samples Received: 15/06/22
Date Instructions Received: 16/06/22
Date Analysis Completed: 27/06/22

Approved by:



Danielle Brierley
Deputy Client Services Supervisor

Envirolab Job Number: 22/05878

Client Project Name: Crompton Avenue

Client Project Ref: Not specified

Lab Sample ID	22/05878/1	22/05878/2	22/05878/3	22/05878/4	22/05878/5	22/05878/6	22/05878/7	Units	Limit of Detection	Method ref
Client Sample No	TP1	TP2	TP3	TP4	TP5	TP6	TP7			
Client Sample ID										
Depth to Top	0.50	0.50	1.00	0.50	1.00	0.20	0.50			
Depth To Bottom										
Date Sampled	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4A	4A	4A	4A	4A	5AE	4A			
% Stones >10mm _A	<0.1	2.8	3.5	<0.1	11.3	1.3	5.3	% w/w	0.1	A-T-044
pH _D ^{M#}	5.39	5.80	6.06	6.16	6.04	4.90	6.01	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{M#}	790	<200	<200	<200	<200	750	<200	mg/kg	200	A-T-028s
Cyanide (total) _A ^{M#}	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	0.2	A-T-050s
Organic Matter _D ^{M#}	15.1	0.6	0.6	<0.1	<0.1	4.8	<0.1	% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	9	<1	<1	<1	<1	12	<1	mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	mg/kg	1	A-T-027s
Cadmium _D ^{M#}	0.8	<0.5	0.6	<0.5	<0.5	1.1	<0.5	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	39	8	10	3	4	34	3	mg/kg	1	A-T-024s
Chromium _D ^{M#}	17	10	11	3	4	21	4	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-040s
Lead _D ^{M#}	75	6	7	3	4	106	3	mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	24	12	12	4	4	15	4	mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-024s
Zinc _D ^{M#}	58	24	25	11	13	89	11	mg/kg	5	A-T-024s

Envirolab Job Number: 22/05878

Client Project Name: Crompton Avenue

Client Project Ref: Not specified

Lab Sample ID	22/05878/1	22/05878/2	22/05878/3	22/05878/4	22/05878/5	22/05878/6	22/05878/7	Units	Limit of Detection	Method ref
Client Sample No	TP1	TP2	TP3	TP4	TP5	TP6	TP7			
Client Sample ID										
Depth to Top	0.50	0.50	1.00	0.50	1.00	0.20	0.50			
Depth To Bottom										
Date Sampled	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4A	4A	4A	4A	4A	5AE	4A			
Asbestos in Soil (inc. matrix)										
Asbestos in soil _D [#]	NAD	-	-	-	-	NAD	-			A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	-	-	-	-	N/A	-			A-T-045

Envirolab Job Number: 22/05878

Client Project Name: Crompton Avenue

Client Project Ref: Not specified

Lab Sample ID	22/05878/1	22/05878/2	22/05878/3	22/05878/4	22/05878/5	22/05878/6	22/05878/7	Units	Limit of Detection	Method ref
Client Sample No	TP1	TP2	TP3	TP4	TP5	TP6	TP7			
Client Sample ID										
Depth to Top	0.50	0.50	1.00	0.50	1.00	0.20	0.50			
Depth To Bottom										
Date Sampled	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4A	4A	4A	4A	4A	5AE	4A			
PAH-16MS										
Acenaphthene _A ^{M#}	0.01	<0.01	<0.01	<0.01	<0.01	0.12	<0.01	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.03	<0.02	<0.02	<0.02	<0.02	0.19	<0.02	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.07	<0.04	<0.04	<0.04	<0.04	0.69	<0.04	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.05	<0.04	<0.04	<0.04	<0.04	0.63	<0.04	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.08	<0.05	<0.05	<0.05	<0.05	0.81	<0.05	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	<0.05	<0.05	<0.05	<0.05	0.36	<0.05	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07	<0.07	<0.07	0.28	<0.07	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.10	<0.06	<0.06	<0.06	<0.06	0.81	<0.06	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04	<0.04	0.10	<0.04	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.18	<0.08	<0.08	<0.08	<0.08	1.44	<0.08	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	<0.01	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	0.44	<0.03	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.14	<0.03	<0.03	<0.03	<0.03	0.79	<0.03	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.18	<0.07	<0.07	<0.07	<0.07	1.39	<0.07	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	0.84	<0.08	<0.08	<0.08	<0.08	8.13	<0.08	mg/kg	0.01	A-T-019s

Envirolab Job Number: 22/05878

Client Project Name: Crompton Avenue

Client Project Ref: Not specified

Lab Sample ID	22/05878/1	22/05878/2	22/05878/3	22/05878/4	22/05878/5	22/05878/6	22/05878/7	Units	Limit of Detection	Method ref
Client Sample No	TP1	TP2	TP3	TP4	TP5	TP6	TP7			
Client Sample ID										
Depth to Top	0.50	0.50	1.00	0.50	1.00	0.20	0.50			
Depth To Bottom										
Date Sampled	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22	15-Jun-22			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4A	4A	4A	4A	4A	5AE	4A			
TPH CWG with Clean Up										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	8	<1	<1	<1	<1	6	<1	mg/kg	1	A-T-055s
Total Aliphatics _A	8	<1	<1	<1	<1	6	<1	mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1	<1	<1	<1	<1	1	<1	mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C12-C16 _A	1	<1	<1	<1	<1	2	<1	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	3	<1	<1	<1	<1	13	<1	mg/kg	1	A-T-055s
Aro >C21-C35 _A	8	<1	<1	<1	<1	45	<1	mg/kg	1	A-T-055s
Total Aromatics _A	12	<1	<1	<1	<1	62	<1	mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	21	<1	<1	<1	<1	67	<1	mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 22/05878

Client Project Name: Crompton Avenue

Client Project Ref: Not specified

Lab Sample ID	22/05878/8							Units	Limit of Detection	Method ref
Client Sample No	TP8									
Client Sample ID										
Depth to Top	0.20									
Depth To Bottom										
Date Sampled	15-Jun-22									
Sample Type	Soil - ES									
Sample Matrix Code	4AE									
% Stones >10mm _A	37.2							% w/w	0.1	A-T-044
pH _D ^{M#}	8.29							pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01							g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{M#}	390							mg/kg	200	A-T-028s
Cyanide (total) _A ^{M#}	<1							mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2							mg/kg	0.2	A-T-050s
Organic Matter _D ^{M#}	11.9							% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	<1							mg/kg	1	A-T-024s
Boron (water soluble) _D	1.1							mg/kg	1	A-T-027s
Cadmium _D ^{M#}	0.5							mg/kg	0.5	A-T-024s
Copper _D ^{M#}	20							mg/kg	1	A-T-024s
Chromium _D ^{M#}	13							mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1							mg/kg	1	A-T-040s
Lead _D ^{M#}	21							mg/kg	1	A-T-024s
Mercury _D	0.94							mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	16							mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1							mg/kg	1	A-T-024s
Zinc _D ^{M#}	60							mg/kg	5	A-T-024s

Envirolab Job Number: 22/05878/8

Client Project Name: Crompton Avenue

Client Project Ref: Not specified

Lab Sample ID	22/05878/8							Units	Limit of Detection	Method ref
Client Sample No	TP8									
Client Sample ID										
Depth to Top	0.20									
Depth To Bottom										
Date Sampled	15-Jun-22									
Sample Type	Soil - ES									
Sample Matrix Code	4AE									
Asbestos in Soil (inc. matrix)										
Asbestos in soil _D [#]	NAD									A-T-045
Asbestos Matrix (visual) _D	-									A-T-045
Asbestos Matrix (microscope) _D	-									A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A									A-T-045

Envirolab Job Number: 22/05878

Client Project Name: Crompton Avenue

Client Project Ref: Not specified

Lab Sample ID	22/05878/8							Units	Limit of Detection	Method ref
Client Sample No	TP8									
Client Sample ID										
Depth to Top	0.20									
Depth To Bottom										
Date Sampled	15-Jun-22									
Sample Type	Soil - ES									
Sample Matrix Code	4AE									
PAH-16MS										
Acenaphthene _A ^{M#}	0.21							mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.10							mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.55							mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	1.72							mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	3.16							mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	3.36							mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	2.15							mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	1.22							mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	2.58							mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.64							mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	3.60							mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.15							mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	2.57							mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.30							mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	1.42							mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	3.31							mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	26.6							mg/kg	0.01	A-T-019s

Envirolab Job Number: 22/05878

Client Project Name: Crompton Avenue

Client Project Ref: Not specified

Lab Sample ID	22/05878/8									
Client Sample No	TP8									
Client Sample ID										
Depth to Top	0.20									
Depth To Bottom										
Date Sampled	15-Jun-22									
Sample Type	Soil - ES									
Sample Matrix Code	4AE									
TPH CWG with Clean Up										
Ali >C5-C6 _A [#]	<0.05							mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.05							mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<20							mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<20							mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<20							mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	<20							mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	840							mg/kg	1	A-T-055s
Total Aliphatics _A	840							mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.05							mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.05							mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<20							mg/kg	1	A-T-055s
Aro >C10-C12 _A	<20							mg/kg	1	A-T-055s
Aro >C12-C16 _A	<20							mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	53							mg/kg	1	A-T-055s
Aro >C21-C35 _A	506							mg/kg	1	A-T-055s
Total Aromatics _A	579							mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	1420							mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.05							mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.05							mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.05							mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.05							mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.05							mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.05							mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Subscript ""^" indicates analysis has dependant options against results. Testing dependant on results appear in the comments area of your sample receipt.

EPH CWG results have humics mathematically subtracted through instrument calculation

TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these

humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	BEK Enviro Ltd, Suite One , No 3 Mitton Road Business Park , Mitton Road , Whalley , Lancashire , BB7 9YE	Project No:	22/05878
Project:	Crompton Avenue	Date Received:	16/06/2022 (am)
Clients Project No:		Cool Box Temperatures (°C):	16.3

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	22/05878/1	22/05878/2	22/05878/3	22/05878/4	22/05878/5	22/05878/6	22/05878/7	22/05878/8
Client Sample No	TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP8
Client Sample ID/Depth	0.50m	0.50m	1.00m	0.50m	1.00m	0.20m	0.50m	0.20m
Date Sampled	15/06/22	15/06/22	15/06/22	15/06/22	15/06/22	15/06/22	15/06/22	15/06/22
A-T-004s	22/06/2022					22/06/2022		22/06/2022
A-T-007s	21/06/2022					21/06/2022		21/06/2022
A-T-019s	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022
A-T-022s	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	23/06/2022
A-T-024s	22/06/2022	22/06/2022	22/06/2022	22/06/2022	22/06/2022	22/06/2022	22/06/2022	22/06/2022
A-T-025w	27/06/2022					27/06/2022		27/06/2022
A-T-026s	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	24/06/2022
A-T-026w	27/06/2022					27/06/2022		27/06/2022
A-T-027s	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022
A-T-028s	22/06/2022	22/06/2022	22/06/2022	22/06/2022	22/06/2022	22/06/2022	22/06/2022	22/06/2022
A-T-031s	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022
A-T-031w	27/06/2022					27/06/2022		27/06/2022
A-T-032 OM	22/06/2022	22/06/2022	22/06/2022	22/06/2022	22/06/2022	22/06/2022	22/06/2022	22/06/2022
A-T-032s	22/06/2022					22/06/2022		22/06/2022
A-T-032w	27/06/2022					27/06/2022		27/06/2022
A-T-037w	27/06/2022					27/06/2022		27/06/2022
A-T-040s	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022
A-T-042sTCN	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	27/06/2022
A-T-044	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022
A-T-045	17/06/2022					17/06/2022		17/06/2022
A-T-050s	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022
A-T-050w	27/06/2022					27/06/2022		27/06/2022
A-T-055s	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	21/06/2022	23/06/2022
Calc-no stones	27/06/2022					27/06/2022		27/06/2022
Probe (w)	27/06/2022					27/06/2022		27/06/2022

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Final Test Report

Envirolab Job Number: 22/05878
Issue Number: 1
Date: 27-Jun-22

Client: BEK Enviro Ltd
Suite One
No 3 Mitton Road Business Park
Mitton Road
Whalley
Lancashire, BB7 9YE

Project Manager: Mick Buckley
Project Name: Crompton Avenue
Project Ref: Not specified
Order No: 7499-22081-M

Date Samples Received: 15-Jun-22
Date Instructions Received: 16-Jun-22
Date Analysis Completed: 27-Jun-22

Notes - Soil analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in *italic font* they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

HWOL TPH Code: EH_CU_1D_AL: Extractable hydrocarbons - i.e. everything extracted by the solvent(s), Clean-up - e.g. by florisil, silica gel, GC - Single coil gas chromatography, Aliphatics only

Approved by:

Holly Neary-King

Holly Neary-King
Client Services Supervisor

Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	22/05878/1				
Client Sample Number				TP1	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID								
Depth to Top				0.5				
Depth to Bottom								
Date Sampled				15/06/2022				
Sample Type				Soil - ES				
Sample Matrix Code				4A				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	5.39	-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N		-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N		-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N		-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	8.77	3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	0.88	100	-	-	
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	<10	500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007	1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01	6	-	-	
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.003	0.030	0.5	2	25
Barium	A-T-025	N	N	0.018	0.180	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	0.001	0.010	0.5	10	70
Copper	A-T-025	N	N	0.018	0.180	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	<0.01	0.5	10	30
Nickel	A-T-025	N	N	0.005	0.050	0.4	10	40
Lead	A-T-025	N	N	0.028	0.280	0.5	10	50
Antimony	A-T-025	N	N	<0.001	<0.01	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.014	0.140	4	50	200
Chloride	A-T-026	N	N	3	34	800	15000	25000
Fluoride	A-T-026	N	N	0.3	3.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	2	19	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	<20	<200	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	20.50	205	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	8.1				
Conductivity (µS/cm)	A-T-037	N	N	18				
Mass Sample (kg)				0.244				
Dry Matter (%)	A-T-044	N	N	71.7				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Sample Details					Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	22/05878/6			
Client Sample Number				TP6	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID							
Depth to Top				0.2			
Depth to Bottom							
Date Sampled				15/06/2022			
Sample Type				Soil - ES			
Sample Matrix Code				5AE			
Solid Waste Analysis							
pH (pH Units) _D	A-T-031	N	N	4.90	-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N		-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N		-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	2.81	3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	8.26	100	-	-
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	<10	500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007	1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01	6	-	-
				10:1	10:1	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)	
				mg/l	mg/kg		
Arsenic	A-T-025	N	N	<0.001	<0.01	0.5	25
Barium	A-T-025	N	N	0.006	0.060	20	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	5
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	70
Copper	A-T-025	N	N	0.006	0.060	2	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	2
Molybdenum	A-T-025	N	N	<0.001	<0.01	0.5	30
Nickel	A-T-025	N	N	0.001	0.010	0.4	40
Lead	A-T-025	N	N	0.005	0.050	0.5	50
Antimony	A-T-025	N	N	<0.001	<0.01	0.06	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	7
Zinc	A-T-025	N	N	0.012	0.120	4	200
Chloride	A-T-026	N	N	<1.00	<10	800	25000
Fluoride	A-T-026	N	N	0.2	2.0	10	500
Sulphate as SO ₄	A-T-026	N	N	<1.00	<10	1000	50000
Total Dissolved Solids	A-T-035	N	N	<20	<200	4000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	1000
Leach Test Information							
pH (pH Units)	A-T-031	N	N	7.9			
Conductivity (µS/cm)	A-T-037	N	N	<10			
Mass Sample (kg)				0.21			
Dry Matter (%)	A-T-044	N	N	83.3			
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation							

Sample Details					Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	22/05878/8			
Client Sample Number				TP8	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID							
Depth to Top				0.2			
Depth to Bottom							
Date Sampled				15/06/2022			
Sample Type				Soil - ES			
Sample Matrix Code				4AE			
Solid Waste Analysis							
pH (pH Units) _D	A-T-031	N	N	8.29	-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N		-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N		-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	6.9	3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	27.6	100	-	-
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	654	500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007	1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01	6	-	-
Eluate Analysis				10:1	10:1	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)	
				mg/l	mg/kg		
Arsenic	A-T-025	N	N	0.003	0.030	0.5	25
Barium	A-T-025	N	N	0.013	0.130	20	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	5
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	70
Copper	A-T-025	N	N	0.007	0.070	2	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	2
Molybdenum	A-T-025	N	N	0.001	0.010	0.5	30
Nickel	A-T-025	N	N	0.002	0.020	0.4	40
Lead	A-T-025	N	N	0.008	0.080	0.5	50
Antimony	A-T-025	N	N	<0.001	<0.01	0.06	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	7
Zinc	A-T-025	N	N	0.014	0.140	4	200
Chloride	A-T-026	N	N	<1.00	<10	800	25000
Fluoride	A-T-026	N	N	<0.10	<1	10	500
Sulphate as SO ₄	A-T-026	N	N	<1.00	<10	1000	50000
Total Dissolved Solids	A-T-035	N	N	44	440	4000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	1000
Leach Test Information							
pH (pH Units)	A-T-031	N	N	7.4			
Conductivity (µS/cm)	A-T-037	N	N	89			
Mass Sample (kg)				0.177			
Dry Matter (%)	A-T-044	N	N	98.7			
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation							

APPENDIX C

UKWIR Assessment

Supplementary guidance for the selection of water pipes in land potentially affected by contamination



Introduction

In January 2011, UK Water Industry Research (UKWIR) published "Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites" (Ref 10/WM/03/21; the 'UKWIR Guidance'). Its aim is to ensure that the correct materials are selected for water pipes and components to be used below ground in brownfield sites to protect the quality of drinking water whilst taking into account the service life of the water distribution system. It supersedes the Water Regulations Advisory Scheme (WRAS) Information and Guidance Note 9-04-03 "Laying Pipes in Contaminated Land" which has been withdrawn.

The UKWIR Guidance is for use by developers, self-lay organisations, water companies and consultants when planning, designing and constructing water mains and/or services in brownfield sites. It defines brownfield sites as "land or premises that have previously been used or developed. They may also be vacant or derelict. However, they are not necessarily contaminated." The UKWIR Guidance states that it does not apply to greenfield sites; however, we consider this supplementary guidance and the relevant sections of the UKWIR guidance as being equally suitable for application to those greenfield sites considered to be potentially affected by contamination. Where greenfield sites are not affected by contamination a preliminary risk assessment (see below) will suffice.

The UKWIR Guidance also states that there should be no departure from its provisions "*except where formally approved by the Water Company, such departure being technically justifiable or representing advances in knowledge or product development*".

We have adopted the UKWIR Guidance in principle and produced this company specific supplementary guidance (the 'UUW Guidance') which includes the Risk Assessment for Water Pipes (the 'RA').

This guidance does not cover operative safety, health exposure modelling or accidental pipe damage.

Risk Assessment for Water Pipes in Land Potentially Affected by Contamination

Any application for new water supplies to a development (construction of new properties, or renovation or conversion of existing buildings) in land potentially affected by contamination shall include a completed RA.

As a minimum a desk study (preliminary risk assessment) shall be provided with the RA in accordance with the framework in Environment Agency publication "Model Procedures for the Management of Land Contamination" (ref: CLR11) that sets out whether the land through which the pipes are to be laid may be affected by contamination. The application of the source, pathway, receptor concept will be an integral part of any pipeline risk assessment. For each potential source (the contamination) and each potential receptor (the water pipe), consideration shall be given to whether a potential pathway between source and receptor exists, or may exist in the future, linking the two. There are normally only three pathways by which contamination may come into contact with water pipes. These are direct contact with the soil or backfill, an excessive vapour phase or a contaminated groundwater regime. If none of these conditions exist on site (adopting the source, pathway, receptor concept) then it is likely that extended and/or targeted soil testing will not be required and a simple risk assessment will suffice. For those sites where land may be affected by contamination appropriate testing shall be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. The testing requirements are as described in the following section.

The signatories of the Water Supply Application Form and the RA must ensure that all assessments of land condition have been carried out in accordance with applicable current standards and guidelines by or under the direction of a suitably qualified competent person.

We require the competent person to be a) a chartered member of an appropriate professional body (such as the Institution of Civil Engineers, the Geological Society of London or the Royal Institution of Chartered Surveyors) with relevant experience of investigating contaminated sites or b) a Specialist in Land Condition (SiLC) with appropriate geo-environmental experience.

Testing Requirements

The soil, rock and if appropriate groundwater tests that are required on all sites where the potential for organic contamination has been identified in the desk study and where water pipes are proposed to be laid must be accredited by United Kingdom Accreditation Service (UKAS) as a minimum and where commercially available the Environment Agency's Monitoring Certification Service (MCERTS). These accredited tests should be undertaken for:

Banded hydrocarbons EC5-EC10, EC10-EC16, EC16-EC40 (Total aliphatic and aromatic hydrocarbons for each banding may be summed). Aliphatic/aromatic fractionation and subsequent banding may be required should a more detailed site specific risk assessment be undertaken. The bandings have been amended to take into account readily available laboratory tests. The equivalent carbon number (EC) is used to assess petroleum hydrocarbon mixtures rather than the actual number of carbon atoms in the molecule in line with guidance issued by the Environment Agency (2005).

Volatile organic compounds (VOCs) (method by head space or purge & trap GCMS) with tentative identification of compounds greater than 20µg/kg. The method used should be capable of detecting a wide range of compounds listed in US EPA Method 8260C or similar. The method should include analysis of naphthalene.

BTEX (Benzene, toluene, ethyl benzene and xylenes) plus MTBE (Methyl-tertiary butyl ether) (by head space GCMS)

Semi-Volatile Organic Compounds (SVOCs) (method by GCMS) with tentative identification of compounds greater than 20µg/kg. The method used should be capable of detecting the compounds listed in US EPA Method 8270D or similar. The total concentration of SVOCs excludes polycyclic aromatic hydrocarbons, ethers, nitrobenzene, ketones, aldehydes, phenols, cresols and chlorinated phenols. Phenols, cresols and chlorinated phenols which are detected by the SVOC analysis are given their own assessment criteria.

We do not consider Table G1 and Table 3.1 of the UKWIR Guidance to be a definitive guide for assessing total concentrations. Table 1 in the RA below replaces Table 3.1 of the UKWIR Guidance.

Where previous site uses include the use, storage, treatment, disposal or manufacture of any of the following, appropriate testing for these substances will be required:

Ethers, nitrobenzene, ketones, aldehydes and amines. Note that the presence of amines on any site at the proposed pipe depth +/- 1.0m precludes the use of polyethylene. The methods of analysis and method of calculation of total concentrations of these compounds will need to be agreed with UUW.

To comply with the testing requirements, the suites of tests that are required on all brownfield sites where wrapped steel, wrapped ductile iron or copper pipes are to be laid as minimum must include:

pH, Conductivity and redox potential

Sufficiency of Testing

Water pipes are normally laid at between 0.75 and 1.35m from finished ground level to crown of pipe. Samples taken and tested must represent both a) the soil in which the water pipes are to be laid and b) the soil down to at least 500mm below the underside of the proposed pipe. Where the proposed depth of the pipes is unknown at the time of application, soil samples representative of the ground condition between surface level and 1.5m below finished ground level shall be taken as a minimum. Where appropriate (see UKWIR Guidance) groundwater sampling and groundwater monitoring will also be

necessary. Photo-ionisation detection (PID) monitoring along the proposed route of the pipeline may be employed, though this does not provide a definitive guide to the suitability of water pipe materials.

Where required a sufficient number of test results should be obtained from the material in which the pipes are to be laid. CLAIRE/CIEH 2008 "Guidance on comparing soil contamination data with a critical concentration" may be used, where appropriate, to justify the number of soil samples tested; however, this statistical model should not be used on heterogeneous materials or used to average test results from different types of materials.

Further guidance on representative sampling is contained within BS10175:2011 Code of Practice for the Investigation of Potentially Contaminated Sites, the Department of the Environment's Contaminated Land Research Report "Sampling strategies for contaminated land" prepared by The Centre for Research into the Built Environment, Nottingham Trent University (Ref: CLR 4; 1994) and the Environment Agency's "Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination" (ref: R&D Technical Report P5-066/TR; 2000).

Where remediation has been carried out on the site, the test results obtained from validation samples will be used in the assessment. Where a horizontal capping system has been or will be employed using materials spread across a site, sufficient samples will need to be taken to characterise the capping material used and the results presented to UUW. However, the sufficiency of sampling on the horizontal capping system, in which the pipeline will be placed, may be assessed on the basis of the source, quantity and type of materials used.

Detection Limits

Only positive concentrations, ie those above the limit of detection should be used in summation of VOC and SVOC (or other test groups of compounds ie phenols, cresols and chlorinated phenols). Laboratory methods shall provide a minimum limit of detection of 10µg/kg for each individual VOC or SVOC (or other test groups of compounds) quantitatively detected in accordance with the methods described above. For tentatively identified compounds (TICs), only those compounds with a concentration of 20µg/kg or greater shall be used in the summation of VOC and SVOC (or other test groups of compounds).

Protective Measures

Where polyethylene, ductile iron, steel or copper pipes are to be laid on a brownfield site or other land potentially affected by contamination (whether or not it has been remediated) and where the concentrations exceed the generic guideline values set out in Table 1 of the RA, the developer shall provide either:

- a) a robust risk assessment to show how any contaminants will not significantly impact on proposed water supplies or buried assets over the lifetime of the assets; or
- b) more suitable pipe materials; or
- c) an engineering solution to protect the pipe work backed up by an adequate assessment of the risk.

Liquid free phase product (e.g. oil or free solvent layers) shall not remain in the ground or groundwater in the vicinity of water pipes, whether barrier pipe or any other pipe materials are used.

When designing pipe routes on land potentially affected by contamination, new preferential contamination pathways along the route of new water pipes shall not be created. Particular measures may be required to prevent the possible migration of contamination through pipe bedding and into controlled waters.

References

BS10175:2011 "Investigation of Potentially Contaminated Sites Code of Practice"

CLAIRE/CIEH "Guidance on comparing soil contamination data with a critical concentration" 2008

Department of the Environment Contaminated Land Research Report "Sampling strategies for contaminated land" prepared by The Centre for Research into the Built Environment, Nottingham Trent University (Ref: CLR 4) 1994

Environment Agency "Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination" (ref: R&D Technical Report P5-066/TR) 2000

Environment Agency "Model Procedures for the Management of Land Contamination" (ref: CLR11), 2004

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

UK Water Industry Research (UKWIR) "Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites" (Ref 10/WM/03/21)" January 2011

Water Regulations Advisory Scheme (WRAS) Information and Guidance Note 9-04-03 "Laying Pipes in Contaminated Land" 2002



About us

United Utilities is the North West's water company. We keep the taps flowing and toilets flushing for seven million customers every day. From Crewe to Carlisle, we work hard behind the scenes to help your life flow smoothly.

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If you need any help completing the form please call us on 0845 026 4296.

Section 1: Development Details	
Development Name <i>(if it has one)</i>	Land off Crompton Avenue, Rochdale
Development Address	Land off Crompton Avenue, Rochdale, OL16 4PB
OS Grid Reference <i>(mid point)</i>	390679, 411276
Developers Name	Lancet Homes
UUW reference number <i>(for UU use only)</i>	
Please provide details below of the current and historical use of the site and adjacent sites.	
<i>If your supporting information has details of the current and historical site use, please reference below the relevant sections of your report.</i>	
The site is located immediately east of Crompton Avenue, Rochdale, at postcode OL16 4PB. The site is approximately 1.5 km south-east of Rochdale town centre. The National Grid Reference for the centre of the site is 390679, 411276. The site is occupied by a roughly rectangular shaped plot of land of approximately 1.02 ha. The site is a field covered with grass, rough vegetation, and some shrubs and trees around the perimeter. The site slopes gently downwards towards the north. Access is via a gate from Crompton Avenue. Some waste materials and made ground were observed in this area, including the relict footings of a garage or outhouse. Historically, the site has been a field with no previous development.	

Has your desk study and site walkover identified any land potentially affected by contamination?	☒ Yes ☐ No
If the site is potentially affected by contamination but you have not completed any intrusive site investigation please provide details below of the rationale behind the intended pipe selection.	
<i>If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.</i>	

Section 3: Intrusive Site Investigation	
Have you completed any intrusive site investigation?	☒ Yes ☐ No
Date(s) when the site investigation(s) undertaken	June 2022
At what level has groundwater been encountered?	1 to 2.8 m metres below ground level or ☐ Not encountered
Table 1 (Pipeline Selection Risk Assessment Summary (PSRAS)) below classifies testing required where the preliminary risk assessment has identified land potentially affected by contamination. Please provide details below of any test groups which have not been tested and the rationale for not testing. <i>If your supporting information has details of the rationale behind not testing any particular test groups, please reference below the relevant sections of your report.</i> Following a thorough assessment of history of the site and the surrounding land use as well as existing land use, the potential contaminants of concern were determined. The assessment of site history and surrounding land use is detailed in BEK Enviro Ltd - Preliminary Risk Assessment - Crompton Avenue, Rochdale - Ref: BEK-22081-1, July 2022. The information presented in the Report includes a Preliminary Risk Assessment (qualitative assessment) to identify the potential contaminants of concern present based on historic and current site activities and this has informed the extent and scope of the site investigation works undertaken. The site investigation tested for the following contaminants of concern as recommended by the phase 1 report and following a review of ground conditions at the site: As, Cd, Cr, Cr (VI) Cu, Pb, Ni, Se, Hg, Zn, Cu, Cyanide, sulphate, pH, phenols, polycyclic aromatic hydrocarbons (PAHs), Speciated Total Petroleum Hydrocarbons, soil organic matter and asbestos. If the intrusive site investigation has identified concentrations above the PE threshold (see PSRAS) and your intended pipe selection is PE please provide details below of the rationale behind the intended pipe selection. <i>If your supporting information has details of the rationale behind the intended pipe selection, please reference below the relevant sections of your report.</i> Concentrations of Total Petroleum Hydrocarbons (TPH) fractions C21 – C35 in the soil sample from Trial Pit No TP8 at 0.2 m were found to be elevated above the UKWIR guidelines for PE pipes. However, this is one isolated location immediately below made ground on the perimeter of the site. Therefore, it is unlikely that this would be the route of the new potable supply pipe. Additionally, the limited area of made ground and underlying soil is to be removed from site and in all cases the pipe will be lain in the natural strata. Given that the localised contaminated made ground and underlying arisings are to be removed from site and that the pipe will be lain in clean uncontaminated natural strata at depth >0.75 m, no pollutant linkages are considered present between the source (to be removed) and the receptor (the pipe to be lain in uncontaminated natural strata). PE pipe is recommended on site.	
Section 4: Site Remediation	
Please provide details below of any site remediation (which may include a change in site levels) already completed. <i>If your supporting information has details of the site remediation already completed, please reference below the relevant sections of your report.</i> None	
Has the PSRAS (Table 1) been completed using appropriate data after remediation?	☐ Yes ☒ No ☐ N/A
Please provide details below of any proposed site remediation and an analysis of whether this will affect your intended pipe selection. <i>If your supporting information has details of any proposed site remediation and whether this will affect your intended pipe selection, please reference below the relevant sections of your report.</i>	

Removal of locally contaminated ground in the confines of TP8. This will remove the source of all elevated TPH-CWG compounds from the site rendering the site uncontaminated. Therefore, PE pipe will be suitable

Section 5: Final Use of Site

Please provide details below of any chemicals (including fuel) to be stored on site and any other future contamination risks which may affect your intended pipe selection.

If your supporting information has details of potential contamination risks which may affect your intended pipe selection, please reference below the relevant sections of your report.

N/A - residential development

What water pipe materials are intended to be used on site?

☒ PE ☐ PE Barrier Pipe Type A ☐ PE Barrier Pipe Type B
Other (please specify):

Section 6: Additional Information

Please use the section below to provide any additional details to support your intended pipe selection.

If your supporting information has additional information to support your intended pipe selection, please reference below the relevant sections of your report.

Section 7: Risk Assessor

Name and relevant qualifications of person directing the risk assessment for water pipes	Michael Buckley MSc(Hons) MSc MEnvSci CEnv
Name and address of risk assessor's company	BEK Enviro Limited - Suite 1 - No 3 Mitton Road Business Park - Mitton Road - Whalley - Lancashire - BB7 9YE
Date risk assessment performed	10 August 2022

Section 8: Declaration

I confirm I have completed this form and provided supporting information in accordance with 'UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' and UUW's Supplementary Guidance. I also confirm that if any further site investigation is needed and carried out, I will be required to submit an additional Risk Assessment for Water Pipes with the relevant supporting information. I understand that failure to supply any of the required information may delay my application being processed.

Name	Michael Buckley	Company	BEK Enviro Limited
Phone Number	07906753583	Date	10 August 2022

Please e-mail the completed form and supporting information to water.connections@uuplc.co.uk. Alternatively you can fax a paper version to 01925 678926 or post to us at United Utilities Water, Metering and Connections, Ullswater House, Lingley Mere, Warrington, WA5 3LP.



About us

United Utilities is the North West's water company. We keep the taps flowing and toilets flushing for seven million customers every day. From Crewe to Carlisle, we work hard behind the scenes to help your life flow smoothly.

United Utilities Water PLC, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Warrington WA5 3LP.
Registered in England and Wales. Registered Number 2366678.

02/12/2019/1995

Table 1 - Pipe Selection Risk Assessment Summary (PSRAS)

- 1) Testing must be undertaken on the materials within which the pipes are to be laid, whether that be existing ground materials, remediated materials or imported capping materials. Please use the appropriate testing data to complete Table 1 below.
- 2) If more than one pipe selection is being made, for example, for pipes in different areas of a large site, a completed PSRAS is required for each selection.

What materials have been tested to populate Table 1 below?

☒ Existing ground materials ☐ Remediated materials ☐ Imported capping materials

All concentrations in mg/kg

Test Group	Testing Required?	PE threshold	Metal Pipes/ Barrier Pipe	Laboratory Detection Limit	Testing UKAS accredited Y/N	Maximum concentration at proposed pipeline depth See Note [2]	Maximum site concentration See Note [3]	Locations and depths where concentrations exceed proposed pipeline threshold
Total VOCs	Where Preliminary Risk Assessment (PRA) has identified land potentially affected by contamination	0.5	Pass	---	---	---	---	---
Total BTEX & MTBE		0.1	Pass	<0.05	Y	---	<0.05	---
Total SVOCs (excluding PAHs and those substances marked with an *)		2	Pass	---	---	---	---	---
EC5-EC10 aliphatic and aromatic hydrocarbons		2	Pass	<1	Y	<1	1	N/A
EC10-EC16 aliphatic and aromatic hydrocarbons		10	Pass	<1	Y	<1	2	N/A
EC16-EC40 aliphatic and aromatic hydrocarbons		500	Pass	<1	Y	<1	1346	1346 mg/kg - TP8 (0.2 m)
Phenols* (from SVOC analysis)		2	Pass	---	---	---	---	---
Cresols and chlorinated phenols* (from SVOC analysis)		2	Pass	---	---	---	---	---
Ethers*	Only where identified	0.5	Pass					
Nitrobenzene*		0.5	Pass					
Ketones*		0.5	Pass					
Aldehydes*		0.5	Pass					
Amines		Fail	Pass					
Corrosive	Conductivity, Redox and pH	Pass	See Note [1]					

Note [1] Threshold: For wrapped steel, corrosive if pH<7 and conductivity > 400µS/cm. For wrapped ductile iron corrosive if pH<5, Eh not neutral and conductivity > 400µS/cm. For copper, corrosive if pH<5 or >8 and Eh positive.

Note [2] Water pipes are normally laid at 0.75-1.35m below finished ground level.

Note [3] Also state if liquid free product is present in soil or groundwater.

APPENDIX D

Photographs



P1: TP3

P2: TP3



P3: TP4

P4: TP4



P5: TP5

P6: TP5

Comments:



Photographs 1 to 6

This appendix is for illustrative purposes only and is for use only in conjunction with associated reports relating to the project

Site:
Crompton Avenue, Rochdale
Title: Appendix F – Trial Pit Photographs

Project No:
22081
Client: Lancet Homes

Created By:
J Taylor

Date:
21/07/2022



P7: TP6



P8: TP6



P9: TP7



P10: TP7



P11: TP8

Comments:



P12: TP8



Photographs 7 to 12

This appendix is for illustrative purposes only and is for use only in conjunction with associated reports relating to the project

Site:
Crompton Avenue, Rochdale
Title: Appendix F – Trial Pit Photographs

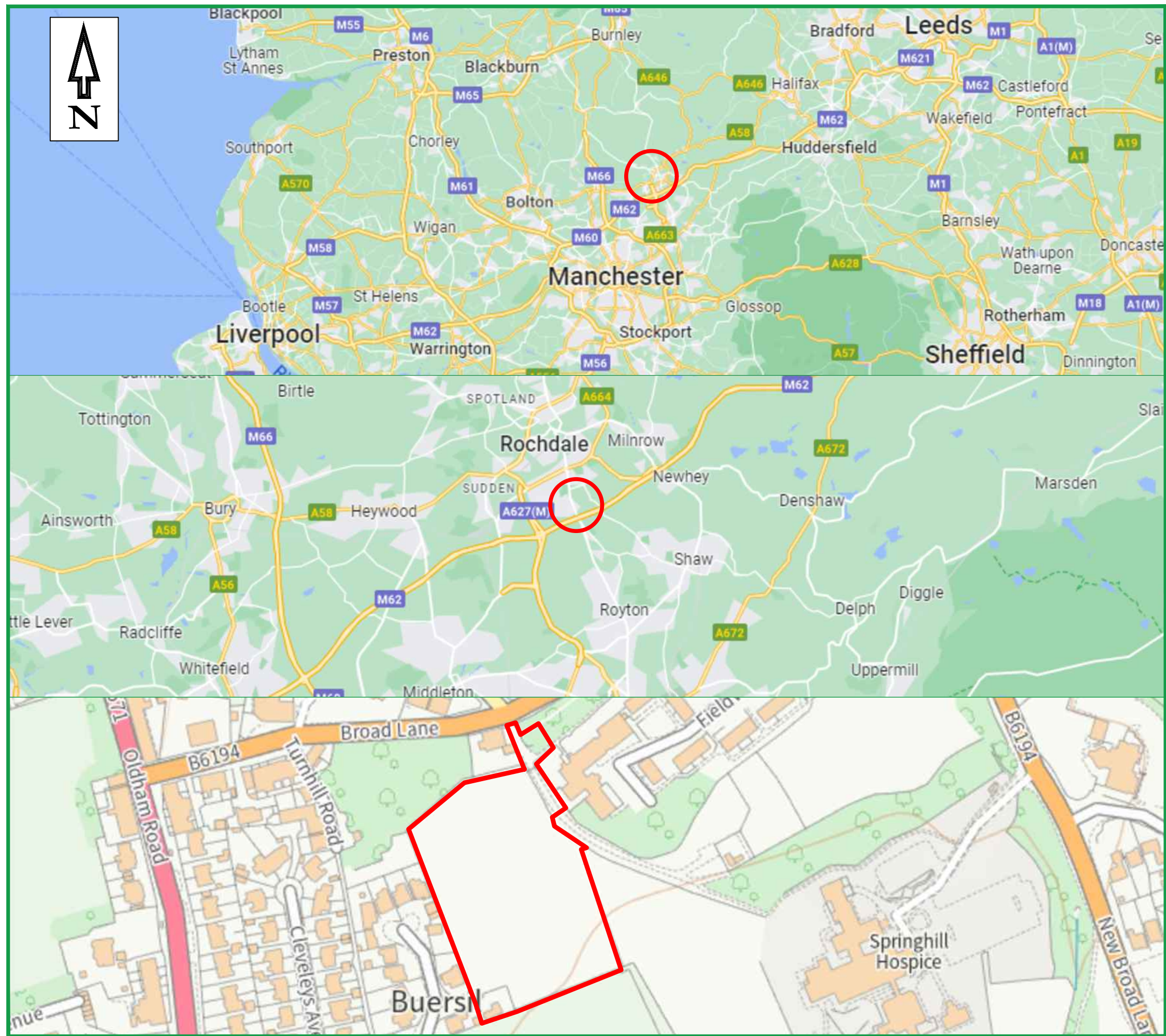
Project No:
22081
Client: Lancet Homes

Created By:
J Taylor

Date:
21/07/2022

APPENDIX E

Drawings



LEGEND

— SITE LOCATION

REV	DESCRIPTION	DATE	BY
A	AMENDED REDLINE BOUNDARY	03/04/23	D.E



GEO-ENVIRONMENTAL CONSULTING ENGINEERS

Suite One, No 3 Mitton Road Business Park,
Mitton Road, Whalley, Lancashire, BB7 9YE
Tel: 01254 377 622
Email: mbuckley@bekenviro.co.uk
Web: www.bekenviro.co.uk

CLIENT.	LANCET HOMES
---------	--------------

JOB TITLE.	LAND OFF CROMPTON AVEBNU, ROCHDALE
------------	---------------------------------------

DRAWING TITLE.	SITE LOCATION PLAN
----------------	--------------------

SCALE © A3. N'TS	DRAWN BY. D.E.	APPROVED BY. M.B.	DATE. 14/06/22
DRAWING No. 22081-1	REV. A		



LEGEND

— SITE FOOTPRINT

A	AMENDED REDLINE BOUNDARY	03/04/23	D.E
REV	DESCRIPTION	DATE	BY



GEO-ENVIRONMENTAL CONSULTING ENGINEERS
Suite One, No 3 Mitton Road Business Park,
Mitton Road, Whalley, Lancashire, BB7 9YE
Tel: 01254 377 622
Email: mbuckley@bekenviro.co.uk
Web: www.bekenviro.co.uk

CLIENT.	LANCET HOMES
---------	--------------

JOB TITLE.	LAND OFF CROMPTON AVEBNUE, ROCHDALE
------------	--

DRAWING TITLE.	SITE LAYOUT PLAN
----------------	------------------

SCALE © A3. NT'S	DRAWN BY. D.E.	APPROVED BY. M.B.	DATE. 14/06/22
DRAWING No.	22081-2	REV.	A



LEGEND



TRIAL PIT



INFILTRATION TEST TRIAL
PIT

A	AMENDED REDLINE BOUNDARY	03/04/23	D.E
REV	DESCRIPTION	DATE	BY



GEO-ENVIRONMENTAL CONSULTING ENGINEERS
Suite One, No 3 Mitton Road Business Park,
Mitton Road, Whalley, Lancashire, BB7 9YE
Tel: 01254 377 622
Email: mbuckley@bekenviro.co.uk
Web: www.bekenviro.co.uk

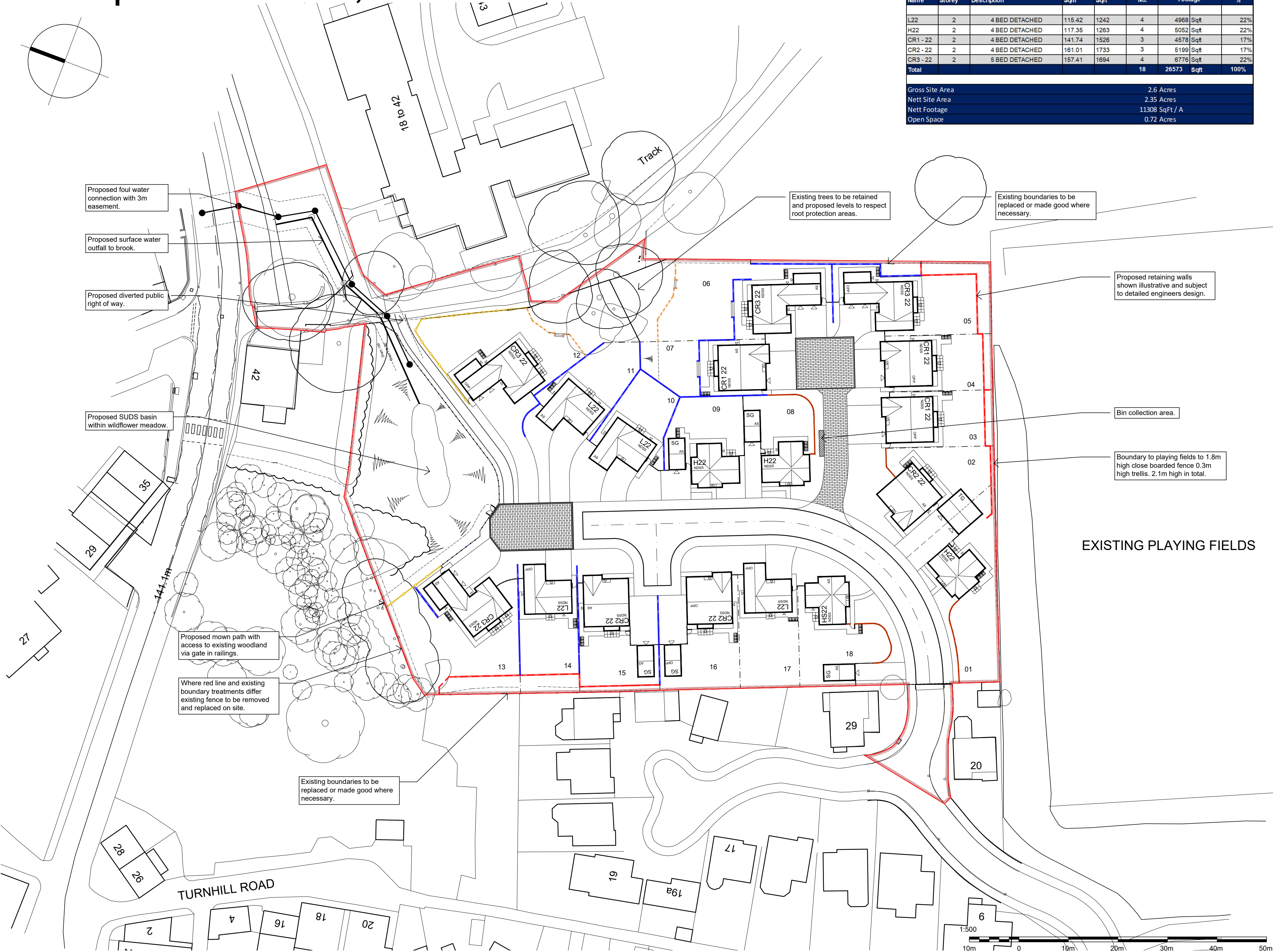
CLIENT.
BROOKHOUSE GROUP

JOB TITLE.
LAND OFF CROMPTON AVEBNU, ROCHDALE

DRAWING TITLE.
SITE INVESTIGATION LOCATION PLAN

SCALE © A3. N'TS	DRAWN BY. D.E.	APPROVED BY. M.B.	DATE. 23/06/22
DRAWING No.	22081-3	REV.	A

Crompton Avenue, Rochdale.



Schedule Of Accommodation							
Name	Storey	Description	Sqm	Sqft	No.	Footage	%
L22	2	4 BED DETACHED	115.42	1242	4	4968 Sqft	22%
H22	2	4 BED DETACHED	117.35	1263	4	5052 Sqft	22%
CR1 - 22	2	4 BED DETACHED	141.74	1526	3	4578 Sqft	17%
CR2 - 22	2	4 BED DETACHED	161.01	1733	3	5199 Sqft	17%
CR3 - 22	2	5 BED DETACHED	157.41	1694	4	6776 Sqft	22%
Total					18	26573 Sqft	100%
Gross Site Area						2.6 Acres	
Nett Site Area						2.35 Acres	
Nett Footage						11308 SqFt / A	
Open Space						0.72 Acres	

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Do not scale from this drawing - Work to figured dimensions only. All dimensions to be checked on site prior to the execution of any work.

For the avoidance of doubt all dimensions are measured to wall structure and not the finishes unless otherwise stated.

Where any discrepancy is found to exist within or between drawings and/or documents it should be reported to the architect immediately.

MP&L Planning & Design Ltd. shall not be liable for any use of drawings and documents for any purpose other than for which the same were prepared by or on behalf of MP&L Planning & Design Ltd.

NOTE:
Layout to be read in conjunction with boundary treatment layout, boundary treatment details, materials layout and engineer's drawing for retaining wall heights.

- KEY**
- Denotes proposed tegula paved areas
 - Denotes bin collection area
 - Denotes access gates to private properties.
 - Denotes 1.8m high screen brick wall & piers, to match adjacent property.
 - Denotes 1.8m high close-boarded timber screen fence with 0.3m high trellis. 2.1m total height.
 - Denotes 1.8m high plot divisional fence.
 - Denotes 1.2m high iron railings - painted black
 - Denotes retaining wall **A** Low rendered wall within gardens
 - Denotes retaining wall **B** Brick retaining wall within gardens
 - Denotes retaining wall **C** Brick retaining wall with piers and timber fence infill.
 - Denotes retaining wall **D** Low timber retaining wall.
 - Denotes proposed steps in gardens. Location and size shown indicatively, refer to engineers details for more information.

17.04.2023	Site boundary amended. Drainage strategy updated to reflect RSI 8 of the Drainage Strategy Plan.	CW
06.04.2023	Layout finalised for submission.	CW
31.03.2023	Notes added and plot 18 garage moved forward.	AC
20.01.2023	Boundary treatments amended & SUDS area updated.	AC
29.11.2022	Plot 02 & 03 amended.	AC

Client

LANCET HOMES

Drawing Title

PLANNING LAYOUT

Project

Proposed Residential Development, Crompton Avenue, Rochdale.

Job No	20109	Dwg No	01	Drawn	AC	Rev	E
Scale	1:500 @ A2	Date	APRIL 2023	Stage	FOR PLANNING		

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