



Intelligent
Ground
Remediation

Phase II

Contaminated Land Site Assessment

Ceylon Service Station
Yorkshire Street,
Rochdale,
OL16 2DR

For Mr A Y Patel

18 September 2023
Report ref. 23/1326.2.1



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Contents

1.0	Introduction.....	1
1.1	Scope of Works	1
2.0	Description of the Site and Surroundings	2
2.1	Site Description	2
2.2	Site Walkover	3
2.3	Site Surroundings	3
2.4	Site Infrastructure	3
2.4.1	Surfacing and Drainage.	3
2.4.2	Fuel Storage Infrastructure	3
3.0	Desk Study	4
3.1	Desk Study Data	4
3.2	Site History	5
4.0	Preliminary Risk Assessment	6
4.1	Source – Pathway – Receptor	6
4.2	Hazard Identification	6
4.3	Initial Conceptual Site Model	6
5.0	Site Investigation	8
5.1	Site Investigation	8
5.2	Ground Conditions	8
5.2.1	Obstructions	9
5.2.2	Observed Potential Contamination	9
5.3	Groundwater Investigation	9
6.0	Laboratory Analysis	10
6.1	Analysis Rationale	10
6.2	Soils Analysis	10
6.2.1	Soil Testing Results	11
6.3	Groundwater Analysis	11
6.3.1	Groundwater Testing Results	12
7.0	Risk Estimation.....	13
7.1	Discussion of Investigation Findings	13
7.2	Limitations and Uncertainty	13
7.3	Qualitative Risk Assessment	13
8.0	Conclusions and Recommendations	15
8.1	Conclusions	15
8.2	Recommendations	15
9.0	Limitations.....	16
10.0	References	17

Appendices

- Appendix A – Figures
- Appendix B – Photographs
- Appendix C – Exploratory Hole Logs
- Appendix D – Environmental Testing Results
- Appendix E – Risk Assessment Terminology

1.0 Introduction

Geo² Remediation Limited were commissioned by Mr A Y Patel to conduct a Phase II Intrusive Investigation of a parcel of land located at

Ceylon Service Station,

Yorkshire Street,
Rochdale,
OL16 2DR.

The site is approximately 0.08 hectares in area and located at grid reference 390250, 413900.

The study was undertaken prior to proposed redevelopment of the site. The proposed development comprises the demolition of the existing shop and car wash building and erection of replacement petrol station forecourt shop, installation of new pump island equipment and vents.

A proposed development plan for the site can be referred to within Appendix A.

1.1 Scope of Works

The assessment has been undertaken in accordance with the Environment Agency Guidance, Land Contamination Risk Management, consisting of a desk-study and preliminary risk assessment followed by an intrusive sub-surface ground investigation and generic quantitative risk assessment, conducted in order to establish the presence and extent of sub-surface contaminants, if any, resulting from the site's current and historic land use.

A Phase 1 Preliminary Risk Assessment report for the site has previously been completed by Geo², report ref. 1326.1.1 dated 26 October 2022.

The intrusive investigation has been undertaken in line with planning condition no 3 for planning application ref 22/01582/FUL (Rochdale Borough Council).

The intrusive investigation was conducted on 24th August 2023. The investigation was undertaken in accordance with Geo²'s Method Statement SMS SI 1326. The findings of the investigation are presented herein.

2.0 Description of the Site and Surroundings

2.1 Site Description

The site is located 1 km northeast of the centre of the town of Rochdale. The site is situated on Yorkshire Street (A58) and is currently accessed by two ingress/egress points located at the north-western and north-eastern site corners. Figures 1 and 2 in Appendix A show the location of the site.

The site is currently an active Shell petrol filling station (PFS). The canopy-covered forecourt resides in the centre-west with three pump islands (Image 2). The shop is located on the western boundary whilst a non-operational hand car wash building, is located on the southern boundary (Image 6).

The area shown within the red site boundary on Figure A below, will be referred to throughout this document as 'the site'.



Figure A: Site Location Plan. Red is approximate site boundary and pink are 50m and 100m buffers. Extract from Envirocheck report.

2.2 Site Walkover

A site walkover was undertaken on 24th August 2023, with a photographic survey included in Appendix B. The site walkover findings are detailed below.

The site was observed to be gently sloping to the east. The forecourt ground conditions were in poor yet adequate conditions with various cracks and signs of renewed concrete.

The site is predominantly occupied by PFS with a decommissioned carwash on the southern boundary. There is one ingress and one egress to the site located on the northeast and northwest of the site respectively. A three-stage interceptor is located at the eastern side of the site, next to the car wash building.

No visual or olfactory evidence of contamination was observed during the site walkover.

2.3 Site Surroundings

The site is located in the northern region of the town Rochdale located in Greater Manchester. The nearest residential property is located 12m east of the site. The surrounding land uses of the site are summarised in Table 1 below.

Direction	Land Use
North	Yorkshire Street (A58) with residential properties beyond
East	Flannel Street with residential properties beyond
South	Back Bradshaw Street with a judo club beyond
West	East Street with a restaurant beyond

Table 1. Land Uses in the Surrounding Area.

2.4 Site Infrastructure

2.4.1 Surfacing and Drainage.

The site is surfaced with concrete slabs, judged to be in fair to poor condition (Images 1-6, Appendix B). Gullies follow the line of the site boundaries.

Surface drainage is found by the ingress and egress of the PFS; a gully is located by its eastern border, and another is found in the southern area (Image 5). The drainage by the egress appears to be mostly silted.

The three-stage interceptor is located on the southern area of the site, next to the disused car wash building. Its first stage shows a visible layer of unidentified hydrocarbon (Image4).

2.4.2 Fuel Storage Infrastructure

The information, number, location, and status of any underground storage tanks (UST) or above ground storage tanks (AST) was not provided to Geo² at the time of writing this report.

Five UTS are present in the eastern side of the forecourt area (Image 1). Upon opening the manholes, no information regarding the tank volumes could be found, and this information was not disclosed by the site manager. The offset fills of the five tanks are located by the pump aisle next to pumps 3 and 4, and their vents are located on the disused car wash (Image 6).

3.0 Desk Study

3.1 Desk Study Data

Information regarding the environmental setting of the site was obtained from the Envirocheck report, which collated information from a variety of sources. A copy of the Envirocheck report included within the aforementioned Geo² Phase 1 PRA with the data summarised below.

Where indicated in Tables 2 and 3 below, the data from the Envirocheck report has been supplemented with additional information obtained from freely available online data.

Site Geology	BGS data indicates bedrock consists of Old Lawrence Rock – sandstone. Superficial deposits are indicated to comprise glaciofluvial deposits, Devensian – sand and gravel. There are three BGS Recorded Mineral Sites within 1 km of the site. The nearest was 92 m south and is a now-ceased opencast sand quarry. The site has no to very low hazard regarding the potential for ground stability hazards including collapsible ground, compressible ground, ground dissolution, landslide, running sand and shrinking and swelling clays
Coal	A review of the Coal Authority online interactive mapping indicates that while the site is located within a coal mining reporting area, the site is not located within a Development High Risk Area (DHRA) and the nearest recorded mine shafts, coal outcrops and probable shallow coal mine workings are all located >500 m east.
Radon	The site is in a low probability radon area (less than 1% of homes are estimated to be at or above the Action Level). As such, no radon protective measures are necessary in the construction of new dwellings or extensions.
Site Hydrogeology	The bedrock and superficial deposits are classified as a Secondary A Aquifer. The site is not located within a Source Protection Zone (SPZ) and there are no active or potable groundwater abstractions within 1km. The nearest active groundwater abstraction point is located 495m south for boiler feed and domestic water supplies. The groundwater beneath the site in the combined productive bedrock and productive superficial aquifers has been classed as high vulnerability.
Site Hydrology	The nearest surface water feature is a marsh area and Foxholes Brook located 217m northeast, flowing east to the River Roch which flows southeast and has a Grade C water quality.

Table 2. Environmental Assessment of the Site.

Waste and Infilled Land	There is one BGS recorded landfill site located 466m southeast named as the Waithlands Tip. There are seven historical landfill sites within 1km of the site. The nearest is 330 m northwest: Carrex Metals Limited. The waste type and last input date are not supplied. There are 21 licenced waste management facilities within 1km of the site. The nearest is 94m north and is operated by CAR.I.P Limited who deal with end-of-life vehicles. There are nine records of potentially infilled land (non-water) within 1km of the site. The nearest is 86m southeast and may relate to an infilled sand pit. There are 39 records of potentially infilled land (water) within 1km of the site. The nearest is 199m north and may relate to the partial infilling of Foxholes Brook.
Unexploded Ordnance	A review of Zetica online risk mapping for the area indicates the site is located in a Low risk area with respect to unexploded ordnance.

Table 3. Environmental Assessment of the Site.

3.2 Site History

Details regarding the development of the site, its immediate surroundings and potentially contaminative land uses were obtained from a review of historical maps, included within the Envirocheck report. A summary of the detailed history of the site from the Phase 1 PRA report is provided below.

Early mapping shows the site in 1851 containing commercial buildings along with two roads which adjoin to many residential houses outside of site. From 1891, a new road layout has created the site boundary with 3no buildings situated in the north-western corner, whilst the surrounding of the site is the new road network. There is also further development of housing estate located southeast.

In 1910 the remaining section of the site in the south-east has been turned into a warehouse which in the 1930s became a cinema and a hall with a small courtyard situated in the middle.

From 1971, the cinema and hall have been demolished and a garage in the southern part of the site has been erected. From 1889 the garage has been demolished and reconstructed in a new configuration which forms the current structure seen today.

4.0 Preliminary Risk Assessment

4.1 Source – Pathway – Receptor

UK legislation and guidance on assessing potentially contaminated land recommends the use of a risk assessment process based on a review of source/pathway/receptor relationships for various environmental media. The first stage of any risk assessment is to identify, using the desk study data and site information, the presence and extent of any hazard at the site, theoretical or demonstrable.

A key component of the overall risk assessment process is identification of “significant contaminant linkages” between contaminants and receptors. This can be accomplished through development of a site-specific conceptual model in which the potential contaminants, pathways and receptors identified on-site are described.

Each element can be defined as follows:

- **Contaminant source:** A substance either on or under the land and which has the potential to cause harm or pollution to human or environmental receptors.
- **Pathway:** A route or means by which a receptor can be exposed to or affected by a source.
- **Receptor:** A living organism or an ecological system, or controlled water, or property including buildings, crops and livestock.

The presence of all three of the above elements identifies a contaminant linkage and a potentially unacceptable risk. To ensure that any risk present to, or, from the site can be appropriately managed each of these contamination linkages will be targeted by the investigation.

4.2 Hazard Identification

Potentially contaminative onsite activities relate to the historical use of the site as a garage from the 1970s and a PFS from the 1980s. Contamination sources may exist related to Made Ground soils on site and the presence of underground storage tanks (USTs).

Due to periods of development and redevelopment since pre-1850s, it is likely that asbestos materials were used in the construction of buildings, leading to potential for asbestos in shallow made ground soils.

As the site is situated in a historically industrial area, numerous offsite contaminative sources have been identified, particularly the garages, foundries, and works all historically located within 250m of the site in addition to an active auto-repair garage and metal scrap yard 100m north.

4.3 Initial Conceptual Site Model

All contamination linkages arising as a result of the interconnection of the contaminant source, contamination pathways and potential receptors are summarised in **Error! Reference source not found. 4** on the following page. These contamination linkages are used to design the site investigation, guiding the type of investigation, location of exploratory boreholes and the required sample analysis.

Linkage No.	Source	Pathway	Receptor
1	Potential contamination (e.g., hydrocarbons) associated with the historical operation as a garage and current operation of the site as a PFS. No asbestos register has been obtained; the pre-2000 development of the site makes asbestos presence in building fabrics or made ground possible.	Leaching to groundwater, lateral and vertical flow, followed by migration within the aquifer	Surface water such as the Hey Brook stream, 217 m northeast flowing southeast
2			Bedrock and superficial deposits are Secondary A Aquifer No SPZ or potable groundwater abstraction within 1km.
3		Exposure to harmful vapours, hazardous ground gas and tainting of water supply	Current and proposed commercial site end users
4			Neighbouring site users, principally within enclosed spaces
5		Direct contact, inhalation, and ingestion	Current and proposed commercial site end users, principally within landscaped areas
6	Historical works, garages, foundries, and mills within 250m of the site Active garage and scrap yard 100m north	Exposure to harmful vapours, and hazardous ground gas	Current and proposed commercial site end users

Table 4. Identified Initial Contamination Linkages

5.0 Site Investigation

In order to provide an assessment of each of the identified contamination linkages, an intrusive investigation was specified to obtain further information regarding the geology of the site and the quality of the soils and groundwater.

5.1 Site Investigation

Eight soil bores (WS1-8) were constructed on 24th August 2023 to depths of up to 4.0m below ground level (m bgl) at locations indicated on the Exploratory Hole Location Plan presented in Appendix A. The soil bores were constructed using window sampling techniques. As a result of the drilling techniques, relatively undisturbed soils were able to be obtained for field and laboratory analysis and for logging of ground conditions. Field analysis comprised the examination of each of the samples for visual and olfactory indications of contamination. Analysis was also conducted for volatile hydrocarbons using a photo-ionisation detector (PID).

The site investigation was limited by a combination of the small size of the site and the existence of buried services. Borehole positions were chosen strategically so to target areas of the site most likely to be contaminated. Table 5 below, shows the location rationale of boreholes.

Target / Rational for Investigative Locations	Location							
	WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8
General Site Coverage	✓	✓	✓	✓	✓	✓	✓	✓
Proposed New Shop	✓							
Tank Farm				✓	✓			
Interceptor		✓						
Forecourt		✓				✓		✓

Table 5. Borehole Location Rationale

5.2 Ground Conditions

The logs of the boreholes, which are presented in Appendix C, detail the ground conditions and the sampling depths together with the visual and olfactory characteristics of the soils.

Ground conditions encountered across the site comprised concrete hardstanding over made ground. Concrete was typically 0.20-0.30m thick.

Made ground comprised a layer of dark brown/dark grey sandy silty gravel of fill underlain by grey/brown silty gravelly sand, with gravels of brick, concrete and occasional cobbles. In general, the made ground recorded during the investigation was shallower across the southeastern side of the site (1.1-1.5m bgl) and deeper across the northwestern side (2.3-2.4m bgl), likely reflecting historical periods of development as residential properties, cinema and then garage. Zones of loose gravels were generally encountered across the made ground strata.

Natural superficial soils were generally described as gravelly sand or sandy clays, with interbedded sand across the whole site, and organic silt intrusions on the southeastern border of the site. These deposits are considered to represent glaciofluvial deposits as mapped by the BGS.

The base of the glaciofluvial deposits was not encountered during the investigation, which terminated at a maximum depth of 4.00m bgl. No bedrock was encountered.

During the investigation, water strikes were recorded in WS1 at 3.0m bgl, WS3 at 2.3m bgl and WS4 at 2.9m bgl. In WS1, the groundwater was recorded to rise to 1.725m bgl. Groundwater is therefore considered to be perched within pockets of the interbedded glaciofluvial superficial deposits and not consistent across the site.

5.2.1 Obstructions

Shallow obstructions were recorded at 1.5m and 2.5m bgl in boreholes WS5 and WS7 respectively, where the boreholes terminated on large cobbles.

5.2.2 Observed Potential Contamination

Hydrocarbon (HC) odours were noted in WS1 (2.0 – 2.5m bgl) at the southern corner of the site, but PID results were negative for all soil samples.

The only positive PID readings were recorded in the soils of borehole WS2, where the highest value was 65ppm at 0.8m bgl.

5.3 Groundwater Investigation

Monitoring wells were installed in three boreholes WS1, WS4 and WS8 with ø50mm plastic pipe. Wells were monitored for groundwater depth, and water samples were obtained for laboratory analysis following completion of the ground investigation on 24th August 2023. Monitoring well WS8 did not reach groundwater.

Groundwater data is presented in Table 6 below.

Monitoring Well	Location on Site	Response Zone (m bgl)	Target Strata	Depth to Product (m bgl)	Depth to Water (m bgl)	Depth to Base (m bgl)
WS1	South corner, on the western side of the old car wash.	1.1 – 2.5	Clayey gravelly sand	-	1.725	2.432
WS4	Eastern boundary north of WS3.	1.3 – 3.3	Organic silty sandy clay	-	2.898	3.235
WS8	Along the northern boundary just before the egress route.	1.0 – 3.0	Sandy gravel and sand	-	Dry	2.658

Table 6. Groundwater Monitoring Data

6.0 Laboratory Analysis

6.1 Analysis Rationale

Nine soil and two water samples were selected for laboratory analysis following field screening, via visual and olfactory methods.

Samples were analysed for contaminants associated with historical and current use of the site as a PFS and former garage, in line with guidance provided in CIRIA's Contaminated Land Risk Assessment: a guide to good practise (CIRIA C552, 2001).

All samples were placed in laboratory provided containers and stored in cool boxes prior to being transported to the laboratory under the laboratory's chain of custody documentation. The laboratory used for the ground investigation on this occasion was Envirolab, a UKAS and MCERTS accredited laboratory.

6.2 Soils Analysis

Analysis scheduled for soil samples is shown below in Table 7. The soil samples were selected from a range of depths and strata and from across the site, to gain an understanding of site-wide ground conditions.

Exploratory Hole	Sample Depth (m bgl)	Target Strata	Suite of Analysis
WS2	0.8	Made Ground	TPH-CWG, CLEA Metals, Asbestos ID and Quantification, VOCs and SVOCs.
	1.8	Gravelly Sand	TPH-CWG.
	3.5	Sandy Clay	
WS3	1.8	Organic Clay	TPH-CWG.
WS4	0.8	Made Ground	
	3.8	Clay	
WS6	1.8	Sandy Clay	TPH-CWG.
WS7	0.8	Made Ground	
WS8	2.5 - 3.0	Sand	TPH-CWG.

Table 7. Soil Sample Selection Strategy

The analysis, conducted by a Gas Chromatography / Flame Ionisation Detector (GC/FID) and Gas Chromatography / Mass Spectrometry (GC / MS) comprised fractionation and speciation of hydrocarbons including analysis for benzene, toluene, ethylbenzene and xylenes (BTEX) and MTBE compounds. Selected samples were analysed for:

- Heavy metals by IRIS emission spectroscopy.
- Volatile and semi volatile components (including PAHs and PCBs), by GC/MS.
- Asbestos Containing Materials (ACMs) by Polarised light microscopy / Gravimetry.

The analytical results were analysed for contaminants associated with use of the site as a PFS and generic industrial land use. The results of soil analysis were compared using the following UK guidance:

- LQM/CIEH's Suitable for Use Levels (S4ULs)
- DEFRA Category 4 Screening Levels (C4SLs);
- EIC Soil Generic Assessment Criteria for Human Health (2010).

6.2.1 Soil Testing Results

The results of laboratory analyses on the soil samples undertaken, detailed in Table 7, are presented in Appendix D.

Due to the site's current and proposed redevelopment end use as a PFS, the soil analysis testing results have been compared against 'Commercial' end use Generic Assessment Criteria (GACs) thresholds. GAC concentrations associated with a conservative 1% Soil Organic Matter (SOM) have been utilised.

No exceedances were recorded within the samples analysed for Commercial/Industrial GACs.

Asbestos identification testing was undertaken on 3no made ground soil samples, with asbestos positively identified in one of the samples, WS2 at 0.8m bgl. Quantification analysis on the soil sample positively identified the presence of loose Chrysotile asbestos fibres, recorded <0.001%.

No visible asbestos containing material (ACM) was observed in made ground soils on site by the Geo² engineer or within laboratory samples.

6.3 Groundwater Analysis

The 2no groundwater samples collected from WS1 and WS4 were analysed for TPH-CWG due to the site's current use as a PFS.

The analysis, conducted by a Gas Chromatography / Flame Ionisation Detector (GC/FID) and Gas Chromatography / Mass Spectrometry (GC / MS) comprised fractionation and speciation of hydrocarbons including analysis for hydrocarbons, benzene, toluene, ethylbenzene and xylenes (BTEX) compounds and MTBE.

The samples were analysed for contaminants associated with use of the site as a PFS and former garage. The results of analyses of the water samples were compared to screening criteria sourced from the following legislation:

- Water Supply (Water Quality) Regulation, 2018.
- Standards for Hazardous Substances (from the WFD, 2006/60/EC), 2013.
- Drinking Water Quality Standards England and Wales (DWS), amended 2016.
- Environmental Quality Standards (EQS) as presented in the River Basin Districts Typology, Standards and Groundwater Threshold Values (England and Wales) Directions, 2022.
- World Health Organisation (WHO), Guidelines for Drinking Water Quality, 2017.
- SoBRA Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater, 2017.

6.3.1 Groundwater Testing Results

The results of laboratory analyses on the groundwater samples undertaken are presented in Appendix D.

All TPH, BTEX and MTBE concentrations within the groundwater samples were below SoBRA Commercial guidelines, indicating no risk to site end users from volatile contaminants in groundwater on site.

All TPH, BTEX and MTBE concentrations within the groundwater samples were below WHO threshold concentrations, indicating no risk to controlled waters.

7.0 Risk Estimation

7.1 Discussion of Investigation Findings

Current and historic industrial use of the site as a garage and PFS was identified in the Preliminary Risk Assessment as the main potential source of site contamination, along with the former presence of industrial works, foundries and garages as close as 80m north of the site.

The encountered made ground thickness ranges from 1.1m to 2.4m bgl; however, from the analysed soil samples, all recorded concentrations were lower than the commercial GAC 1% SOM thresholds. Similarly, all the groundwater samples analysed recorded concentrations lower than the WHO thresholds.

Asbestos was positively identified in one of the made ground samples, WS2 at 0.8m bgl. Quantification analysis on the soil sample identified the presence of loose Chrysotile asbestos fibres, recorded <0.001%. No visible ACMs were present in made ground soils as observed by the Geo² engineer.

No evidence of an offsite source impacting upon the site, or offsite migration of any contaminants was identified, although gas migration cannot be ruled out.

7.2 Limitations and Uncertainty

It is important to note that the investigation was restricted in areas of the site due to buildings and buried services, this was especially true around the forecourt, USTs and interceptor.

7.3 Qualitative Risk Assessment

Each of the identified potential contamination linkages in the preliminary conceptual site model is reviewed based upon the findings of the site investigation which allows a greater understanding of the ground conditions at the site, site observations, soil and groundwater quality and chemical analysis.

The qualitative risk assessment is undertaken, detailed in Table 8 on the following page, in line with guidance provided in CIRIA's Contaminated Land Risk Assessment: a guide to good practice CIRIA C552, 2001. The purpose of this assessment is to determine the relative significance of the identified contamination linkages by assessing the probability of an impact occurring and by assessing the perceived severity of an impact to a receptor.

The perceived risk is based on a consideration of both the likelihood of an event (probability) occurring, and the severity of the potential consequence. Classification of these two factors is detailed in Appendix E.

Those linkages considered of low risk or less on the basis of the available site data will not be considered any further in this assessment. Linkages considered to be more significant are identified as presenting potentially unacceptable risk to the identified receptor. In these instances, further works may be considered necessary.

Source	Pathway	Receptor	Probability	Severity	Risk Classification
Made ground was encountered at all exploratory hole locations to depths of 1.1-2.4m bgl. 3no made ground and 6no natural soil samples were analysed for a range of contaminants but did not record any GAC threshold exceedances. Groundwater analysis records no GAC exceedances.	Leaching to groundwater, lateral and vertical flow, followed by migration within the aquifer	The nearest water feature is Hey Brook, 217m northeast flowing south.	Unlikely Considering the relatively far distance to the surface water receptors and all soil and water samples were all under GAC thresholds.	Mild (non-sensitive receptor)	Very Low Risk
		Bedrock and superficial deposits Secondary A Aquifer. The site is not in a source protection zone and no potable groundwater abstraction within 1km.	Unlikely Considering all soil and water samples were all under GAC thresholds, it is unlikely for potential contamination to enter the pathway and reach the receptor.	Medium (sensitive receptor)	Low Risk
	Exposure to harmful vapours, hazardous ground gas and tainting of water supply	Current and proposed Commercial site end users	Unlikely Considering all soil and water samples were all under GAC thresholds, it is unlikely for potential contamination to enter the pathway and reach the receptor.	Medium (human health)	Low Risk
		Neighbouring site users, principally within enclosed spaces			
No asbestos register has been obtained; the pre-2000 development of the site makes asbestos presence in building fabrics possible. Sample WS2 identified <0.001% loose Chrysotile fibers in the made ground. No visible ACM identified in made ground soils during the SI.	Direct contact, inhalation of asbestos and ingestion	Current and proposed Commercial site end users, principally within landscaped area	Unlikely No soft landscaping proposed, with areas of hard standing breaking any pathway between made ground soils and end users.	Medium (human health)	Low Risk
		Construction workers	Low Likelihood Asbestos was only found in only 1 of 3 made ground samples and lab analysis recorded <0.001% loose Chrysotile asbestos fibres.	Medium (human health)	Moderate / Low Risk
Historical works, garages, foundries, and mills within 250 m of the site Active garage and scrap yard 100 m north	Exposure to harmful vapours, and hazardous ground gas	Current and proposed commercial site end users	Unlikely No evidence of off-site contamination impacting upon the site.	Medium (human health)	Low Risk

Table 8. Summary of Qualitative Risk Assessment

8.0 Conclusions and Recommendations

8.1 Conclusions

A Phase II Intrusive Investigation of Ceylon Service Station site, located off Yorkshire Street, Rochdale, OL16 2DR was undertaken, prior to the proposed redevelopment of the existing petrol filling station in line with planning condition no 3 for planning application ref 22/01582/FUL.

The purpose of the assessment was to evaluate the potential for risk to be posed to human health and sensitive environmental receptors from historical and current use of the site. During the site walkover undertaken on 24th August 2023, no visual or olfactory evidence of contamination was identified at the site.

No known leaks from the tanks have been made known to Geo² at the time of writing this report, and stock reconciliation reports were not made available for review.

The underlying glaciofluvial deposits (sand and gravel), Old Lawrence sandstone bedrock, and the vulnerable Secondary A Aquifers indicate a potential risk to groundwater receptors. However, considering that all soil and perched water samples recorded contaminants below available GAC thresholds, current ground conditions are not considered to present a risk to controlled waters.

Sample WS2, acquired at 0.8m bgl in the southern area of the site, contained loose chrysotile fibres. The results show that asbestos was quantified in concentrations <0.001%, therefore not posing a significant risk to the end site users. Because of made ground conditions, however, it is not possible to rule out the possibility for other occasional asbestos fibres to be found in that area.

As such, Geo² considers there is a **Moderate/Low** risk to construction workers from potential asbestos fibres during the site's redevelopment and a **Low** risk to site end users, neighbours and controlled waters.

8.2 Recommendations

The following measures are recommended to address the identified risks:

- Contractors undertaking redevelopment works on site, should be made aware that one made ground sample located by the interceptor recorded loose chrysotile fibres in a concentration <0.001%.
- If underground fuel storage and distribution infrastructure is removed during any future redevelopment, these features should be inspected and validated by a suitably qualified person to ensure no residual contamination is present.
- When development works take place on site, any unidentified contaminated material should be considered in the event of a redevelopment as costs for offsite disposal of these materials may be significant.

9.0 Limitations

Geo²'s conclusions, recommendations and opinions are based on information gathered at the time of the investigation from a variety of third-party sources and from observations made during site reconnaissance. Therefore, there may be conditions at the site that have not been taken into account which were not apparent at the time of investigation.

A portion of this report is based solely upon information provided by third parties. The information has not been independently verified by Geo². Whilst this report and the opinions given in it are accurate to the best knowledge of Geo², Geo² cannot guarantee the completeness or accuracy of any descriptions, opinions or conclusions based solely upon information that has not been independently verified.

The recommendations contained within this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted industry practices and hydrological and engineering practices at this time. As such they are not a guarantee that the site is free of hazardous materials or conditions.

Geo² prepared this report for our Client; any third parties using this report do so entirely at their risk. Geo² makes no warranty or representation whatsoever, express or implied, with respect to the use by a third party of any information contained in this report or its suitability for any purpose. Geo² assumes no responsibility for any costs, claims, damages or expenses (including any consequential damages) resulting from the use of this report or any information contained in this report by a third party.

10.0 References

British Standards Institute

BS10175:2011 "Investigation of potentially contaminated land sites – code of practice"

CIRIA

C552 Contaminated Land Risk Assessment, a guide to good practise, 2001.

C665, Assessing risks posed by hazardous ground gases to buildings, 2007.

CL:AIRE

Good Practice For Risk Assessment For Coal Mine Gas Emissions, October 2021.

Environmental Agency

Land Contamination Risk Management (LCRM) Guidance, 2020

Geo² Remediation Ltd

Phase I Preliminary Risk Assessment, ref 22/1326.1.1 dated 26 Oct 2022



Appendix A – Figures

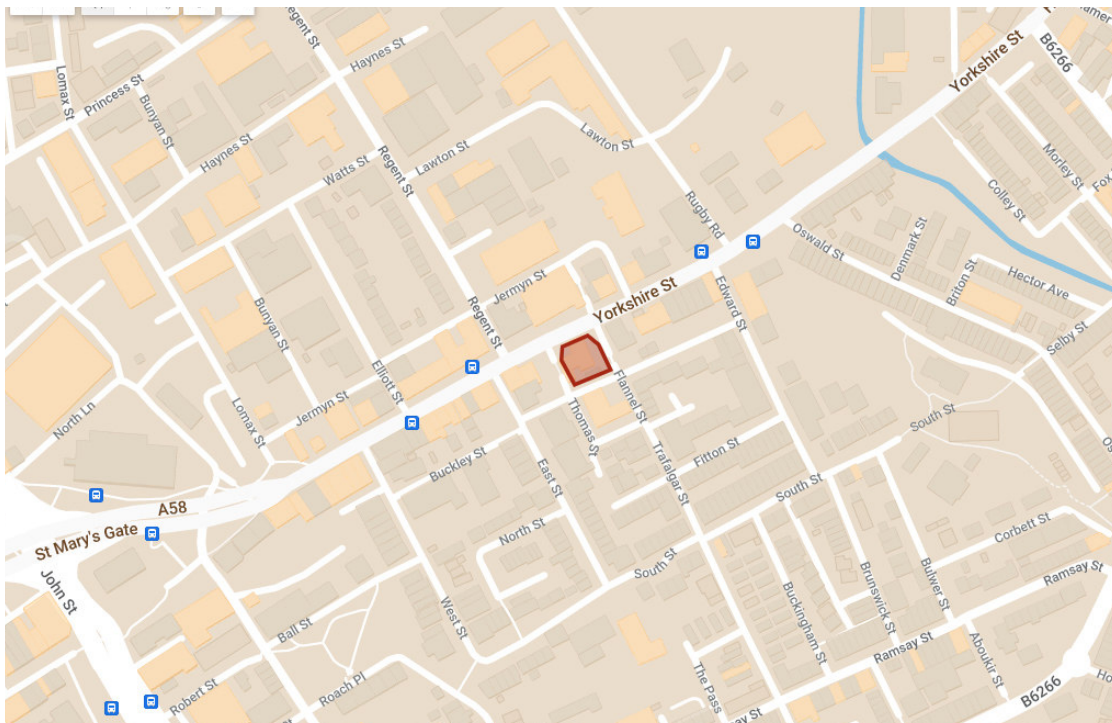


Figure 1: Site Location (Local)

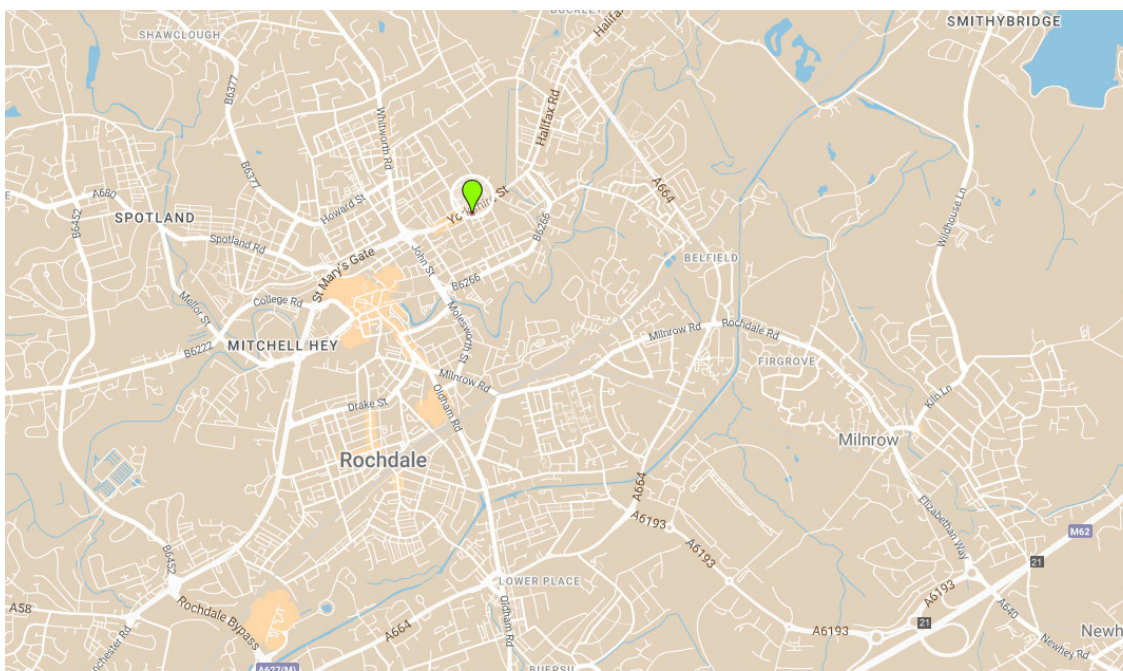


Figure 2: Site Location (Regional)

Ref: Google Maps



Figures 1 & 2 - Site Location

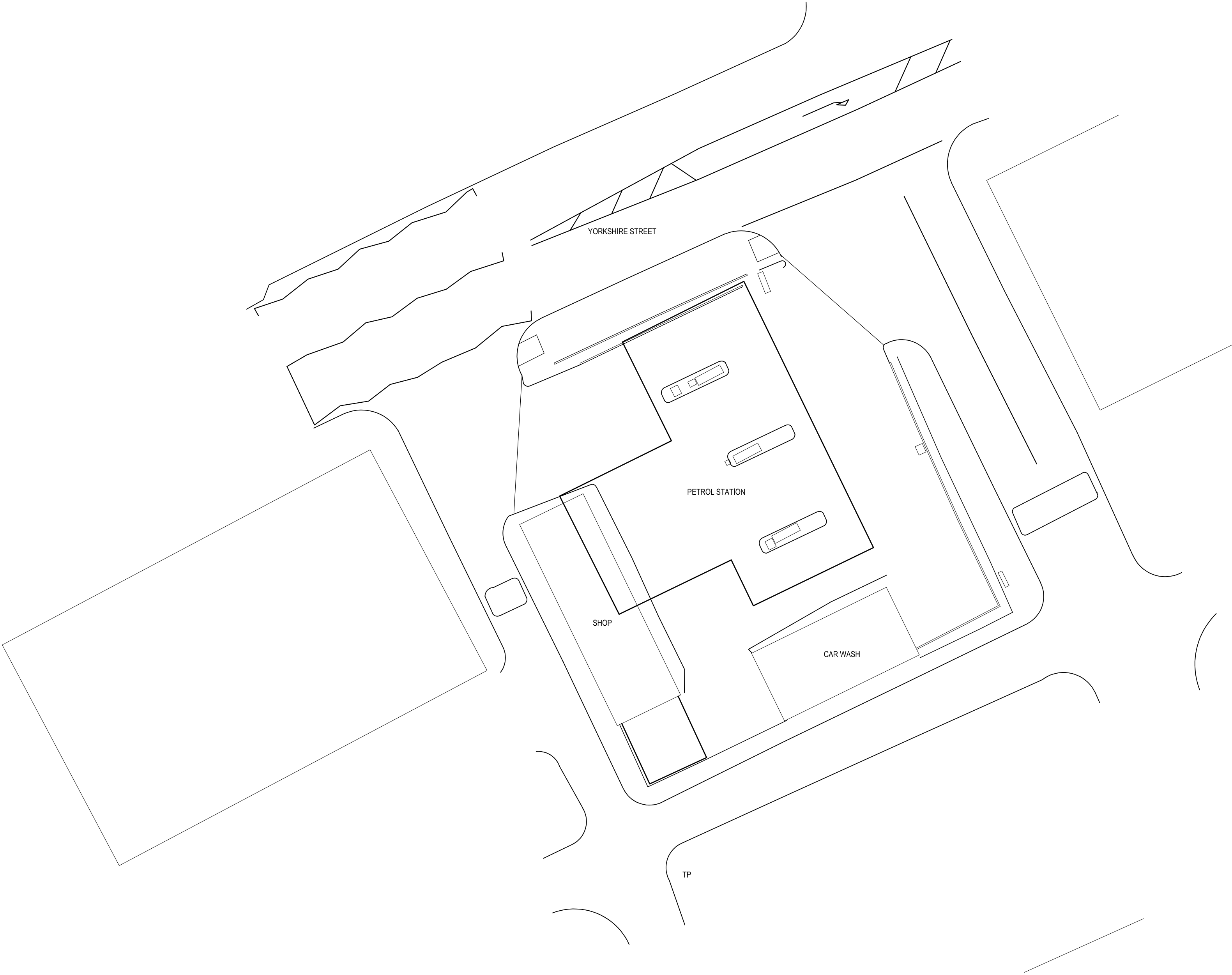
NOT TO SCALE

Ceylon Service Station (Shell), Yorkshire Street, Rochdale, OL16 2DR

Geo² Remediation Limited, The Coniston, Louisa Street, Idle, West Yorkshire, BD10 8NE

Tel: (0113) 2575397

www.geo2.co.uk



Rev B	30.01.23	Existing site plan scaled changed to 1:200 to meet Local Authority Local List information. Topo levels removed.
Rev A	10.01.23	Existing finished floor levels removed

Amendments



Architectural
Technologist
& Building
Design
Consultant

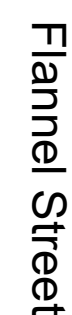
Ian Pawson Ltd, 26 Essex Street, Barnoldswick, Yorkshire, BB18 5DT
Tel: 01282 814148
E-mail: info@ianpawson.com
www.ianpawson.com

Client.
A Y & Y PATEL

Project.
SHELL SERVICE STATION
YORKSHIRE STREET, ROCHDALE OL16 2DR

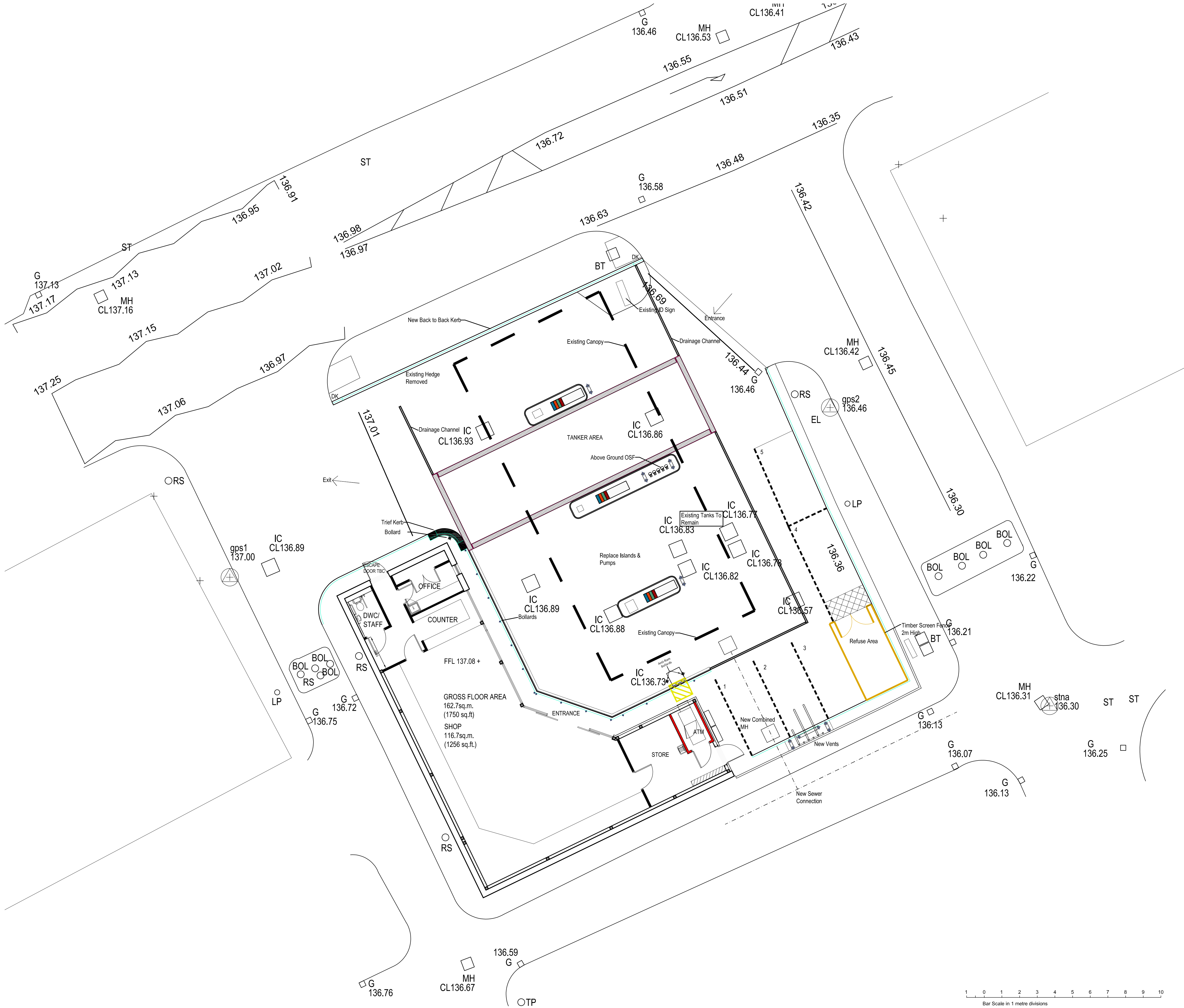
SITE PLAN AS EXISTING

Scale.	1:200 @ A1	Drawing No.	Am.
By.		2	B
Date.	AUG 2022		
Job No.	2722 /		



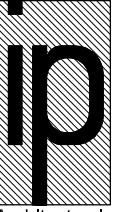


7



Rev A 10.01.23 Demolition areas removed see drawing 2722/7 for demolition

Amendments



Ian Pawson Ltd, 26 Essex Street, Barnoldswick, Yorkshire, BB18 5DT
Tel: 01282 814148
E-mail: info@ianpawson.com
www.ianpawson.com

Client.
A Y & Y PATEL

Project.
SHELL SERVICE STATION
YORKSHIRE STREET, ROCHDALE OL16 2DR

SITE PLAN AS PROPOSED

Scale.	1:100 @ A1	Drawing No.	Am.
By.	I PAWSON		
Date.	OCT 2022		
Job No.	2722 /		

5

A



Appendix B – Photographs

1326 – Shell, Rochdale – Photographic Survey 1

Image 1: PFS forecourt with Yorkshire St in the background and shop to the left. Facing northwest.



Image 2: PFS forecourt with Yorkshire St in the background. Facing north.



Image 3: PFS forecourt with disused car wash facility in the background. Facing southeast.



Image 4: Three stage interceptor, near car wash building. First stage shown.



Image 5: Southern corner of the site, used as general deposit.

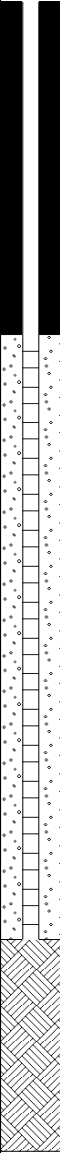


Image 6: Air pump near the eastern hedge and car wash in the back. Tank vents in the building's corner. Facing southeast.

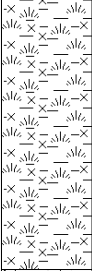
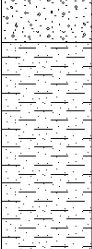
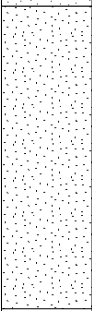




Appendix C – Exploratory Hole Logs

		Geo2, Coniston House, Louisa St. Idle, Bradford. BSD10 8NE		Borehole Log							
Project Name: Ceylon SS, Rochdale				Client: Ayny Patel				Date: 24/08/2023			
Location: Yorkshire Street, Rochdale, OL162DR				Contractor: Cape Site Services							
Project No. : 1326				Crew Name:				Drilling Equipment: WIndow Sampling Rig			
Borehole Number WS1		Hole Type WS		Level		Logged By Paolo De Marchi		Scale 1:25		Page Number Sheet 1 of 1	
Well 	Water Strikes  	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.30	PID	PID=0.0	0.30			MADE GROUND - Concrete			
					0.70			MADE GROUND - Brown sandy silty GRAVEL. with occasional cobbles and brick fragments. Gravels are fine to medium, sub-angular.			
					1.00			NO RECOVERY			
					1.10			MADE GROUND - Brown silty sandy GRAVEL. Occasional cobbles and brick fragments. Gravels are fine to coarse, sub-angular.	1		
		1.30	PID	PID=0.0				SAND- Brown to light brown clayey SAND medium to coarse, with occasional sub-rounded fine to coarse gravels.			
		1.80	PID	PID=0.0							
					2.00			SAND - Brown to Black gravelly SAND, fine to coarse. Gravels are fine to coarse sub-angular. Slight hydrocarbon odour.	2		
		2.30	PID	PID=0.0							
					2.50			CLAY - Dark Brown to orange gravelly CLAY. Gravels are fine to coarse sub-angular and sub-rounded. Sandy band 0.1m thick at 2.8m.			
		2.80	PID	PID=0.0							
					3.00			SAND - Partially caved in. Wet black coarse silty SAND.	3		
3.30	PID	PID=0.0									
			3.50			SAND - Light brown, damp fine SAND with black bands of silt . Clay bands at 3.7m.					
3.80	PID	PID=0.0	3.80			End of Borehole at 3.800m	4				
5											
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		3.80	50								
Remarks											
Terminated at 3.8m on sand. Water strike at 3m, Dip measured at 1.725m.											

		Geo2, Coniston House, Louisa St. Idle, Bradford. BSD10 8NE		Borehole Log								
Project Name: Ceylon SS, Rochdale				Client: Ayny Patel				Date: 24/08/2023				
Location: Yorkshire Street, Rochdale, OL162DR				Contractor: Cape Site Services								
Project No. : 1326				Crew Name:				Drilling Equipment: Window Sampling Rig				
Borehole Number WS2		Hole Type WS		Level		Logged By Paolo De Marchi		Scale 1:25		Page Number Sheet 1 of 1		
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description				
		Depth (m)	Type	Results								
		0.30	PID	PID=3.3	0.25			MADE GROUND - Concrete and plastic membrane.		1		
				0.80 0.80	ES PID		PID=65.0				MADE GROUND - Light brown loose GRAVEL of fill, fine to coarse sub-angular and sub-rounded.	
											MADE GROUND - Brown sandy gravelly CLAY, fine to coarse , sub-angular. Numerous brick fragments.	
		1.30	PID	PID=2.9	1.30			MADE GROUND - Sandy GRAVEL with bricks and brick fragments.				
								SAND - Light brown to grey clayey gravelly SAND with occasional cobble . Gravels are fine to coarse, sub-rounded.				
		1.80 1.80	ES PID	PID=1.2	2.00		NO RECOVERY		2			
							2.30	PID		PID=3.6		
		2.80	PID	PID=0.0	2.80							CLAY- Firm brown to grey sandy CLAY, with occasional gravels fine to medium sub-rounded.
							3.50 3.50	ES PID	PID=2.5	3.50	End of Borehole at 3.500m	
						5						
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation				
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation	
Remarks												
Terminated at 3.5 on sandy clay.												

		Geo2, Coniston House, Louisa St. Idle, Bradford. BSD10 8NE		Borehole Log							
Project Name: Ceylon SS, Rochdale				Client: Ayny Patel				Date: 24/08/2023			
Location: Yorkshire Street, Rochdale, OL162DR				Contractor: Cape Site Services							
Project No. : 1326				Crew Name:				Drilling Equipment: Window Sampling Rig			
Borehole Number WS3		Hole Type WS		Level		Logged By Paolo De Marchi		Scale 1:25		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.30	PID	PID=0.0	0.25			MADE GROUND - Concrete			
					0.50			MADE GROUND - Grey to brown sandy silty GRAVEL. Gravels are fine to coarse sub-rounded, with occasional brick fragments. Sandy band at 0.4-0.5m depth.			
		0.80	PID	PID=0.0	0.90			MADE GROUND - Grey to brown silty SAND. Gravels are fine to coarse sub-rounded.			
					1.00			MADE GROUND - Dark brown gravelly sandy CLAY. Gravels are fine to coarse sub-angular.			
		1.30	PID	PID=0.0				CLAY- Organic peaty silty CLAY, with numerous rootlets and wood fragments.			
					1.90			SAND - Grey gravelly SAND fine to coarse. Gravels are medium to coarse sub-rounded.			
		1.80	ES								
		1.80	PID	PID=0.0							
		2.30	PID	PID=0.0	2.30			CLAY- Grey to light brown sandy firm CLAY. Fine sandy Lenses. Wet.			
		2.80	PID	PID=0.0	3.00			SAND - Grey to light brown medium to coarse SAND, with occasional silty black bands.			
3.30	PID	PID=0.0						3			
3.80	PID	PID=0.0	4.00					4			
						End of Borehole at 4.000m		5			
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
Remarks											
Terminated at 4m on sand.											



Geo2, Coniston
House, Louisa St. Idle,
Bradford. BSD10 8NE

Borehole Log

Project Name: Ceylon SS, Rochdale

Location: Yorkshire Street, Rochdale, OL162DR

Project No. : 1326

Client: Ayny Patel

Contractor: Cape Site Services

Crew Name:

Date: 24/08/2023

Drilling Equipment: Window Sampling Rig

Borehole Number
WS4

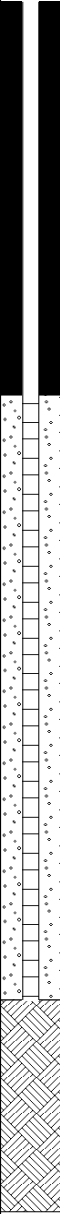
Hole Type
WS

Level

Logged By
Paulo De Marchi

Scale
1:25

Page Number
Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.25		MADE GROUND - Concrete	1	
							MADE GROUND - Grey GRAVEL, fine to coarse sub-angular. Occasional cobble.		
					0.70		MADE GROUND- Brown gravelly SAND, fine to coarse. Gravels are fine to coarse, sub-angular and sub-rounded. Occasional cobbles and glass fragments.		
			0.80 0.80	ES PID	PID=0.0	1.10		SILT- Dark Brown organic SILT with rootlets and wood fragments.	2
					1.60		SAND- Grey gravelly SAND which is medium to coarse. Gravels are fine to coarse and sub-rounded to rounded.		
			1.30	PID	PID=0.0	2.60		CLAY- Dark brown, firm sandy CLAY. Sand is coarse.	3
			1.80	PID	PID=0.0	3.20		CLAY - Light brown firm sandy CLAY. Fine to coarse sand. Sandy bands. Becoming clay at 3.9m.	
			2.30	PID	PID=0.0	4.00		End of Borehole at 4.000m	4
		2.80	PID	PID=0.0					
		3.30	PID	PID=0.0				5	
		3.80 3.80	ES PID	PID=0.0					

Hole Diameter

Casing Diameter

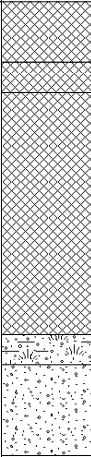
Chiselling

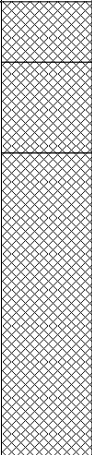
Inclination and Orientation

Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		3.30	50								

Remarks

Terminated at 4m on Clay.

		Geo2, Coniston House, Louisa St. Idle, Bradford. BSD10 8NE		Borehole Log							
Project Name: Ceylon SS, Rochdale				Client: Ayny Patel				Date: 24/08/2023			
Location: Yorkshire Street, Rochdale, OL162DR				Contractor: Cape Site Services							
Project No. : 1326				Crew Name:				Drilling Equipment: Window Sampling Rig			
Borehole Number WS5		Hole Type WS		Level		Logged By Paolo De Marchi		Scale 1:25		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
					0.20			MADE GROUND - Concrete.			
					0.30			MADE GROUND - Dark Brown clayey SAND with brick and clay pipe fragments. Plastic membrane on top.			
		0.50	PID	PID=0.0				MADE GROUND - GRAVEL of fill with brick, cobble and concrete fragments.			
		0.80	PID	PID=0.0							
		1.10									
					1.20			CLAY - Dark brown sandy organic CLAY with occasional rootlets.			
1.30	PID	PID=0.0			1.50			SAND - Light brown gravelly SAND. Sand is generally medium to coarse. Gravels are fine to medium sub-angular and sub-rounded with some cobble.			
								End of Borehole at 1.500m			
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
Remarks											
Refused at 1.5m on cobbles.											

		Geo2, Coniston House, Louisa St. Idle, Bradford. BSD10 8NE		Borehole Log							
Project Name: Ceylon SS, Rochdale				Client: Ayny Patel				Date: 24/08/2023			
Location: Yorkshire Street, Rochdale, OL162DR				Contractor: Cape Site Services							
Project No. : 1326				Crew Name:				Drilling Equipment: Window Sampling Rig			
Borehole Number WS6		Hole Type WS		Level		Logged By Paolo De Marchi		Scale 1:25		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.30	PID	PID=0.0	0.20 0.50			MADE GROUND - Concrete.		1	
								MADE GROUND - Brown to grey sandy silty GRAVEL, fine to coarse sub-angular.			
								MADE GROUND - Orange to dark brown sandy GRAVEL, fine to coarse angular and sub-angular. Mostly brick fragments and cobbles.			
		1.30	PID	PID=0.0	1.50			CLAY - Dark grey gravelly sandy soft CLAY. Gravels are fine to coarse sub-angular. Occasional small cobble.		2	
								SAND - Light Brown, fine to coarse SAND. Black and silty for last 0.05m.			
		1.80 1.80	ES PID	PID=0.0	1.80 2.00			End of Borehole at 2.000m		5	
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
Remarks											
Terminated at 2m due to loose gravel caving in.											



Geo2, Coniston
House, Louisa St. Idle,
Bradford. BSD10 8NE

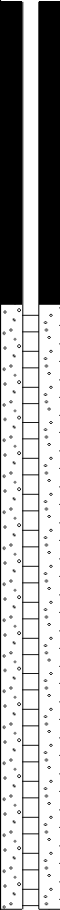
Borehole Log

Project Name: Ceylon SS, Rochdale		Client: Ayny Patel		Date: 24/08/2023	
Location: Yorkshire Street, Rochdale, OL162DR		Contractor: Cape Site Services			
Project No. : 1326		Crew Name:		Drilling Equipment: Window Sampling Rig	
Borehole Number WS7	Hole Type WS	Level	Logged By Paolo De Marchi	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30			MADE GROUND - Concrete.	
		0.40	PID	PID=0.0	0.40			MADE GROUND - Black gravelly SAND , fine to coarse. Gravels are fine to coarse sub-angular. MADE GROUND - Brown, orange and grey gravel of fill. Gravels are fine to coarse, angular, sub-angular and sub-rounded. Occasional cobbles, brick fragments and purple slag. No recovery between 1.9 - 2.3m	1
		0.80	PID	PID=0.0					
		1.50	PID	PID=0.0					2
		2.50	PID	PID=0.0	2.40 2.50			SAND- Light brown gravelly SAND fine to medium. Gravels are fine to medium sub-rounded. End of Borehole at 2.500m	3
									4
									5

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

Remarks Refused at 2.5m on cobbles.	
--	--

		Geo2, Coniston House, Louisa St. Idle, Bradford. BSD10 8NE		Borehole Log							
Project Name: Ceylon SS, Rochdale				Client: Ayny Patel				Date: 24/08/2023			
Location: Yorkshire Street, Rochdale, OL162DR				Contractor: Cape Site Services							
Project No. : 1326				Crew Name:				Drilling Equipment: Window Sampling Rig			
Borehole Number WS8		Hole Type WS		Level		Logged By Paolo De Marchi		Scale 1:25		Page Number Sheet 1 of 1	
Well 	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.30								MADE GROUND - Concrete.	
		0.50	PID	PID=0.0				MADE GROUND - Dark to light grey sandy GRAVEL, fine to coarse sub-angular to angular. Numerous brick fragments and cobbles.			
		1.50	PID	PID=0.0							
		2.30									
2.50	ES						No Recovery				
2.50 - 3.00							SAND - Orange to light brown SAND, fine to medium.				
3.00	PID	PID=0.0					End of Borehole at 3.000m				
Remarks Terminated at 3m due to loose gravels caving in.											



Appendix D – Environmental Testing Results

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 23/08622
Issue Number: 1

Date: 07 September, 2023

Client: Geo2 Remediation Ltd
Coniston House,
Louisa Street
Bradford
BD10 8NE

Project Manager: Paolo de Marchi/Steven Jackson
Project Name: Ceylon SS
Project Ref: 1326
Order No: 1326/PDM
Date Samples Received: 26/08/23
Date Instructions Received: 29/08/23
Date Analysis Completed: 07/09/23

Approved by:



Gemma Berrisford
Deputy Client Services Supervisor

Envirolab Job Number: 23/08622

Client Project Name: Ceylon SS

Client Project Ref: 1326

Lab Sample ID	23/08622/1	23/08622/2	23/08622/3	23/08622/4	23/08622/5	23/08622/6	23/08622/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS2	WS2	WS2	WS3	WS4	WS6	WS7			
Depth to Top	0.80	1.80	3.50	1.80	0.80	1.80	0.80			
Depth To Bottom										
Date Sampled	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	4AB	4A	6A	6A	4A	4A	4AB			
% Stones >10mm _A	<0.1	<0.1	<0.1	<0.1	36.1	<0.1	26.2	% w/w	0.1	A-T-044
Arsenic _D ^{M#}	3	-	-	-	<1	-	4	mg/kg	1	A-T-024s
Barium _D	149	-	-	-	28	-	95	mg/kg	1	A-T-024s
Beryllium _D	<0.5	-	-	-	<0.5	-	0.6	mg/kg	0.5	A-T-024s
Boron (water soluble) _D ^{M#}	<1.0	-	-	-	<1.0	-	<1.0	mg/kg	1	A-T-027s
Cadmium _D ^{M#}	0.6	-	-	-	<0.5	-	0.5	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	18	-	-	-	10	-	29	mg/kg	1	A-T-024s
Chromium _D ^{M#}	9	-	-	-	7	-	11	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	-	-	-	<1	-	<1	mg/kg	1	A-T-040s
Chromium (trivalent)	9	-	-	-	7	-	11	mg/kg	1	Calc
Lead _D ^{M#}	366	-	-	-	24	-	446	mg/kg	1	A-T-024s
Mercury _D	0.78	-	-	-	<0.17	-	0.81	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	10	-	-	-	8	-	10	mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	-	-	-	<1	-	<1	mg/kg	1	A-T-024s
Vanadium _D ^{M#}	12	-	-	-	6	-	17	mg/kg	1	A-T-024s
Zinc _D ^{M#}	148	-	-	-	20	-	46	mg/kg	5	A-T-024s

Envirolab Job Number: 23/08622

Client Project Name: Ceylon SS

Client Project Ref: 1326

Lab Sample ID	23/08622/1	23/08622/2	23/08622/3	23/08622/4	23/08622/5	23/08622/6	23/08622/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS2	WS2	WS2	WS3	WS4	WS6	WS7			
Depth to Top	0.80	1.80	3.50	1.80	0.80	1.80	0.80			
Depth To Bottom										
Date Sampled	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	4AB	4A	6A	6A	4A	4A	4AB			
Asbestos in Soil (inc. matrix) ^										
Asbestos in soil _D #	Chrysotile	-	-	-	NAD	-	NAD			A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) _D	Loose Fibres	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	-	-	-	N/A	-	N/A			A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) _D	<0.001	-	-	-	-	-	-	% w/w	0.001	A-T-054

Envirolab Job Number: 23/08622

Client Project Name: Ceylon SS

Client Project Ref: 1326

Lab Sample ID	23/08622/1	23/08622/2	23/08622/3	23/08622/4	23/08622/5	23/08622/6	23/08622/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS2	WS2	WS2	WS3	WS4	WS6	WS7			
Depth to Top	0.80	1.80	3.50	1.80	0.80	1.80	0.80			
Depth To Bottom										
Date Sampled	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	4AB	4A	6A	6A	4A	4A	4AB			
PAH-16MS										
Acenaphthene _A ^{M#}	-	-	-	-	-	-	0.04	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	-	-	-	-	-	-	0.03	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	-	-	-	-	-	-	0.21	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	-	-	-	-	-	1.38	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	-	-	-	-	-	1.49	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	-	-	-	-	-	-	1.77	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	-	-	-	-	-	0.78	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	-	-	-	-	-	-	0.62	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	-	-	-	-	-	-	1.42	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A	-	-	-	-	-	-	0.18	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	-	-	-	-	-	-	2.69	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	-	-	-	-	-	-	0.03	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	-	-	-	-	-	-	0.92	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	-	-	-	-	-	-	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	-	-	-	-	-	-	0.51	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	-	-	-	-	-	-	2.39	mg/kg	0.07	A-T-019s
Total PAH-16MS _A	-	-	-	-	-	-	14.5	mg/kg	0.01	A-T-019s

Envirolab Job Number: 23/08622

Client Project Name: Ceylon SS

Client Project Ref: 1326

Lab Sample ID	23/08622/1	23/08622/2	23/08622/3	23/08622/4	23/08622/5	23/08622/6	23/08622/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS2	WS2	WS2	WS3	WS4	WS6	WS7			
Depth to Top	0.80	1.80	3.50	1.80	0.80	1.80	0.80			
Depth To Bottom										
Date Sampled	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	4AB	4A	6A	6A	4A	4A	4AB			
SVOC										
4-Bromophenyl phenyl ether _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Hexachlorobenzene _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Diethyl phthalate _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Dimethyl phthalate _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Dibenzofuran _A	374	-	-	-	-	-	-	µg/kg	100	A-T-052s
Carbazole _A	2030	-	-	-	-	-	-	µg/kg	100	A-T-052s
Butylbenzyl phthalate _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Bis(2-ethylhexyl)phthalate _A	<100	-	-	-	-	-	-	µg/kg	500	A-T-052s
Bis(2-chloroethoxy)methane _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Bis(2-chloroethyl)ether _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
4-Nitrophenol _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
3+4-Methylphenol _A	125	-	-	-	-	-	-	µg/kg	100	A-T-052s
4-Chloro-3-methylphenol _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
2-Nitrophenol _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
2-Methylphenol _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
1,2,4-Trichlorobenzene _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
2-Chlorophenol _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
2,6-Dinitrotoluene _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
2,4-Dinitrotoluene _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
2,4-Dimethylphenol _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
2,4-Dichlorophenol _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
2,4,6-Trichlorophenol _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
2,4,5-Trichlorophenol _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
1,4-Dichlorobenzene _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
1,3-Dichlorobenzene _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
1,2-Dichlorobenzene _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
2-Chloronaphthalene _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
2-Methylnaphthalene _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Acenaphthylene _A	371	-	-	-	-	-	-	µg/kg	100	A-T-052s
Acenaphthene _A	2100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Anthracene _A	9980	-	-	-	-	-	-	µg/kg	100	A-T-052s
Benzo(a)anthracene _A	27200	-	-	-	-	-	-	µg/kg	100	A-T-052s

Envirolab Job Number: 23/08622

Client Project Name: Ceylon SS

Client Project Ref: 1326

Lab Sample ID	23/08622/1	23/08622/2	23/08622/3	23/08622/4	23/08622/5	23/08622/6	23/08622/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS2	WS2	WS2	WS3	WS4	WS6	WS7			
Depth to Top	0.80	1.80	3.50	1.80	0.80	1.80	0.80			
Depth To Bottom										
Date Sampled	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	4AB	4A	6A	6A	4A	4A	4AB			
Benzo(b)fluoranthene _A	28300	-	-	-	-	-	-	µg/kg	100	A-T-052s
Benzo(k)fluoranthene _A	6250	-	-	-	-	-	-	µg/kg	100	A-T-052s
Benzo(a)pyrene _A	15300	-	-	-	-	-	-	µg/kg	100	A-T-052s
Benzo(ghi)perylene _A	10700	-	-	-	-	-	-	µg/kg	100	A-T-052s
Chrysene _A	45200	-	-	-	-	-	-	µg/kg	100	A-T-052s
Fluoranthene _A	39500	-	-	-	-	-	-	µg/kg	100	A-T-052s
Fluorene _A	2450	-	-	-	-	-	-	µg/kg	100	A-T-052s
Indeno(1,2,3-cd)pyrene _A	10500	-	-	-	-	-	-	µg/kg	100	A-T-052s
Phenanthrene _A	37400	-	-	-	-	-	-	µg/kg	100	A-T-052s
Pyrene _A	33200	-	-	-	-	-	-	µg/kg	100	A-T-052s
Naphthalene _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Dibenzo(ah)anthracene _A	3170	-	-	-	-	-	-	µg/kg	100	A-T-052s
Bis(2-chloroisopropyl)ether _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Phenol _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Pentachlorophenol _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
n-Nitroso-n-dipropylamine _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
n-Diethylphthalate _A	<100	-	-	-	-	-	-	µg/kg	500	A-T-052s
n-Dibutylphthalate _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Nitrobenzene _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Isophorone _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Hexachloroethane _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Hexachlorobutadiene _A	<100	-	-	-	-	-	-	µg/kg	100	A-T-052s
Perylene _A	6520	-	-	-	-	-	-	µg/kg	100	A-T-052s

Envirolab Job Number: 23/08622

Client Project Name: Ceylon SS

Client Project Ref: 1326

Lab Sample ID	23/08622/1	23/08622/2	23/08622/3	23/08622/4	23/08622/5	23/08622/6	23/08622/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS2	WS2	WS2	WS3	WS4	WS6	WS7			
Depth to Top	0.80	1.80	3.50	1.80	0.80	1.80	0.80			
Depth To Bottom										
Date Sampled	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	4AB	4A	6A	6A	4A	4A	4AB			
VOC										
Dichlorodifluoromethane _A	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Chloromethane _A	<10	-	-	-	-	-	-	µg/kg	10	A-T-006s
Vinyl Chloride (Chloroethene) _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromomethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Chloroethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Trichlorofluoromethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1-Dichloroethene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Carbon Disulphide _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Dichloromethane _A	<5	-	-	-	-	-	-	µg/kg	5	A-T-006s
trans 1,2-Dichloroethene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1-Dichloroethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
cis 1,2-Dichloroethene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
2,2-Dichloropropane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromochloromethane _A [#]	<5	-	-	-	-	-	-	µg/kg	5	A-T-006s
Chloroform _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1,1-Trichloroethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1-Dichloropropene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Carbon Tetrachloride _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2-Dichloroethane _A [#]	<2	-	-	-	-	-	-	µg/kg	2	A-T-006s
Benzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Trichloroethene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2-Dichloropropane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Dibromomethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromodichloromethane _A [#]	<10	-	-	-	-	-	-	µg/kg	10	A-T-006s
cis 1,3-Dichloropropene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Toluene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
trans 1,3-Dichloropropene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1,2-Trichloroethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,3-Dichloropropane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Tetrachloroethene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Dibromochloromethane _A [#]	<3	-	-	-	-	-	-	µg/kg	3	A-T-006s
1,2-Dibromoethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s

Envirolab Job Number: 23/08622

Client Project Name: Ceylon SS

Client Project Ref: 1326

Lab Sample ID	23/08622/1	23/08622/2	23/08622/3	23/08622/4	23/08622/5	23/08622/6	23/08622/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS2	WS2	WS2	WS3	WS4	WS6	WS7			
Depth to Top	0.80	1.80	3.50	1.80	0.80	1.80	0.80			
Depth To Bottom										
Date Sampled	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	4AB	4A	6A	6A	4A	4A	4AB			
Chlorobenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1,1,2-Tetrachloroethane _A	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Ethylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
m & p Xylene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
o-Xylene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Styrene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromoform _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Isopropylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1,2,2-Tetrachloroethane _A	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2,3-Trichloropropane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromobenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
n-Propylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
2-Chlorotoluene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,3,5-Trimethylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
4-Chlorotoluene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
tert-Butylbenzene _A [#]	<2	-	-	-	-	-	-	µg/kg	2	A-T-006s
1,2,4-Trimethylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
sec-Butylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
4-Isopropyltoluene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,3-Dichlorobenzene _A	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,4-Dichlorobenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
n-Butylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2-Dichlorobenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2-Dibromo-3-chloropropane (DCBP) _A	<2	-	-	-	-	-	-	µg/kg	2	A-T-006s
1,2,4-Trichlorobenzene _A	<3	-	-	-	-	-	-	µg/kg	3	A-T-006s
Hexachlorobutadiene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2,3-Trichlorobenzene _A	<3	-	-	-	-	-	-	µg/kg	3	A-T-006s

Envirolab Job Number: 23/08622

Client Project Name: Ceylon SS

Client Project Ref: 1326

Lab Sample ID	23/08622/1	23/08622/2	23/08622/3	23/08622/4	23/08622/5	23/08622/6	23/08622/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS2	WS2	WS2	WS3	WS4	WS6	WS7			
Depth to Top	0.80	1.80	3.50	1.80	0.80	1.80	0.80			
Depth To Bottom										
Date Sampled	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23	24-Aug-23			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	4AB	4A	6A	6A	4A	4A	4AB			
TPH CWG with Clean Up										
Ali >C5-C6 _A	<0.01	<0.01	<0.01	<0.06	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	11	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	15	<1	<1	7	<1	<1	2	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	85	4	2	177	2	2	9	mg/kg	1	A-T-055s
Total Aliphatics _A	111	4	2	184	2	2	11	mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<10	<1	<1	4	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C10-C12 _A	<10	<1	<1	7	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C12-C16 _A	24	2	1	11	1	1	3	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	213	2	1	11	<1	1	12	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	1090	8	2	43	3	2	58	mg/kg	1	A-T-055s
Total Aromatics _A	1330	13	5	76	5	4	76	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	1440	16	7	260	7	6	87	mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 23/08622

Client Project Name: Ceylon SS

Client Project Ref: 1326

Lab Sample ID	23/08622/8	23/08622/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS8	WS4								
Depth to Top	2.50	3.80								
Depth To Bottom	3.00									
Date Sampled	24-Aug-23	24-Aug-23								
Sample Type	SOIL	SOIL								
Sample Matrix Code	1A	6A								
% Stones >10mm _A	<0.1	<0.1						% w/w	0.1	A-T-044

Envirolab Job Number: 23/08622

Client Project Name: Ceylon SS

Client Project Ref: 1326

Lab Sample ID	23/08622/8	23/08622/9								
Client Sample No										
Client Sample ID	WS8	WS4								
Depth to Top	2.50	3.80								
Depth To Bottom	3.00									
Date Sampled	24-Aug-23	24-Aug-23								
Sample Type	SOIL	SOIL								
Sample Matrix Code	1A	6A								
TPH CWG with Clean Up										
Ali >C5-C6 _A	<0.01	<0.01						mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	<0.01	<0.01						mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	<1						mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1						mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	<1						mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	<1	<1						mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	<1	2						mg/kg	1	A-T-055s
Total Aliphatics _A	<1	2						mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	<0.01						mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01						mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1	<1						mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	<1						mg/kg	1	A-T-055s
Aro >C12-C16 _A	<1	2						mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	<1	2						mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	<1	2						mg/kg	1	A-T-055s
Total Aromatics _A	<1	7						mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	<1	10						mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01						mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01						mg/kg	0.01	A-T-022s

Report Notes

General

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 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 within the same delivery, will be disposed of **six weeks** after the 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 our scope of accreditation.
 The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client.
 A deviating sample 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.

Key

Superscript "#"	Accredited to ISO 17025
Superscript "M"	Accredited to MCertS
Superscript "U"	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript "A"	Analysis performed on as-received Sample
Subscript "D"	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript "A"	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
N/A	Not applicable

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.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

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 by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
 Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.
 Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

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

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

Please contact your client manager if you require 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:	Geo2 Remediation Ltd, Coniston House,, Louisa Street, Bradford, BD10 8NE	Project No:	23/08622
Project:	Ceylon SS	Date Received:	29/08/2023 (am)
Clients Project No:	1326	Cool Box Temperatures (°C):	17.8

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	23/08622/1	23/08622/2	23/08622/3	23/08622/4	23/08622/5	23/08622/6	23/08622/7	23/08622/8	23/08622/9
Client Sample No									
Client Sample ID/Depth	WS2 0.80m	WS2 1.80m	WS2 3.50m	WS3 1.80m	WS4 0.80m	WS6 1.80m	WS7 0.80m	WS8 2.50-3.00m	WS4 3.80m
Date Sampled	24/08/23	24/08/23	24/08/23	24/08/23	24/08/23	24/08/23	24/08/23	24/08/23	24/08/23
A-T-006s	01/09/2023								
A-T-019s							01/09/2023		
A-T-022s	01/09/2023	01/09/2023	01/09/2023	05/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023
A-T-024s	05/09/2023				05/09/2023		05/09/2023		
A-T-027s	05/09/2023				05/09/2023		05/09/2023		
A-T-040s	05/09/2023				05/09/2023		05/09/2023		
A-T-044	05/09/2023	05/09/2023	05/09/2023	05/09/2023	05/09/2023	05/09/2023	05/09/2023	05/09/2023	05/09/2023
A-T-045	31/08/2023				31/08/2023		31/08/2023		
A-T-052s	01/09/2023								
A-T-054	07/09/2023								
A-T-055s	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023
Calc	05/09/2023				05/09/2023		05/09/2023		
Calc-As Recd	01/09/2023	01/09/2023	01/09/2023	05/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023	01/09/2023

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 ANALYTICAL TEST REPORT

Envirolab Job Number: 23/08605
Issue Number: 1

Date: 01 September, 2023

Client: Geo2 Remediation Ltd
Coniston House,
Louisa Street
Bradford
BD10 8NE

Project Manager: Paolo de Marchi/Steven Jackson
Project Name: Ceylon SS
Project Ref: 1326
Order No: 1326/PDM
Date Samples Received: 26/08/23
Date Instructions Received: 29/08/23
Date Analysis Completed: 01/09/23

Approved by:



Gemma Berrisford
Deputy Client Services Supervisor

Envirolab Job Number: 23/08605

Client Project Name: Ceylon SS

Client Project Ref: 1326

Lab Sample ID	23/08605/1	23/08605/2								
Client Sample No										
Client Sample ID	WS1	WS4								
Depth to Top										
Depth To Bottom										
Date Sampled	24-Aug-23	24-Aug-23								
Sample Type	WATER - GW	WATER - GW								
Sample Matrix Code	N/A	N/A								
TPH CWG (w) with Clean Up										
Ali >C5-C6 (w) _A [#]	<1	<1						µg/l	1	A-T-022w
Ali >C6-C8 (w) _A [#]	<1	<1						µg/l	1	A-T-022w
Ali >C8-C10 (w) _A [#]	<5	<5						µg/l	5	A-T-055w
Ali >C10-C12 (w) _A [#]	<5	<5						µg/l	5	A-T-055w
Ali >C12-C16 (w) _A [#]	<5	<5						µg/l	5	A-T-055w
Ali >C16-C21 (w) _A [#]	<5	<5						µg/l	5	A-T-055w
Ali >C21-C35 (w) _A [#]	<5	<5						µg/l	5	A-T-055w
Total Aliphatics (w) _A [#]	<5	<5						µg/l	5	Calc-As Recd
Aro >C5-C7 (w) _A [#]	<1	<1						µg/l	1	A-T-022w
Aro >C7-C8 (w) _A [#]	<1	<1						µg/l	1	A-T-022w
Aro >C8-C10 (w) _A	<5	<5						µg/l	5	A-T-055w
Aro >C10-C12 (w) _A [#]	<5	<5						µg/l	5	A-T-055w
Aro >C12-C16 (w) _A [#]	5	<5						µg/l	5	A-T-055w
Aro >C16-C21 (w) _A [#]	<5	<5						µg/l	5	A-T-055w
Aro >C21-C35 (w) _A	<10	<10						µg/l	10	A-T-055w
Total Aromatics (w) _A	<10	<10						µg/l	10	Calc-As Recd
TPH (Ali & Aro >C5-C35) (w) _A	<10	<10						µg/l	10	Calc-As Recd
BTEX - Benzene (w) _A [#]	<1	<1						µg/l	1	A-T-022w
BTEX - Toluene (w) _A [#]	<1	<1						µg/l	1	A-T-022w
BTEX - Ethyl Benzene (w) _A [#]	<1	<1						µg/l	1	A-T-022w
BTEX - m & p Xylene (w) _A [#]	<1	<1						µg/l	1	A-T-022w
BTEX - o Xylene (w) _A [#]	<1	<1						µg/l	1	A-T-022w
MTBE (w) _A [#]	<1	<1						µg/l	1	A-T-022w

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Key

Superscript "#"	Accredited to ISO 17025
Superscript "M"	Accredited to MCertS
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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.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

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 by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
 Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.
 Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

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

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

Please contact your client manager if you require 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:	Geo2 Remediation Ltd, Coniston House,, Louisa Street, Bradford, BD10 8NE	Project No:	23/08605
Project:	Ceylon SS	Date Received:	29/08/2023 (am)
Clients Project No:	1326	Cool Box Temperatures (°C):	17.8

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	23/08605/1	23/08605/2
Client Sample No		
Client Sample ID/Depth	WS1	WS4
Date Sampled	24/08/23	24/08/23
A-T-022w	31/08/2023	31/08/2023
A-T-055w	01/09/2023	01/09/2023
Calc-As Recd	01/09/2023	01/09/2023

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



Appendix E – Risk Assessment Terminology

Definitions and Classifications of Risk Assessment Terminology.

Probability

Probability can be defined as the chance of a particular event occurring in a given period of time.

Descriptions of each of the four qualitative terms to be used in this report to describe the perceived probability of any identified pollutant linkage becoming realised are shown below in Table W.

Term	Description
High Likelihood	There is pollutant linkage and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution.
Likely	There is pollutant linkage and all the elements are present and in the right place which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.
Low Likelihood	There is pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place, and is less likely in the shorter term.
Unlikely	There is pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long-term.

Table W. Description of Probability Classifications

Severity

Severity (consequence) can be defined as the adverse effects (or harm) arising from a defined hazard, which impairs the quality of human health or the environment in the short or longer term.

Descriptions of each of the four qualitative terms to be used in this report to describe the perceived potential severity of any identified pollutant linkage becoming realised are shown below in Table X.

Term	Description
Severe	Highly elevated concentrations likely to result in "significant harm" to human health as defined by the EPA 1990, Part 2A, if exposure occurs. Equivalent to EA Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce. Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population. Catastrophic damage to crops, buildings or property.
Medium	Elevated concentrations which could result in "significant harm" to human health as defined by the EPA 1990, Part 2A if exposure occurs. Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce. Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population. Significant damage to crops, buildings or property.
Mild	Exposure to human health unlikely to lead to "significant harm". Equivalent to EA Category 3 pollution incident including minimal or short-lived effect on water quality; marginal effect on amenity value, agriculture or commerce. Minor or short-lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long-term maintenance of the population. Minor damage to crops, buildings or property.
Minor	No measurable effect on humans. Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems. Repairable effects of damage to buildings, structures and services.

Table X. Description of Severity Classifications

Once the severity and probability of a pollutant linkage has been determined the risk can be assessed using the risk matrix shown overleaf on Table Y.

Risk Matrix

By cross referencing the derived severity and probability in Table Y, below the perceived potential risk can be determined.

		Severity			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate / Low Risk
	Likely	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

Table Y. Risk Assessment Matrix

The risk categories detailed above are defined below in the following Table Z.

Term	Description
Very High Risk	There is a high probability that significant harm could arise to a designated receptor from an identified hazard at the site without appropriate remedial action.
High Risk	Significant harm is likely to arise to a designated receptor from an identified hazard at the site without appropriate remedial action.
Moderate Risk	It is possible that without appropriate remedial action, harm could arise to a designated receptor but it is relatively unlikely that any such harm would be severe and if any harm were to occur, it is likely that such harm would be relatively mild.
Low Risk	It is possible that significant harm could arise to a designated receptor from an identified hazard but it is likely that at worst this harm if realised would normally be mild.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

Table Z. Definition of Risk