

CCG-C-21-12518-3

**PHASE II GEOENVIRONMENTAL REPORT
FOR LAND AT THE FORMER
PRESCOT POLICE STATION
DERBY STREET
PRESCOT
MERSEYSIDE
L34**

SEPTEMBER 2021

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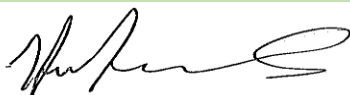
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1.0 INTRODUCTION

CC GEOTECHNICAL LIMITED (CCG) is providing consultancy services to **PRIMA GROUP** in connection with the proposed redevelopment of land located immediately to the north of Derby Street, Prescott, L34.

It is understood that an existing Police Station fronting on to Derby Street is to be retained and modified / converted for residential land use to form 7nr self-contained apartments, with an outbuilding located to the rear of the site being modified / converted to provide 2nr self-contained apartments.

It is further proposed that the land to the rear of the Police Station is to be developed by the construction of 4nr 2.5-storey town houses constructed of traditional brick elevations under pitched roofing materials together with associated newly created hard paved access / egress roadway, off-road car parking facilities and front and rear private gardens.

The proposed site layout is as annotated on **KWL ARCHITECTS** architectural drawings contained herein.

The proposed development falls within the administrative jurisdiction of **KNOWSLEY METROPOLITAN BOROUGH COUNCIL**.

2.0 PREVIOUS STUDIES

The development site was the subject of a Phase I Desk Study Report prepared by **CCG** under report Reference No. **CCG-C-21-12516**, dated September 2021 which concluded that a Phase II intrusive investigation was required, and made recommendations on the scope of the Phase II investigation.

In addition, given that the site is located within the '*Knowsley District Coal Mining Referral Area*', a coal mine risk assessment (CMRA) report was commissioned (prepared by **CCG** under Report Reference No. CCG-C-21-12517, dated September 2021).

This report documents the findings of the Phase II investigation.

This report should be read in conjunction with **CCG** Desk Study Report No. **CCG-C-21-12516**, and **CCG** CMRA Report Reference No. **CCG-C-21-12517**, and with Notes on Limitations, contained herein.

2.0 PURPOSE & AIMS OF THE PHASE II INTRUSIVE INVESTIGATION

The primary purpose of the Phase II intrusive investigation was to confirm the indications of the desk study with respect to:

- The collation of data on soil and groundwater contamination, insofar as they may adversely impact on human and/or environmental receptors
- The collation of data on the properties of the substrata, insofar as they relate to the design and construction of house foundations, ground slabs, and development infrastructure

3.0 SITE DATA

The site is located immediately to the north of Derby Street, Prescott, L34 3LG as shown on **CCG** Drawing No. CCG-C-21-12518-1 contained herein. The **ORDNANCE SURVEY** coordinates for the approximate site centre are 346312 392867. It stands at an approximate elevation of c.72maOrdnance Datum.

The site is situated predominantly within a residential context and comprises an irregular shaped parcel of land which extends to the approximate dimensions of c.68m x 48m, its long axis being on a north – south alignment.

It is bound to the south by public pavements extending along Derby Street (A57), and to the west by an un-named roadway. Its south-eastern boundary is adjoined by commercial premises (Bridal Storey), with its northern and eastern boundaries being adjoined by a series of private gardens associated with residential properties fronting on to Egerton Road and Stanley Crescent respectively.

Existing structures occupying the site comprise a well-maintained 2-storey property fronting on to Derby Street with associated single storey out-buildings to the rear, each constructed of traditional brick and dressed sandstone elevations under pitched roofing materials with a terrace of prefabricated flat roofed garages extending along its northern boundary.

The external topography across the site was seen to be sensibly flat with surface cover comprising black bituminous paving.

Given that the site was previously utilised for commercial land use, there is a potential for the presence of buried services to exist beneath the site.

There was no visual evidence of the presence of native and/or non-native plant species within, or adjoining, the site boundary.

Vehicle and pedestrian access can be made via its Derby Street frontage to the south.

3.1 Published Geology

The geology of the site was researched by reference to the 1:50000 scale **BRITISH GEOLOGICAL SURVEY (BGS)** Sheet 097 Liverpool (Solid and Drift Editions: 1977 - 1980).

These indicate the site is devoid of natural drift cover. However, given the presence of natural drift deposits comprising impermeable diamicton (boulder clay) of glacial origin (*Late-Quaternary Epoch - Devensian Age*), there is a potential for the presence of unrecorded drift deposits to be present.

The documented solid geology comprises the Pennine Lower Coal Measures Formation (formerly the Lower Coal Measures) of the Pennine Coal Measures Group comprising interbedded argillaceous mudstone, siltstones, fluvial sandstones and productive coal measure, of the Upper Carboniferous Period (Silesian: Westphalian A: Langsettian Age).

The study site is located within an area where ancient earth movements have caused significant displacements and miss-alignments of the underlying country rock and nearby associated coal seams. Hence the general dip of the solid geology within the surrounding area is seen on the **BGS** mapping data is seen to vary between 8°-30° in a south / south-westerly direction.

There are numerous geological lines of weakness (*i.e. faults, coal seams, etc.*) within the surrounding area, the nearest being geological fault which extends on a north – south alignment immediately to the east of the study site.

The **BGS** solid geology mapping information shows the presence of 2nr seams of coal sub-crop within close proximity to the sites northern and southern boundaries.

The '*Indicative Atlas of Radon in England and Wales*' (Miles. J.C.H et.al, 2007) Map 13 '*Northern Welsh Marches and Liverpool*', shows the site to be situated within an area where it is believed that less than 1% of the properties within the area are affected by Radon and therefore no Radon Protection Measures will be required for new structures in contact with the ground.

Notwithstanding the above radon classification, current radon mapping (<https://www.ukradon.org/information/ukmaps>) (accessed 26th April 2024) shows the site to be within an area where it is believed that between 3-5% of the properties within the area are affected by Radon, consequently Basic Radon protective measures are required for all new buildings in contact with the ground.

As with many previously developed sites superficial made ground deposits of an unknown composition thickness and extent associated with the development of the site and its immediate environs may underlie the site.

3.2 Hydrogeology & Hydrology

Information pertaining to hydrogeological and hydrological features of the site may be summarised as follows:

- The solid geology (Pennine Lower Coal Measures Formation) is classified as being a Secondary A Aquifer
- The overlying made ground deposits, if present, are classified as an Unproductive Aquifer
- There are no records pertaining to Ground Water Abstraction Licences within 1km of the site
- There are no records pertaining to the presence of Surface Water Abstraction points within 0.4km of the study site, the nearest being 415m west: James Whitaker & Sons Nurserymen Ltd. Licence No: 2569028003
- There are no records pertaining to the presence of Portable Water Abstraction points within 1km of the study site
- The site is not located within a designated Source Protection Zone (SPZ)
- The site is not located within an Environment Agency Zone II and/or III Flood Plain

4.0 PRELIMINARY CONCEPTUAL MODEL

4.1 Introduction

The risk assessment methodologies adopted by **CCG** are based on current available guidance from several sources and are included in Appendix I.

A Tier 1 Risk Assessment and Preliminary Conceptual Model (PCM) were formulated using the information collated in the Phase I Desk Study and based on the following assumptions:

- It is understood that an existing Police Station fronting on to Derby Street is to be retained and modified / converted for residential land use to form 7nr self-contained apartments, with an outbuilding located to the rear of the site being modified / converted to provide 2nr self-contained apartments.
- It is further proposed that the land to the rear of the Police Station is to be developed by the construction of 4nr 2.5-storey town houses constructed of traditional brick elevations under pitched roofing materials together with associated newly created hard paved access / egress roadway, off-road car parking facilities and front and rear private gardens.
- The proposed site layout is as annotated on **KWL ARCHITECTS** architectural drawings contained herein.
- Drinking water will be from a mains supply.

In constructing the Preliminary Conceptual Model (PCM), **CCG** applied the guidance contained in CIRIA C552: 2001. This recommends use of a Risk Matrix which classifies risk based on the product of Probability of a source being present, and the Consequence of receptors being exposed to the source. Guidance tables setting out the classifications of probability and consequence together with a risk matrix are given in Tables 1-3 hereunder. In using this approach **CCG** recommends actual intrusive investigation of any Risk Classification of “*Moderate*” or over.

Table 1: Matrix of consequences against probability to gain a risk classification [CIRIA C552, 2001]

		CONSEQUENCE			
		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 2: Classification Definitions (C552 CIRIA, 2001)

CLASSIFICATION	DEFINITION
Very High	There is a high probability that severe harm could arise to a designated receptor from an identified hazard. Or, there is evidence that server harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that such harm would be server, or if any harm were to occur it is more likely that harm would be relatively mild. Investigation (if not undertaken already) is normally required to clarify the risk and to determine to potential liability. Some remedial works may be required in the longer term.
Moderate / Low	-
Low	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild
Very Low	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 server.

4.2 Preliminary Conceptual Model

By application of the risk assessment methodology outlined above, the following PCM was constructed.

Table 3: Preliminary Conceptual Model (PCM)

POLLUTANT LINKAGE	SOURCE	PATHWAY	RECEPTOR	PROBABILITY	CONSEQUENCE	RISK RATING
1	Broad spectrum of heavy metals, aggressive pH, hydrocarbons, PAH's in Made Ground associated with the development & redevelopment of the site & adjoining area	Soil and / or soil dust ingestion	Construction workers Future occupants (adults & infants) Offsite receptors Flora	Likely	Medium	Moderate
2	Asbestos containing materials (ACM) in made ground soils associated with the development & redevelopment of the site & adjoining area	Fibre Inhalation	Construction workers Future occupants (adults & infants) Offsite receptors	Likely	Severe (ACM)	High
3	Inhalation of vapours associated with potential made ground deposits etc.	Inhalation	Future residents	Unlikely	Medium	Moderate
4	Inhalation of ground gases from onsite or offsite sources i.e. historical mine workings, made ground soils etc.	Inhalation	Future residents	Unlikely	Medium	Moderate
5	pH & Sulphate attack on concrete	Future building	Future building	Likely	Mild	Moderate / Low
6	Organic contamination	Direct contact with water mains	Potable water supply	Unlikely	Medium	Moderate

The contaminants of concern associated with those risks which require intrusive investigation were researched by reference to published industry profiles, and are summarised hereunder:

Table 4: Summary of Contaminants of Concern based on PCM

LINKAGE NO.	METALS	NON-METALS	ORGANICS	GASES	OTHERS
PL1, PL2 PL5, PL6	Be, Cd, Cr (total and VI), Ni, Cu, Pb, Hg, Se	As, sulphates	TPHCWG, PAH's, BTEX, Volatiles (by PID)	-	pH Asbestos
PL3 & PL4	-	-	-	CH ₄ , CO ₂ , H ₂ S	-
PL1, PL6	-	-	TPHCWG PAH's, BTEX, Volatiles (by PID)	-	-
PL1-PL6	Be, Cd, Cr (total and VI), Ni, Cu, Pb, Hg, Se	As, sulphates	TPHCWG, BTEX PAH's, Volatiles (by PID)	CH ₄ , CO ₂ , H ₂ S	pH Asbestos

4.3 Summary of Risks

The foregoing analysis identified a significant number of potential risks, and if present, these could adversely impact on human or environmental receptors. Given the sensitivity of the proposed end use, an intrusive phase of investigation was undertaken to determine whether the postulated pollutant linkages are present on site.

5.0 FIELDWORK

5.1 Introduction

A programme of fieldwork investigation was undertaken in August 2021. The programme comprised:

- The manual excavation, logging and sampling of 6nr borehole service clearance pits, each extending to 1.2mbngl
- The sinking of boreholes from the base of each service avoidance pit using light dynamic sampling methods
- The subsampling of borehole arisings for laboratory testing
- Installation of 50mm HDPE plain and slotted well-tube and associated headworks, complete with non-lime pea gravel surround and bentonite seals at 3nr borehole positions
- The instigation of a programme of groundwater / gas monitoring comprising 6nr rounds over a 3-month period

The fieldwork was planned in accordance with BSEN 1997-1 (2007) Eurocode 7, BS10175: 2011, BS5930: 1999, and the sampling and monitoring methodologies employed by **CCG** as presented in Appendix B, insofar as they related to the scope of the investigation.

The layout of the proposed intrusive investigation is as annotated on **PRIMA GROUP** Drawing No. 102-013 'Existing & Proposed Site Plan' contained herein.

5.2 Borehole Drilling & Monitoring Installations

5.2.1 Light Dynamic Sampling Boreholes

In accordance with the ground investigation plan, 6nr boreholes were sunk using light dynamic sampling methods using a Dando Terrier 2000 rig deploying 100mm casings and associated tools. 3

Each borehole location was positioned clear of overhead services and was scanned for buried electrical services using CAT cable avoidance scanner before and during hand excavation of a starter pit extending to 1.2mbgl.

Boring tools were decontaminated prior to commencement.

In this method of investigation samples of subsoils are recovered by driving and extracting a series of reducing diameter 1m long steel tubes. Standard penetration test's (SPT's) were undertaken at regular depth increments.

This method of sampling recovers relatively "undisturbed" soil profiles in Perspex tubes, which are used to line the steel tubes. The Perspex tubes were split and carefully logged and subsampled. Subsamples for potential chemical analysis were removed at appropriate positions from the profile and transferred to chilled amber glass jars and vials for laboratory analysis.

The logs of the boreholes, annotated with sampling details, SPT 'N' values and details of standpipe construction are presented in Appendix C.

5.2.2 Monitoring Installations

Standpipes comprising 50mm diameter HDPE plain and slotted well tube set in bentonite and non-limestone pea gravel surround were installed at 3nr borehole positions. Each standpipe was fitted with a gas valve connector and was protected by a flush cover set in concrete. Details of standpipe installations are provided on the relevant borehole logs in Appendix C and summarised in the tabulation hereunder:

Table 5: Borehole Installation Details

BOREHOLE	DEPTH OF BOREHOLE (mbgl)	DEPTH OF STANDPIPE [mbgl]	RESPONSE ZONE (mbgl)	
			FROM	TO
WS1	3.0m	3.0m	0.5m	3.0m
WS3	3.0m	2.5m	0.5m	2.5m
BH2	2.8m	2.8m	0.5m	2.8m

The standpipe installations were periodically monitored for flow rate and composition of ground gas using a Geotechnical Instruments GA 2000 infra-red analyser. The installations were also monitored for standing water levels with an electronic dip meter.

The results of the gas and groundwater monitoring, together with calibration certificates of the instruments used are given in Appendix D.

6.0 OBSERVED STRATIGRAPHY

The stratigraphy of the boreholes was generally consistent with the documented geology. The succession may be generalised as tabulated hereunder:

Table 6: Observed Stratigraphy

Location	STRATIGRAPHY
WS1	Bituminous paving and associated sub-base overlying superficial made ground deposits comprising dark brown clayey sands and gravel extending to 0.45mbgl. The sequence thereafter continues in natural drift deposits comprising loose red / brown sands and gravel to 2mbgl, then grey / brown weathered mudstone thereafter, recovered as soft becoming stiff clay, proven to 3mbgl. Borehole reported to be dry on completion
WS2	Bituminous paving and associated sub-base overlying made ground deposits comprising black sandy gravel extending to 0.5mbgl. The sequence thereafter continues in natural drift deposits comprising dark grey varying to brown sandy locally organic clay to 1.2mbgl, loose grey clayey silt to 1.9mbgl, then grey weathered siltstone / mudstone thereafter, recovered as medium dense becoming dense clayey silts, proven to 2.6mbgl Slight seepage reported at 1.8mbgl
WS3	Bituminous paving and associated sub-base overlying natural drift deposits comprising grey / brown sandy clay to 0.35mbgl, black silty organic clay to 0.5mbgl, light grey sands to 0.85mbgl, firm grey silty clay to 2.1mbgl, then grey weathered mudstone thereafter, recovered as very dense very clayey sands and gravel, proven to 3mbgl Borehole reported to be dry on completion
WS4	Bituminous paving and associated sub-base extending to 0.1mbgl. the sequence thereafter continues in natural drift deposits comprising firm brown varying to grey silty clay to 1.35mbgl, medium dense clayey gravel to 1.5mbgl, firm grey clay to 2mbgl, then grey weathered mudstone recovered as medium dense varying to dense very clayey gravel, proven to 2.7mbgl. Slight seepage reported at c.1.7mbgl
WS5	Bituminous paving and associated sub-base overlying made ground deposits comprising dark brown clayey sands and gravel extending to

	0.7mbgl. The sequence thereafter continues in natural drift deposits comprising soft brown varying to grey silty clay to 1.6mbgl, loose dark grey clayey gravel to 2mbgl, then weathered mudstone interbedded with thin coal thereafter, recovered as stiff gravelly silty clay to 2mbgl, then medium dense becoming dense clayey gravel, proven to 3mbgl Slight seepage reported from coal horizon
WS6	Bituminous paving and associated sub-base overlying superficial made ground deposits comprising dark brown clayey gravelly sand extending to 0.55mbgl. The sequence thereafter continues in natural drift deposits comprising medium dense very gravelly sands to 1.85mbgl, then dense becoming very dense grey locally brown sandy silty gravel thereafter, possibly weathered mudstone, proven to 2.8mbgl Slight seepage reported at 2.8mbgl

There was no visual and/or olfactory evidence of contamination and/or biodegradable materials affecting the made ground mass at any sampling position.

7.0 GROUNDWATER REGIME

Slight seepages were reported at some borehole positions, with monitored standing water levels being in the order of 2.3mbgl during the ongoing gas – groundwater standpipe monitoring programme.

8.0 LABORATORY TESTING

8.1 Soil Engineering Test

A programme of soil engineering testing was undertaken at a UKAS / MCERTS accredited laboratory associated with **CCG**. The programme comprised:

- Determination of soil moisture content in accordance with BS: 1377: Part 2: 1990
- Determination of Atterberg Limits in accordance with BS: 1377: Part 2: 1990
- Determination of pH and water-soluble sulphate content in accordance with BS 1377: Part 4: 1990

The soil engineering test results are presented in Appendix E.

8.2 Contamination Analyses

A programme of soil / groundwater chemical analyses was undertaken at a UKAS / MCERTS accredited laboratory:

- 6nr subsamples of made ground soils were analysed to a broad range of contaminants including metals, non-metals, speciated PAH's
- 6nr subsamples of made ground soils were analysed for hydrocarbons to the TPHCWG methodology
- 6nr subsamples of made ground soils were analysed for BTEX compounds
- 6nr subsamples of made ground soils were screened for asbestos contaminants
- 6nr subsamples of soil were analysed for pH and water-soluble sulphate content
- In the absence of recoverable volumes of water in standpipes, a leachate was prepared on soil recovered from made ground at WS2 and was analysed for a broad range of contaminants including metals, non-metals, heavy metals, speciated PAH's, and hydrocarbons to the TPHCWG methodology

The soil / soil leachate contamination test results and certificates are presented in Appendix F.

9.0 ASSESSMENT OF RISKS TO THE BUILT ENVIRONMENT

9.1 Specification of Buried Concrete

The data obtained in the investigations was assessed against the guidance given in BRE Special Digest 1: 2005, as summarised hereunder:

Table 7: Design Chemical Class Based on Soil Data

CONCRETE SPECIFICATION DATA SHEET		
Is the site Brownfield or Greenfield?	Brownfield	
Is the water table static or mobile?	Static	
Highest water-soluble Sulphate results	50mg/l	Design Sulphate Class of DS-1 Class of AC-1
Lowest pH result	7.3	
Intended Working Life	50 years	Adopt Design Chemical Classification of DC-1

Based on the foregoing assessments, concrete in the ground should be specified to conform to the compositional requirements of Design Chemical Class **DC 1**, as defined in BRE Special Digest 1: 2005.

9.2 New Water Mains Supply

The assessment of requirements for new water mains within the investigation area was based on the criteria specified in Paper 10/WM/03/21 'Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites' published by UK Water Industry Research (UKWIR) January 2011.

The preliminary findings indicate that the soil concentrations of pertinent hydrocarbon contaminant species are above the threshold concentrations specified by the UKWIR, indicating that ProtectaLine (PE/AL/PE) water mains should be deployed. Good practice requires that alkathene mains be laid in a remediated alignment comprising of clean granular fill extending to 600mm + pipe diameter and to 300mm below pipe underside.

Pipes should be laid in accordance with BS EN 12201-2 'Plastic piping systems for water supply, and for drainage and sewerage under pressure as stated in UKWIR guidance.

It should be noted that this recommendation is subject to the opinion of the water supplier, and in this instance the local water authority (**UNITED UTILITIES**) must be consulted to confirm that the proposals above accord with their interpretation of current guidance.

9.3 Assessment of Risk from Ground Gases

Standpipes were constructed such that response zones were within the permeable made ground strata. Using the data gathered in the monitoring programme, a gas risk assessment was undertaken in accordance with the ground gas risk assessment methodology (See Appendix I) employed by **CCG**. The ground gas risk assessment methodology conforms to current UK guidance on the assessment of risks posed by ground gases.

The potential sources of gas identified in the desk study were generally considered as sources of "Low" generation potential, but since the development is of high sensitivity, a programme of monitoring comprising of 6 rounds distributed over a 3-month period was adopted.

A gas risk assessment was undertaken in accordance with current UK guidelines set out in CIRCA C665 2007 "Assessing Risk Posed by Hazardous Gases to Buildings". The CIRIA risk assessment methodology uses typical maximum soil gas concentrations and worse case borehole flow rates to define a "Characteristic Situation" for the shallow gas regime.

The volumetric gas flow rate used by the risk assessment is termed "Gas Screening Value (GSV)" in the guidance and is defined below.

Table 8: Gas Monitoring Data

Position	WS1	WS3	BH6
No Monitoring Visits	6	6	6
CH ₄ (%)	Nil	Nil	Nil
CO ₂ (%)	Nil	Nil	Nil
O ₂ (%)	20.0	20.0	20.0
H ₂ S (ppm)	Nil	Nil	Nil
CO (ppm)	Nil	Nil	Nil
Flow (l/hr)	<0.1	<0.1	<0.1
Water Levels (m)	2.32	Dry	2.21
PID response	0.0	0.0	0.0
Pressure Range (mb)	1004mbar		

After 6th round of monitoring, a preliminary Gas Screening Value (GSV) of 0.0001l/hrs is calculated for CO₂, and <0.0001l/hr for CH₄.

Using these GSV values, the risk to the proposed development was assessed in line with Situation A as defined in CIRIA C665, and on this basis the site complies with Characteristic Situation 1 (CS1) and based on this classification gas protection measures are not required.

Notwithstanding the above assessment, current radon mapping (<https://www.ukradon.org/information/ukmaps>) (accessed 26th April 2024) shows the site to be within an area where it is believed that between 3-5% of the properties within the area are affected by Radon, consequently Basic Radon protective measures are required for all new buildings in contact with the ground.

10.0 HUMAN HEALTH RISK ASSESSMENT

10.1 Legislative Background to Contaminated Land Assessment

Current approaches (CLR11- 'Model Procedures for the Management of Land Contamination' and Part IIA of the Environmental Protection Act 1990) to risk assessment of contaminated land suggest the construction of a Preliminary Conceptual Model. The purpose of this model is to define all possible complete pollution linkages, where the requisite source – pathway – target elements are present; these elements being defined as:

- A contaminant (source) is a hazardous substance or agent, present at levels that have the potential to cause harm or damage a receptor
- A pathway is the means by or through which a contaminant meets, or otherwise affects, the receptor
- A receptor (target) is an entity (human being, aquatic environment, flora, and fauna etc) that is vulnerable to the adverse effects of the contaminant

This relationship is termed a “pollution linkage”. It should be recognised that for a health or environmental risk to exist, all three elements of the relationship or linkage must be present, *i.e.*

- If there is no contaminant, or contaminant present at levels below those considered to be harmful or damaging to a receptor, then there can be no adverse effect on a receptor
- If there is no receptor present that can be adversely affected by a contaminant, no harm or damage can arise
- Even where both a contaminant and a receptor are present, no harm or damage will occur if there is no pathway by or through which a linkage between the two can be established

10.2 Risk Assessment Methodologies

The risk assessment methodologies employed by **CCG** are based on the use of CLEA 1.06 and are detailed in Appendix I.

10.3 Basis of Assessment of Risk to Human Health

The Human Health Risk Assessment was carried out in accordance with the **CCG** methodology for assessing soil contamination data as contained in Appendix I, and since it is proposed that the site be redeveloped for residential land use, the assessment was based on criteria contained in publication LQM/CIEH S4UL's for Human Health Risk Assessment (2015) (**CCG** Licence No. S4UL3233), applicable to the “Residential With plant uptake” scenario. This document does not provide criteria for Lead, for which the results were compared to the C4SL (200mg/kg) published by DEFRA SP1010 Development of Category 4 Screening Levels.

10.4 Assessment of Contamination Data

Based on a Soil Organic Matter content of an average 2.5%, an assessment of the soil data was undertaken as summarised in the tabulations hereunder, and presented on the worksheets in Appendix G.

10.4.1 Assessment of Metal Data

The assessment of the metal data is presented hereunder:

Table 9: Assessment of Metal Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Cadmium	11	1.1		
Chromium	910	42.3		
Copper	240	446		
Lead	200	309	305 309 234	WS1 WS2 WS5
Mercury	1.2	0.9		
Nickel	180	55.0		
Zinc	3700	322		

The above assessment confirms the presence of Lead at 3nr sampling positions, hence a potential risk to human health is indicated

10.4.2 Assessment of Non-Metal Data

The assessment of the non-metal data is presented hereunder:

Table 10: Assessment of Non-Metal Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Arsenic	37	446	446 439 37.1	WS1 WS2 WS3
Selenium	250	1.3		
Free Cyanide	22	<1.0		

The above assessment confirms the presence of Arsenic at 3nr sampling positions, hence a potential risk to human health is indicated

10.4.3 Assessment of PAH Data

The assessment of the non-metal data is presented hereunder:

Table 11: Assessment of PAH Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Naphthalene	5.6	5.0		
Acenaphthylene	420	0.3		
Acenaphthene	510	11.3		
Fluorene	400	7.1		
Phenanthrene	220	83.7		
Anthracene	5400	16.2		
Fluoranthene	560	130		
Pyrene	1200	112		
Benz(a)anthracene	11	41.6	41.6	WS1
Chrysene	22	49.7	49.7	WS1
Benzo(b)fluoranthene	3.3	43.9	43.9 8.6	WS1 WS2
Benzo(k)fluoranthene	93	33.9		
Benzo(a)pyrene	2.7	41.8	41.8 8.5	WS1 WS2
Indeno(123-cd)pyrene	36	35.9		
Dibenz(ah)anthracene	0.28	7.8	7.8 1.4	WS1 WS2
Benzo(ghi)perylene	340	31.3		

The above assessment confirms the presence of some PAH contaminants in soils recovered from boreholes WS1 and WS2 respectively, hence a potential risk to human health is indicated.

10.4.4 Assessment of Petroleum Hydrocarbon Data

The assessment of the Petroleum Hydrocarbon (TPH) data is presented hereunder:

Table 12: Assessment of Hydrocarbon Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Aromatic EC5-EC7	140	<0.01		
Aromatic EC7-EC8	290	<0.01		
Aromatic EC8-EC10	83	<1.0		
Aromatic EC10-EC12	180	8.6		
Aromatic EC12-EC16	330	51.3		
Aromatic EC16-EC21	540	266		
Aromatic EC21-EC35	1500	1100		
Aliphatic EC5-EC6	78	<0.01		
Aliphatic EC6-EC8	230	<0.01		
Aliphatic EC8-EC10	65	<1.0		
Aliphatic EC10-EC12	330	1.8		
Aliphatic EC12-EC16	2400	8.3		
Aliphatic EC16-EC35	92000	115.4		

The above assessment confirms that no soil hydrocarbon fraction exceeds its respective soil guideline criterion, hence no risk to human health is indicated.

10.4.5 Assessment of Asbestos Data

Asbestos containing materials (ACM's) were not detected in any sample analysed and therefore no risk to human health is indicated

10.4.6 Assessment of BTEX Data

The appended laboratory contamination results confirm that all BTEX compounds are below their limit of detection (LOD) and therefore no risk to human health is indicated.

10.4.7 Summary of Human Health Assessment

The above human health risk assessment confirms presence of:

- Lead at 3nr sampling positions
- Arsenic at 2nr sampling positions
- Benz(a)anthracene at 1nr sampling position
- Chrysene at 1nr sampling position
- Benzo(b)fluoranthene at 2nr sampling positions
- Benzo(a)pyrene at 2nr sampling positions
- Dibenzo(ah)anthracene at 2nr sampling position

These results indicate a potential risk to human health via the dermal and ingestion pathways and as such some remedial works are required to mitigate these risks. Suitable forms of remediation are discussed in Table 15 hereunder.

11.0 CONTROLLED WATERS RISK ASSESSMENT

11.1 Assessment of Soil Leachate Metals, Non-Metals & Polycyclic Aromatic Hydrocarbon (PAH) Data

In the absence of adequate groundwater, leachates prepared on soils recovered from 1nr borehole position (WS2) were analysed for a broad range of contaminants including speciated PAH and TPH concentrations. The results were assessed against Environmental Quality Standards (AA-EQS) for freshwater as shown hereunder.

Table 13: Assessment of Soil Leachate Data

Contaminant	WS2 Result (ug/l)	AA-EQS (ug/l)
Naphthalene	0.02	2.4
Lead	<5	20
Fluoranthene	<0.01	0.1
Phenanthrene	0.02	-
Anthracene	<0.01	-
Acenaphthylene	<0.01	-
Pyrene	<0.01	-
Chrysene	<0.01	-
Fluorene	<0.01	-
Nickel	<5	150
Indeno(123-cd)pyrene	<0.01	0.02
Benzo(ghi)perylene	<0.01	0.02
Copper	7	40
Benzo[a]pyrene	<0.01	0.05
Benzo[a]anthracene	<0.01	0.05
Benzo[k]fluoranthene	<0.01	0.03
Benzo[b]fluoranthene	<0.01	0.03
Boron	20	1000
Cyanide	<5	-
Arsenic	338	25
Mercury	<0.1	1
Selenium	<5	-
Cadmium	<1	5
pH<	8.7	-
Sulphate	3	400000

The above assessment confirms the presence of elevated concentrations of Arsenic when assessed against EQS Freshwater criteria and hence a potential risk to controlled waters is indicated.

11.2 Assessment of Groundwater Hydrocarbon Data

Speciated hydrocarbon results were assessed by comparison with AA-EQS values for inland waters. In case of determinands not covered by AA-EQS values, results were compared to EQS Freshwater Criteria values or where no EQS Freshwater Criterion is available, then WHO guidelines for Drinking Water are adopted.

Table 14: Assessment of Soil Leachate Hydrocarbon Data

Contaminant	WS2 Result (ug/l)	AA-EQS (ug/l)	WHO ug/l
Aromatic EC5-EC7 (benzene)	<1.0	10	10
Aromatic EC7-EC8 (toluene)	<1.0	-	700
Aromatic EC8-EC10 (ethyl benzene)	<5.0	-	300
Aromatic EC10-EC12	<5.0	-	100
Aromatic EC12-EC16	5.4	-	100
Aromatic EC16-EC21	5.5	-	90
Aromatic EC21-EC35	<5.0	-	90
Aliphatic EC5-EC6	<1.0	-	15000
Aliphatic EC6-EC8	<1.0	-	15000
Aliphatic EC8-EC10	13.1	-	300
Aliphatic EC10-EC12	7.2	-	300
Aliphatic EC12-EC16	5.3	-	300
Aliphatic EC16-EC21	<5.0	-	(300)*
Aliphatic EC21-EC35	36.6	-	(300)*

The above assessment confirms that no hydrocarbon fraction exceeds its respective guideline criteria. Hence no risk to controlled waters and/or human health is indicated.

11.3 Summary of Controlled Waters Risk Assessment

The above assessment confirms the presence of elevated concentrations of Arsenic, hence a potential risk to controlled waters is indicated.

Notwithstanding the above assessment, given the absence of nearby sensitive receptors (*i.e. Principal Aquifer, water abstraction points, Source Protection Zones, surface water bodies etc.*) it is considered that the single exceedance poses an insignificant risk to controlled waters.

12.0 POST INVESTIGATION CONCEPTUAL MODEL

Based on the findings of the investigation, a post investigation conceptual model may be constructed illustrating proven pollution linkages and summarising the conceptual remediation recommendations discussed above, as tabulated hereunder.

Table 15: Post Investigation Conceptual Model

Source	Pathway	Receptor	Remedial Options
The above human health risk assessment confirms presence of elevated concentrations of some contaminants, hence a risk to human health is indicated	Oral / ingestion / dermal pathways	Construction workers Future residents (adults / children)	No remedial works required under areas of permanent hard standing. Site levels in proposed rear gardens to be reduced by 600mm below finished garden levels and the levels restored by placement of 600mm clean imported topsoil. Cover placed in all gardens will be undertaken under a strict validation regime comprising a 1nr analyses per 50m³ with a minimum of 4nr analyses per material source. Cover thickness is to be independently validated by excavation and photography for inclusion in a Validation Report. Imported soils are to comply with the analysis criteria contained in Appendix G. In additional to the recommendations given above, as with all developments, disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination insofar as the exposed conditions may have the potential to impact on receptors including inter alia humans, animals, controlled waters, or the fabric of buildings. Any such

		encounters will require the contractor to halt work, isolate the risk area, and summon CCG to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in a detailed site Remediation Report.
--	--	--

13.0 **PRELIMINARY WASTE CLASSIFICATION**

A waste classification exercise was undertaken in relation to potential offsite disposal of excavation arisings. The first stage entailed the assessment of the basic soil contamination data via the **HAZWASTE** online program. The output data from this basic assessment is provided in Appendix H. This program generates the baseline 'Hazardous / Non-Hazardous' classification of soils.

The appended **HAZWASTE** report classifies soils recovered from borehole WS1 to be 'Hazardous' by virtue of elevated concentrations of Total Petroleum Hydrocarbons (TPH) (1680mg/kg). All other soils analysed classify as being 'Non-Hazardous Waste'.

Notwithstanding the above, it should be noted that the final decision on waste classification is at the discretion of the accepting landfill, and it is recommended that consultation with landfill operators be undertaken during the development of the waste management plan.

14.0 **GEOTECHNICAL ASSESSMENT**

14.1 **Introduction**

It is understood that an existing Police Station fronting on to Derby Street is to be retained and modified / converted for residential land use to form 7nr self-contained apartments, with an outbuilding located to the rear of the site being modified / converted to provide 2nr self-contained apartments.

It is further proposed that the land to the rear of the Police Station is to be developed by the construction of 4nr 2.5-storey town houses constructed of traditional brick elevations under pitched roofing materials together with associated newly created hard paved access / egress roadway, off-road car parking facilities and front and rear private gardens.

The proposed site layout is as annotated on **KWL ARCHITECTS** architectural drawings contained herein.

14.2 **Observed Ground Conditions**

This site investigation confirms the presence of bituminous paving and associated sub-base overlying made ground deposits generally comprising grey / brown clayey sands and gravel extending to depths varying between 0.15m - 0.7mbgl. The sequence thereafter continues in natural drift deposits comprising loose silty, locally gravelly, sands and soft becoming firm brown / grey clay deposits extending to depths varying between 1.5m – 2mbgl. Thereafter, the sequence continued in grey weathered mudstone locally interbedded with thin intact coal, recovered as firm becoming stiff clay and locally as dense sands and gravel.

Slight seepages were reported at some borehole positions during the intrusive investigation, with monitored standing water levels being in the order of 2.21m - 2.32mbgl during the ongoing gas – groundwater standpipe monitoring programme.

There was no visual and/or olfactory evidence of contamination and/or biodegradable materials affecting the made ground mass at any sampling position.

14.3 **Foundations**

Reinforced strip foundations may be adopted for the proposed development but taking account of the variability in the shallow ground conditions, it is recommended that foundations of the new houses bear on the underlying weathered mudstone / siltstone formations at a notional depth of 2mbgl. Foundations set at this depth may be designed on a Presumed Bearing Value of 140kN/m².

It is important that all foundation excavations be inspected by a competent ground engineer to ensure that the predicted founding strata has been encountered.

Foundation should comprise of strips if minimum thickness 300mm and be reinforced in the bottom third by A393 mesh.

Given the variable densities of shallow drift deposits and given the presence of some organic content in shallow clay deposits, as identified in boreholes WS2 and WS3, it is recommended that fully suspended passively vented block and beam floors incorporating Basic Radon protective measures be adopted.

Notwithstanding the above, taking into account the above CMRA, and given the potential for historical shallow underground coal mining activities, since there is a potential risk of surface instability at this site it is therefore recommended that a further intrusive investigation be carried out to probe for the presence / absence of mine related voids and/or broken ground at locations as annotated on **PRIMA GROUP** Drawing No. 102-013 'Existing & Proposed Site Plan' contained herein. The findings of the investigation should be used in the preparation of a further interpretative report assessing the actual risks of surface instability, and if appropriate, making recommendations for preconstruction remedial works.

14.5 Excavations

Excavations in the observed made ground and natural drift soils may be undertaken by light hydraulic excavators. Excavations in excess of 1.2mbgl will require side support.

14.6 Groundwater Management

Slight seepages were reported at some borehole positions, with monitored standing water levels being in the order of 2.21m - 2.32mbgl during the ongoing gas – groundwater standpipe monitoring programme. Hence, a prudent contractor would allow for some pumping to maintain dry working conditions during foundation construction and/or service installations, particularly during periods of heavy / prolonged periods of precipitation.

15.0 SUMMARY CONCLUSIONS

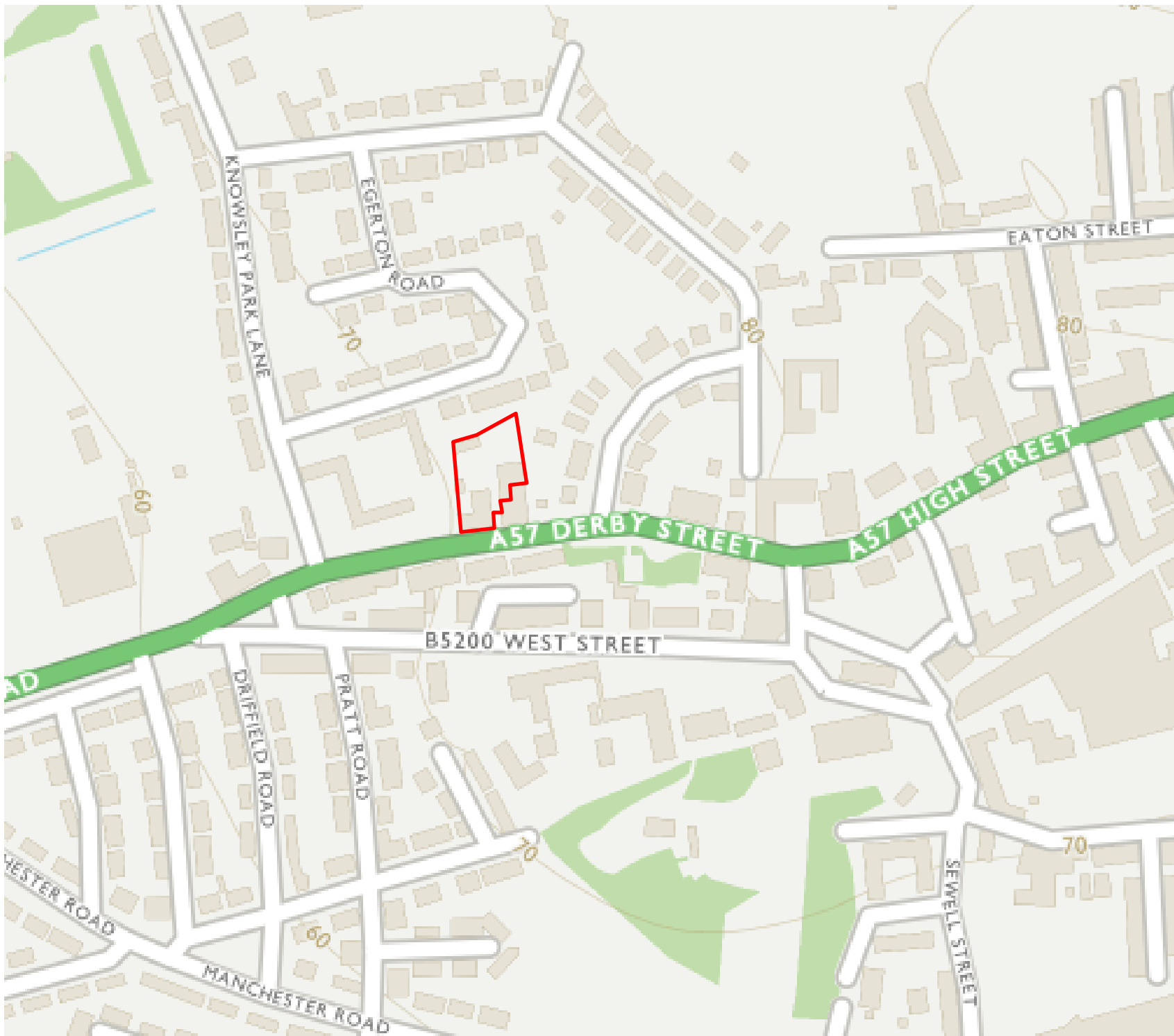
The recommendations hereunder are based on the salient sections of the report and should not be referred to in isolation of the relevant sections of the report. All recommendations are subject to Regulatory Local Authority review.

Table 17: Summary of Conclusions

Soil Contamination & Remediation	No remedial works required under areas of permanent hard standing.
	Site levels in proposed rear garden to be reduced by 600mm below finished garden levels and the levels restored by the placement of 600mm clean imported topsoil.
Controlled waters	Cover placed in all gardens will be undertaken under a strict validation regime comprising a 1nr analyses per 50m ³ with a minimum of 4nr analyses per material source.
	Cover thickness is to be independently validated by excavation and photography for inclusion in a Validation Report.
Water Mains	Imported soils are to comply with the analysis criteria contained in Appendix G.
	In additional to the recommendations given above, as with all developments, disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination insofar as the exposed conditions may have the potential to impact on receptors including inter alia humans, animals, controlled waters, or the fabric of buildings. Any such encounters will require the contractor to halt work, isolate the risk area, and summon CCG to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in a detailed site Remediation Report.
Preliminary Waste Classification	The above assessment confirms the presence of elevated concentrations of Arsenic, hence a potential risk to controlled waters is indicated.
	Notwithstanding the above assessment, given the absence of nearby sensitive receptors (<i>i.e. Principal Aquifer, water abstraction points source protection zones nearby water courses etc.</i>) and given that the impacted soils will be removed during site preparation works to allow for foundation construction and/or service installations, it is considered that the slight exceedance pose an insignificant risk to controlled waters.
Preliminary Waste Classification	The preliminary findings indicate that the soil concentrations of pertinent hydrocarbon contaminant species are above the threshold concentrations specified by the UKWIR, indicating that normal Protecta Line (PE/AL/PE) water mains may be deployed. Good practice requires that alkathene mains be laid in a remediated alignment comprising of clean granular fill extending to 600mm + pipe diameter and to 300mm below pipe underside.
	Pipes should be laid in accordance with BS EN 12201-2 'Plastic piping systems for water supply, and for drainage and sewerage under pressure as stated in UKWIR guidance.
Preliminary Waste Classification	It should be noted that this recommendation is subject to the opinion of the water supplier, and in this instance the local water authority (United Utilities) must be consulted to confirm that the proposals above accord with their interpretation of current guidance.
	The appended Hazwaste report classifies soils recovered from borehole WS1 to be 'Hazardous' by virtue of elevated concentrations of Total Petroleum Hydrocarbons (TPH) (1680mg/kg). All other soils analysed classify as being 'Non-

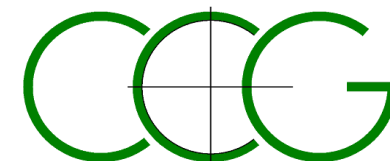
Concrete specification	<i>Hazardous Waste’.</i>
	Notwithstanding the above, it should be noted that the final decision on waste classification is at the discretion of the accepting landfill, and it is recommended that consultation with landfill operators be undertaken during the development of the waste management plan.
	Concrete in the ground should be specified to conform to the compositional requirements of DC-1 as defined in BRE Special Digest 1: 2005
Gas Risk Assessment	After 6nr round of monitoring, a Gas Screening Value (GSV) of 0.0001l/hrs is calculated for CO ₂ , and <0.0001l/hr for CH ₄ .
	Using these GSV values, the risk to the proposed development was assessed in line with Situation A as defined in CIRIA C665, and on this basis the site complies with Characteristic Situation 1 (CS1) and based on this classification gas protection measures are not required.
	Notwithstanding the above assessment, current radon mapping (https://www.ukradon.org/information/ukmaps) (accessed 26 th April 2024) shows the site to be within an area where it is believed that between 3-5%.of the properties within the area are affected by Radon, consequently Basic Radon protective measures are required for all new buildings in contact with the ground.
Foundation Design	See Section 14.0 for fuller discussion
Floor Slabs	See Section 14.0 for fuller discussion
Groundwater Control	Slight seepages were reported at some borehole positions, with monitored standing water levels being in the order of 2.21m - 2.32mbgl during the ongoing gas – groundwater standpipe monitoring programme. Hence, a prudent contractor would allow for some pumping to maintain dry working conditions during foundation construction and/or service installations, particularly during periods of heavy / prolonged periods of precipitation.
Excavations	Light hydraulic excavators may Excavations in the observed made ground and natural drift soils may be undertaken by light hydraulic excavators.
	Excavations in excess of 1.2mbgl will require side support.
Further work	• Prepare Phase III Remediation Strategy Report • Prepare Phase IV Validation Report • Undertake intrusive mining investigation – see below
Ground Stability	The referenced Coal Mine Risk Assessment confirms there is a potential for the presence of historical shallow coal mining activities beneath the site, hence the client is advised to commission a ground stability assessment
	Following the procurement of a Coal Authority permit to drill in productive coal measures, it is recommended that 3nr boreholes be sunk to a notional depth of 30mbgl using rotary open hole drilling methods to determine the presence / absence of mine related voids and/or broken ground with boreholes being grouted to rock head level on completion of works.
	It is further recommended that each borehole be monitored for mine related gases during fieldworks.
	The proposed location of the mining boreholes are annotated on PRIMA GROUP Drawing No. 102-013 ‘Existing & Proposed Site Plan’ contained herein.

APPENDIX A: DRAWINGS



DO NOT SCALE

Notes: Study Site



CC GEOTECHNICAL LIMITED
UNIT 1 DELTIC WAY
KNOWSLEY INDUSTRIAL ESTATE
LIVERPOOL
L33 7BA
0151 545 2750

Client:
Prima Group

Project:
Phase I-II Geoenvironmental Report for Land at
Former Prescott Police Station, Derby Road

Title:
Aerial Photograph

Scale:
NTS

Issue:
01

Drawn by:
DG

Date:
August 2021

Project No.
CCG-C-21-12518

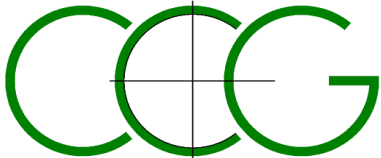
Drawing No.
01

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DO NOT SCALE

Notes: Study Site



CC GEOTECHNICAL LIMITED
UNIT 1 DELTIC WAY
KNOWSLEY INDUSTRIAL ESTATE
LIVERPOOL
L33 7BA
0151 545 2750

Client:
Prima Group

Project:
Phase I-II Geoenvironmental Report for Land at
Former Prescott Police Station, Derby Road

Title:
Aerial Photograph

Scale:
NTS

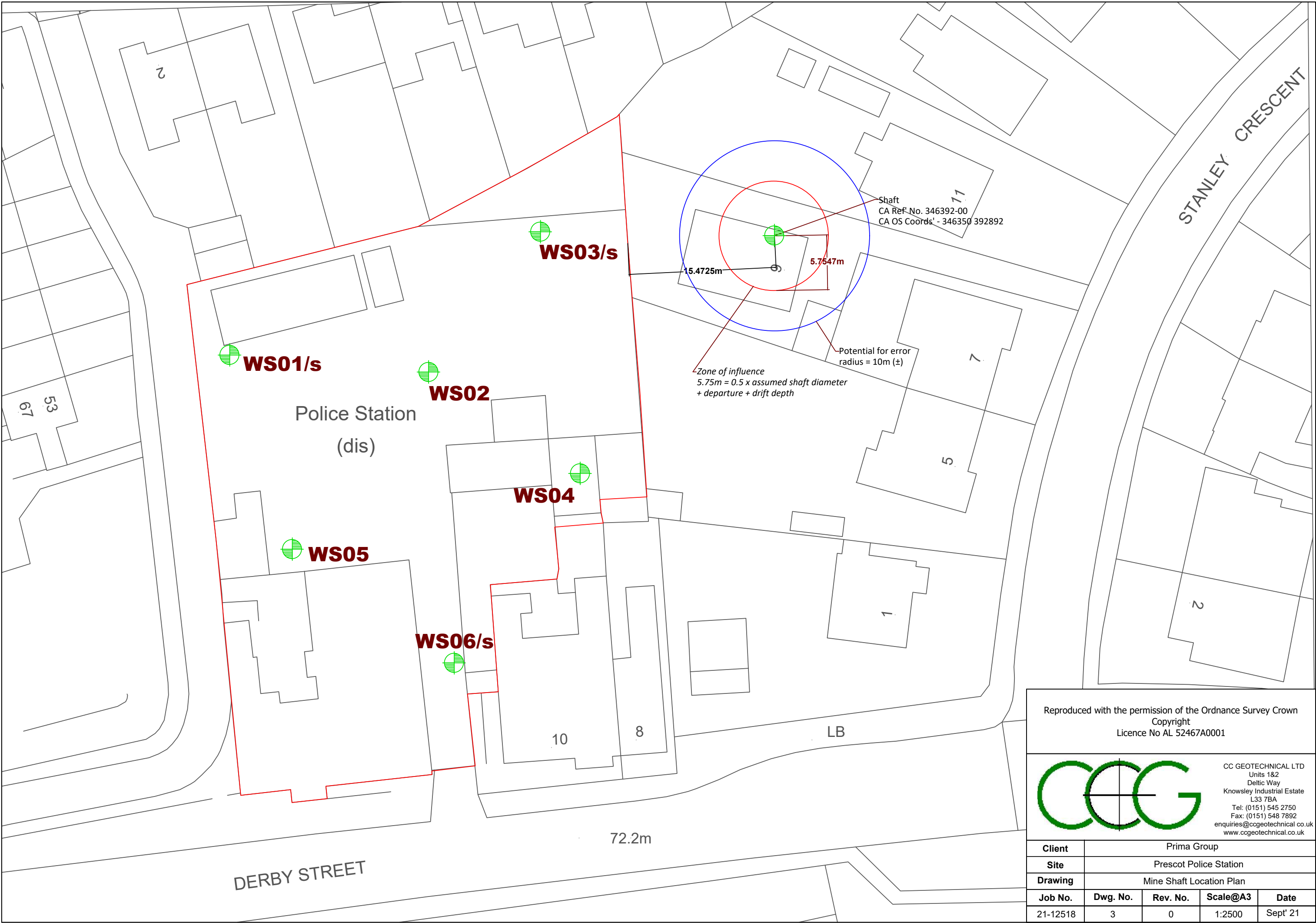
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Drawn by:
DG

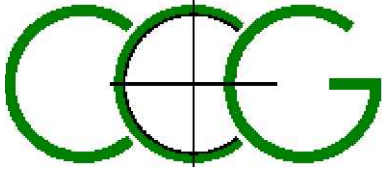
Date:
August 2021

Project No.
CCG-C-21-12518

Drawing No.
02

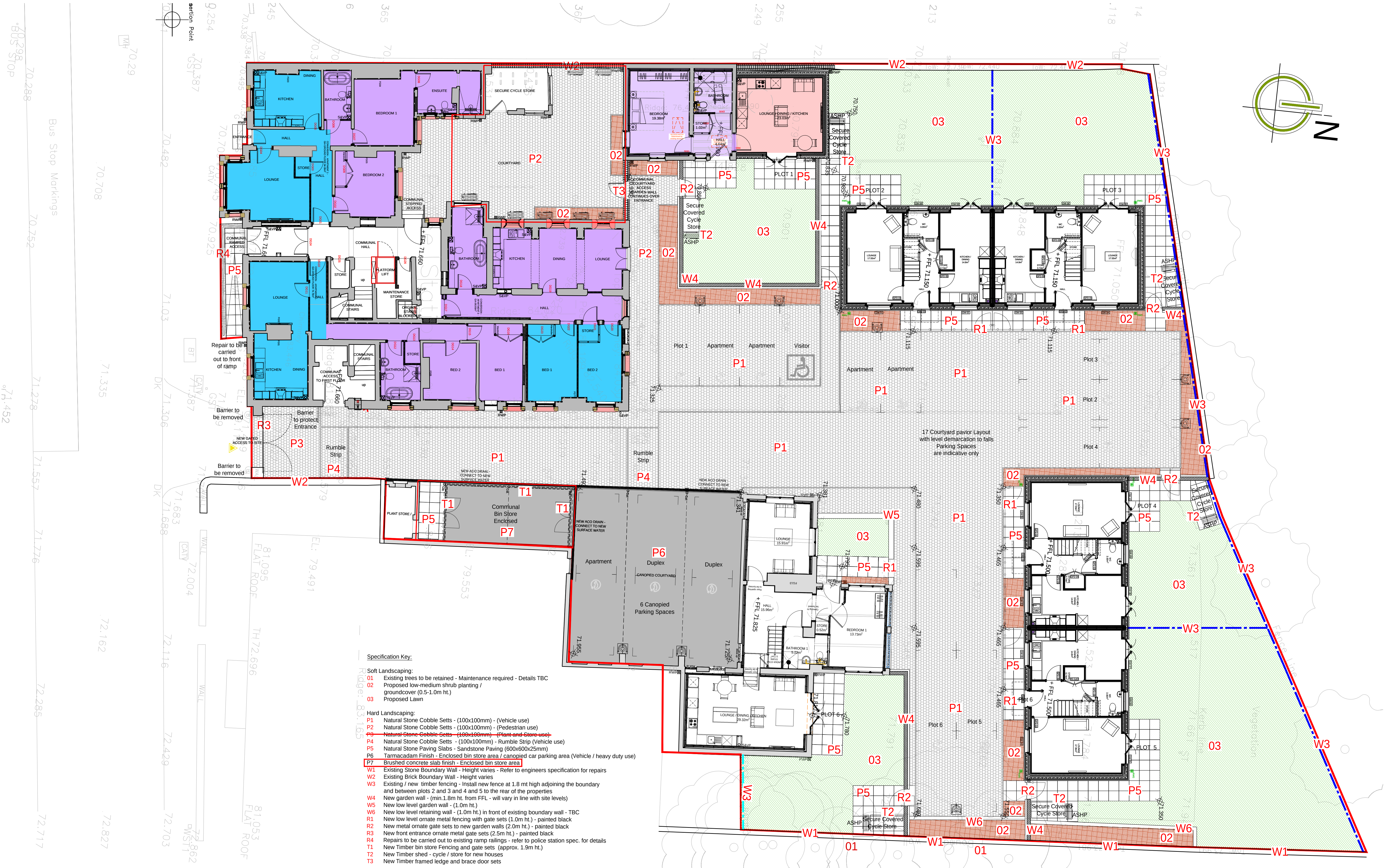


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Client	Prima Group			
Site	Prescot Police Station			
Drawing	Mine Shaft Location Plan			
Job No.	Dwg. No.	Rev. No.	Scale@A3	Date
21-12518	3	0	1:2500	Sept' 21



Specification Key:

Soft Landscaping:

- 01 Existing trees to be retained - Maintenance required - Details TBC
- 02 Proposed low-medium shrub planting / groundcover (0.5-1.0m ht.)
- 03 Proposed Lawn

Hard Landscaping:

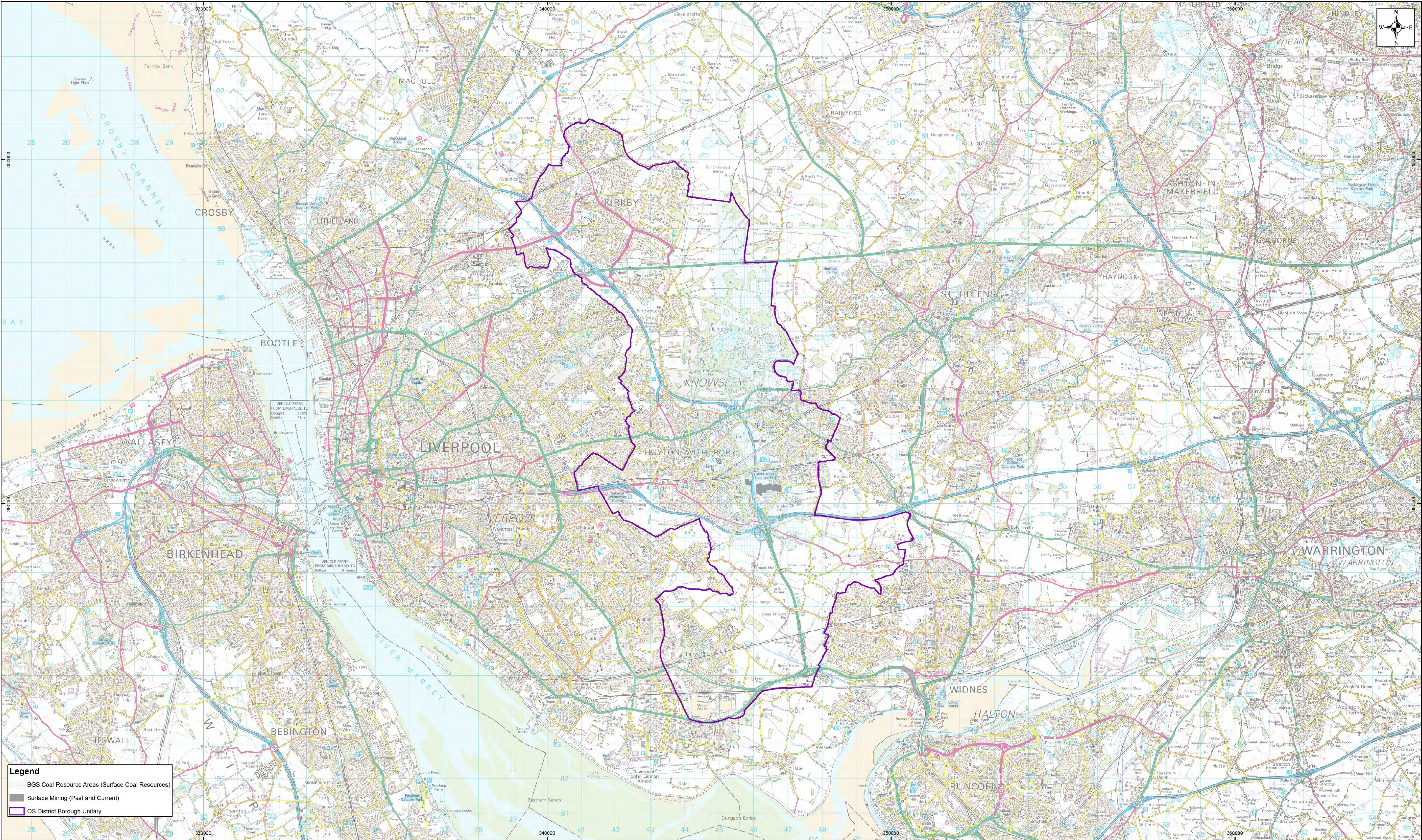
- P1 Natural Stone Cobble Setts - (100x100mm) - (Vehicle use)
- P2 Natural Stone Cobble Setts - (100x100mm) - (Pedestrian use)
- ~~P3 Natural Stone Cobble Setts - (100x100mm) - (Plant and Store use)~~
- P4 Natural Stone Cobble Setts - (100x100mm) - Rumble Strip (Vehicle use)
- P5 Natural Stone Paving Slabs - Sandstone Paving (600x600x25mm)
- P6 Tarmacadam Finish - Enclosed bin store area / canopied car parking area (Vehicle / heavy duty use)
- P7 Brushed concrete slab finish - Enclosed bin store area
- W1 Existing Stone Boundary Wall - Height varies - Refer to engineers specification for repairs
- W2 Existing Brick Boundary Wall - Height varies
- W3 Existing / new timber fencing - Install new fence at 1.8 mt high adjoining the boundary and between plots 2 and 3 and 4 and 5 to the rear of the properties
- W4 New garden wall - (min.1.8m ht. from FFL - will vary in line with site levels)
- W5 New low level garden wall - (1.0m ht.)
- W6 New low level retaining wall - (1.0m ht.) in front of existing boundary wall - TBC
- R1 New low level ornate metal fencing with gate sets (1.0m ht.) - painted black
- R2 New metal ornate gate sets to new garden walls (2.0m ht.) - painted black
- R3 New front entrance ornate metal gate sets (2.5m ht.) - painted black
- R4 Repairs to be carried out to existing ramp railings - refer to police station spec. for details
- T1 New Timber bin store Fencing and gate sets (approx. 1.9m ht.)
- T2 New Timber shed - cycle / store for new houses
- T3 New Timber framed ledge and brace door sets

Revision	Date	Description	Drawn
Rev A	30.06.2025	Adjusted levels to suit existing boundary walls adjoining Plot 1 and 2. Separated Outbuilding 1 ASHP unit from the courtyard.	JT
Rev B	30.06.2025	Material finishes added and additional planting beds.	JT
Rev C	12.06.2025	Added schedules and key plan to site plan.	JT
Rev D	15.09.2025	Garden wall heights amended.	JT
Rev E	09.10.2025	Changed specification of under canopy surface finish from cobbled paving to TarmacadamGarden wall heights amended.	JT
Rev F	21.10.2025	Boundary wall type W3 added to plan. Removed P3 from schedule, added P7 to bin store area as in schedule of works, existing courtyard plant store is new cycle store.	JT

Client	PRIMA
Project	FORMER SITE OF PRESCOT POLICE STATION, DERBY STREET, PRESCOT
Drawing	SITE - PROPOSED SITE PLAN

Scale	Date	Drawn	Checked
1:100 @ A1	30.01.2025	JT	RJS
Job No.	Dwg No.	Revision	Status
5388	T212	F	TENDER

Knowsley District (B) - Surface Coal Resource



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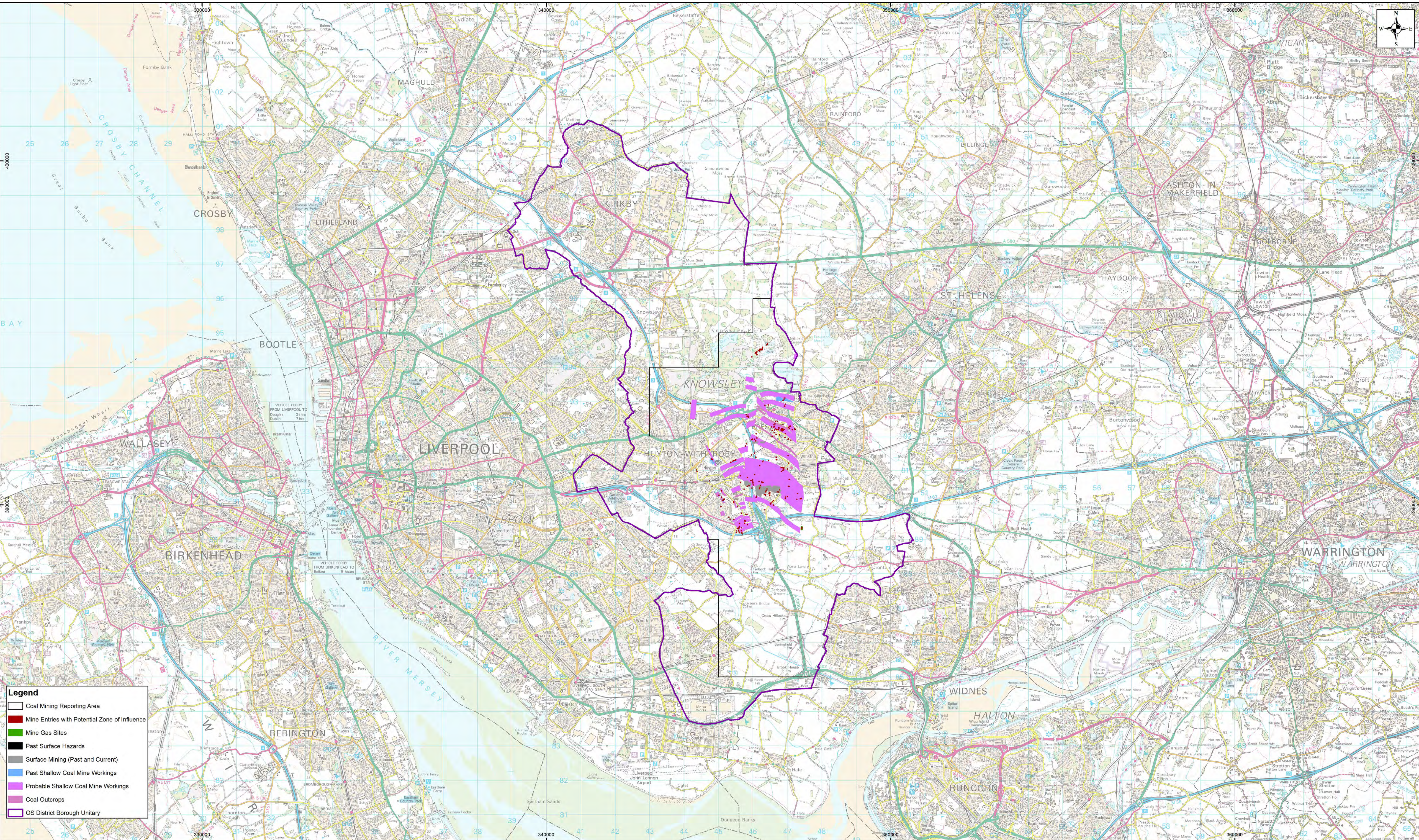
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Knowsley District (B) - Specific Risk



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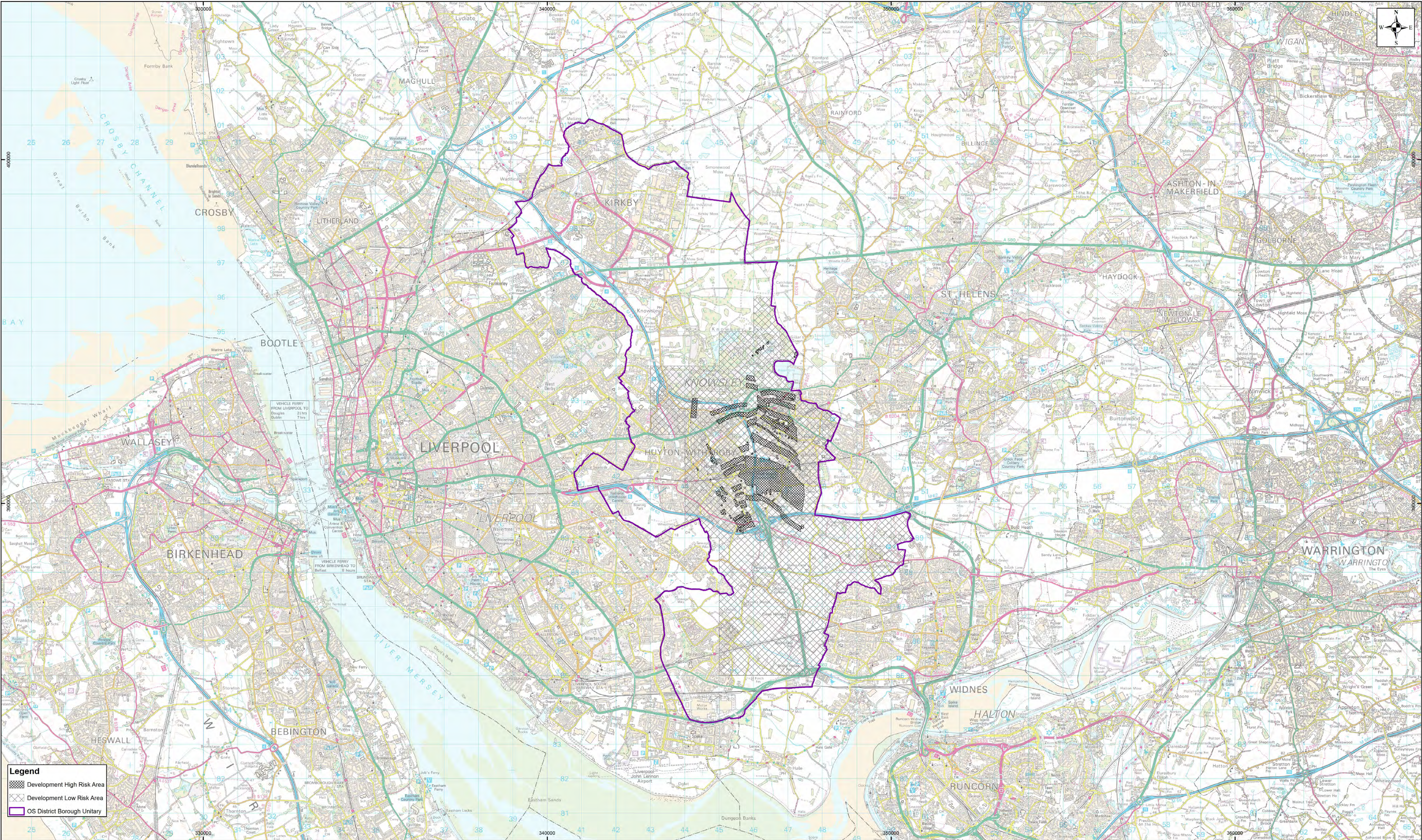
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Published on: 12/06/2014



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Knowsley District (B) -Development Risk



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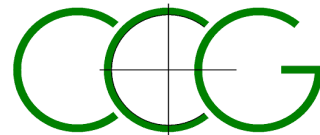
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Published on: 06/08/2014



The Coal
Authority

APPENDIX B: SAMPLING METHODOLOGIES



SAMPLING, SAMPLE TRANSPORTATION, AND FIELD MONITORING PROTOCOLS

Soil, water and gas sampling and monitoring methodologies employed by **CC GEOTECHNICAL LTD** are presented hereunder.

SAMPLING OF SOIL FOR CHEMICAL ANALYSIS

Soil samples may be recovered from a variety of intrusive investigation methods including *inter alia* dynamic sampling boreholes, cable percussion boreholes, machine or manual excavation of trial pits.

All equipment which has the potential to introduce extraneous materials into soils – borehole casings, sampling drilling rods, borehole sampling tools, hand tools such as trowels and spades etc. – must be cleaned by jet washing before initial use and between sampling positions.

Cable Percussion Boreholes

In this method of investigation disturbed bulk and small disturbed samples are recovered at regular depth increments throughout the length of the borehole. Each bulk/small disturbed sample is uniquely labelled with the Project Name / Project No / Borehole No / Depth / Date. Where possible, samples are immediately scanned by PID.

Light Dynamic Sampling Boreholes

In this method of investigation samples are recovered in relatively undisturbed 1m long Perspex liners. Each liner is uniquely labelled with the Project Name / Project No / Borehole No / Depth / Date. The liner tubes are sealed by air tight caps fitted at each end, and are temporarily stored out of sunlight. Where possible, samples are immediately split, scanned by PID, logged and subsampled. In the event that splitting and logging on site is not practicable, then the liners are immediately transported to the laboratory where they are immediately split, scanned by PID, logged and subsampled.

Trial Pits

Samples are to be taken from the bucket of an excavator and placed in appropriate airtight containers. Each container is uniquely labelled with the Project No / Trial Pit No / Depth / Date. The samples are then immediately placed in a cool box chilled by ice packs, and the boxes are sealed for transportation to the chemical laboratory.

Sampling Containers

Containers used to store soil samples are selected dependant on the required analysis. The testing laboratory will be consulted should there be any doubt as to the correct sampling container. Typically, a minimum of 1nr 1kg plastic tub, 1nr 500g plastic tub, 1nr 250g amber glass jar and 2nr glass vials are taken at each sample depth. Samples held on site awaiting same day courier collection are stored at 4°C in a cool box. Only in circumstances where same day collection cannot be arranged are samples held overnight, and in this event all samples are refrigerated at 4 °C either on site (if a refrigerator is available) or at CC GEOTECHNICAL soil laboratory. Courier collection is then arranged for immediate pick up the following day.

Chain of Custody records

A Chain of Custody Record (CoC) is to be sent with each batch of samples submitted to the testing laboratory. A copy of the CoC will be made available for inspection by the client, their agents, or any requesting regulatory authority.

HEADSPACE ANALYSES

Duplicate subsamples of all soil samples selected for laboratory analysis may be taken for headspace analyses.

Headspace analysis is undertaken using a MiniRae 2000 Photo Ionisation Detector (PID). In the test method, an amber glass jar is half filled with soil, and the lid is sealed with aluminium foil secured by an elastic band. The jar and contents are agitated for 30 seconds and left for a minimum of 30 minutes out of direct sunlight for the headspace to achieve equilibrium. The PID then pierces the seal and the maximum reading is recorded. Prevailing weather conditions and ambient air temperature are also recorded.

The PID headspace results are recorded on the exploratory borehole or trial pit logs.

PID headspace data is then used to inform the chemical testing schedule for volatile organic compounds analyses.

SAMPLING OF GROUNDWATER FOR CHEMICAL ANALYSIS

Groundwater is sampled from standpipes or piezometers installed during borehole drilling. On completion of the construction of the standpipe, the installation is initially developed by removing up to 10 x the internal volume of the

installation. The volume of water purged is recorded. The installation is then typically left for a week for hydraulic equilibrium to be restored.

Prior to sampling the standpipe, the depth to the water table, and the depth to the base of the installation are monitored using an electronic dipmeter. In circumstances where free phase product is suspected to be present, then an 'Interface Meter' is used to determine the free phase film thickness.

A minimum of 3 x the installation volume is then removed. The pH of the water is then monitored and the sample is taken when the change in pH between any two consecutive extracts is less than 10%. The volume of water removed is recorded.

A sample comprises of a minimum of 3 litres. Two litres are taken in amber glass bottles, and one litre in a plastic bottle.

To avoid cross-contamination one bailer is used per position.

The samples are uniquely labelled with Project Name / Project No / Borehole No / Depth / Date Sampled. They are placed in a cool box chilled by ice packs, and the containers are sealed for transportation to the laboratory.

Once the samples are received in the **CC GEOTECHNICAL LTD** laboratory, the samples are stored in a refrigerator and returned to the cool boxes once collected.

Water taken from the installations are taken back to the **CC GEOTECHNICAL LTD** laboratory and disposed.

Other data recorded in the sampling comprises:

- Volume of water removed during development of well
- Volume of water removed during purging of the well
- Results of on-site pH analyses
- Sample appearance – colour, suspended solids

MONITORING OF GAS

Prior to embarking on a gas-monitoring round, all equipment is checked for functionality and the calibration status is confirmed.

At the commencement of the monitoring round, the prevailing weather conditions, air temperature, barometric pressure and direction of movement of barometric pressure are recorded.

The flow meter is first attached to the standpipe valve, and the flow rate is measured (peak and steady flow) for 1 minute. The results are recorded in l.hr^{-1} . The flow meter tube is protected from the effects of wind by aligning the exhaust downwind.

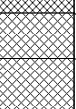
Following measurement of borehole flow rate, the installation is left for a minimum of 10 minutes for the headspace to restore equilibrium.

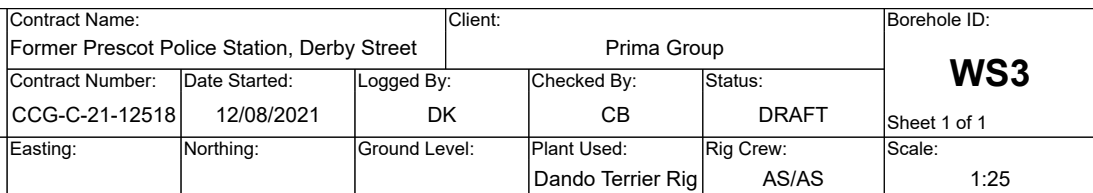
Once the gas in the installation has regained equilibrium, the gas analyser is connected and monitoring commences. The peak and steady state readings for CH_4 , CO_2 , CO , H_2S and CO are recorded. The steady state is monitored for a minimum of one minute, and possibly up to a maximum of 10 minutes where fluctuations continue.

When the monitoring is complete, the depth to the water table, and the depth to the base of the well are monitored using an electronic dipmeter. In circumstances where free phase product is suspected to be present, then an 'Interface Meter' is used to determine the free phase film thickness.

APPENDIX C: BOREHOLE LOGS

	Contract Name: Former Prescott Police Station, Derby Street			Client: Prima Group			Borehole ID: WS1						
	Contract Number: CCG-C-21-12518	Date Started: 12/08/2021	Logged By: DK	Checked By: CB	Status: DRAFT		Sheet 1 of 1						
Dynamic Sampling Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: Dando Terrier Rig	Rig Crew: AS/AS/	Scale: 1:25							
	Weather:		Termination:		SPT Hammer: N/R, Energy Ratio: N/R								
Samples & In Situ Testing			Strata Details					Groundwater					
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		Water Strike	Backfill/ Installation				
0.00 - 1.00	U	SPT(S)N=5 (4,2/3,1,0,1)		0.05	  	TARMAC	1						
0.50	ES			0.25		Black very sandy GRAVEL. Gravel is fine to medium sub-angular cinders and brick (MADE GROUND)							
				0.45		Dark brown very clayey gravelly SAND. Gravel is fine to coarse sub-angular sandstone, cinders and brick (MADE GROUND)							
1.00 - 2.00	U	SPT(S)N=4 (1,0/1,0,1,2)		(1.55)		Loose reddish brown sandstone GRAVEL	2						
2.00 - 3.00	U					2.00				Grey / brown weathered MUDSTONE recovered as soft becoming stiff gravelly slightly sandy silty friable clay			
						(1.00)							
		SPT(S)N=39 (7,7/9,8,9,13)		3.00		End of Borehole at 3.00m	3						
							4						
							5						
Start & End of Shift Observations			Borehole Diameter		Casing Diameter		Remarks:						
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1 hour hand excavating 1.20mbgl service avoidance pit				
Chiselling					Installation				Water Strikes				
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
				0.00	0.50	PLAIN							
				0.50	3.00	SLOTTED							
CC GEOTECHNICAL LTD 0151 545 2750 www.ccgeotechnical.com													

	Contract Name: Former Prescott Police Station, Derby Street				Client: Prima Group			Borehole ID: WS2		
	Contract Number: CCG-C-21-12518		Date Started: 12/08/2021		Logged By: DK		Checked By: CB		Status: DRAFT	
	Easting:		Northing:		Ground Level:		Plant Used: Dando Terrier Rig		Rig Crew: AS/AS	
Dynamic Sampling Borehole Log								Scale: 1:25		
Weather:				Termination:				SPT Hammer: N/R, Energy Ratio: N/R		
Samples & In Situ Testing				Strata Details					Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description			Water Strike	Backfill/ Installation
0.00 - 1.00	U			0.05		TARMAC				
				0.20		Dark grey sandy GRAVEL. Gravel is fine to coarse sub-angular limestone (MADE GROUND)				
				(0.30)		Black sandy GRAVEL. Gravel is fine to medium sub-angular cinders (MADE GROUND)				
0.50	ES			0.50		Dark grey sandy slightly silty organic CLAY				
				(0.40)						
				0.90		Light brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub-angular mudstone and siltstone				
1.00 - 2.00	U	SPT(S)N=6 (1,0/1,0,3,2)		(0.30)					1	
		HVP=110		1.20		Loose light greyish brown sandy clayey SILT with frequent pockets of sand				
		HVP=100		(0.70)						
2.00 - 2.60	U	SPT(S)N=18 (4,4/4,5,4,5)		1.90		Grey /brown weathered SILTSTONE recovered at the surface as medium dense becoming dense gravelly clayey silt			2	
				(0.70)						
		SPT(S)50 (25 for 110mm/50 for 170mm)		2.60		End of Borehole at 2.60m				
									3	
									4	
									5	
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1 hour hand excavating 1.20mbgl service avoidance pit	
Chiselling					Installation				Water Strikes	
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)
								1.80		
								0		
CC GEOTECHNICAL LTD 0151 545 2750 www.ccgeotechnical.com										



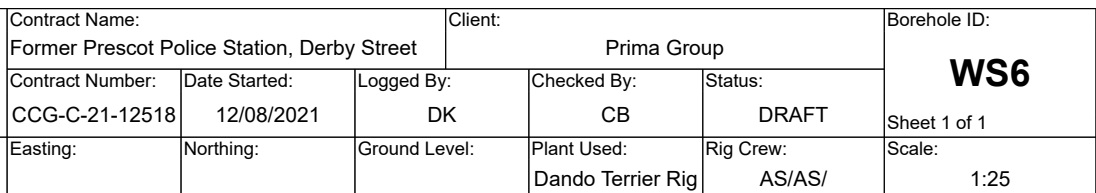
Samples & In Situ Testing	Strata Details	Groundwater
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[illegible]

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)						
1 hour hand excavating 1.20mbgl service avoidance pit														
Water Strikes														
Chiselling					Installation				Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)				0		Borehole dry
					0.00	0.50	PLAIN							
					0.50	2.50	SLOTTED							
CC GEOTECHNICAL LTD 0151 545 2750 www.ccgeotechnical.com														

	Contract Name: Former Prescott Police Station, Derby Street				Client: Prima Group			Borehole ID: WS4			
	Contract Number: CCG-C-21-12518		Date Started: 12/08/2021		Logged By: DK		Checked By: CB		Status: DRAFT		
	Easting:		Northing:		Ground Level:		Plant Used: Dando Terrier Rig		Rig Crew: AS/AS		
Dynamic Sampling Borehole Log								Scale: 1:25			
Weather:				Termination:				SPT Hammer: N/R, Energy Ratio: N/R			
Samples & In Situ Testing				Strata Details					Groundwater		
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description			Water Strike	Backfill/ Installation	
0.00 - 1.00	U	SPT(S)N=11 (1,2/3,3,3,2)		0.10		Grey GRAVEL. Gravel is fine to coarse sub-angular limestone and tarmac (MADE GROUND)			1		
0.50	ES			(0.80)		Brown slightly sandy silty CLAY					
1.00 - 2.00	U			0.90		Firm grey slightly sandy silty CLAY					
				1.35		Medium dense brown very clayey GRAVEL. Gravel is fine to medium sub-angular to sub-rounded mudstone			2		
				1.50		Firm grey slightly sandy silty friable CLAY (possible weathered MUDSTONE)					
				(0.50)							
2.00 - 2.70	U	SPT(S)N=22 (3,4/4,4,7,7)		2.00		Grey weathered MUDSTONE recovered at the surface as medium dense becoming dense clayey sands and gravel			3		
						(0.70)					
						2.70	End of Borehole at 2.70m				
		SPT(S)50 (25 for 125mm/50 for 165mm)							4		
									5		
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:		
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1 hour hand excavating 1.20mbgl service avoidance pit		
Chiselling					Installation				Water Strikes		
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	
								1.70			
								0			
CC GEOTECHNICAL LTD 0151 545 2750 www.ccgeotechnical.com											

	Contract Name: Former Prescott Police Station, Derby Street			Client: Prima Group			Borehole ID: WS5													
	Contract Number: CCG-C-21-12518	Date Started: 12/08/2021	Logged By: DK	Checked By: CB	Status: DRAFT		Sheet 1 of 1													
Dynamic Sampling Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: Dando Terrier Rig	Rig Crew: A/AS	Scale: 1:25														
	Weather:		Termination:		SPT Hammer: N/R, Energy Ratio: N/R															
Samples & In Situ Testing			Strata Details					Groundwater												
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		Water Strike	Backfill/Installation											
0.00 - 1.00	U	SPT(S)N=7 (1,2/1,2,2,2)		0.05		TARMAC	1													
			0.20	Dark grey sandy GRAVEL. Gravel is fine to coarse sub-angular cinders, limestone and tarmac (MADE GROUND)																
0.50	ES		(0.50)	Dark brown very clayey very gravelly SAND. Gravel is fine to coarse sub-angular sandstone and brick (MADE GROUND)																
			0.70		Brown slightly sandy slightly gravelly silty CLAY with frequent pockets of sand. Gravel is fine to medium sub-angular to sub-rounded sandstone															
			(0.45)																	
1.00 - 2.00	U	SPT(S)N=20 (4,3/5,4,4,7)		1.15		Soft grey slightly sandy silty CLAY with occasional pockets of coal gravel	2													
			1.60	Dark grey clayey GRAVEL. Gravel is fine to coarse mudstone																
			(0.40)																	
2.00 - 3.00	U		2.00		Grey weathered MUDSTONE recovered at the surface as stiff gravelly clay															
			(0.45)																	
		2.45		Black intact COAL recovered as sands and gravel	3															
		2.60		Grey weathered MUDSTONE recovered at the surface as dense clayey gravel																
		(0.40)																		
		SPT(S)N=50 (4,8/50 for 255mm)		3.00	End of Borehole at 3.00m		4													
							5													
Start & End of Shift Observations			Borehole Diameter		Casing Diameter		Remarks:													
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1 hour hand excavating 1.20mbgl service avoidance pit											
Chiselling					Installation															
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)													
Water Strikes <table border="1"> <tr> <th>Strike (m)</th> <th>Casing (m)</th> <th>Sealed (m)</th> <th>Time (mins)</th> <th>Rose to (m)</th> <th>Remarks</th> </tr> <tr> <td>2.50</td> <td></td> <td></td> <td>0</td> <td></td> <td></td> </tr> </table>									Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	2.50			0		
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks															
2.50			0																	
CC GEOTECHNICAL LTD 0151 545 2750 www.ccgeotechnical.com																				



Weather:	Termination:	SPT Hammer: N/R, Energy Ratio: N/R
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Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.00	U	SPT(S)N=16 (1,3/4,4,4,4)		0.05		TARMAC	1	
0.50	ES			0.25		Dark grey GRAVEL. Gravel is fine to medium sub-angular cinders and limestone (MADE GROUND)		
				(0.30)		Dark brown very clayey gravelly SAND. Gravel is fine to coarse sub-angular brick, cinders and sandstone (MADE GROUND)		
				0.55		Medium dense brown very gravelly silty SAND with occasional pockets of clay. Gravel is fine to coarse sub-angular siltstone and sandstone		
1.00 - 2.00	U			SPT(S)N=39 (4,3/4,6,12,17)	(1.30)			
2.00 - 2.80	U	1.85			Dense grey slightly sandy GRAVEL. Gravel is fine to coarse sub-angular sandstone			
		(0.55)						
		SPT(S)N=50 (10,13/50 for 260mm)	2.40		Brown / grey weathered SILTSTONE recovered at the surface as dense silty GRAVEL	3		
			(0.40)					
			2.80		End of Borehole at 2.80m		4	
							5	

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1 hour hand excavating 1.20mbgl service avoidance pit					
									Water Strikes					
Chiselling					Installation				Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	2.50			0		
					0.00	0.50	PLAIN							
					0.50	2.80	SLOTTED							
CC GEOTECHNICAL LTD 0151 545 2750 www.ccgeotechnical.com														

APPENDIX D: GAS – GROUNDWATER MONITORING

GAS AND WATER MONITORING RESULTS



	Date:	19-Aug-21	23-Aug-21	06-Sep-21	06-Oct-21	25-Oct-21	13-Nov-21						
	Visit Number	1	2	3	4	5	6						
	Atmos Press mb	1004	1030	1023	1008	1012	1035						
	Pressure Trend	Steady	Steady	Steady	Steady	Steady	Steady						
	Air Temp °C	16	17	20	12	11	6						
	Cloud cover	Overcast	Overcast	Partial cloud	High white clouds	Partial cloud	Overcast						
	Wind velocity	Light breeze	Light breeze	Light breeze	Light breeze	Light breeze	Breezy						
	Precipitation	Rain	Dry	Dry	Dry	Dry	Dry						
	State of Ground	Wet	Dry	Dry	Dry	Dry	Dry						
WS1	CH ₄ (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO ₂ (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	O ₂ (%):	20.0	20.2	20.0	20.2	20.2	20.3						
	H ₂ S (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	PID (ppm):	0.0	0.0	0.0	0.0	0.0	0.00						
	Flow (l/hr):	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
WS3	Water Level (mbgl):	2.32	2.33	2.34	1.96	1.97	1.99						
	CH ₄ (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO ₂ (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	O ₂ (%):	20.0	20.2	20.0	20	20.0	20.1						
	H ₂ S (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	PID (ppm):	0.0	0.0	0.0	0.0	0.0	0.0.1						
WS6	Flow (l/hr):	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
	Water Level (mbgl):	2.21	2.21	2.21	2.32	2.33	2.4						
	CH ₄ (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO ₂ (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	O ₂ (%):	20.1	20.1	20.1	20	20.1	20.2						
	H ₂ S (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	PID (ppm):	0.0	0.0	0.0	0.0	0.0	0.0						
	Flow (l/hr):	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
	Water Level (mbgl):	2.21	2.21	2.21	2.32	2.33	2.4						

CCG-CMS-FO-129

Issue 2

Job No: CCG-C-21-12517

Site: Former Prescott Police Station

Instrument:

GFM436

TEST DATE AND CONDITIONS			
Date		09/03/2021	
Atmospheric Pressure Ambient Temperature EnviroNics Serial No.		1001	mB
		22.3	°C
		5089	

**GFM436 Final Inspection & Calibration
Check Certificate**

GAS DATA LTD

Unit 4, Fairfield Court

Seven Stars Estate

Wheler Rd

Coventry

CV3 4LJ

Tel 02476303311

Fax 02476307711



Customer	C C Geotechnical
Certificate Number	122336
Order Number	327973

Serial Number	12667
Software Version	G436-00.0027/0010

Recalibration DUE Date
09/03/22

Instrument Checks					
Keyboard	✓		Display Contrast	✓	
Pump Flow In	450	Accept > 200 cc/min	Pump Flow @ -200mB	300	Accept > 200 cc/min
Clock Set / Running	✓		Labels Fitted	✓	

Gas Checks						
Sensor	CH ₄		CO ₂		O ₂	
	Instrument Gas	True Gas Value %	Instrument Gas	True Gas Value %	Instrument Gas	True Gas Value %
	Readings %		Readings %		Readings %	
	59.7	60	40	40	20.9	20.9
	Accept ±3.0		Accept ±3.0		Accept ±0.5	
	5	5	4.9	5	6	6
	Accept ±0.3		Accept ±0.3		Accept ±0.3	
Zero Reading 100% N ₂	0	0	0	0	0	0
	Accept ±0.0		Accept ±0.0		Accept ±0.1	

Optional Gas Checks						
Applied Gas & Range		Concentration Tested @ (ppm)	Instrument Readings (ppm)			
Gas Type	Range (ppm)		Zero Reading		Instrument Gas Reading	
H ₂ S	5000	1500	0	Accept ±0.0	1500	Accept ±5.0
CO	2000	1000	0	Accept ±0.0	999	Accept ±5.0
Hexane	2.0%	2.0%	0	Accept ±0.0	1.99	Accept ±10.0

Cross Gas Effects									
Applied Gas (ppm)		Instrument Readings (ppm)							
Gas Type	Concentration	Toxic 1:	H2S	Toxic 2:	CO	Toxic 3:			
H2S	1500	1500		0		0			
CO	1000	40		999		0			
Hexane	2.0%	0		0		1.99			

Pressure Checks			
Atmospheric Pressure [AP] (mB)			
Current Atmospheric Pressure (mB)		Instrument Atmospheric Pressure Reading (mB)	
AP Open Ports		1001	Accept ± 2.0
AP Port (Internal)	+800 mB	800	Accept ± 5.0
	+1200mB	1200	Accept ± 5.0

Flow Checks					
Borehole Flow			Differential Pressure		
Applied Reading (l/h)	Instrument Reading (l/h)		Applied Pressure (Pa)	Instrument Reading (Pa)	
-30	-30	Accept ± 3.0	-476	-484	Accept ± 50
-3	-3	Accept ± 1.0	-17	-17	Accept ± 6.0
0	0	Accept ± 0.0	0	0	Accept ± 0.5
3	3	Accept ± 0.5	13	12	Accept ± 3.0
30	29.7	Accept ± 3.0	314	312	Accept ± 50
60	59.5	Accept ± 6.0	962	953	Accept ± 130
90	90.6	Accept ± 9.0	1915	1951	Accept ± 250

Temperature Checks		
Calibration Temperature	Instrument Temperature Reading $^{\circ}\text{C}$	
Applied Temperature $^{\circ}\text{C}$		
-10	-10	Accept ± 2.0
0	0	Accept ± 1.0
30	30	Accept ± 1.0
60	60	Accept ± 1.0
100	100	Accept ± 1.0

Technician:	Date Tested:
Les Treece	10/03/2021

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.



Life-saving solutions

CERTIFICATE OF CALIBRATION

Phocheck Tiger

CALIBRATION CERTIFICATE NO: 71067

ISSUED BY: SHAWCITY LIMITED
DATE: 01-Jun-21
APPROVED SIGNATORY: 
NAME: Dave Godfrey
CUSTOMER: CC Geotechnical Ltd
INSTRUMENT: PhoCheck Tiger
SERIAL NUMBER: T-110194
CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference value is that generated by the certified source and the indicated value is that measured by the instrument.

CALIBRATION RESULTS

GAS	LOT No	REF. VALUE	INDICATED VALUE
Isobutylene	WO297301-1	100 ppm	100 ppm
Isobutylene	WO188023-1	5000 ppm	5000 ppm

COMMENTS:

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$.
This provides a level of confidence of uncertainty of approximately 95%.
The uncertainty of measurement is $\pm 2\%$
The results indicate that the instrument conforms to the applicable parts of the published specification.

HEALTH & SAFETY, OCCUPATIONAL HYGIENE AND ENVIRONMENTAL MONITORING INSTRUMENTS

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Instrument House, 91-92 Shrivenham Hundred Business Park
Watchfield, Oxfordshire, SN6 8TY

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service@shawcity.co.uk

PARTS REQUIRED FOR JOB NUMBER: 71067

DESCRIPTION	PART NO.	QTY	Serial No.	LOC
10.6 Lamp	LA4TM600			S4H B1
Lamp Stack	A-846267	1	070614	S4H B3
PTFE Filter Disk	A-861632	1		S4H B2
Probe O-Ring	5/OV-02			S4H B4
Sensor seal	A-861214	1		S4H B1
Probe	880207			S4E B1
Probe Kit	A-880210			S4H B4
Filter Clamp (black)	880201			S4E B1
Probe Seal	880202			S4E B5
Filter Clamp (clear)	861219			S4H B6
Pump	A-861298			S4F B2
Manifold	861213			S4E B6
Outlet Barbs	5/JHS-03			S4E B6
Nozzle O-Ring	5/OV-04			S4H B2
Probe pipe	A-861286a			S4G B5
Tubing Inv Cone	5/JO-01			S4D B1
Tiger Battery	A-861240			S4G B1
Inlet Outlet Seal	861215	2		S4H B5
Display	1/OM-05			S4E B3
Battery Charging Cradle/Dock	A-861220			S4F B2
Charger Lead	1/VS-22			S4F B3
Fuse FU100/101/103/105/106	1/FB-10			S4G B3
FU1 fuse	1/FB-12			S3A B1
Standard Top Housing	A-861551			service
LT Top Housing	A-880218			
Charging Dock Magnet	2/AP-08			S4C B2
Bottom Housing	861203-2			S4F B4
Pneumatics Kit	A-861509			S4F B3
Tiger Battery	A-861240			S4G B1
Sensor PCB	A-861103			S4E B5
Orange stack for Tiger LT	A-846496	1		S4C B1
PAT Test	PAT 1	1		
Mainboard Assembly	A-861120			



Life-saving solutions

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SERVICE / INSPECTION SHEET

JOB NUMBER: 71067
INSTRUMENT: Phocheck Tiger

SERIAL NUMBER: T-110194
DATE RECEIVED: 28/05/2021

FIRMWARE: 5.12

CUSTOMER: CC Geotechnical Ltd

ITEMS RECEIVED	Received	RTN?
Instrument	YES	
Rubber Boot	YES	
Battery Charger		
Charging Cradle		
Operation Manual		
Quick Start Guide		
Spares Kit		
Comms Cable		
Probe FLEXI		
Peli Case		
Tubing		
Regulator		
Software (Memory Stick)		
PLASTIC CASE	YES	
	SIGNED:	

TESTS:	Pre Service	Post Service
Charger Test		Ok
Battery charge Test		Ok
Lamp Test		Ok
Air Flow Test $\geq$ 220ml/min		274ml/min
Block Flow Test $\leq$ 15ml/min		10 ml/min
Moisture Sensitivity = 0.0ppm		0.0 ppm
Switch Test		Ok
Sensor Test		Ok
Alarm Test		Ok
PC Comms Test		Ok
Datalog Test		Ok
Display Test		Ok
Physical Inspection		Ok
PAT Test		Ok
Firmware Upgrade	n/a	
Software Upgrade (usb)	n/a	
Function Test		Ok
Run time	20hr49	

Comments:

Real Time Clock set
Replaced sensor stack and seal, PTFE filter and inlet/outlet seals as per annual maintenance
Replaced lamp as per biennial scheduled service.
Flow rate measured at 274 ml/min
Instrument calibrated and bump tested
Moisture sensitivity 0.0 ppm
Datalogging and pc transfer tested
Power supply output 11.95Vdc. PAT tested and labelled
Charger cradle output 5.52Vdc.o/cct

Please note: Zero at Power on is set to OFF, as received.

TECHNICIAN: Dave Godfrey

DATE: 01/06/2021

APPENDIX E: SOIL CLASSIFICATION REPORT

APPENDIX F: SOIL CONTAMINATION REPORT



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 21-35429

Issue: 1

Date of Issue: 23/08/2021

Contact: Tony Gerrard

Customer Details: CC Geotechnical Ltd
Unit 1 & 2 Deltic Place
Deltic Way
Liverpool
Merseyside L33 7BA

Quotation No: Q14-00045

Order No: Not Supplied

Customer Reference: CCG-C-21-12518

Date Received: 16/08/2021

Date Approved: 23/08/2021

Details: Former Prescott Police Station, Derby St', Prescott

Approved by:

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

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Sample Summary

Report No.: 21-35429, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
247916	WS1 0.40	12/08/2021	16/08/2021	Sandy silty loam	
247917	WS2 0.50	12/08/2021	16/08/2021	Sandy silty loam	
247918	WS3 0.50	12/08/2021	16/08/2021	Silty loam	
247919	WS4 0.50	12/08/2021	16/08/2021	Silty clayey loam	
247920	WS5 0.50	12/08/2021	16/08/2021	Sandy silty loam	
247921	WS6 0.40	12/08/2021	16/08/2021	Sandy silty loam	



Results Summary

2683

Report No.: 21-35429, issue number 1

ELAB Reference				247916	247917	247918	247919
Customer Reference							
Sample ID							
Sample Type				SOIL	SOIL	SOIL	SOIL
Sample Location				WS1	WS2	WS3	WS4
Sample Depth (m)				0.40	0.50	0.50	0.50
Sampling Date				12/08/2021	12/08/2021	12/08/2021	12/08/2021
Determinand	Codes	Units	LOD				
Soil sample preparation parameters							
Material removed	N	%	0.1	23.1	31.0	< 0.1	< 0.1
Description of Inert material removed	N		0	Stones,brick,clinker	Stones,brick,clinker	None	None
Metals							
Arsenic	M	mg/kg	1	446	439	37.1	14.5
Cadmium	M	mg/kg	0.5	1.1	0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	25.6	22.0	35.8	42.3
Copper	M	mg/kg	5	410	446	66.8	36.7
Lead	M	mg/kg	5	305	309	145	18.4
Mercury	M	mg/kg	0.5	0.6	0.7	< 0.5	< 0.5
Nickel	M	mg/kg	5	36.6	35.1	38.2	55.0
Selenium	M	mg/kg	1	< 1.0	< 1.0	1.3	< 1.0
Zinc	M	mg/kg	5	322	199	40.3	82.2
Anions							
Water Soluble Sulphate	M	g/l	0.02	0.05	0.05	0.03	0.05
Inorganics							
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2
Acid Soluble Sulphate (SO4)	U	%	0.02	0.04	0.05	0.04	0.07
Water Soluble Boron	N	mg/kg	0.5	< 0.5	1.1	< 0.5	< 0.5
Miscellaneous							
pH	M	pH units	0.1	8.1	7.3	7.3	7.8
Soil Organic Matter	U	%	0.1	6.3	5.8	8.1	0.7

Results Summary

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Report No.: 21-35429, issue number 1

ELAB Reference	247916	247917	247918	247919
Customer Reference				
Sample ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sample Location	WS1	WS2	WS3	WS4
Sample Depth (m)	0.40	0.50	0.50	0.50
Sampling Date	12/08/2021	12/08/2021	12/08/2021	12/08/2021

Determinand	Codes	Units	LOD				
Polyaromatic hydrocarbons							
Naphthalene	M	mg/kg	0.1	5.0	0.2	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	0.3	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	11.3	0.7	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	7.1	0.5	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	83.7	7.0	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	16.2	1.8	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	130	18.2	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	112	15.7	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	41.6	8.5	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	49.7	9.7	< 0.1	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1	43.9	8.6	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	33.9	7.5	< 0.1	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1	41.8	8.5	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	35.9	6.4	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	7.8	1.4	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	31.3	5.0	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	651	99.8	< 0.4	< 0.4
BTEX							
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
TPH CWG							
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	1.8	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	8.3	< 1.0	1.3	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	23.9	< 1.0	1.7	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	91.5	3.7	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	3.1	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	8.6	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	51.3	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	266	8.4	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	1100	80.6	4.4	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	122	23.7	4.8	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	1680	116	12.3	< 1.0



Results Summary

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Report No.: 21-35429, issue number 1

ELAB Reference	247920	247921
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	WS5	WS6
Sample Depth (m)	0.50	0.40
Sampling Date	12/08/2021	12/08/2021

Determinand	Codes	Units	LOD		
Soil sample preparation parameters					
Material removed	N	%	0.1	< 0.1	< 0.1
Description of Inert material removed	N		0	None	None
Metals					
Arsenic	M	mg/kg	1	22.3	15.4
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	20.9	21.9
Copper	M	mg/kg	5	179	71.1
Lead	M	mg/kg	5	234	89.6
Mercury	M	mg/kg	0.5	0.9	< 0.5
Nickel	M	mg/kg	5	41.7	33.7
Selenium	M	mg/kg	1	< 1.0	< 1.0
Zinc	M	mg/kg	5	124	90.4
Anions					
Water Soluble Sulphate	M	g/l	0.02	0.02	< 0.02
Inorganics					
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2
Acid Soluble Sulphate (SO4)	U	%	0.02	0.04	0.02
Water Soluble Boron	N	mg/kg	0.5	0.6	< 0.5
Miscellaneous					
pH	M	pH units	0.1	7.7	7.8
Soil Organic Matter	U	%	0.1	4.4	3.0



Results Summary

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Report No.: 21-35429, issue number 1

ELAB Reference	247920	247921
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	WS5	WS6
Sample Depth (m)	0.50	0.40
Sampling Date	12/08/2021	12/08/2021

Determinand	Codes	Units	LOD		
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	0.1	0.2
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	0.2	0.6
Pyrene	M	mg/kg	0.1	0.2	0.7
Benzo(a)anthracene	M	mg/kg	0.1	0.1	0.5
Chrysene	M	mg/kg	0.1	0.2	0.5
Benzo(b)fluoranthene	M	mg/kg	0.1	0.2	0.9
Benzo(k)fluoranthene	M	mg/kg	0.1	0.2	0.8
Benzo(a)pyrene	M	mg/kg	0.1	0.2	0.9
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	0.2	0.8
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	0.2
Benzo[g,h,i]perylene	M	mg/kg	0.1	0.1	0.5
Total PAH(16)	M	mg/kg	0.4	1.9	6.6
BTEX					
Benzene	M	ug/kg	10	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0
TPH CWG					
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	10.5
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	1.6
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	12.0



Results Summary

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Report No.: 21-35429, issue number 1

ELAB Reference	247917
Customer Reference	
Sample ID	
Sample Type	SOIL
Sample Location	WS2
Sample Depth (m)	0.50
Sampling Date	12/08/2021

Determinand	Codes	Units	LOD	
Metals				
Arsenic 10:1 extract	N	ug/l	5	338
Boron 10:1 extract	N	ug/l	5	20
Cadmium 10:1 extract	N	ug/l	1	< 1
Calcium 10:1 extract	N	ug/l	100	5890
Chromium 10:1 extract	N	ug/l	5	< 5
Copper 10:1 extract	N	ug/l	5	7
Lead 10:1 extract	N	ug/l	5	< 5
Magnesium 10:1 extract	N	ug/l	100	1220
Mercury 10:1 extract	N	ug/l	0.1	< 0.1
Nickel 10:1 extract	N	ug/l	5	< 5
Selenium 10:1 extract	N	ug/l	5	< 5
Zinc 10:1 extract	N	ug/l	5	5
Anions				
Sulphate 10:1 extract	N	mg/l	1	3
Inorganics				
Free Cyanide	N	ug/l	5	< 5
Sulphide 10:1 extract	N	mg/l	0.1	< 0.1
Miscellaneous				
Dissolved organic carbon	N	mg/l	1.5	15.8
pH (10:1 extract)	N	pH units	0.1	8.7
Hardness (CaCO ₃)	N	mg/l CaCO ₃	0.1	20
Polyaromatic hydrocarbons				
Naphthalene Leachate GCMS	N	ug/l	0.01	0.02
Acenaphthylene Leachate GCMS	N	ug/l	0.01	< 0.01
Acenaphthene Leachate GCMS	N	ug/l	0.01	0.02
Fluorene Leachate GCMS	N	ug/l	0.01	< 0.01
Phenanthrene Leachate GCMS	N	ug/l	0.01	0.02
Anthracene Leachate GCMS	N	ug/l	0.01	< 0.01
Fluoranthene Leachate GCMS	N	ug/l	0.01	< 0.01
Pyrene Leachate GCMS	N	ug/l	0.01	< 0.01
Benzo (a) anthracene Leachate GCMS	N	ug/l	0.01	< 0.01
Chrysene Leachate GCMS	N	ug/l	0.01	< 0.01
Benzo (b) fluoranthene Leachate GCMS	N	ug/l	0.01	< 0.01
Benzo (k) fluoranthene Leachate GCMS	N	ug/l	0.01	< 0.01
Benzo (a) pyrene Leachate GCMS	N	ug/l	0.01	< 0.01
Indeno (1,2,3-cd) pyrene Leachate GCMS	N	ug/l	0.01	< 0.01
Dibenzo(a,h)anthracene Leachate GCMS	N	ug/l	0.01	< 0.01
Benzo(ghi)perylene Leachate GCMS	N	ug/l	0.01	< 0.01
Total PAH(16) Leachate GCMS	N	ug/l	0.01	0.14



Results Summary

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Report No.: 21-35429, issue number 1

ELAB Reference	247917
Customer Reference	
Sample ID	
Sample Type	SOIL
Sample Location	WS2
Sample Depth (m)	0.50
Sampling Date	12/08/2021

Determinand	Codes	Units	LOD	
TPH CWG				
>C5-C6 Aliphatic in Leachate	N	ug/l	1	< 1.0
>C6-C8 Aliphatic in Leachate	N	ug/l	1	< 1.0
>C8-C10 Aliphatic Leachate	N	ug/l	5	13.1
>C10-C12 Aliphatic Leachate	N	ug/l	5	7.2
>C12-C16 Aliphatic Leachate	N	ug/l	5	5.3
>C16-C21 Aliphatic Leachate	N	ug/l	5	< 5.0
>C21-C35 Aliphatic Leachate	N	ug/l	5	11.0
>C35-C40 Aliphatic Leachate	N	ug/l	5	< 5.0
Total (>C5-C40) Aliphatic Leachate	N	ug/l	5	36.6
>C5-C7 Aromatic in Leachate	N	ug/l	1	< 1.0
>C7-C8 Aromatic in Leachate	N	ug/l	1	< 1.0
>C8-C10 Aromatic Leachate	N	ug/l	5	< 5.0
>C10-C12 Aromatic Leachate	N	ug/l	5	< 5.0
>C12-C16 Aromatic Leachate	N	ug/l	5	5.4
>C16-C21 Aromatic Leachate	N	ug/l	5	5.5
>C21-C35 Aromatic Leachate	N	ug/l	5	< 5.0
>C35-C40 Aromatic Leachate	N	ug/l	5	< 5.0
Total (>C5-C40) Aromatic Leachate	N	ug/l	5	10.9
Total (>C5-C40) Ali/Aro Leachate	N	ug/l	5	47.5



Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
Tel: +44 (0)1424 718618, Email: info@elab-uk.co.uk, Web: www.elab-uk.co.uk

Results Summary

Report No.: 21-35429, issue number 1

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #)
in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
247916	0.40	WS1	Brown sandy soil, stones, concrete, brick, clinker, tar	No asbestos detected	n/t	n/t	n/t	n/t
247917	0.50	WS2	Grey sandy soil, stones, concrete, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
247918	0.50	WS3	Grey sandy soil, stones, concrete, clinker	No asbestos detected	n/t	n/t	n/t	n/t
247919	0.50	WS4	Grey/Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
247920	0.50	WS5	Brown sandy soil, stones, brick, clinker, glass	No asbestos detected	n/t	n/t	n/t	n/t
247921	0.40	WS6	Brown sandy soil, stones, concrete, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 21-35429, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Aliphatic hydrocarbons in leachate	N		19/08/2021		GC-FID
Aliphatic/Aromatic hydrocarbons in leach	N		20/08/2021		GC-FID
Aromatic hydrocarbons in leachate	N		19/08/2021		GC-FID
Carbon in leachates	N		19/08/2021		IR
Leachate cyanide 10:1 extract	N		18/08/2021		Colorimetry
Leachate sulphide 10:1 extract	N		20/08/2021		Colorimetry
pH of leachates	N		18/08/2021		Electromeric
Free cyanide	N	As submitted sample	19/08/2021	107	Colorimetry
Sulphide	N	As submitted sample	18/08/2021	109	Colorimetry
Hexavalent chromium	N	As submitted sample	18/08/2021	110	Colorimetry
pH	M	Air dried sample	19/08/2021	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	19/08/2021	115	Ion Chromatography
PAH (GC-FID)	M	As submitted sample	18/08/2021	133	GC-FID
PAHs and/or PCBs in leachates	N		19/08/2021	135	GC-MS
Water soluble anions	M	Air dried sample	18/08/2021	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	19/08/2021	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	19/08/2021	181	GC-MS
BTEX in solids	M	As submitted sample	19/08/2021	181A	GC-MS
Low range Aliphatic hydrocarbons leachat	N		20/08/2021	200	GC-MS
Low range Aromatic hydrocarbons leachate	N		20/08/2021	200	GC-MS
Water soluble boron	N	Air dried sample	18/08/2021	202	Colorimetry
Aliphatic hydrocarbons in soil	N	As submitted sample	18/08/2021	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	23/08/2021	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	18/08/2021	214	GC-FID
Anions in leachates	N		18/08/2021	270	Ion Chromatography
Asbestos identification	U	Air dried sample	19/08/2021	280	Microscopy
Aqua regia extractable metals	M	Air dried sample	18/08/2021	300	ICPMS
Leachate metals 10:1 extract	N		18/08/2021	301	ICPMS
Soil organic matter	U	Air dried sample	18/08/2021	BS1377:P3	Titrimetry
Water					
Hardness in soil leachates	N		19/08/2021	APHA	ICPMS

Tests marked N are not UKAS accredited

Report Information

Report No.: 21-35429, issue number 1

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

LOD LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.
Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.
ELAB are unable to provide an interpretation or opinion on the content of this report.
The results relate only to the sample received.
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request
Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

APPENDIX G: SOIL CONTAMINATION SUMMARY TABLES

SOIL ASSESSMENT CRITERIA FOR RESIDENTIAL LAND USE (WITH HOME GROWN PRODUCE)

Contaminant	Assessment Criteria for Residential at 1% SOM (mg/kg)	Assessment Criteria for Residential at 2.5% SOM (mg/kg)	Assessment Criteria for Residential at 6% SOM (mg/kg)
<u>Metals</u>			
Arsenic	37	37	37
Boron	290	290	290
Cadmium	11	11	11
Chromium III	910	910	910
Chromium VI	6	6	6
Copper	240	240	240
*Lead	200	200	200
Mercury	1.2	1.2	1.2
Nickel	180	180	180
Selenium	250	250	250
Vanadium	410	410	410
Zinc	3700	3700	3700
<u>Non-Metals</u>			
Phenol	280	550	1100
<u>Polyaromatic Hydrocarbons (PAH)</u>			
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Anthracene	2400	5400	11000
Benz[a]anthracene	7.2	11	13
Benzo[a]pyrene	2.2	2.7	3.0
Benzo[b]fluoranthene	2.6	3.3	3.7
Benzo[ghi]perylene	320	340	350
Benzo[k]fluoranthene	77	93	100
Chrysene	15	22	27
Dibenz[ah]anthracene	0.24	0.28	0.3
Fluoranthene	280	560	890
Fluorene	170	400	860
Indeno[123-cd]pyrene	27	36	41
Naphthalene	2.3	5.6	13
Phenanthrene	95	220	440
Pyrene	620	1200	2000
Coal Tar [Bap as surrogate marker]	0.79	0.98	1.1
<u>Petroleum Hydrocarbons</u>			
Aliphatic EC 5-6	42	78	160
Aliphatic EC >6-8	100	230	530
Aliphatic EC >8-10	27	65	150
Aliphatic EC >10-12	130	330	760
Aliphatic EC >12-16	1100	2400	4300
Aliphatic EC >16-35	65000	92000	110000
Aliphatic EC >35-44	65000	92000	110000
Aromatic EC 5-7 (Benzene)	70	140	300
Aromatic EC >7-8 (Toluene)	130	290	660
Aromatic EC >8-10	34	83	190
Aromatic EC >10-12	74	180	380
Aromatic EC >12-16	140	330	660
Aromatic EC >16-21	260	540	930
Aromatic EC >21-35	1100	1500	1700
Aromatic EC >35-44	1100	1500	1700
Aliphatic – Aromatic EC >44-70	1600	1800	1900

Copyright: Land Quality Management Limited (LQM)

The above is based on criteria contained in publication LQM/CIEH S4UL's for Human Health Risk Assessment (2015) (CCG Licence No. S4UL3233), applicable to the "Residential" land use (with home grown produce) scenario for soil organic matter (SOM) content of 1% - 6%.

*This document does not provide criteria for Lead, for which the results were compared to the C4SL published by DEFRA SP1010 Development of Category 4 Screening Levels.



METALS DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 21-12518

Site name: Former Prescott Police Station

Prepared by: TG

Authorised by: CB

Proposed land use: Residential with plant uptake

SOM % used: 2.5

 = Threshold exceeded

 = Below Limit of detection

n/t = Not tested

Contaminants			Metals							
			Cadmium	Chromium III	Chromium VI	Copper	Lead	Mercury (elemental)	Nickel	Zinc
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.5	5.0	0.8	5.0	5.0	0.5	5.0	5.0
Human Health Risk Assessment (GAC)			11	910	6	2400	200	1.2	180	3700
Sample Location	Sample Depth (m)	Sample type								
WS1	0.40	SOIL	1.1	25.6	< 0.8	410	305	0.6	36.6	322
WS2	0.50	SOIL	0.5	22	< 0.8	446	309	0.7	35.1	199
WS3	0.50	SOIL	< 0.5	35.8	< 0.8	66.8	145	< 0.5	38.2	40.3
WS4	0.50	SOIL	< 0.5	42.3	< 0.8	36.7	18.4	< 0.5	55	82.2
WS5	0.50	SOIL	< 0.5	20.9	< 0.8	179	234	0.9	41.7	124
WS6	0.40	SOIL	< 0.5	21.9	< 0.8	71.1	89.6	< 0.5	33.7	90.4
Human Health Risk Assessment (GAC)			11	910	6	2400	200	1.2	180	3700



SEMI-METALS, NON-METALS, INORGANICS AND OTHER DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 21-12518

Site name: Former Prescott Police Station

Prepared by: TG

Authorised by: CB

Proposed land use: Residential with plant uptake

SOM % used: 2.5

 = Threshold exceeded

 = Below Limit of detection

n/t = Not tested

			Semi/non-metals			Inorganics		Other		
Contaminants			Arsenic	Boron	Selenium	Cyanide (free)	Sulphate (water soluble)	Sulphate (water soluble)	pH (units)	Soil Organic Matter %
Units			mg/kg	mg/kg	mg/kg	mg/kg	g/l	mg/l	units	units
Limit of Detection			1.0	0.5	1.0	1.0	0.02	20.0	0.1	0.1
Human Health Risk Assessment (GAC)			37	290	250	22	NA	NA	NA	NA
Sample Location	Sample Depth (m)	Sample type								
WS1	0.40	SOIL	446	< 0.5	< 1.0	< 1.0	0.05	n/t	8.1	6.3
WS2	0.50	SOIL	439	1.1	< 1.0	< 1.0	0.05	n/t	7.3	5.8
WS3	0.50	SOIL	37.1	< 0.5	1.3	< 1.0	0.03	n/t	7.3	8.1
WS4	0.50	SOIL	14.5	< 0.5	< 1.0	< 1.0	0.05	n/t	7.8	0.7
WS5	0.50	SOIL	22.3	0.6	< 1.0	< 1.0	0.02	n/t	7.7	4.4
WS6	0.40	SOIL	15.4	< 0.5	< 1.0	< 1.0	< 0.02	n/t	7.8	3
Human Health Risk Assessment (GAC)			37	290	11	22	NA	NA	NA	NA



SPECIATED PAH'S DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 21-12518

Site name: Former Prescott Police Station

Prepared by: TG

Authorised by: CB

Proposed land use: Residential with plant uptake

SOM % used: 2.5

 = Threshold exceeded

 = Below Limit of detection

 = Not tested

Contaminants

PAH's

			Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[ghi]perylene	Benzo[k]fluoranthene	Chrysene	Dibenzo[ah]anthracene	fluoranthene	fluorene	Indeno[123-cd]pyrene	Napthalene	Pheanthrene	Pyrene	Total PAH's
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4
Human Health Risk Assessment (GAC)			510	420	5400	11	2.7	3.3	340	93	22	0.28	560	400	36	5.6	220	1200	NA
Sample Location	Sample Depth (m)	Sample type																	
WS1	0.40	SOIL	11.3	0.3	16.2	41.6	41.8	43.9	31.3	33.9	49.7	7.8	130	7.1	35.9	5	83.7	112	651
WS2	0.50	SOIL	0.7	< 0.1	1.8	8.5	8.5	8.6	5	7.5	9.7	1.4	18.2	0.5	6.4	0.2	7	15.7	99.8
WS3	0.50	SOIL	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.4
WS4	0.50	SOIL	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.4
WS5	0.50	SOIL	< 0.1	< 0.1	< 0.1	0.1	0.2	0.2	0.1	0.2	0.2	< 0.1	0.2	< 0.1	0.2	< 0.1	0.1	0.2	1.9
WS6	0.40	SOIL	< 0.1	< 0.1	< 0.1	0.5	0.9	0.9	0.5	0.8	0.5	0.2	0.6	< 0.1	0.8	< 0.1	0.2	0.7	6.6
Human Health Risk Assessment (GAC)			510	420	11	11	2.7	3.3	340	93	22	0.28	560	400	36	5.6	220	1200	NA



SPECIATED TPH'S DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: **21-12518**

Site name: **Former Prescott Police Station**

Prepared by: **TG**

Authorised by: **CB**

Proposed land use: **Residential with plant uptake**

SOM % used: **2.5**

 	=	Threshold exceeded
 	=	Below Limit of detection
n/t	=	Not tested

			Speciated TPH's															
			Aromatics							Aliphatics								
Contaminants			EC5-7	EC7-8	EC8-10	EC10-12	EC12-16	EC16-21	EC21-35	EC35-44	EC5-6	EC6-8	EC8-10	EC10-12	EC12-16	EC16-35	EC35-44	TOTAL TPH'S
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.01	0.01	1.0	1.0	1.0	1.0	1.0	1.0	0.01	0.01	1.0	1.0	1.0	1.0	1.0	1.0
Human Health Risk Assessment (GAC)			140	290	83	180	330	540	1500	1500	78	230	65	330	2400	92000	92000	NA
Sample Location	Sample Depth (m)	Sample type																
WS1	0.40	SOIL	< 0.01	< 0.01	< 1.0	8.6	51.3	266	1100	122	< 0.01	< 0.01	< 1.0	1.8	8.3	115.4	3.1	1680
WS2	0.50	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	8.4	80.6	23.7	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	3.7	< 1.0	116
WS3	0.50	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	< 1.0	4.4	4.8	< 0.01	< 0.01	< 1.0	< 1.0	1.3	1.7	< 1.0	12.3
WS4	0.50	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
WS5	0.50	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
WS6	0.40	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	< 1.0	10.5	1.6	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	12
Human Health Risk Assessment (GAC)			140	290	11	180	330	540	1500	1500	78	230	65	330	2400	92000	92000	NA



BTEX DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: **21-12518**

Site name: **Former Prescott Police Station**

Prepared by: **TG**

Authorised by: **CB**

Proposed land use: **Residential with plant uptake**

SOM % used: **2.5**

 = **Threshold exceeded**

 = **Below Limit of detection**

n/t = **Not tested**

			BTEX			
Contaminants			Benzene	Toluene	Ethylbenzene	Total Xylenes
Units			µg/kg	µg/kg	µg/kg	µg/kg
Limit of Detection			10	10	10	10
Human Health Risk Assessment (GAC)			170	290000	110000	130000
Sample Location	Sample Depth (m)	Sample type				
WS1	0.40	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS2	0.50	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS3	0.50	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS4	0.50	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS5	0.50	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS6	0.40	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
Human Health Risk Assessment (GAC)			170	11	110000	130000

**ASBESTOS ASSESSMENT SHEET****Job number: 21-12518****Site name: Former Prescott Police Station****Prepared by: TG****Authorised by: CB**

Sample Location	Sample Depth (m)	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)	Assessment
WS1	0.40	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected
WS2	0.50	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected
WS3	0.50	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected
WS4	0.50	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected
WS5	0.50	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected
WS6	0.40	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected

APPENDIX H: PRELIMINARY WASTE CLASSIFICATION REPORT



Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



17R42-ZVWER-BO340

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in **pale yellow**.

Job name

Former Police Station, Prescott

Description/Comments

Project

Site

Classified by

Name: **Tony Gerrard**
Date: **31 Aug 2021 09:28 GMT**
Telephone: **0151 545 2750**
Company: **CC Geotechnical Ltd**

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

Course: **Hazardous Waste Classification**

Date

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS1	0.40	Hazardous	HP 3(i), HP 7, HP 11	2
2	WS2	0.50	Non Hazardous		7
3	WS3	0.50	Non Hazardous		12
4	WS4	0.50	Non Hazardous		17
5	WS5	0.50	Non Hazardous		21
6	WS6	0.40	Non Hazardous		25

Related documents

#	Name	Description
1	CCG SOIL A 2020	waste stream template used to create this Job

Report

Created by: Tony Gerrard

Created date: 31 Aug 2021 09:28 GMT

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	30
Appendix B: Rationale for selection of metal species	34
Appendix C: Version	34



Classification of sample: WS1

 **Hazardous Waste**
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:	LoW Code:
WS1	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 03 * (Soil and stones containing hazardous substances)
0.40 m	

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.168%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.168%)

Hazard properties (substances considered hazardous until shown otherwise)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.168%)

Determinands

Moisture content: **0% No Moisture Correction applied (MC)**

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	 arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	446	mg/kg	1.32	588.865	mg/kg	0.0589 %		
2	 cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0	1.1	mg/kg	1.142	1.257	mg/kg	0.000126 %		
3	 chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9	25.6	mg/kg	1.462	37.416	mg/kg	0.00374 %		
4	 copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	410	mg/kg	1.126	461.614	mg/kg	0.0462 %		
5	 lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	305	mg/kg	1.56	475.744	mg/kg	0.0305 %		



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
6	mercury { mercury dichloride }				0.6	mg/kg	1.353	0.812	mg/kg	0.0000812 %		
	080-010-00-X	231-299-8	7487-94-7									
7	nickel { nickel chromate }				36.6	mg/kg	2.976	108.931	mg/kg	0.0109 %		
	028-035-00-7	238-766-5	14721-18-7									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8											
9	zinc { zinc chromate }				322	mg/kg	2.774	893.275	mg/kg	0.0893 %		
	024-007-00-3	236-878-9	13530-65-9									
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
	006-007-00-5											
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.8	mg/kg	1.923	<1.538	mg/kg	<0.000154 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
12	boron { diboron trioxide; boric oxide }				<0.5	mg/kg	3.22	<1.61	mg/kg	<0.000161 %		<LOD
	005-008-00-8	215-125-8	1303-86-2									
13	pH		PH		8.1	pH		8.1	pH	8.1 pH		
14	phenol				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	604-001-00-2	203-632-7	108-95-2									
15	naphthalene				5	mg/kg		5	mg/kg	0.0005 %		
	601-052-00-2	202-049-5	91-20-3									
16	acenaphthylene				0.3	mg/kg		0.3	mg/kg	0.00003 %		
		205-917-1	208-96-8									
17	acenaphthene				11.3	mg/kg		11.3	mg/kg	0.00113 %		
		201-469-6	83-32-9									
18	fluorene				7.1	mg/kg		7.1	mg/kg	0.00071 %		
		201-695-5	86-73-7									
19	phenanthrene				83.7	mg/kg		83.7	mg/kg	0.00837 %		
		201-581-5	85-01-8									
20	anthracene				16.2	mg/kg		16.2	mg/kg	0.00162 %		
		204-371-1	120-12-7									
21	fluoranthene				130	mg/kg		130	mg/kg	0.013 %		
		205-912-4	206-44-0									
22	pyrene				112	mg/kg		112	mg/kg	0.0112 %		
		204-927-3	129-00-0									
23	benzo[a]anthracene				41.6	mg/kg		41.6	mg/kg	0.00416 %		
	601-033-00-9	200-280-6	56-55-3									
24	chrysene				49.7	mg/kg		49.7	mg/kg	0.00497 %		
	601-048-00-0	205-923-4	218-01-9									
25	benzo[b]fluoranthene				43.9	mg/kg		43.9	mg/kg	0.00439 %		
	601-034-00-4	205-911-9	205-99-2									
26	benzo[k]fluoranthene				33.9	mg/kg		33.9	mg/kg	0.00339 %		
	601-036-00-5	205-916-6	207-08-9									
27	benzo[a]pyrene; benzo[def]chrysene				41.8	mg/kg		41.8	mg/kg	0.00418 %		
	601-032-00-3	200-028-5	50-32-8									
28	indeno[123-cd]pyrene				35.9	mg/kg		35.9	mg/kg	0.00359 %		
		205-893-2	193-39-5									
29	dibenz[a,h]anthracene				7.8	mg/kg		7.8	mg/kg	0.00078 %		
	601-041-00-2	200-181-8	53-70-3									
30	benzo[ghi]perylene				31.3	mg/kg		31.3	mg/kg	0.00313 %		
		205-883-8	191-24-2									
31	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
32	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
33	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
34	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
35	TPH (C6 to C40) petroleum group TPH				1680 mg/kg		1680 mg/kg	0.168 %			
36	confirm TPH has NOT arisen from diesel or petrol				.1		.1				<LOD
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
38	polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
39	asbestos 650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
40	antimony { antimony trioxide } 051-005-00-X	215-175-0	1309-64-4		<0.1 mg/kg	1.197	<0.12 mg/kg	<0.000012 %			<LOD
41	beryllium { beryllium oxide } 004-003-00-8	215-133-1	1304-56-9		<0.1 mg/kg	2.775	<0.278 mg/kg	<0.0000278 %			<LOD
42	manganese { manganese sulphate } 025-003-00-4	232-089-9	7785-87-7		<0.1 mg/kg	2.749	<0.275 mg/kg	<0.0000275 %			<LOD
43	molybdenum { molybdenum(VI) oxide } 042-001-00-9	215-204-7	1313-27-5		<0.1 mg/kg	1.5	<0.15 mg/kg	<0.000015 %			<LOD
44	1,1-dichloroethane and 1,2-dichloroethane (combined) 203-458-1, 200-863-5		107-06-2, 75-34-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
45	tetrachloroethylene 602-028-00-4	204-825-9	127-18-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
46	carbon tetrachloride; tetrachloromethane 602-008-00-5	200-262-8	56-23-5		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
47	trichloroethylene; trichloroethene 602-027-00-9	201-167-4	79-01-6		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
48	vinyl chloride; chloroethylene 602-023-00-7	200-831-0	75-01-4		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
49	DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane 602-045-00-7	200-024-3	50-29-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
50	chlordan (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan 602-047-00-8	200-349-0	57-74-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
51	hexachlorocyclohexanes, including lindane 602-043-00-6	210-168-9, 200-401-2, 206-270-8, 206-271-3	58-89-9, 319-84-6, 319-85-7, 608-73-1		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
52	dieldrin (ISO) 602-049-00-9	200-484-5	60-57-1		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
53	endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene 602-051-00-X	200-775-7	72-20-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
54	heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-046-00-2	200-962-3	76-44-8							
55	hexachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
56	chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	606-019-00-6	205-601-3	143-50-0							
57	aldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-048-00-3	206-215-8	309-00-2							
58	pentachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-074-00-5	210-172-0	608-93-5							
59	dodecachloropentacyclo[5.2.1.02.6.03.9.05.8]decane; mirex				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-077-00-1	219-196-6	2385-85-5							
60	camphechlor (ISO); toxaphene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-044-00-1	232-283-3	8001-35-2							
61	hexabromobiphenyl				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		252-994-2	36355-01-8							
62	2,3,7,8-TeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
		217-122-7	1746-01-6							
63	1,2,3,7,8-PeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			40321-76-4							
64	1,2,3,4,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			39227-28-6							
65	1,2,3,6,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			57653-85-7							
66	1,2,3,7,8,9-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			19408-74-3							
67	1,2,3,4,6,7,8-HpCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			35822-46-9							
68	OCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			3268-87-9							
69	2,3,7,8-TeCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			51207-31-9							
70	1,2,3,7,8-PeCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			57117-41-6							
71	2,3,4,7,8-PeCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			57117-31-4							
72	1,2,3,4,7,8-HxCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			70648-26-9							
73	1,2,3,6,7,8-HxCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			57117-44-9							
74	1,2,3,7,8,9-HxCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			72918-21-9							
75	2,3,4,6,7,8-HxCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			60851-34-5							
76	1,2,3,4,6,7,8-HpCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			67562-39-4							
77	1,2,3,4,7,8,9-HpCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			55673-89-7							
78	OCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			39001-02-0							
79	petrol (gasoline) petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
80	diesel petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
			68334-30-5, 68476-34-6,							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
			94114-59-7, 1159170-26-9							
81	●	heavy/residual fuel oils petroleum group			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
82	●	crude oils petroleum group			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
83	●	kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9							
Total:								0.474 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification



Classification of sample: WS2

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS2	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.50 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				439 mg/kg	1.32	579.623 mg/kg	0.058 %			
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				0.5 mg/kg	1.142	0.571 mg/kg	0.0000571 %			
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				22 mg/kg	1.462	32.154 mg/kg	0.00322 %			
		215-160-9	1308-38-9								
4	copper { dicopper oxide; copper (I) oxide }				446 mg/kg	1.126	502.146 mg/kg	0.0502 %			
	029-002-00-X	215-270-7	1317-39-1								
5	lead { lead chromate }			1	309 mg/kg	1.56	481.983 mg/kg	0.0309 %			
	082-004-00-2	231-846-0	7758-97-6								
6	mercury { mercury dichloride }				0.7 mg/kg	1.353	0.947 mg/kg	0.0000947 %			
	080-010-00-X	231-299-8	7487-94-7								
7	nickel { nickel chromate }				35.1 mg/kg	2.976	104.467 mg/kg	0.0104 %			
	028-035-00-7	238-766-5	14721-18-7								
8	selenium { selenium compounds with the exception of cadmium selenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
9	zinc { zinc chromate }				199 mg/kg	2.774	552.055 mg/kg	0.0552 %			
	024-007-00-3	236-878-9	13530-65-9								
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
	006-007-00-5										
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.8 mg/kg	1.923	<1.538 mg/kg	<0.000154 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
12	boron { diboron trioxide; boric oxide }				1.1 mg/kg	3.22	3.542 mg/kg	0.000354 %			
	005-008-00-8	215-125-8	1303-86-2								
13	pH				7.3 pH		7.3 pH	7.3 pH			
14	phenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
15	naphthalene				0.2 mg/kg		0.2 mg/kg	0.00002 %			
	601-052-00-2	202-049-5	91-20-3								



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
16	acenaphthylene	205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
17	acenaphthene	201-469-6	83-32-9		0.7	mg/kg		0.7	mg/kg	0.00007 %		
18	fluorene	201-695-5	86-73-7		0.5	mg/kg		0.5	mg/kg	0.00005 %		
19	phenanthrene	201-581-5	85-01-8		7	mg/kg		7	mg/kg	0.0007 %		
20	anthracene	204-371-1	120-12-7		1.8	mg/kg		1.8	mg/kg	0.00018 %		
21	fluoranthene	205-912-4	206-44-0		18.2	mg/kg		18.2	mg/kg	0.00182 %		
22	pyrene	204-927-3	129-00-0		15.7	mg/kg		15.7	mg/kg	0.00157 %		
23	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	8.5	mg/kg		8.5	mg/kg	0.00085 %		
24	chrysene	601-048-00-0	205-923-4	218-01-9	9.7	mg/kg		9.7	mg/kg	0.00097 %		
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	8.6	mg/kg		8.6	mg/kg	0.00086 %		
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	7.5	mg/kg		7.5	mg/kg	0.00075 %		
27	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	8.5	mg/kg		8.5	mg/kg	0.00085 %		
28	indeno[123-cd]pyrene	205-893-2	193-39-5		6.4	mg/kg		6.4	mg/kg	0.00064 %		
29	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	1.4	mg/kg		1.4	mg/kg	0.00014 %		
30	benzo[ghi]perylene	205-883-8	191-24-2		5	mg/kg		5	mg/kg	0.0005 %		
31	benzene	601-020-00-8	200-753-7	71-43-2	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
32	toluene	601-021-00-3	203-625-9	108-88-3	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
33	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
34	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
35	TPH (C6 to C40) petroleum group		TPH		116	mg/kg		116	mg/kg	0.0116 %		
36	confirm TPH has NOT arisen from diesel or petrol				.1			.1				<LOD
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
38	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
39	asbestos	650-013-00-6	----- 12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
40	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4	<0.1	mg/kg	1.197	<0.12	mg/kg	<0.000012 %		<LOD
41	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9	<0.1	mg/kg	2.775	<0.278	mg/kg	<0.0000278 %		<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
42	manganese { manganese sulphate }				<0.1 mg/kg	2.749	<0.275 mg/kg	<0.0000275 %		<LOD
	025-003-00-4	232-089-9	7785-87-7							
43	molybdenum { molybdenum(VI) oxide }				<0.1 mg/kg	1.5	<0.15 mg/kg	<0.000015 %		<LOD
	042-001-00-9	215-204-7	1313-27-5							
44	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3							
45	tetrachloroethylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-028-00-4	204-825-9	127-18-4							
46	carbon tetrachloride; tetrachloromethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-008-00-5	200-262-8	56-23-5							
47	trichloroethylene; trichloroethene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-027-00-9	201-167-4	79-01-6							
48	vinyl chloride; chloroethylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
49	DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-045-00-7	200-024-3	50-29-3							
50	chlordan (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-047-00-8	200-349-0	57-74-9							
51	hexachlorocyclohexanes, including lindane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-043-00-6	210-168-9, 200-401-2, 206-270-8, 206-271-3	58-89-9, 319-84-6, 319-85-7, 608-73-1							
52	dieldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-049-00-9	200-484-5	60-57-1							
53	endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-051-00-X	200-775-7	72-20-8							
54	heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-046-00-2	200-962-3	76-44-8							
55	hexachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
56	chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	606-019-00-6	205-601-3	143-50-0							
57	aldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-048-00-3	206-215-8	309-00-2							
58	pentachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-074-00-5	210-172-0	608-93-5							
59	dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-077-00-1	219-196-6	2385-85-5							
60	camphechlor (ISO); toxaphene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-044-00-1	232-283-3	8001-35-2							
61	hexabromobiphenyl				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		252-994-2	36355-01-8							
62	2,3,7,8-TeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
		217-122-7	1746-01-6							
63	1,2,3,7,8-PeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			40321-76-4							
64	1,2,3,4,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			39227-28-6							
65	1,2,3,6,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			57653-85-7							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
66	1,2,3,7,8,9-HxCDD		19408-74-3		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
67	1,2,3,4,6,7,8-HpCDD		35822-46-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
68	OCDD		3268-87-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
69	2,3,7,8-TeCDF		51207-31-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
70	1,2,3,7,8-PeCDF		57117-41-6		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
71	2,3,4,7,8-PeCDF		57117-31-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
72	1,2,3,4,7,8-HxCDF		70648-26-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
73	1,2,3,6,7,8-HxCDF		57117-44-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
74	1,2,3,7,8,9-HxCDF		72918-21-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
75	2,3,4,6,7,8-HxCDF		60851-34-5		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
76	1,2,3,4,6,7,8-HpCDF		67562-39-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
77	1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
78	OCDF		39001-02-0		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
79	petrol (gasoline) petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
80	diesel petroleum group		68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
81	heavy/residual fuel oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
82	crude oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
83	kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened	232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.231 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Concentrations too low to be considered flammable risk



Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0116%)



Classification of sample: WS3

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS3	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.50 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number					
1	arsenic { arsenic trioxide }							
	033-003-00-0	215-481-4	1327-53-3		37.1 mg/kg	1.32	48.984 mg/kg	0.0049 %
2	cadmium { cadmium oxide }							
	048-002-00-0	215-146-2	1306-19-0		<0.5 mg/kg	1.142	<0.571 mg/kg	<0.0000571 %
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }							
		215-160-9	1308-38-9		35.8 mg/kg	1.462	52.324 mg/kg	0.00523 %
4	copper { dicopper oxide; copper (I) oxide }							
	029-002-00-X	215-270-7	1317-39-1		66.8 mg/kg	1.126	75.209 mg/kg	0.00752 %
5	lead { lead chromate }			1				
	082-004-00-2	231-846-0	7758-97-6		145 mg/kg	1.56	226.173 mg/kg	0.0145 %
6	mercury { mercury dichloride }							
	080-010-00-X	231-299-8	7487-94-7		<0.5 mg/kg	1.353	<0.677 mg/kg	<0.0000677 %
7	nickel { nickel chromate }							
	028-035-00-7	238-766-5	14721-18-7		38.2 mg/kg	2.976	113.693 mg/kg	0.0114 %
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }							
	034-002-00-8				1.3 mg/kg	1.405	1.827 mg/kg	0.000183 %
9	zinc { zinc chromate }							
	024-007-00-3	236-878-9	13530-65-9		40.3 mg/kg	2.774	111.798 mg/kg	0.0112 %
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }							
	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %
11	chromium in chromium(VI) compounds { chromium(VI) oxide }							
	024-001-00-0	215-607-8	1333-82-0		<0.8 mg/kg	1.923	<1.538 mg/kg	<0.000154 %
12	boron { diboron trioxide; boric oxide }							
	005-008-00-8	215-125-8	1303-86-2		<0.5 mg/kg	3.22	<1.61 mg/kg	<0.000161 %
13	pH							
					7.3 pH		7.3 pH	7.3 pH
14	phenol							
	604-001-00-2	203-632-7	108-95-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %
15	naphthalene							
	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
16	acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
17	acenaphthene	201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
18	fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
19	phenanthrene	201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
20	anthracene	204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
21	fluoranthene	205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
22	pyrene	204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
23	benzo[a]anthracene	601-033-00-9	200-280-6		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
24	chrysene	601-048-00-0	205-923-4		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
25	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
26	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
27	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
28	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
29	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
30	benzo[ghi]perylene	205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
31	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
32	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
33	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
34	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
35	TPH (C6 to C40) petroleum group		TPH		12.3 mg/kg		12.3 mg/kg	0.00123 %			
36	confirm TPH has NOT arisen from diesel or petrol				.1		.1				<LOD
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
38	polychlorobiphenyls; PCB	602-039-00-4	215-648-1		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
39	asbestos	650-013-00-6	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
40	antimony { antimony trioxide }	051-005-00-X	215-175-0		<0.1 mg/kg	1.197	<0.12 mg/kg	<0.000012 %			<LOD
41	beryllium { beryllium oxide }	004-003-00-8	215-133-1		<0.1 mg/kg	2.775	<0.278 mg/kg	<0.0000278 %			<LOD



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
42	manganese { manganese sulphate }				<0.1	mg/kg	2.749	<0.275	mg/kg	<0.0000275 %		<LOD
	025-003-00-4	232-089-9	7785-87-7									
43	molybdenum { molybdenum(VI) oxide }				<0.1	mg/kg	1.5	<0.15	mg/kg	<0.000015 %		<LOD
	042-001-00-9	215-204-7	1313-27-5									
44	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3									
45	tetrachloroethylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	602-028-00-4	204-825-9	127-18-4									
46	carbon tetrachloride; tetrachloromethane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	602-008-00-5	200-262-8	56-23-5									
47	trichloroethylene; trichloroethene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	602-027-00-9	201-167-4	79-01-6									
48	vinyl chloride; chloroethylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-023-00-7	200-831-0	75-01-4									
49	DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-045-00-7	200-024-3	50-29-3									
50	chlordan (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-047-00-8	200-349-0	57-74-9									
51	hexachlorocyclohexanes, including lindane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-043-00-6	210-168-9, 200-401-2, 206-270-8, 206-271-3	58-89-9, 319-84-6, 319-85-7, 608-73-1									
52	dieldrin (ISO)				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-049-00-9	200-484-5	60-57-1									
53	endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-051-00-X	200-775-7	72-20-8									
54	heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-046-00-2	200-962-3	76-44-8									
55	hexachlorobenzene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-065-00-6	204-273-9	118-74-1									
56	chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	606-019-00-6	205-601-3	143-50-0									
57	aldrin (ISO)				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-048-00-3	206-215-8	309-00-2									
58	pentachlorobenzene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-074-00-5	210-172-0	608-93-5									
59	dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-077-00-1	219-196-6	2385-85-5									
60	camphechlor (ISO); toxaphene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-044-00-1	232-283-3	8001-35-2									
61	hexabromobiphenyl				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		252-994-2	36355-01-8									
62	2,3,7,8-TeCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
		217-122-7	1746-01-6									
63	1,2,3,7,8-PeCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
			40321-76-4									
64	1,2,3,4,7,8-HxCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
			39227-28-6									
65	1,2,3,6,7,8-HxCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
			57653-85-7									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
66	1,2,3,7,8,9-HxCDD		19408-74-3		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
67	1,2,3,4,6,7,8-HpCDD		35822-46-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
68	OCDD		3268-87-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
69	2,3,7,8-TeCDF		51207-31-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
70	1,2,3,7,8-PeCDF		57117-41-6		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
71	2,3,4,7,8-PeCDF		57117-31-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
72	1,2,3,4,7,8-HxCDF		70648-26-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
73	1,2,3,6,7,8-HxCDF		57117-44-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
74	1,2,3,7,8,9-HxCDF		72918-21-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
75	2,3,4,6,7,8-HxCDF		60851-34-5		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
76	1,2,3,4,6,7,8-HpCDF		67562-39-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
77	1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
78	OCDF		39001-02-0		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
79	petrol (gasoline) petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
80	diesel petroleum group		68334-30-5; 68476-34-6; 94114-59-7; 1159170-26-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
81	heavy/residual fuel oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
82	crude oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
83	kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened	232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.0572 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Concentrations too low to be considered flammable risk



Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00123%)



Classification of sample: WS4

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS4	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.50 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				14.5 mg/kg	1.32	19.145 mg/kg	0.00191 %		
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				<0.5 mg/kg	1.142	<0.571 mg/kg	<0.0000571 %		<LOD
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				42.3 mg/kg	1.462	61.824 mg/kg	0.00618 %		
		215-160-9	1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }				36.7 mg/kg	1.126	41.32 mg/kg	0.00413 %		
	029-002-00-X	215-270-7	1317-39-1							
5	lead { lead chromate }			1	18.4 mg/kg	1.56	28.701 mg/kg	0.00184 %		
	082-004-00-2	231-846-0	7758-97-6							
6	mercury { mercury dichloride }				<0.5 mg/kg	1.353	<0.677 mg/kg	<0.0000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
7	nickel { nickel chromate }				55 mg/kg	2.976	163.695 mg/kg	0.0164 %		
	028-035-00-7	238-766-5	14721-18-7							
8	selenium { selenium compounds with the exception of cadmium selenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
	034-002-00-8									
9	zinc { zinc chromate }				82.2 mg/kg	2.774	228.035 mg/kg	0.0228 %		
	024-007-00-3	236-878-9	13530-65-9							
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
	006-007-00-5									
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.8 mg/kg	1.923	<1.538 mg/kg	<0.000154 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
12	boron { diboron trioxide; boric oxide }				<0.5 mg/kg	3.22	<1.61 mg/kg	<0.000161 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
13	pH				7.8 pH		7.8 pH	7.8 pH		
14	phenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
15	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-052-00-2	202-049-5	91-20-3							



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
16	acenaphthylene	205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
17	acenaphthene	201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
18	fluorene	201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
19	phenanthrene	201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
20	anthracene	204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21	fluoranthene	205-912-4	206-44-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22	pyrene	204-927-3	129-00-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
24	chrysene	601-048-00-0	205-923-4	218-01-9	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
27	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
28	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
29	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
30	benzo[ghi]perylene	205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
31	benzene	601-020-00-8	200-753-7	71-43-2	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
32	toluene	601-021-00-3	203-625-9	108-88-3	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
33	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
34	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
35	TPH (C6 to C40) petroleum group		TPH		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
36	confirm TPH has NOT arisen from diesel or petrol				.1			.1				<LOD
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
38	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
39	asbestos	650-013-00-6	----- 12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
40	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4	<0.1	mg/kg	1.197	<0.12	mg/kg	<0.000012 %		<LOD
41	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9	<0.1	mg/kg	2.775	<0.278	mg/kg	<0.0000278 %		<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
42	manganese { manganese sulphate }				<0.1 mg/kg	2.749	<0.275 mg/kg	<0.0000275 %		<LOD
	025-003-00-4	232-089-9	7785-87-7							
43	molybdenum { molybdenum(VI) oxide }				<0.1 mg/kg	1.5	<0.15 mg/kg	<0.000015 %		<LOD
	042-001-00-9	215-204-7	1313-27-5							
44	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3							
45	tetrachloroethylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-028-00-4	204-825-9	127-18-4							
46	carbon tetrachloride; tetrachloromethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-008-00-5	200-262-8	56-23-5							
47	trichloroethylene; trichloroethene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-027-00-9	201-167-4	79-01-6							
48	vinyl chloride; chloroethylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
49	DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-045-00-7	200-024-3	50-29-3							
50	chlordan (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-047-00-8	200-349-0	57-74-9							
51	hexachlorocyclohexanes, including lindane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-043-00-6	210-168-9, 200-401-2, 206-270-8, 206-271-3	58-89-9, 319-84-6, 319-85-7, 608-73-1							
52	dieldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-049-00-9	200-484-5	60-57-1							
53	endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-051-00-X	200-775-7	72-20-8							
54	heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-046-00-2	200-962-3	76-44-8							
55	hexachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
56	chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	606-019-00-6	205-601-3	143-50-0							
57	aldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-048-00-3	206-215-8	309-00-2							
58	pentachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-074-00-5	210-172-0	608-93-5							
59	dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-077-00-1	219-196-6	2385-85-5							
60	camphechlor (ISO); toxaphene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-044-00-1	232-283-3	8001-35-2							
61	hexabromobiphenyl				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		252-994-2	36355-01-8							
62	2,3,7,8-TeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
		217-122-7	1746-01-6							
63	1,2,3,7,8-PeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			40321-76-4							
64	1,2,3,4,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			39227-28-6							
65	1,2,3,6,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			57653-85-7							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
66	1,2,3,7,8,9-HxCDD		19408-74-3		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
67	1,2,3,4,6,7,8-HpCDD		35822-46-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
68	OCDD		3268-87-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
69	2,3,7,8-TeCDF		51207-31-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
70	1,2,3,7,8-PeCDF		57117-41-6		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
71	2,3,4,7,8-PeCDF		57117-31-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
72	1,2,3,4,7,8-HxCDF		70648-26-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
73	1,2,3,6,7,8-HxCDF		57117-44-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
74	1,2,3,7,8,9-HxCDF		72918-21-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
75	2,3,4,6,7,8-HxCDF		60851-34-5		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
76	1,2,3,4,6,7,8-HpCDF		67562-39-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
77	1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
78	OCDF		39001-02-0		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
79	petrol (gasoline) petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
80	diesel petroleum group		68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
81	heavy/residual fuel oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
82	crude oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
83	kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened	232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.0546 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification



Classification of sample: WS5

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS5	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.50 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				22.3 mg/kg	1.32	29.443 mg/kg	0.00294 %			
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				<0.5 mg/kg	1.142	<0.571 mg/kg	<0.0000571 %			<LOD
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				20.9 mg/kg	1.462	30.547 mg/kg	0.00305 %			
		215-160-9	1308-38-9								
4	copper { dicopper oxide; copper (I) oxide }				179 mg/kg	1.126	201.534 mg/kg	0.0202 %			
	029-002-00-X	215-270-7	1317-39-1								
5	lead { lead chromate }			1	234 mg/kg	1.56	364.997 mg/kg	0.0234 %			
	082-004-00-2	231-846-0	7758-97-6								
6	mercury { mercury dichloride }				0.9 mg/kg	1.353	1.218 mg/kg	0.000122 %			
	080-010-00-X	231-299-8	7487-94-7								
7	nickel { nickel chromate }				41.7 mg/kg	2.976	124.11 mg/kg	0.0124 %			
	028-035-00-7	238-766-5	14721-18-7								
8	selenium { selenium compounds with the exception of cadmium selenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
9	zinc { zinc chromate }				124 mg/kg	2.774	343.994 mg/kg	0.0344 %			
	024-007-00-3	236-878-9	13530-65-9								
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
	006-007-00-5										
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.8 mg/kg	1.923	<1.538 mg/kg	<0.000154 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
12	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.932 mg/kg	0.000193 %			
	005-008-00-8	215-125-8	1303-86-2								
13	pH				7.7 pH		7.7 pH	7.7 pH			
14	phenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
15	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
16	acenaphthylene	205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
17	acenaphthene	201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
18	fluorene	201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
19	phenanthrene	201-581-5	85-01-8		0.1	mg/kg		0.1	mg/kg	0.00001 %		
20	anthracene	204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21	fluoranthene	205-912-4	206-44-0		0.2	mg/kg		0.2	mg/kg	0.00002 %		
22	pyrene	204-927-3	129-00-0		0.2	mg/kg		0.2	mg/kg	0.00002 %		
23	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.1	mg/kg		0.1	mg/kg	0.00001 %		
24	chrysene	601-048-00-0	205-923-4	218-01-9	0.2	mg/kg		0.2	mg/kg	0.00002 %		
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.2	mg/kg		0.2	mg/kg	0.00002 %		
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.2	mg/kg		0.2	mg/kg	0.00002 %		
27	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.2	mg/kg		0.2	mg/kg	0.00002 %		
28	indeno[123-cd]pyrene	205-893-2	193-39-5		0.2	mg/kg		0.2	mg/kg	0.00002 %		
29	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
30	benzo[ghi]perylene	205-883-8	191-24-2		0.1	mg/kg		0.1	mg/kg	0.00001 %		
31	benzene	601-020-00-8	200-753-7	71-43-2	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
32	toluene	601-021-00-3	203-625-9	108-88-3	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
33	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
34	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
35	TPH (C6 to C40) petroleum group		TPH		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
36	confirm TPH has NOT arisen from diesel or petrol				.1			.1				<LOD
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
38	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
39	asbestos	650-013-00-6	----- 12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
40	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4	<0.1	mg/kg	1.197	<0.12	mg/kg	<0.000012 %		<LOD
41	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9	<0.1	mg/kg	2.775	<0.278	mg/kg	<0.0000278 %		<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
42	manganese { manganese sulphate }				<0.1 mg/kg	2.749	<0.275 mg/kg	<0.0000275 %		<LOD
	025-003-00-4	232-089-9	7785-87-7							
43	molybdenum { molybdenum(VI) oxide }				<0.1 mg/kg	1.5	<0.15 mg/kg	<0.000015 %		<LOD
	042-001-00-9	215-204-7	1313-27-5							
44	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3							
45	tetrachloroethylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-028-00-4	204-825-9	127-18-4							
46	carbon tetrachloride; tetrachloromethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-008-00-5	200-262-8	56-23-5							
47	trichloroethylene; trichloroethene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-027-00-9	201-167-4	79-01-6							
48	vinyl chloride; chloroethylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
49	DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-045-00-7	200-024-3	50-29-3							
50	chlordan (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-047-00-8	200-349-0	57-74-9							
51	hexachlorocyclohexanes, including lindane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-043-00-6	210-168-9, 200-401-2, 206-270-8, 206-271-3	58-89-9, 319-84-6, 319-85-7, 608-73-1							
52	dieldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-049-00-9	200-484-5	60-57-1							
53	endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-051-00-X	200-775-7	72-20-8							
54	heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-046-00-2	200-962-3	76-44-8							
55	hexachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
56	chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	606-019-00-6	205-601-3	143-50-0							
57	aldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-048-00-3	206-215-8	309-00-2							
58	pentachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-074-00-5	210-172-0	608-93-5							
59	dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-077-00-1	219-196-6	2385-85-5							
60	camphechlor (ISO); toxaphene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-044-00-1	232-283-3	8001-35-2							
61	hexabromobiphenyl				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		252-994-2	36355-01-8							
62	2,3,7,8-TeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
		217-122-7	1746-01-6							
63	1,2,3,7,8-PeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			40321-76-4							
64	1,2,3,4,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			39227-28-6							
65	1,2,3,6,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			57653-85-7							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
66	1,2,3,7,8,9-HxCDD		19408-74-3		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
67	1,2,3,4,6,7,8-HpCDD		35822-46-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
68	OCDD		3268-87-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
69	2,3,7,8-TeCDF		51207-31-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
70	1,2,3,7,8-PeCDF		57117-41-6		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
71	2,3,4,7,8-PeCDF		57117-31-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
72	1,2,3,4,7,8-HxCDF		70648-26-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
73	1,2,3,6,7,8-HxCDF		57117-44-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
74	1,2,3,7,8,9-HxCDF		72918-21-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
75	2,3,4,6,7,8-HxCDF		60851-34-5		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
76	1,2,3,4,6,7,8-HpCDF		67562-39-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
77	1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
78	OCDF		39001-02-0		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
79	petrol (gasoline) petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
80	diesel petroleum group		68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
81	heavy/residual fuel oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
82	crude oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
83	kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened	232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.0979 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification



Classification of sample: WS6

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS6	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.40 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				15.4 mg/kg	1.32	20.333 mg/kg	0.00203 %			
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				<0.5 mg/kg	1.142	<0.571 mg/kg	<0.0000571 %			<LOD
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				21.9 mg/kg	1.462	32.008 mg/kg	0.0032 %			
		215-160-9	1308-38-9								
4	copper { dicopper oxide; copper (I) oxide }				71.1 mg/kg	1.126	80.051 mg/kg	0.00801 %			
	029-002-00-X	215-270-7	1317-39-1								
5	lead { lead chromate }			1	89.6 mg/kg	1.56	139.759 mg/kg	0.00896 %			
	082-004-00-2	231-846-0	7758-97-6								
6	mercury { mercury dichloride }				<0.5 mg/kg	1.353	<0.677 mg/kg	<0.0000677 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
7	nickel { nickel chromate }				33.7 mg/kg	2.976	100.3 mg/kg	0.01 %			
	028-035-00-7	238-766-5	14721-18-7								
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
9	zinc { zinc chromate }				90.4 mg/kg	2.774	250.783 mg/kg	0.0251 %			
	024-007-00-3	236-878-9	13530-65-9								
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
	006-007-00-5										
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.8 mg/kg	1.923	<1.538 mg/kg	<0.000154 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
12	boron { diboron trioxide; boric oxide }				<0.5 mg/kg	3.22	<1.61 mg/kg	<0.000161 %			<LOD
	005-008-00-8	215-125-8	1303-86-2								
13	pH				7.8 pH		7.8 pH	7.8 pH			
14	phenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
15	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
16	acenaphthylene	205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
17	acenaphthene	201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
18	fluorene	201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
19	phenanthrene	201-581-5	85-01-8		0.2	mg/kg		0.2	mg/kg	0.00002 %		
20	anthracene	204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21	fluoranthene	205-912-4	206-44-0		0.6	mg/kg		0.6	mg/kg	0.00006 %		
22	pyrene	204-927-3	129-00-0		0.7	mg/kg		0.7	mg/kg	0.00007 %		
23	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.5	mg/kg		0.5	mg/kg	0.00005 %		
24	chrysene	601-048-00-0	205-923-4	218-01-9	0.5	mg/kg		0.5	mg/kg	0.00005 %		
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.9	mg/kg		0.9	mg/kg	0.00009 %		
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.8	mg/kg		0.8	mg/kg	0.00008 %		
27	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.9	mg/kg		0.9	mg/kg	0.00009 %		
28	indeno[123-cd]pyrene	205-893-2	193-39-5		0.8	mg/kg		0.8	mg/kg	0.00008 %		
29	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.2	mg/kg		0.2	mg/kg	0.00002 %		
30	benzo[ghi]perylene	205-883-8	191-24-2		0.5	mg/kg		0.5	mg/kg	0.00005 %		
31	benzene	601-020-00-8	200-753-7	71-43-2	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
32	toluene	601-021-00-3	203-625-9	108-88-3	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
33	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
34	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
35	TPH (C6 to C40) petroleum group		TPH		12	mg/kg		12	mg/kg	0.0012 %		
36	confirm TPH has NOT arisen from diesel or petrol				.1			.1				<LOD
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
38	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
39	asbestos	650-013-00-6	----- 12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
40	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4	<0.1	mg/kg	1.197	<0.12	mg/kg	<0.000012 %		<LOD
41	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9	<0.1	mg/kg	2.775	<0.278	mg/kg	<0.0000278 %		<LOD



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
42	manganese { manganese sulphate }				<0.1	mg/kg	2.749	<0.275	mg/kg	<0.0000275 %		<LOD
	025-003-00-4	232-089-9	7785-87-7									
43	molybdenum { molybdenum(VI) oxide }				<0.1	mg/kg	1.5	<0.15	mg/kg	<0.000015 %		<LOD
	042-001-00-9	215-204-7	1313-27-5									
44	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3									
45	tetrachloroethylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	602-028-00-4	204-825-9	127-18-4									
46	carbon tetrachloride; tetrachloromethane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	602-008-00-5	200-262-8	56-23-5									
47	trichloroethylene; trichloroethene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	602-027-00-9	201-167-4	79-01-6									
48	vinyl chloride; chloroethylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-023-00-7	200-831-0	75-01-4									
49	DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-045-00-7	200-024-3	50-29-3									
50	chlordan (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-047-00-8	200-349-0	57-74-9									
51	hexachlorocyclohexanes, including lindane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-043-00-6	210-168-9, 200-401-2, 206-270-8, 206-271-3	58-89-9, 319-84-6, 319-85-7, 608-73-1									
52	dieldrin (ISO)				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-049-00-9	200-484-5	60-57-1									
53	endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-051-00-X	200-775-7	72-20-8									
54	heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-046-00-2	200-962-3	76-44-8									
55	hexachlorobenzene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-065-00-6	204-273-9	118-74-1									
56	chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	606-019-00-6	205-601-3	143-50-0									
57	aldrin (ISO)				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-048-00-3	206-215-8	309-00-2									
58	pentachlorobenzene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-074-00-5	210-172-0	608-93-5									
59	dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-077-00-1	219-196-6	2385-85-5									
60	camphechlor (ISO); toxaphene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	602-044-00-1	232-283-3	8001-35-2									
61	hexabromobiphenyl				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		252-994-2	36355-01-8									
62	2,3,7,8-TeCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
		217-122-7	1746-01-6									
63	1,2,3,7,8-PeCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
			40321-76-4									
64	1,2,3,4,7,8-HxCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
			39227-28-6									
65	1,2,3,6,7,8-HxCDD				<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
			57653-85-7									



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
66	1,2,3,7,8,9-HxCDD		19408-74-3		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
67	1,2,3,4,6,7,8-HpCDD		35822-46-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
68	OCDD		3268-87-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
69	2,3,7,8-TeCDF		51207-31-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
70	1,2,3,7,8-PeCDF		57117-41-6		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
71	2,3,4,7,8-PeCDF		57117-31-4		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
72	1,2,3,4,7,8-HxCDF		70648-26-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
73	1,2,3,6,7,8-HxCDF		57117-44-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
74	1,2,3,7,8,9-HxCDF		72918-21-9		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
75	2,3,4,6,7,8-HxCDF		60851-34-5		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
76	1,2,3,4,6,7,8-HpCDF		67562-39-4		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
77	1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
78	OCDF		39001-02-0		<0.1	ng/kg		<1.0e-07	mg/kg	<1.0e-11 %		<LOD
79	petrol (gasoline) petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
80	diesel petroleum group		68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
81	heavy/residual fuel oils petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
82	crude oils petroleum group				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
83	kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened	232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
Total:										0.0603 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Concentrations too low to be considered flammable risk



Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0012%)



Appendix A: Classifier defined and non CLP determinands

■ **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

CLP index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

■ **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

■ **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

■ **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

■ **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410



▪ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2 H351

▪ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

▪ **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

▪ **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

▪ **confirm TPH has NOT arisen from diesel or petrol**

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

▪ **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4

Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

▪ **1,1-dichloroethane and 1,2-dichloroethane (combined)** (EC Number: 203-458-1, 200-863-5, CAS Number: 107-06-2, 75-34-3)

Description/Comments: Combines the hazard statements and risk phrases for 1,1-dichloroethane and 1,2-dichloroethane

Data source: N/a

Data source date: 14 Oct 2016

Hazard Statements: Flam. Liq. 2 H225 , Acute Tox. 4 H302 , Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 1B H350 , Aquatic Chronic 3 H412

▪ **hexabromobiphenyl** (EC Number: 252-994-2, CAS Number: 36355-01-8)

Description/Comments:

Data source: POP specific threshold from ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004).

Data source date: 01 Jul 2013

Hazard Statements: POP >= 0.005 %

▪ **2,3,7,8-TeCDD** (EC Number: 217-122-7, CAS Number: 1746-01-6)

Description/Comments: 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)

Data source date: 24 Aug 2010

Hazard Statements: PCDD/PCDF (TEF=1)



■ **1,2,3,7,8-PeCDD** (CAS Number: 40321-76-4)

Description/Comments: 1,2,3,7,8-pentachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=1)

■ **1,2,3,4,7,8-HxCDD** (CAS Number: 39227-28-6)

Description/Comments: 1,2,3,4,7,8-hexachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

■ **1,2,3,6,7,8-HxCDD** (CAS Number: 57653-85-7)

Description/Comments: 1,2,3,6,7,8-hexachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

■ **1,2,3,7,8,9-HxCDD** (CAS Number: 19408-74-3)

Description/Comments: 1,2,3,7,8,9-hexachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

■ **1,2,3,4,6,7,8-HpCDD** (CAS Number: 35822-46-9)

Description/Comments: 1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.01)

■ **OCDD** (CAS Number: 3268-87-9)

Description/Comments: octachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.0003)

■ **2,3,7,8-TeCDF** (CAS Number: 51207-31-9)

Description/Comments: 2,3,7,8-tetrachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

■ **1,2,3,7,8-PeCDF** (CAS Number: 57117-41-6)

Description/Comments: 1,2,3,7,8-pentachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.03)

■ **2,3,4,7,8-PeCDF** (CAS Number: 57117-31-4)

Description/Comments: 2,3,4,7,8-pentachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.3)

■ **1,2,3,4,7,8-HxCDF** (CAS Number: 70648-26-9)

Description/Comments: 1,2,3,4,7,8-hexachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

■ **1,2,3,6,7,8-HxCDF** (CAS Number: 57117-44-9)

Description/Comments: 1,2,3,6,7,8-hexachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)



▪ **1,2,3,7,8,9-HxCDF** (CAS Number: 72918-21-9)

Description/Comments: 1,2,3,7,8,9-hexachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

▪ **2,3,4,6,7,8-HxCDF** (CAS Number: 60851-34-5)

Description/Comments: 2,3,4,6,7,8-hexachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

▪ **1,2,3,4,6,7,8-HpCDF** (CAS Number: 67562-39-4)

Description/Comments: 1,2,3,4,6,7,8-heptachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.01)

▪ **1,2,3,4,7,8,9-HpCDF** (CAS Number: 55673-89-7)

Description/Comments: 1,2,3,4,7,8,9-heptachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.01)

▪ **OCDF** (CAS Number: 39001-02-0)

Description/Comments: octachlorodibenzo[b,d]furan
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.0003)

▪ **petrol (gasoline) petroleum group**

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 1 H224 , Skin Irrit. 2 H315 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , STOT SE 3 H336 , Asp. Tox. 1 H304 , Aquatic Chronic 2 H411

▪ **diesel petroleum group** (CAS Number: 68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3 H226 , Skin Irrit. 2 H315 , Acute Tox. 4 H332 , Carc. 2 H351 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Aquatic Chronic 2 H411

▪ **heavy/residual fuel oils petroleum group**

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Muta. 1B H340 , Carc. 1B H350 , Acute Tox. 4 H332 , Repr. 2 H361d , STOT RE 2 H373 , Aquatic Chronic 2 H411

▪ **crude oils petroleum group**

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 2 H225 , Carc. 1B H350 , Eye Irrit. 2 H319 , Asp. Tox. 1 H304 , STOT RE 2 H373 , STOT SE 3 H336 , Aquatic Chronic 2 H411

▪ **kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened** (EC Number: 232-366-4; 265-184-9; 294-799-5, CAS Number: 8008-20-6; 64742-81-0; 91770-15-9)

Description/Comments: Review of ECHA Registered Substances database; Concawe report: hazard classification and labelling of petroleum substances in the European Economic Area - 2012; REACH compliant SDS from Total, Petrobras; Petrochem; Shell; ESS
Data source: <http://echa.europa.eu/information-on-chemicals/registered-substances>; Hazard classification and labelling of petroleum substances in the European Economic Area - 2012 (CONCAWE); SDS: company websites
Data source date: 21 Jan 2014
Hazard Statements: Flam. Liq. 3 H226 , Skin Irrit. 2 H315 , Asp. Tox. 1 H304 , Aquatic Chronic 2 H411



Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worst case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {selenium compounds with the exception of cadmium sulposelenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulposelenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required)

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required)

manganese {manganese sulphate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2021.222.4848.9214 (10 Aug 2021)
HazWasteOnline Database: 2021.222.4848.9214 (10 Aug 2021)



This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2019 - UK: 2019 No. 720 of 27th March 2019

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:

2020 No. 1540 of 16th December 2020

POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

APPENDIX I: CURRENT GUIDANCE & LEGISLATIONS

CURRENT CONTAMINATED LAND LEGISLATION / GUIDANCE & ENVIRONMENTAL RISK ASSESSMENT **METHODOLOGY**

LEGISLATION OVERVIEW

This report includes hazard identification and risk assessment in line with the risk-based methods referred to in relevant UK legislation and guidance. Government environmental policy is based upon a "suitable for use approach". When considering the current use of land, Part IIA of the Environment Protection Act 1990 (EPA 1990) provides the regulatory regime, which was introduced by Section 57 of the Environment Act 1995, which came into force in England on 1 April 2000. The main objective of introducing the Part IIA regime is to provide an improved system for the identification and remediation of land where contamination is causing unacceptable risks to human health or the wider environment given the current use and circumstances of the land.

Part IIA provides a statutory definition of contaminated land under Section 78A(2) as:

"any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on, or under the land, that:

- (a) Significant harm is being caused or there is a significant possibility of such harm being caused;
- or
- (b) Pollution of controlled waters is being, or is likely to be, caused."

Part IIA provides a statutory definition of the pollution of controlled waters under Section 78A(9) as:

*"the entry into controlled waters of **any** poisonous, noxious or polluting matter or **any** solid waste matter".*

In order to assist in establishing if there is a "significant possibility of significant harm" there must be a "significant pollutant linkage" for potential harm to exist. That means there must be a source(s) of contamination, sensitive receptors present and a connection or pathway between the two. This combination of source-pathway-receptor is termed a "pollutant linkage or SPR linkage."

Part IIA of The Environmental Protection Act 1990 is supported by a substantial quantity of guidance and other Regulations, especially DEFRA Circular 01/2006 Contaminated Land (this replaces DETR Circular 02/2000). Part IIA defines the duties of Local Authorities in dealing with it. With the exception of situations of very high pollution risk, Part IIA places contaminated land responsibility on the planning and redevelopment process. In situations where there is very high pollution risk direct action from the Local Authority is usually necessary. Planning Policy Statement 23 (PPS23) provides guidance on the planning process and requires that sites which have been developed shall not be capable of being determined "contaminated land" under Part IIA.

The criteria for assessing levels of pollutants and hence determining whether a site represents a hazard are based on a range of techniques, models and guidance. Within this context it is relevant to note that Government objectives are:

- (a) to identify and remove unacceptable risks to human health and the environment;
- (b) to seek to bring damaged land back into beneficial use;
- (c) to seek to ensure that the cost burdens faced by individuals, companies and society as a whole are proportionate, manageable and economically sustainable.

These three objectives underlie the "suitable for use" approach to remediation of contaminated land. The "suitable for use" approach focuses on the risks caused by land contamination. The approach recognises that the risks presented by any given level of contamination will vary greatly according to the use of the land and a wide range of other factors, such as the underlying geology of the site. Risks therefore should be assessed on a site-by-site basis.

The "suitable for use" approach then consists of three elements:

- (a) ensuring that land is suitable for its current use - in other words, identifying any land where contamination is causing unacceptable risks to human health and the environment, assessed on the basis of the current use and circumstances of the land, and returning such land to a condition where such risks no longer arise; the contaminated land regime provides the regulatory mechanisms to achieve this;
- (b) ensuring that land is made suitable for any new use, as planning permission is given for that new use - in other words, assessing the potential risks from contamination, on the basis of the proposed future use and circumstances, before official permission is given for the development and, where necessary to avoid unacceptable risks to human health and the environment, remediating the land before the new use commences; this is the role of the town and country planning and building control regimes; and
- (c) limiting requirements for remediation to the work necessary to prevent unacceptable risks to human health or the environment in relation to the current use or future use of the land for which planning permission is being sought - in other words, recognising that the risks from contaminated land can be satisfactorily assessed only in the context of specific uses of the land (whether current or proposed), and that any attempt to guess what might be needed at some time in the future for other uses is likely to result either in premature work (thereby running the risk of distorting social, economic and environmental priorities) or in unnecessary work (thereby wasting resources).

The mere presence of pollutants does not therefore necessarily warrant action, and consideration must be given to the scale of risk involved for the current and proposed end use of the site.

RISK ASSESSMENT METHODOLOGY

Current practice recommends that the determination of potential liabilities that could arise from land contamination be carried out using the process of risk assessment, whereby "risk" is defined as:

- "(a) The probability, or frequency, or occurrence of a defined hazard; and
- (b) The magnitude (including the seriousness) of the consequences."

The UK's approach to the assessment of environmental risk is set out in by the Department of the Environment (2000) publication "A Guide to Risk Assessment and Risk Management for Environmental Protection." This established an iterative, systematic staged process which comprises:

- (a) Hazard identification
- (b) Hazard assessment
- (c) Risk estimation
- (d) Risk evaluation
- (e) Risk Assessment

At each stage during the investigation process the above steps are repeated as more detailed information becomes available for the site.

CLR11- 'Model Procedures for the Management of Land Contamination', a document published by the Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency (EA) outlines a tiered approach to the assessment of risks posed by contaminated land, as summarised hereunder:

Tier 1: Preliminary Risk Assessment

A Preliminary Risk Assessment is usually undertaken as part of a desk study, outlines potential risks posed by potential contamination to all receptors by defining plausible "pollution linkages" and developing a preliminary conceptual model (PCM). The purpose of this model is to define all possible complete pollution linkages, where the requisite source – pathway – target elements are present, and these elements being defined as:

- a contaminant (source) is a hazardous substance or agent, present at levels that have the potential to cause harm or damage a receptor
- a pathway is the means by or through which a contaminant comes into contact with, or otherwise affects, the receptor
- a receptor (target) is an entity (human being, aquatic environment, flora and fauna etc) that is vulnerable to the adverse effects of the contaminant

This relationship is termed a "pollution linkage". It should be recognised that for a health or environmental risk to exist, all three elements of the relationship or linkage must be present, i.e.

- if there is no contaminant, or contaminant present at levels below those considered to be harmful or damaging to a receptor, then there can be no adverse effect on a receptor
- if there is no receptor present that can be adversely affected by a contaminant, no harm or damage can arise
- even where both a contaminant and a receptor are present, no harm or damage will occur if there is no pathway by or through which a linkage between the two can be established

The absence of one or more of each component (source, pathway, receptor) would prevent a pollutant linkage being established and there would be no significant environmental risk.

The PCM is subject to continual refinement as additional data becomes available. As part of a Phase I Investigation (Desk Study and site walk over) a PCM is formed. Based on the PCM, potential pollutant linkages can be assessed. If the PCM and hazard assessment indicate that a pollution linkage is not of significance then no further assessment or action is required due to this linkage. For each significant and possible linkage a risk assessment is carried out. The linkages which potentially pose significant risks may require a variety of responses ranging from immediate remedial action or risk management or, more commonly, further investigation and risk assessment. This next stage is usually termed a Phase II Main Site Investigation and should provide additional data to allow refinement of the PCM and assess the level of risk from each pollutant linkage. Risk assessment will usually include Tier 2 Generic Quantitative Risk Assessment and / or, if necessary, a Tier 3 Detailed Quantitative Risk Assessment.

Tier 2: Generic Quantitative Risk Assessment (GQRA)

GQRA requires an intrusive investigation in order to characterise the site assisting in the re-assessment of the source-pathway receptor linkage. The conceptual model should be refined accordingly.

Upon completion of an intrusive investigation it must be decided whether Generic Assessment Criteria (GAC) are suitable for assessing the risk posed by potential contamination at the site. If GAC are deemed unacceptable for risk assessment purposes or cannot be developed a Tier 3 Detailed Quantitative Risk Assessment (DQRA) is required.

If GQRA reveals that unacceptable risks are not present then no further action is required. If GQRA identifies a possibility of risk, a decision must be made whether further work is required or necessary for the purposes of risk assessment. If further risk assessment is deemed not suitable not required an Options Appraisal should be undertaken. If further risk assessment is required, the scope nature of further risk assessment must be decided – it is possible that a Tier 3 DQRA will be undertaken in this scenario.

Where the Environment Agency have published an SGV for a contaminant, this will be used in lieu, if the SGV is suitable for the subject site, of the GAC derived by **CC GEOTECHNICAL LTD.** For contaminants where an SGV has not been published

and a GAC has been published by LQM, then this GAC will be used. In house derived GAC's will only be used for contaminants where there is no SGV or LQM GAC.

Tier 3: Detailed Quantitative Risk Assessment (DQRA)

DQRA is used when pollutant linkages require further assessment. DQRA is often undertaken for pollutant linkages where GAC are unavailable or inappropriate for or more conservative than the actual circumstances of the site. Site specific data is used to create Site Specific Assessment Criteria (SSAC) and enable a more accurate assessment of the risks. Further investigation may or may not be required to formulate SSAC depending on the site specific conditions and information already obtained.

If DQRA reveals that unacceptable risks are not present then no further action is required. If DQRA identifies a possibility of risk, a decision must be made whether further work is required or necessary for the purposes of risk assessment. If further risk assessment is deemed not suitable not required an Options Appraisal should be undertaken. If further risk assessment is required, the scope and nature of further risk assessment must be decided at this point.

NOTE: A Tier 1 Preliminary Risk Assessment is undertaken as part of a Desk Study Report and a Preliminary Conceptual Model is developed for all pollutant linkages. However, the methodologies for assessing the risks to human health, risks to controlled waters and risk posed by ground gas using quantitative techniques vary considerably, therefore GQRA and DQRA for human health, controlled waters and ground gas must be undertaken separately. The risk assessment methodologies where quantitative assessment is used for risks to human health, risks to controlled waters and risks posed by ground gas, if relevant, are described hereunder.

BACKGROUND INFORMATION, CURRENT GUIDANCE AND RISK ASSESSMENT METHODOLOGY FOR RISKS POSED TO HUMAN HEALTH

Background

In March 2002, the Department for Environment, Food and Rural Affairs (DEFRA) and the EA published the Contaminated Land Exposure Assessment (CLEA) Model and a series of related reports. These were designed to provide a scientifically based framework for the assessment of chronic risks to human health from contaminated land. These reports (CLR7-10) together with associated "SGV" documents have since been withdrawn (August 2008) and the following documents have been published as revised guidance to the CLEA assessment:

- Environment Agency : 2008: Updated Technical Background to the CLEA model Science Report SC050021/SR3
- Environment Agency : 2008: Human Health Toxicological Assessment of Contaminants in Soil SC050021/SR2

Additional guidance on statistical assessment replacing CLR 7 is provided in:

- CL:AIRE :2008 Guidance on Comparing Data With a Critical Concentration

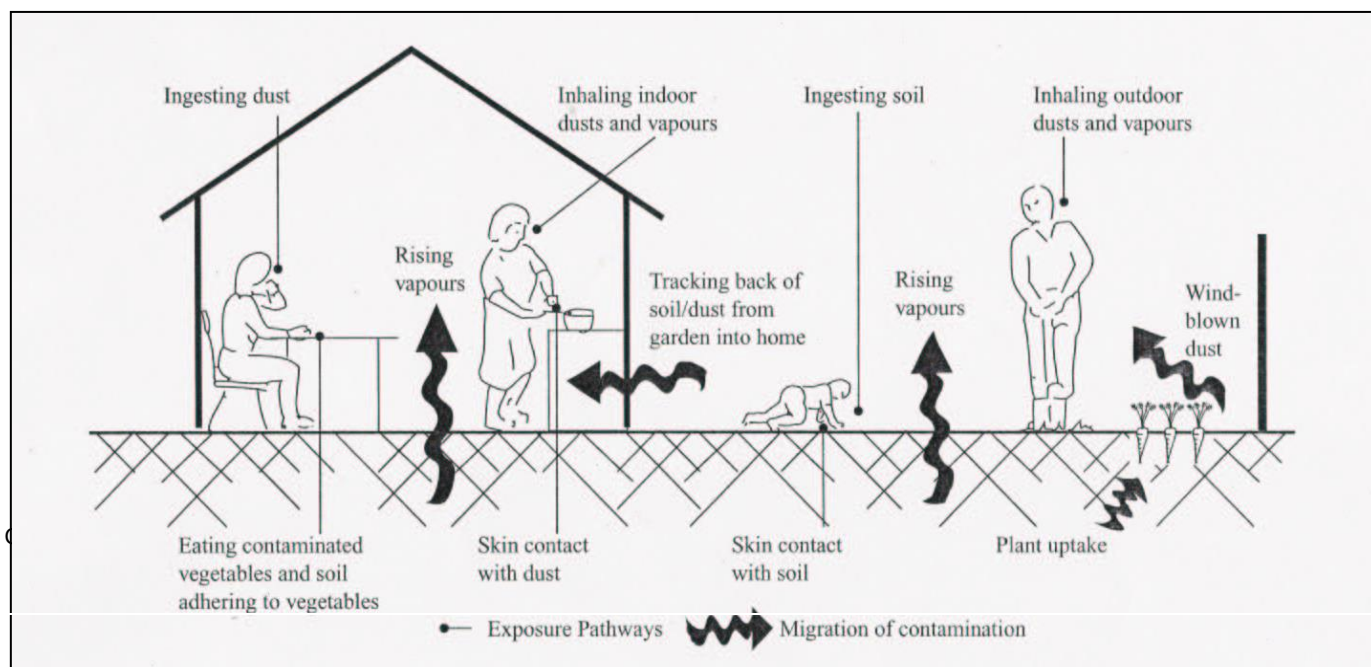
Other guidance/software used in spatial / statistical assessment is provided in:

- USEPA 2006: Data Quality Assessment: Statistical Methods for Practitioners
- Spatial Analysis and Decision Assistance (SADA) – The University of Tennessee

A different approach to the statistical appraisal of data is required depending on whether the assessment of risk is to assess whether land is Contaminated Land in accordance with regulations, or whether the assessment is to determine whether the site is suitable for new development in according with Planning guidance. This is discussed further in CL:AIRE :2008 "Guidance on Comparing Data With a Critical Concentration".

A program for the derivation of GAC's based on the above guidance is provided by the Environment Agency and is entitled "CLEA Software Version 1.06".

The CLEA model has been developed to calculate an estimated tolerable daily soil intake (TDSI) for site users given a set 'default' exposure pathways. Ten human exposure pathways are covered in the CLEA model as presented below:



Ingestion

- ingestion of outdoor soil
- ingestion of indoor dust
- ingestion of home grown produce
- ingestion of soil attached to home grown produce

Dermal Contact

- dermal contact with outdoor soil
- dermal contact with indoor dust

Inhalation

- inhalation of outdoor dust
- inhalation of indoor dust
- inhalation of outdoor soil vapour
- inhalation of indoor soil vapour

It should be noted that there are other potential exposure pathways on some sites not included in the CLEA model e.g. certain organic compounds can pass through plastic water pipes into drinking water supply.

Where contaminated water is present at a depth less than 2.00mbgl and there is a potential risk of inhalation of vapours (only when volatile compounds are present) the risk from inhalation of vapours from soil water will be assessed using a UK compliant version of BP Risc v4.02.

The presence and/or significance of each of the above exposure pathways are dependent on the type of land use being considered and the nature of the contaminant under scrutiny. Accordingly, the CLEA model considers for principle 'default' land use types and makes a series of 'default' assumptions with regard to human exposure frequency, duration and critical human target groups for each land use considered:

- residential
- allotments
- commercial / industrial land use

The above land use categories defined in the CLEA are detailed below:

Residential: This generic scenario assumes a typical residential property consisting of a two-storey house built on a ground-bearing slab with a private garden consisting of lawn, flowerbeds, and a small fruit and vegetable patch. The occupants are assumed to be parents with young children, who make regular use of the garden area.

Allotments: This generic scenario assumes a plot of open space (about 250 m2), commonly made available by the local authority to tenants to grow fruit and vegetables for their own consumption. There are usually several plots to a site and the overall site area may cover more than a hectare. The tenants are assumed to be parents or grandparents and that young children make occasional accompanied visits to the plot.

Commercial/Industrial: There are many different kinds of workplace and work-related activities. This generic scenario assumes a typical commercial or light industrial property consisting of a threestorey building at which employees spend most time indoors and are involved in officebased or relatively light physical work.

Human Health Risk Assessment Methodology

Assessment of risk for the protection of human health is undertaken using the methodology as outlined previously, and summarised hereunder:

- Tier 1 Preliminary Risk Assessment
- Tier 2 Generic Quantitative Risk Assessment
- Tier 3 Detailed Quantitative Risk Assessment

The Tier 1 Preliminary Risk Assessment is undertaken as part of the desk study report and includes the development of a Preliminary Conceptual Model. Tier 2 and Tier 3 Quantitative Risk Assessments are undertaken in order to develop and refine the Preliminary Conceptual Model aiding a more detailed assessment of the risk posed by contaminants revealed by site investigation and soil / soil water chemical analyses.

The methods used by **CC GEOTECHNICAL LTD** to derive assessment criteria, to statistically analyse chemical data and to compare chemical data to the derived assessment criteria are discussed herunder.

Derivation of Generic Assessment Criteria (GAC) and Site Specific Assessment Criteria (SSAC)

GAC's are derived on the basis of the proposed land use and the associated applicable exposure pathways. It should be noted that there are difficulties in establishing soil concentrations of contaminants beyond which risks from exposure to these contaminants would be 'unacceptable' and the GAC value does not necessarily equate to the level for "significant possibility of significant harm" as defined in Part IIA of The Environmental Protection Act (1990) to determine whether land is "contaminated." This ultimately requires detailed 'toxicological' information of the health effects of individual contaminants and also a scientific judgement on what constitutes an 'unacceptable' risk. The primary purpose of the CLEA derived GAC's are as 'minimal risk thresholds' for the assessment of human health risks in relation to land use.

Minimal risk thresholds calculated using generic input parameters for each of the above land uses are termed Generic Assessment Criteria (GAC) and are used for Generic Quantitative Risk Assessment (GQRA). However, further assessment may be required taking into consideration site specific factors such as the way the land is used, the soil type, the building

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characteristics and the exact nature of the receptor, to determine whether there is a significant possibility of risk to human health to site users. Such an assessment is known as a Detailed Quantitative Risk Assessment (DQRA) and the resultant threshold concentrations are known as Site Specific Assessment Criteria (SSAC). Such assessments should be conducted with the agreement of the local authority (or the Environment Agency) since it is the authority that determines whether land is Contaminated Land or whether Planning Permission for a new development may be granted.

For the purposes of this report, assessment criteria have been derived in accordance with current guidance based on the conceptual model for the proposed land use using the CLEA v1.06 software. These criteria are not intended to indicate whether the site may be contaminated land nor do they replace any published soil guideline values. However, the values are intended to provide guidance for the local authority on whether the site may be considered uncontaminated. If, based on the site's proposed future use, the site would be considered by the local authority to be uncontaminated and therefore, on the basis of soil concentrations, fit for purpose, then no further risk assessment based on soil concentrations and the risk to human health would be necessary. However, should these criteria be exceeded or the conceptual site model vary from the model used in the risk assessment to derive these values then the risk assessment should be updated accordingly.

For contaminants routinely analysed where inhalation is a significant pathway (naphthalene, phenanthrene, Aromatic EC5-EC7, Aromatic EC7-EC8, Aromatic EC8-EC10, Aromatic EC10-EC12, Aromatic EC12-EC16, Aliphatic EC5-EC6, Aliphatic EC8-EC10, Aliphatic EC10-EC12, Aliphatic EC12-EC16), plots of the GAC as a function of Soil Organic Matter (SOM) are used to determine if they pose a potential risk to human health, which are presented hereunder. Where there is an exceedance further assessment may be undertaken.

Statistical Assessment of Soil Contamination Data & Comparison of Contamination Data to Threshold Values

In any site investigation only a small fraction of the soil on the site is analysed. Therefore the mean derived from the contamination data for a contaminant may not be the same as the true mean for the contaminant distribution on the site. To improve the reliability of any assessment a statistical analysis is undertaken in line with the CL:AIRE document "Guidance on Comparing Soil Contamination Data with a Critical Concentration".

Statistical assessment of soil data is undertaken using programs based on the guidance in the CL:AIRE document or the USEPA software ProUCL v4.0.

Where the number of results in a dataset is less than four, a statistical assessment is not undertaken, and the assessment is performed by comparison of the maximum value(s) with a Health Criteria Value (HCV), such as Generic Assessment Criteria value(s).

For the Planning situation, the regulator needs to check whether the concentration of contaminants is low compared to the HCV. This decision is based on whether there is at least a 95% confidence level that the true mean of the dataset is lower than the HCV.

For the Part IIA scenario the regulator needs to determine whether the concentration of contaminants is greater than the HCV. This decision is based on whether there is at least a 95% confidence level that the true mean of the dataset is higher than the HCV. However, the regulator may proceed with determination if there is just a 51% probability, "on the balance of probabilities".

The Outlier Test used in the statistical assessment may not be able to identify separate populations if numerous populations are present. In order to ensure that this is not the case a spatial assessment of the data will be undertaken using SADA.

If the screening levels are exceeded then more sophisticated quantitative risk assessment or remedial action may be undertaken. The benefits of undertaking a quantitative risk assessment must be weighed against the likelihood that it will bring about cost savings in the proposed remediation.

BACKGROUND INFORMATION, CURRENT GUIDANCE AND RISK ASSESSMENT METHODOLOGY FOR RISKS POSED TO CONTROLLED WATER

Definition of Controlled Waters

The term 'controlled waters' is defined in Section 104 of the Water Resources Act 1991 as:

"Territorial Waters...which extend seawards for three miles..., coastal waters..., inland freshwaters, waters in any relevant lake or pond or of so much of any relevant river or watercourse as is above the freshwater limit, and ground waters, that is to say, any waters contained in underground strata."

Note that the definition of groundwater under the Water Resources Act 1991 includes all water within underground strata (including soil / pore water in the unsaturated zone). The definition of groundwater under the Groundwater Directive however is limited to water in the saturated zone. For the purposes of Part IIA of the Environmental Protection Act 1990, the Environment Agency recommends that the groundwater within the saturated zone only is considered as the receptor (rather than soil / pore water).

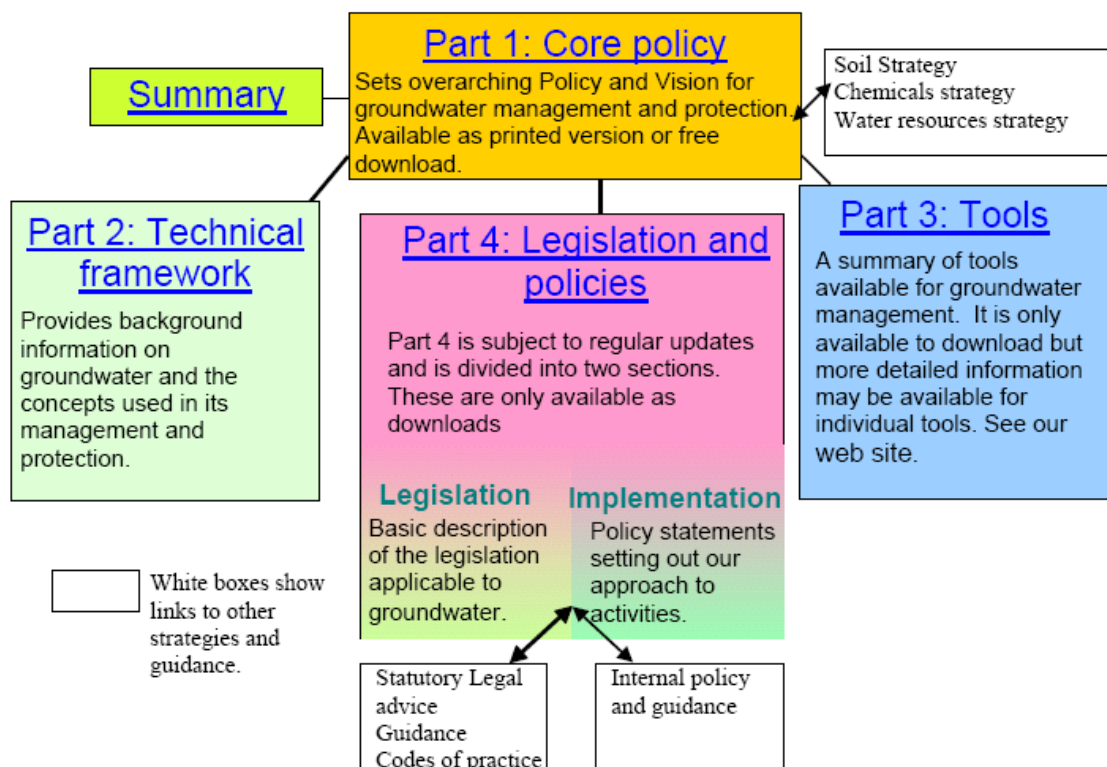
Environment Agency Guidance

Legislation and guidance surrounding the protection of controlled waters in the UK is abundant and can be complex. The Environment Agency's overall position on groundwater is *"To protect and manage groundwater resources for present and future generation in ways that are appropriate for the risks that we identify"* (Groundwater Protection : Policy and Practice GP3, 2006). In brief, the core objectives of the existing legislation serve to enforce this position.

In 1992, the National Rivers Authority published their Policy and Practice for the Protection of Groundwater (PPPG), this document was influential as it provided a focus for key developments such as Source Protection Zones (SPZs) and

Groundwater Vulnerability Maps. The Policy was then revised in 1998, since which there have been substantial changes in legislation, driven by Europe. Key European Directives relating to groundwater include the Groundwater Directive (80/68/EEC) and the Water Framework Directive (2000/60/EC). Aspects of these directives are controlled by primary UK legislation such as the Water Resources Act 1991. Further to legislative changes, gaps identified in the 1998 PPPG required addressing. These changes are reflected in the forthcoming Environment Agency Policy document entitled *Groundwater Protection : Policy and Practice (GP3)*, a draft version of which was available for public consultation (Parts 1 to 3) ending July 2006 with Part 4 issued in March 2008. Part 4 includes a section on key groundwater legislation and the Environment Agency's interpretation of it.

The following gives a breakdown of the structure of the document (taken from the Environment Agency GP3 draft consultation document, 2006)



Controlled Water Risk Assessment Methodology

The risk posed to controlled water is assessed by **CC GEOTECHNICAL** in accordance with current guidance as outlined hereunder.

In order for a developer of a potentially contaminated site to fulfil their obligations under the legislation, a site assessment would be required to be undertaken in order to identify any potential risks to controlled waters and to derive suitable clean-up criteria if necessary to ensure the protection of controlled waters. The general approach for Groundwater Protection is detailed further in Part 3 of GP3.

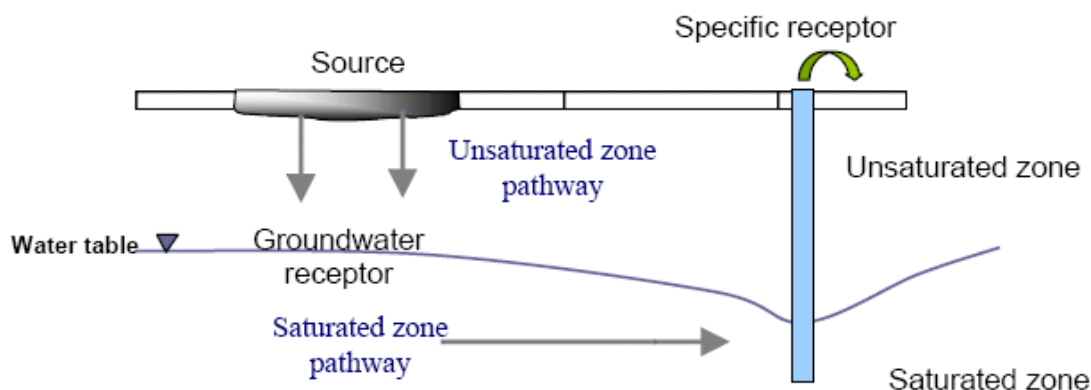
When assessing groundwater impact the Environment Agency advocate the application of their framework methodology "Remedial Targets Methodology – Hydrogeological Risk Assessment for Land Contamination" Environment Agency (2006). The methodology has four levels of assessment as described below:

- **Level 1** considers whether contaminant concentrations in "pore water" in contaminated soil are sufficient to impact on the receptor, ignoring dilution, dispersion and attenuation along the pathway. The "pore water" concentration is determined from:
 - i) measured "pore water" concentrations or perched water quality
 - ii) soil leaching tests
 - iii) theoretical calculations based on soil/water partitioning equations
- **Level 2** considers dilution by the receiving groundwater or surface water body and whether this is sufficient to reduce contaminant concentrations to acceptable levels. The remedial target is defined as the target concentration multiplied by a dilution factor (DF).
- **Levels 3 and 4** consider whether natural attenuation (including dispersion, retardation and degradation) of the contaminant as it moves through the unsaturated and saturated zones to the receptor are sufficient to reduce contaminant concentrations to acceptable levels. The remedial target is defined as target concentration multiplied by a dilution factor (DF) and attenuation factor (AF). In **Level 3** simple analytical models are used to calculate the significance of attenuation. The Environment Agency has released a "Remedial targets worksheet v3.1" to carry out basic calculations using a conservative approach up to **Level 3** using basic principles assuming a simple migration of contaminants from the

source zone into the aquifer receptor. **Level 4** assessment uses more sophisticated numerical models, and allows for the introduction of additional geological horizons and is used mainly to determine whether soil contaminants will reach their target within a specified timeframe. Use of such software should only be used once agreement has been obtained from the Environment Agency.

Three main stages apply to any risk assessment of controlled waters, these are:

- 1. Risk Screening (Tier 1 Preliminary Risk Assessment):** The understanding of the Conceptual Site Model (CSM) is the key to assessing any site. Using a robust CSM, potential pathways or receptors may be screened out from any further assessment at an early stage. For example if the pathway through the unsaturated zone is blocked by the presence of a significant thickness of low permeability clay. A greater understanding of the CSM is achieved with each tier of risk assessment. An example of a basic CSM is given below (taken from the Environment Agency GP3 draft consultation document, 2006):



- 2. Generic Hydrogeological Risk Assessment (EA Remedial Targets Methodology Level 1):** When undertaking the Generic Hydrogeological Risk Assessment (EA Remedial Targets Methodology Tier 1), comparison of chemical analytical results is made with screening criteria. Published values of screening criteria with which chemical test results can be compared are published in the following guidance:

- Water Supply (Water Quality) Regulations 2000
- The Private Water Supplies Regulations 1991
- Environmental Quality Standards for surface waters based on The EC Dangerous Substances Directive (76/464/EEC and Daughter Directives)
- The Surface Waters (Abstraction for Drinking Water Classification) Regulations 1996
- World Health Organisation Drinking Water Standards 2004

Should the Level 1 assessment indicate threshold levels to be exceeded, then there are three alternative ways in which to proceed:

- To devise suitable remedial solutions
- To carry out more investigation, sampling and analysis
- To conduct a site specific Detailed Quantitative Risk Assessment (DQRA) to determine if the materials are suitable for their proposed use, or devise site specific clean-up level

- 3. Detailed Quantitative Risk Assessment (EA Remedial Targets Methodology Levels 2 to 4):** The decision to carry out a DQRA will be dependant on the extent and implications of the initial qualitative and generic assessment. The scope of any such assessment will be accurately defined by the outcomes of the previous levels of assessment. The conceptual model will be sufficiently refined by this stage that only certain contaminants of concern, certain pathways and certain receptors will require further assessment, the remainder having been screened out.

Additional site specific data is normally required for this stage of assessment, as explained above, more processes that are capable of affecting contaminant concentrations are considered (such as dilution and attenuation).

Remediation criteria, if derived, will therefore be specific to each site and will be based on a detailed assessment of the potential impact at the identified receptor or *compliance point*. A greater level of confidence can be placed on the predicted impact on the compliance point following a DQRA.

BACKGROUND INFORMATION, CURRENT GUIDANCE AND RISK ASSESSMENT METHODOLOGY FOR RISKS POSED BY GROUND GAS

Background

Origin of Ground and Landfill Gases

When carrying out a ground gas risk assessment, the origin or source of the gases is important as potential risks will vary depending on the source. This Appendix relates to the risk of the two main ground gases of concern; methane and carbon dioxide, and does not apply to other ground gases (e.g. radon or vapours from hydrocarbon spills). Methane and carbon dioxide are major constituents of landfill gas but can also occur from a variety of anthropogenic and natural sources, as summarised in Table 5 below:

Gas	Source	Comments
Landfill Gas	Anaerobic decomposition of degradable waste within landfill sites. Typically 60% methane and 40% carbon dioxide during methanogenic phase.	Composition varies over time, particularly in early stages. Contains a range of minor constituents (particularly carbon monoxide and hydrogen sulphide).
Landfill Associated Gases	- Anaerobic degradation of leachate external to the site; - Degassing of dissolved gases in groundwater; - Evolution of gases following interaction between leachate and groundwater	Can result in secondary (external) production of methane or carbon dioxide.
Made Ground	Anaerobic degradation of organic components	Very variable depending on source
Sewer Gas, Cess Pits	Anaerobic degradation of organic components of sewage producing methane and carbon dioxide.	Often characterised by hydrogen sulphide odour.
Mains Gas	Leakage from underground pipework or storage tanks. Mainly methane but often contains higher alkanes.	An odouriser is added to permit detection of leaks. Typically 90% CH ₄ , but 1 to 27% C ₂ -C ₄ alkanes, May also contain other trace gases e.g. CO, helium and CO ₂ (from degradation of CH ₄ in the ground).
Other Anthropogenic Sources	- Degradation of leaked or spilled hydrocarbons or other industrial chemicals; - Anaerobic degradation of organic contaminants in groundwaters (e.g. silage liquor); - Reactions between monitoring well construction components and environment; - Burial grounds/cemeteries.	Hydrocarbon spillages often have an 'oily' odour. Fuel spillages common – Petrol or Diesel and can contain a wide range of VOC's. Can degrade to produce methane / carbon dioxide.
Alluvium / Marsh / Peat Gas	Anaerobic microbial degradation of organic material (usually waterlogged vegetation / peat). Often associated with the presence of alluvial deposits or dredgings.	
Geogenic Gas	Natural seepages of carbon dioxide and hydrocarbon gases derived from geologic sources such as coal seams and deep oil / gas source formations. Can be present in solution in groundwaters.	Methane most common but can contain carbon dioxide and higher alkanes.
Mine Gases	Various types. Most common is "fire damp" with high methane, produced by the desorption of gas trapped in coal. "Black damp" (Stythe gas) with high carbon dioxide and denser than air. "White damp" is high in carbon monoxide.	Methane most common. Can contain higher alkanes, carbon dioxide and carbon monoxide. Often low in oxygen.
Natural Shallow Ground Gas	Various types - high carbon dioxide formed by subsurface aerobic activity leading to depleted oxygen and elevated carbon dioxide; - chemical degradation of rocks (e.g. carbonates) producing carbon dioxide; - carbon dioxide production in root zone of soils by plants.	Gases can be emitted from ground under falling barometric pressure conditions.

Table 5. Potential Sources of Ground Gases

This Appendix does not provide guidance for the assessment of risk when other gases are present due to 'Other Sources' from the above table (particularly organic compounds such as BTEX and VOC's or for the risk from radon or hydrogen sulphide).

To determine the origin of the gas a range of factors must be considered together, including;

1. Proximity of likely sources
2. Ground conditions (geology, hydrogeology, anthropogenic pathways etc)
3. Properties of gases present including:
 - Chemical composition
 - Physical properties
 - Ratios of components e.g. methane : carbon dioxide
4. Timeframe of activities such as infilling periods, capping works, installation of gas control systems etc

Identification of the originating source may be problematic given that there may be more than one source present and trace gas analysis may be required. Identification of the sources of the gases encountered during monitoring is usually carried out through a process of eliminating the most unlikely potential sources (given the site setting) and selecting those which are most likely.

Hazards Associated with Presence of Methane

Methane gas is combustible and potentially explosive. When the concentration of methane in air is between the limits of 5.0%v/v and 15.0%v/v an explosive mixture is formed. The Lower Explosive Limit (LEL) of methane is 5.0%v/v, which is equivalent to 100% LEL. The 15.0%v/v limit is known as the Upper Explosive Limit (UEL), but concentrations above this level cannot be assumed to represent safe concentrations. Further, the LEL and UEL will vary (up and down) depending upon the proportion of other gases (including oxygen). However, the fact that methane is a colourless, odourless gas means that there

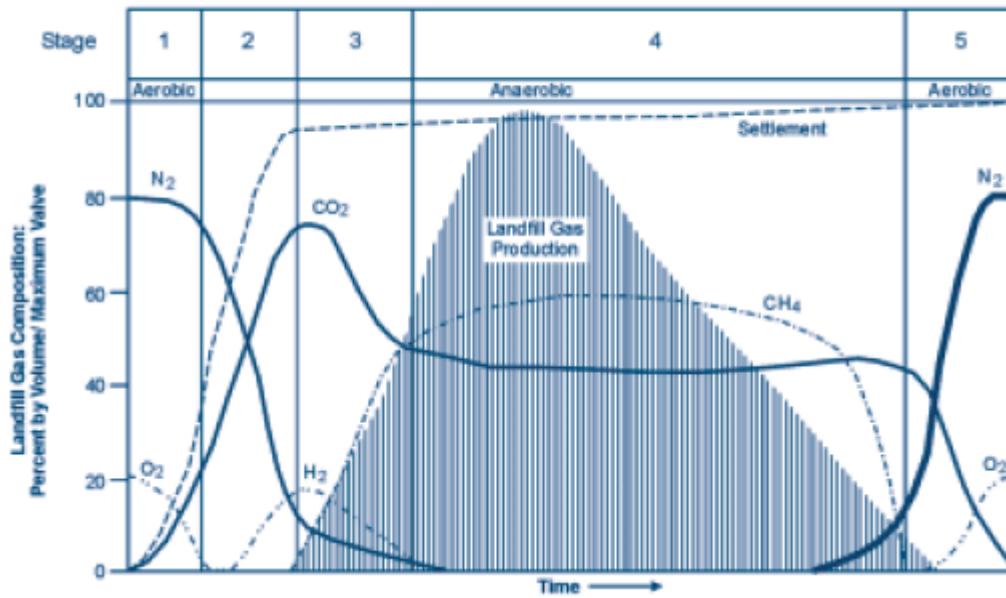
is no simple indicator of the presence of the gas until such a time as explosive limits are reached and an incident occurs. Methane is lighter than air and has a low toxicity. However, at high concentrations it can result in asphyxiation due to oxygen displacement.

Hazards Associated with Presence of Carbon Dioxide

Carbon dioxide is a colourless, odourless gas, which, although non-flammable, is both toxic and an asphyxiant. As carbon dioxide is denser than air, it will collect in low points and depressions. The UK Health & Safety Executive (HSE) has published information relating to concentrations of carbon dioxide that humans may be exposed to, which uses concentrations contained in the Control of Substances Hazardous to Health Regulations 2002 (as amended). These are the Long Term Occupational Exposure Limit (LTOEL, 8 hour period) and the Short Term Occupational Exposure Limit (STOEL, 15 minute period), which are 0.5% and 1.5% carbon dioxide, respectively.

Parameters Influencing the Rate of Ground Gas Production

The figure below is taken from EA guidance document LFTGN 03 illustrates typical ground gas generation curves from biodegradable materials:



The production of methane and carbon dioxide at a landfill site may be expected to be considerable and ongoing. Concentrations of methane will eventually decrease, followed by concentrations of carbon dioxide, but the duration and rate of gas production can vary markedly between sites. Five distinct phases of gas production occur during the process which are, in order of event as marked above, as follows:

1. An aerobic phase involving oxygen depletion and temperature increase through aerobic respiration;
2. The establishment of anaerobic conditions and the evolution of carbon dioxide and hydrogen through acidogenic activity;
3. Commencement of methanogenic activity; the establishment of populations of methanogenic bacteria;
4. A phase of stable methanogenic activity, which may go on for many tens of years;
5. A phase of decreasing methanogenic activity, representing depletion of the organic material and a return to aerobic conditions.

The time scale for the return to the normal ground gas concentrations will be highly variable, depending upon the types and quantities of materials present. In addition, the optimum parameters influencing the rate of decomposition and ground gas production within the ground at a site are as follows:

- High water content with adequate rainfall and water infiltration to provide moisture content between approximately 20 to 26%;
- Conditions that either are or are very close to anaerobic;
- High proportion of biodegradable materials;
- A pH between 6.5 and 8.5, ideally verging slightly on the acidic between pH 6 to 7;
- Temperature between 25°C and 55°C;
- The ratio of the biochemical and chemical oxygen demands (BOD:COD);
- High permeability;
- Small particle size, as finer subsurface materials possess a greater surface area to provide a growing 'face' for the micro-organisms but high fines levels reduces permeability and reduces decomposition rate.

For this reason, it is vital that sources of methane and carbon dioxide are identified prior to the commencement of any work on a construction site, and that the ground gas regime is characterised at the worst temporal conditions a site may experience. From this, a risk assessment is carried out to identify the risk at the site from ground gases so that suitable protection measures can be designed and incorporated into a development to prevent a dangerous build-up of gas occurring.

Factors Influencing the Migration and Behaviour of Ground Gases

There are many factors that influence the migration of ground gases which can effect the risk from a gassing source:

- driving force – pressure differential along a pathway, diffusion and dissolved in solution;
- meteorological conditions – short term and seasonal conditions including atmospheric pressure changes (e.g. rapidly falling pressure causes gas to expand increasing emission rates), rainfall, frozen ground and thawing, temperature;
- geological and groundwater conditions – these can have the over riding influence on the direction/pathways and quantity of migrating gas;
- anthropogenic influences – man-made pathways include mine shafts, service runs/drains, foundation piles, underground voids/pits/basements, foundation/building design/construction

Current Guidance

Previous versions of Building Regulations Approved Document C provided statutory guidance stating that consideration should be given to appropriate action and / or specific solutions in situations where methane concentration exceeded 1%v/v or carbon dioxide concentrations exceeded 5%v/v. The latest Building Regulations Approved Document C (DoE 2004) no longer endorses this approach and recommends the use of a risk based approach to interpreting a gas monitoring survey. This is in line with current EA guidance for landfill gas (LFTGN 03, 2004) which recommends the use of a structured risk based approach similar to that outlined in CLR 11. On this basis, recent guidance has been produced in 2006 and 2007 with the aim of providing up to date advice in relation to residential and commercial development. The guidance does not address issues associated with gas derived from landfills, for this refer to "*Guidance on the Management of Landfill Gas*" (Environment Agency 2004) for an overview.

Recent guidance relevant to gas assessments for residential and commercial development includes;

- **Wilson et al. (CIRIA C665, December 2007) "Assessing Risks Posed by Hazardous Ground Gases for Buildings."**
This document provides up to date advice on all aspects of ground gas risk assessment such as investigation, monitoring programmes, data collection and interpretation. The guidance presents separate methodologies for the characterisation of:
 - All development types except low rise housing with gardens (Situation A)
 - Low rise housing with gardens (Situation B)
- **Boyle and Witherington (NHBC / RSK Group, Report 10627-R01(04) January 2007) "Guidance on the Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present."**
This document presents the "Traffic Lights System" detailed below and is relevant only for low rise properties (e.g. bungalows and town houses) that have a ventilated sub-floor void (i.e. Situation B as described in CIRIA C665).
- **British Standard (BS 8485, December 2007) "Code of Practice for the Characterization and Remediation from Ground Gas in Affected Developments"**
This document provides an overview of gas characterisation and assessment. The Standard is intended to be used by designers of gas protection measures and regulators involved in the assessment of design solutions.

Further guidance, **Wilson and Card (CIEH) "Ground Gas Handbook for Designers and Regulators"** providing practical guidance on ground gas assessments and the design and evaluation of protection measures, is expected to be published in March 2009.

Each of these documents continues to highlight the importance of, and give further guidance towards, carrying out a tiered risk-based decision-making process in accord with government policy on dealing with contamination from historic or natural sources and highlight the importance of the Conceptual Model in site characterisation.

Ground Gas Risk Assessment Methodology

Assessment of risk posed by ground gas is undertaken using the methodology as outlined previously, and summarised hereunder:

- Tier 1 Preliminary Risk Assessment
- Tier 2 Generic Quantitative Risk Assessment
- Tier 3 Detailed Quantitative Risk Assessment

The methodology used in each of the above assessments with concern to ground gas is discussed hereunder.

Tier 1 Preliminary Risk Assessment

All potential sources of methane and carbon dioxide are identified in the Preliminary Conceptual Model and the generation potential determined. The background information discussed earlier is referred to in order to determine the potential for a source to generate ground gas.

CIRIA C665 provides idealised monitoring frequency / period dependant upon generation potential of gas source and sensitivity of the proposed land use as below:

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Idealised Frequency and Period of Monitoring (after Table 5.5a and 5.5b, CIRIA C665)

		Generation Potential of Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of Development	Low (Commercial)	4/1	6/2	6/3	12/6	12/12
	Moderate (Flats)	6/2	6/3	9/6	12/12	24/24
	High (Residential with Gardens)	6/3	9/6	12/6	24/12	24/24

Notes

1. First number is the number of readings and the second is the minimum period in months (e.g. 6/2 – six sets of readings over two months).
2. At least two sets of readings must be at low (preferably under 1,000 mb) and falling pressure.

The monitoring programme is decided using the above table prior to the intrusive site investigation. However, if the intrusive investigation reveals that a the potential source is better or worse than anticipated the monitoring programme should be modified accordingly. For example, if the made ground contains no evidence of organic material and comprises entirely granular brick fill, the potential for that made ground to generate ground gas is reduced considerably.

Tier 2 Generic Quantitative Risk Assessment

Generic Quantitative Risk Assessment is undertaken upon completion of the required gas monitoring period.

All three current guidance documents propose that both ground gas concentrations and flow rates are used to calculate the limiting gas well gas volume flow rates for methane and carbon dioxide, based on the ground gas conditions monitored for during the worse-case temporal conditions. This limiting gas well volume flow rate is termed the Gas Screening Value (GSV, note that this was termed borehole gas volume flow), and is calculated as follows:

$$GSV \text{ (l/hr)} = \frac{[\text{gas well gas concentration (\%v/v)}] \times [\text{gas well flow rate (l/hr)}]}{100}$$

GSV's are compared to typical max concentrations and limiting gas screening values derived for either Situation A - All development except low rise housing with gardens, or Situation B low rise housing with gardens (NHBC Traffic Light System). Table 8.5 from CIRIA C665 is used for comparison of gas screening values for "Situation A Developments" and is presented hereunder:

Characteristic Situation (CIRIA R149)	Comparable Partners in Technology gas Regime (see Box 8.2)	Risk Classification	Gas Screening Value (CH ₄ or CO ₂) (l/hr) ¹	Additional Factors	Typical Source of Generation
1	A	Very low risk	<0.07	Typically methane ≤ 1% and/or carbon dioxide ≤ 5%. Otherwise consider increase to Situation 2	Natural soils with low organic content "Typical" made ground
2	B	Low risk	<0.7	Borehole air flow rate not to exceed 70l/hr. Otherwise consider increase to characteristic Situation 3	Natural soil, high peat/organic content. "Typical" made ground
3	C	Moderate risk	<3.5		Old landfill, inert waste, mineworking flooded
4	D	Moderate to high risk	<15	Quantitative risk assessment required to evaluate scope of protective measures.	Mineworking susceptible to flooding, completed landfill (WMP 26B criteria)
5	E	High risk	<70		Mineworking unflooded inactive with shallow workings near surface
6	F	Very high risk	>70		Recent landfill site

Table 8.5 from CIRIA C665 Modified Wilson and Card Classification

Table 8.7 is used for comparison of gas screening values for "Situation B Developments" and is presented herunder:

Traffic Light	Methane ¹		Carbon Dioxide ²	
	Typical max concentration ³ (% by volume)	Gas screening value ^{2,4} (litres/hour)	Typical max concentration ³ (% by volume)	Gas screening value ^{2,4} (litres/hour)
Green				
Amber 1	1	0.13	5	0.78
Amber 2	5	0.63	10	1.60
Red	20	1.60	30	3.10

Notes:

1. The worst-case ground gas regime identified on the site, either methane or carbon dioxide, at the worst-case temporal conditions that the site may be expected to encounter will be the decoder as to what Traffic Light is allocated;
2. Borehole Gas Volume Flow Rate, in litres per hour as defined in Wilson and Card (1999), is the borehole flow rate multiplied by the concentration in the air stream of the particular gas being considered;
3. The Typical Maximum Concentration can be exceeded in certain circumstances should the Conceptual Site Model indicate it is safe to do so;
4. The Gas Screening Value thresholds should not generally be exceeded without the completion of a detailed ground gas risk assessment taking into account site-specific conditions.

Table 8.7 from CIRIA C665 - NHBC Traffic light system for 150 mm void

Dependant on the outcome of the assessment of risk posed by ground gas it is determined whether gas protection measures are required for the proposed development, and or whether a detailed quantitative risk assessment is required for the site.

Selection & Design of Protective Measures

Table 8.6 and Box 8.4 of CIRIA C665 contain information on the detailed design of protection measures and were initially intended for the purposes of determining then level of protection measures a development requires. These tables and related text include some useful information on the design of gas protection measures, however BS8485:2007, which supersedes the guidance included within CIRIA C665, is used for selection of gas protection measures.

BS8485: 2007 uses a scoring system dependant on the Characteristic Situation / NHBC Traffic Light and proposed end use of the site. The scoring system is summarised in BS8485:2015 Table 2 as presented hereunder:

Characteristic gas situation, CS	NHBC traffic light	Required gas protection			
		Non-managed property e.g. private housing	Public building (a)	Commercial buildings	Industrial buildings (b)
1	Green	0	0	0	0
2	Amber 1	3	3	2	1 (c)
3	Amber 2	4	3	2	2
4	Red	6 (d)	5(d)	4	3
5			6(e)	5	4
6				7	6

NOTE Traffic light indications are taken from NHBC Report no.:10627-RO1 (04) and are mainly applicable to low-rise residential housing¹. These are for comparative purposes but the boundaries between the traffic light indications and CS values do not coincide.

a) Public buildings include, for example, managed apartments, schools and hospitals.
b) Industrial buildings are generally open and well ventilated. However, areas such as office pods might require a separate assessment and may be classified as commercial buildings and require a different scope of gas protection to the main building.
c) Maximum methane concentration 20% otherwise consider and increase to CS3.
d) Residential building on higher traffic light/CS sites is not recommended unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high-performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, e.g. in institutional and/or fully serviced contractual situations.
e) Consideration of issues such as ease of evacuation and how false alarms will be handled are needed when completing the design specification of any gas protection scheme

¹ The NHBC guidance and CIRIA C665 guidance refers to low rise housing (which is up to three storeys without lifts) that is constructed with a 150mm ventilated sub-floor void.

BS8485:2007 Table 2 Required gas protection by characteristic gas situation and type of building

Once a score is assigned, a combination of protection systems / elements is chosen from BS8485:2007 Table 3 shown below:
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PROTECTION ELEMENT /SYSTEM		SCORE	COMMENTS
a) Venting/dilution (See Annex A BS8485)			
Passive sub floor ventilation (venting layer can be a clear void or formed using gravel, geocomposites, polystyrene void formers, etc.) ^A	Very good performance	2.5	Ventilation performance in accordance with Annex A (BS8485)
	Good performance	1	If passive ventilation is poor this is generally unacceptable and some form of active system will be required.
		2.5	There have to be robust management systems in place to ensure the continued maintenance of any ventilation system. Active ventilation can always be designed to meet good performance.
Subfloor ventilation with active abstraction/pressurization (venting layer can be a clear void or formed using gravel, geocomposites, polystyrene void formers, etc.) ^A		2.5	Active ventilation can always be designed to meet good performance.
Ventilated car park (basement or undercroft)		4	Mechanically assisted systems come in two forms: extraction and positive pressurization.
b) Barriers			
Floor slabs			
Block and beam floor slab		0	It is good practice to install ventilation in all foundation systems to effect pressure relief as a minimum. Breaches in floor slabs such as joints have to be effectively sealed against gas ingress in order to maintain these performances.
Reinforced concrete ground bearing slab		0.5	
Reinforced concrete ground bearing foundation raft with limited service penetrations that are cast into slab		1.5	
Reinforced concrete cast in situ suspended floor slab with minimal service penetrations and water bars around all slab penetrations and at joints		1.5	
Fully tanked basement		2	
c) Membranes			
Taped and sealed membrane to reasonable levels of workmanship/in line with current good practice with validation ^{B,C}		0.5	The performance of membranes is heavily dependent on the quality of design of the installation, resistance to damage after installation, and the integrity of joints.
Proprietary gas resistant membrane to reasonable levels of workmanship /in line with good practice under independent inspection (CQA) ^{B,C}		1	
Proprietary gas resistant membrane installed to reasonable levels of workmanship/in line with current good practice under CQA with integrity testing and independent validation		2	
d) Monitoring and detection (not applicable to non-managed property, or in isolation)			
Intermittent monitoring using hand held equipment		0.5	Where fitted, permanent monitoring systems ought to be installed in the underfloor venting/dilution system in the first instance but can also be provided within the occupied space as a fail safe.
Permanent monitoring and alarm system ^A	Installed in the underfloor venting/dilution system	2	
	Installed in the building	1	
e) Pathway Intervention			
Pathway intervention		-	This can consist of site protection measures for off-site or on-site sources (see Annex A, BS8485)
NOTE In practice the choice of materials might well rely on factors such as construction method and the risk of damage after installation. It is important to ensure that the chosen combination gives an appropriate level of protection			
A) It is possible to test ventilation systems by installing monitoring probes for post installation validation.			
B) If a 1 200g DPM material is to function as a gas barrier it should be installed according to BRE 212 /BRE 414 being taped and sealed to all penetrations			
C) Polymeric Materials> 1200 g (proportional to thickness) but their physical properties mean that they are more robust and resistant to damage.			

BS8485:2007 Table 3 Solution Scores

Where the gas situation is 4 or more (and for NHBC Red situations) the site requires a comprehensive risk assessment to confirm the scope of protection measures. These are higher risk sites and reliance on Table 2 and 3 alone is not sufficient.

For a site which is impacted by migratory gases from an off site source, the development may be protected by imposing pathway intervention methods, which if successfully validated, could also remove the need for further analysis. It is essential that the gas regime in these circumstances has been fully characterised and that the only source impacting the site is located off site and that the pathway is clearly defined and its interception equally proven before construction commences. Pathway intervention methods may include vertical membrane installations, venting trenches, rows of stone columns, activated trenches and various proprietary systems. These systems are particularly relevant to domestic housing where there is limited scope for foundation type solutions.

CURRENT GUIDANCE ON REMEDIATION

When risk assessment of the site has been completed and it indicates that remedial works are required, the main guidance in managing this process is set out in the DEFRA/EA publication CLR11 (2004) "Model Procedures for the Management of Land Contamination." The stages of managing remediation are as follows:

- (a) Options Appraisal and develop Remediation Strategy;
- (b) Develop Implementation Plan and Verification Plan;
- (c) Remediation, Verification and Monitoring.

The Remediation Strategy sets out the remediation targets, identifies technically feasible remedial solutions and presents an evaluation of the options so that these can be assessed enabling that the most suitable solution is adopted. An outline of the proposed remedial method should be presented. Agreement should be sought of the appropriate statutory bodies for the Remediation Strategy before proceeding to the next stage.

The Implementation Plan is a detailed method statement setting out how the remediation is to be carried out including stating how the site will be managed, welfare procedures, health and safety considerations together with practical measures such as details of temporary works, programme of works, waste management licences and regulatory consents required. Agreement should again be sought of the appropriate statutory bodies for this Plan.

The Verification Plan sets out the requirements for gathering data to demonstrate that the remediation has met the required remediation objectives and criteria. The Verification Plan presents the requirements for a wide range of issues including the level of supervision, sampling and testing regimes for treated materials, waste and imported materials, required monitoring works during and post remediation, how compliance with all licenses and consents will be checked etc. Agreement should again be sought of the appropriate statutory bodies for the Verification Plan. On completion of the remediation a Verification Report should be produced to provide a complete record of all remediation activities on site and the data collected as required in the Verification Plan. The Verification Report should demonstrate that the remediation has met the remedial targets to show that the site is suitable for the proposed use.

APPENDIX J: NOTES ON LIMITATIONS

Notes on Limitations For Geoenvironmental and Geotechnical Consultancy Services

General

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Phase I Environmental Audits / Desk Studies

The work undertaken to provide the basis of a Phase 1 Desk Study report comprises a study of available documented information from a variety of sources (including the client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in a Desk Study report have been dictated by finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in the report, CC GEOTECHNICAL LTD reserves the right to review such information and to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Factual Ground Investigations

The investigation of the site has been carried out in accordance with the scope and specification instructed by the Client. No interpretations of the data generated by the investigation have been provided or implied. The exploratory holes undertaken in this commission, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of site conditions. Conditions may exist on the site which have not been detected by the works undertaken. Furthermore, the number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" or more widespread contamination where concentrations may be significantly higher than those actually encountered.

Interpretative Phase II Environmental Audits

The investigation of the site has been carried out with the intention of providing sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated to potential human targets, building materials, the environment (including adjacent land), and surface and groundwater.

The amount of exploratory work and chemical testing undertaken may have been restricted by factors including inter alia the Clients budget, the available timescale, access to all parts of the site, the existence of buried services etc., and where this is the case, a more comprehensive investigation may be required if the site is to be redeveloped, since a number of important engineering and environmental issues may need further assessment.

For those reasons, if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

It must be borne in mind, that the exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions present on the site which have not been disclosed by this investigation, and which have therefore not been taken into account in this report. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" or more widespread contamination where concentrations may be significantly higher than those actually encountered. The findings of the investigation are valid for the time of investigation and the passage of time may result in changes to the contamination status of the site, and a reassessment of the site may be required where significant time has elapsed.

Geoenvironmental Ground Investigations

The investigation of the site has been carried out within the constraints of Client budget, available timeframe, access to all parts of the site, the existence of buried services and a more comprehensive investigation may be required to provide sufficient information regarding the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions, to formulate a reasonable assessment of the environmental risks together with engineering and development implications.

If costs have been included in relation to the site remediation, these must be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of the site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions present on the site which have not been disclosed by this investigation, and which have therefore not been taken into account in this report. The findings of the investigation are valid for the time of investigation and the passage of time may result in changes to the contamination status of the site, and a reassessment of the site may be required where significant time has elapsed.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal, weather, or other effects.

The risk assessment and opinions provided, inter alia, take into consideration currently available guidance relating to acceptable contamination concentrations and no liability can be accepted for the retrospective effects of any future changes or amendments to these values.