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INTRUSIVE SITE INVESTIGATION SOIL ANALYSIS - TIER 2

SITE: LAND AT:
GROVE VISTA
TREVARTH ROAD
CARHARRACK
REDRUTH
CORNWALL
TR16 5SE

CLIENT: MR F ANDREWS
ANDREW BROS LTD
UPLANDS
GWEAL-AN-TOP
REDRUTH
CORNWALL
TR15 2DS



Our Ref: A1599/T2/S/JW

Planning Ref: PA19/07024

Date: 16th April 2021

OS Grid Ref: SW 7283/4096

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1. Introduction

Following consultation and instruction from the client, Mr F Andrews of Andrews Bros Ltd, ASI was commissioned to conduct an Intrusive Soil Analysis Investigation/Generic Quantitative Risk Assessment (GQRA) for the following site address:

Site locality: Land at, Grove Vista, Trevarth Road, Carharrack, Redruth, Cornwall.

End-use: Construction of a single residential dwelling with garden amenity area and onsite parking.

This report follows on from an initial Phase 1 Contaminated Land Survey produced by ourselves under report reference A1599/P1/JW and dated 24th May 2019. The survey concluded that the potential for onsite land contamination was possible within the proposed property bounds, with the primary contamination risks being derived from the following sources:

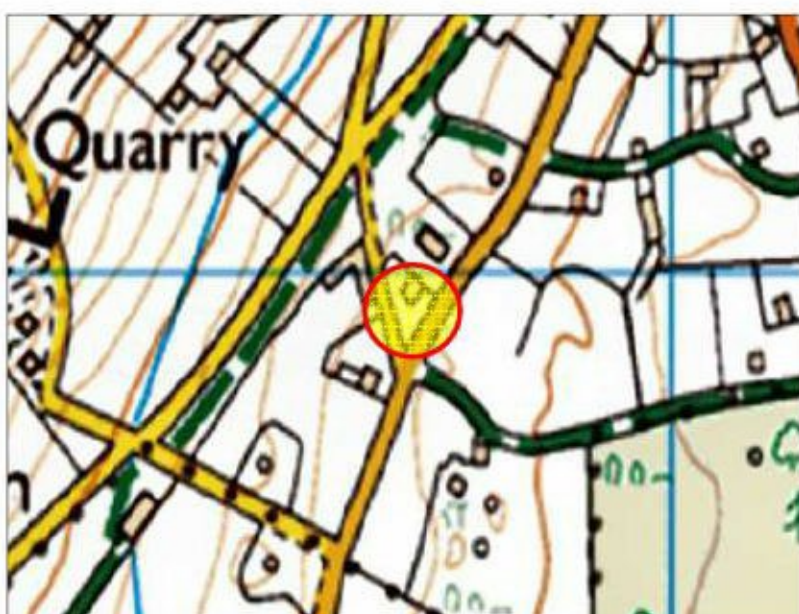
- a) Inferred mine waste horizon indicated to overlay the site area.
- b) Site lies within extensive historic mining land associated to the former Ting Tang Mine.

Due to the sites proposed end-use being for residential purposes, a 'sensitive' end-use, further investigation of the property was considered necessary to identify if the development is at risk from elevated levels of heavy metal contaminants associated to the above potential sources.

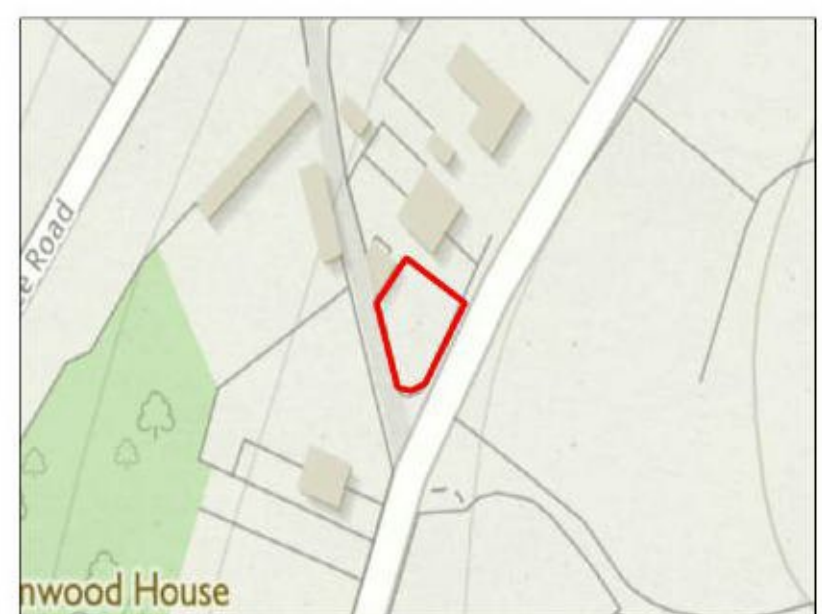
The primary risk from contaminants would be through long term exposure to sensitive end-users of the site, where excessive levels of contaminants can be detrimental to human health and local eco systems, with the level of risk being dependent upon the degree of exceedance when compared to government set threshold values.

In response to these concerns an onsite investigation and laboratory analysis of the soil horizon has been undertaken to determine if contamination is present, with the results being presented below. Following review, this report should be submitted to the Local Council Authority Environmental Department for their records.

Map & Street Plan Showing Location Of Site



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2. Geology & Hydrogeology

2.1 Geology

The geological survey map (British Geological Survey 1:50 000 series, sheet 352 & BGS records) show the site as lying within sedimentary bedrock comprising of Hornfelsed (heat altered/metamorphosed) Slate and Siltstone of the Mylor Slate Formation, formed during the Devonian Geological Period.

Metalliferous lode zones (metalliferous minerals that in-fill a fissure or vein within a rock formation) that have the potential to introduce elevated heavy metal levels into the surrounding ground horizon are not indicated within the site bounds, however lie throughout the site locality.

Soil classification within site locality: Freely draining, acid loamy soils overlying bedrock.

2.2 Hydrogeology

Geological records indicate that the property is sited over rocks that can form minor aquifers of intermediate permeability. These can be fractured or potentially fractured rocks, which do not have a high permeability, or other formations of variable permeability including unconsolidated deposits. Although these aquifers will seldom produce large quantities of water for abstraction, they are important both for local supplies and in supplying base flow to rivers.

3. Screening Criteria

In assessing the levels of compounds in the soil at the site we have referred to the Land Quality Management Ltd (LQM)/Chartered Institute of Environmental Health (CIEH), Suitable 4 Use Levels (S4ULs) 2014 and Soil Guideline Values (SGV) produced by the Environment Agency (EA) where applicable.

In addition we have referenced the Category 4 Screening Levels (C4SL) produced by the Department for the Environment, Food and Rural Affairs (DEFRA) where necessary.

Both C4SLs, S4ULs and SGVs are based upon research undertaken by the LQM/CIEH and by DEFRA and the E.A, with reference to the Contaminated Land Exposure Assessment model (CLEA). The values are founded upon scientifically based generic assessment criteria (GAC) to help evaluate long-term risks to human health from contamination in soil.

The threshold limits are utilised as trigger values. Where soil concentrations are exceeded, there may be the potential for a significant risk to human health and/or environmental impact and may require further investigative works or possible land remediation. Please note, within the context of this report we have referred to the evaluated sample analysis data as Site Assessment Levels (SALs).

The C4SLs, S4ULs and SGVs have been derived for a range of contaminants for six typical land uses as listed below:

- Residential with homegrown produce
- Residential without homegrown produce
- Allotments
- Commercial
- Public open space near residential housing (POS_{resi})
- Public open space park (POS_{park})

Due to the sites end-use scenario being for residential development purposes we have selected the testing scenario as '**residential with homegrown produce**'.

4. Definition Of Contaminated Land

The legal definition of contaminated land from Section 78A(2) of Part IIA of the Environmental Protection Act 1990) is:

'...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 the significant possibility of such harm being caused; or
- (b) pollution of controlled waters is being, or is likely to be, caused.

A key element of the Part IIA regime is the Source-Pathway-Receptor pollutant linkage concept. The meaning of each element is as follows:

- the *source* is the contamination in, on or under the land;
- the *pathway* is the route by which the contamination reaches the receptor; and
- the *receptor* is defined as living organisms, ecological systems or property which may be harmed.

Without the clear identification of all three elements of the pollutant linkage, land cannot be identified as contaminated land under the regime. Contaminating substances may include:

- metals and metallic compounds e.g. cadmium, arsenic, lead, nickel, chromium
- organic compounds e.g. oils, petrol, solvents
- gases e.g. methane, carbon dioxide, hydrogen sulphide

Typical causes of land contamination includes: previous industrial or commercial usage, mining and the land filling of waste. Land can also become contaminated due to its proximity to contaminated areas. However, contamination does not occur solely as a result of human activities and land can be contaminated as a result of its natural state.

5. Soils Analysis Screen & Collection

In total 10no soil samples were collected from the proposed site area on the 31st of March 2021, with the weather conditions at the time of collection being dry. The collected samples were numbered S1(H), to S10(L), with the samples comprising of both disturbed topsoil collected from a spoil heap (H) and subsoil from the lower ground elevation (L).

All collected samples were tested for heavy metal concentrations, acid soluble sulphate and pH levels, therefore acquiring an overall Site Assessment Level (SAL) for the proposed development. The testing suite chosen was considered suitable in relationship to the type of potential contaminants associated to the site, with the nature of the analyses being detailed below:

Metals screen:

Arsenic, cadmium, chromium (III), chromium (VI), lead, mercury, nickel, selenium, copper, zinc

Others:

Acid soluble sulphate (SO₄), pH

Chemical analysis was undertaken by The Environmental Laboratory LTD (ELAB), UKAS accredited, of which the full results are presented in Annex 2.

5.1 Collection & Site Information

The sampling layout was selected to acquire suitable coverage of the site, with the samples being retrieved from an exposed topsoil soil heap (due to prior site clearance) and from the lower subsoil elevation, therefore providing an accurate analytical assessment of the existing ground horizons within the site bounds.

The samples were collected both by hand from across the topsoil heap and by utilising a Kubota KX057-4 5.7 tonne excavator to collect samples from the subsoil horizon, with the plant machinery being operated by Mr R Andrews of Andrew Bros Ltd. All sample locations and the subsequent collection of material was under the supervision of a qualified site geologist.

The samples were obtained by trowel, with the sampling tool being cleaned prior to the retrieval of each sample. Recovered material was then stored in sealed plastic storage containers for acid soluble sulphate, heavy metals and pH. The samples were then made ready for transportation within a pre-chilled cool box to ELAB for laboratory analysis.

Samples collected from the topsoil heap, termed (H), were numbered S1(H), S2(H), S3(H), S4(H) and S5(H) with a total of 5no samples being collected from across the heap. The surface or topsoil horizon is viewed to pose the most potential risk to the end-user, via dermal, inhalation and ingestion pathways from contaminants.

Samples collected from the naturally occurring (lower) subsoil horizon, termed (L) were numbered S6(L), S7(L), S8(L), S9(L) and S10(L), with a total of 5no samples being collected from across the site area at an average depth of 0.50m bgl. Collection from the subsoil elevation provides information on both acid soluble sulphate concentrations relating to concrete design and to ascertain the level of potential heavy metals.

No groundwater was recorded within the area of sampling. For sample locations please refer to Annex 1: Site Plan for details.

6. Soil Sample Composition Table

Sample No.	Sample Type & Depth	Sample Identification & Description
	Upper horizon - topsoil/heap	Laboratory classification: SOIL
S1(H) S2(H) S3(H) S4(H) S5(H)	Heap Heap Heap Heap Heap	Brown, LOAM topsoil with minor quantities of, gravel comprising predominantly of metamorphosed SLATE (average particle size 5mm to 20mm). No notable change recorded within samples S1(H) to S5(H)
	Lower horizon - subsoil	Laboratory classification: SOIL
S6(L) S7(L) S8(L) S9(L) S10(L)	0.50m bgl 0.50m bgl 0.50m bgl 0.50m bgl 0.50m bgl	Buff, firm, coarse grained and moderately stony subsoil, with medium, angular, metamorphosed SLATE gravel (average particle size 5mm to 50mm) and sporadic quartz gravel. No notable change recorded within samples S6(L) to S10(L)
Recorded by: Sample collection date: Weather conditions:		J. Williamson (Site Investigation Manager) 31 st March 2021 Dry

7. C4SL, S4ULs, SGV Threshold Values

The C4SL, S4ULs and SGV threshold values are intended to indicate to an assessor the level at which harm could be caused to receptors i.e. human beings, eco-systems, vegetables and fruit. The values represent the total amount of contaminants contained within a sample of analysed soil, the resulting value being expressed in mg/kg.

The chosen site scenario is for 'residential with homegrown produce' with the values highlighted in bold for reference.

Table 7.1 Values For Heavy Metals

Element	Land usage scenario	Land usage scenario	Land usage scenario	Land usage scenario
	Public open space near residential housing (POS resi)/ Public open space park (POS park) (S4UL)	Commercial (S4UL)	Allotment (S4UL)	Residential with/without homegrown produce (S4UL)
	(mg/kg dry weight soil)	(mg/kg dry weight soil)	(mg/kg dry weight soil)	(mg/kg dry weight soil)
Arsenic	79/170	640	43	37/40
Cadmium	120/532	190	1.9	11/85
Chromium (III)	1500/33000	8600	18000	910/910
Chromium (VI hex)	-	35	2.1	4.3
Lead (C4SL)	760/1400 (C4SL)	2700 (C4SL)	84 (C4SL)	210/330 (C4SL)
Mercury (inorganic)	120/240	1100	19	40/56
Nickel	230/3400	980	230	180/180
Selenium	1100/1800	12000	88	250/430
Phytotoxic: plant affecting				
Copper	12000/44000	68000	520	2400/7100
Zinc	81000/170000	730000	620	3700/40000

Heavy metals are the non-degradable metals. These metals are toxic and possess high density. Heavy metals occur in the earth's crust naturally. Some of the heavy metals are lead, cadmium, mercury, arsenic and chromium. High concentration of heavy metals causes poisoning. The main sources of heavy metals are domestic waste water and urban run-off, industrial waste water, agricultural activities and mining activities.

8. Sample Information

Please refer to Annex 2: Laboratory Results and section 8.2: Arithmetic Mean Values for Heavy Metal Concentrations and section 8.3: US95 Calculations (Mean Value Test) for Failing Heavy Metal Contaminants. All soil values are based on total concentrations, i.e. arsenic 37mg/kg (total).

Where relevant, the percentage level of acid soluble sulphate deemed to present potentially aggressive ground conditions for concrete foundation design will be highlighted in section 8.1: Laboratory Analysis Results (below). Necessary recommendations for design sulphate class (DS class) will be referenced within section 8.5: Acid Soluble Sulphate Recommendations.

Chosen site scenario: 'Residential with homegrown produce'.

8.1 Laboratory Analysis Results

Sample Identification: TOPSOIL/HEAP x 5 samples

Primary Heavy Metals Affecting Human Health											
Samples	S1 (H)	S2 (H)	S3 (H)	S4 (H)	S5 (H)						
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg						
Arsenic	777	1420	849	866	768						
Cadmium	1.4	1.1	1.3	1.2	0.9						
Chromium (III)	27.5	24.7	25.5	20.3	15.9						
Chromium (VI)	<0.8	<0.8	<0.8	<0.8	<0.8						
Lead	366	370	359	314	215						
Mercury (inorganic)	<0.5	<0.5	<0.5	<0.5	<0.5						
Nickel	24.6	23.3	30.8	18.5	13.3						
Selenium	<1.0	1.2	<1.0	<1.0	<1.0						
Primary Heavy Metals Affecting Plants (phytotoxic)											
Samples	S1 (H)	S2 (H)	S3 (H)	S4 (H)	S5 (H)						
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg						
Copper	716	838	780	643	590						
Zinc	807	452	762	588	506						
pH Units	6.8	6.8	6.8	7.3	7.3						
Acid Soluble Sulphate %	0.10	0.08	0.08	0.09	0.08						
Values failing C4SLs and S4ULs threshold limits have been highlighted in red. Recommended action level for Acid Soluble Sulphate 0.24% SO ₃ for concrete in aggressive ground conditions for subsoil/foundation horizon only (Specifying Concrete to BS EN 206-1/BS 8500).											

Sample Identification: SUBSOIL HORIZON x 5 samples

Primary Heavy Metals Affecting Human Health											
Samples	S6 (L)	S7 (L)	S8 (L)	S9 (L)	S10 (L)						
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg						
Arsenic	53.4	54.1	82.7	50.9	268						
Cadmium	<0.5	<0.5	<0.5	<0.5	<0.5						
Chromium (III)	19.0	20.0	19.0	18.7	23.5						
Chromium (VI)	<0.8	<0.8	<0.8	<0.8	<0.8						
Lead	22.1	21.2	20.4	23.3	118						
Mercury (inorganic)	<0.5	<0.5	<0.5	<0.5	<0.5						
Nickel	15.7	16.5	9.1	14.9	13.1						
Selenium	<1.0	<1.0	<1.0	<1.0	<1.0						
Primary Heavy Metals Affecting Plants (phytotoxic)											
Samples	S6 (L)	S7 (L)	S8 (L)	S9 (L)	S10 (L)						
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg						
Copper	31.4	52.5	372	121	347						
Zinc	57.9	74.5	38.4	56.3	100						
pH Units	7.3	6.4	6.3	6.0	6.0						
Acid Soluble Sulphate %	0.02	0.02	0.02	<0.02	0.03						
<p>Values failing C4SLs and S4ULs threshold limits have been highlighted in red. Recommended action level for Acid Soluble Sulphate 0.24% SO₃ for concrete in aggressive ground conditions for subsoil/foundation horizon only (Specifying Concrete to BS EN 206-1/BS 8500).</p>											

8.2 Arithmetic Mean Values For Heavy Metal Concentrations

Samples utilised for representative sample mean values and maximum/lower sample values are derived from the upper topsoil and lower subsoil elevations as defined below.

Sample Identification: TOPSOIL/HEAP x 5 samples

Element	Sample Mean	Maximum Value	Lowest Value	Residential (with homegrown produce) C4SLs/S4ULs
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Arsenic	936	1420	768	37
Cadmium	1.2	1.4	0.9	11
Chromium (III)	23	27.5	15.9	910
Chromium (hex)	<0.8	<0.8	<0.8	4.3
Lead (C4SL)	325	370	215	210
Mercury (inorganic)	<0.5	<0.5	<0.5	40
Nickel	22.1	30.8	13.3	180
Selenium	1	1.2	<1.0	250
Copper	713	838	590	2400
Zinc	623	807	452	3700

Values failing C4SLs and S4ULs threshold limits have been highlighted in red.

Sample Identification: SUBSOIL HORIZON x 5 samples

Element	Sample Mean	Maximum Value	Lowest Value	Residential (with homegrown produce) C4SLs/S4ULs
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Arsenic	102	268	50.9	37
Cadmium	<0.5	<0.5	<0.5	11
Chromium (III)	20	23.5	18.7	910
Chromium (hex)	<0.8	<0.8	<0.8	4.3
Lead (C4SL)	41	118	20.4	210
Mercury (inorganic)	<0.5	<0.5	<0.5	40
Nickel	14	16.5	9.1	180
Selenium	<1.0	<1.0	<1.0	250
Copper	185	372	31.4	2400
Zinc	65	100	38.4	3700

Values failing C4SLs and S4ULs threshold limits have been highlighted in red.

8.3 US95 Calculations (Mean Value Test) For Failing Heavy Metal Contaminants

8.3.1 Calculated Site Assessment Level (SAL/US95) For Arsenic - Topsoil Horizon (Outlier)

Note: Sample location S2(H) has been identified as an outlier or hotspot by failing the Maximum Value Test, i.e. not belonging to the same group or population. Sample S2(H) has subsequently been removed from the US95 calculation, with the true SAL/US95 value shown in section 8.3.2

Sample Identification: TOPSOIL/HEAP x 5 samples

US95 Evaluation - FAIL

A1599: Land at, Grove Vista, Trevarth Rd, Carharrack, Redruth.				
Arsenic		Data Set A		Logs
Sample No.				
S1(H)		777		2.890
S2(H)		1420		3.152
S3(H)		849		2.929
S4(H)		866		2.938
S5(H)		768		2.885
Total		4680	Total	14.794
Number of samples	N	5	Number of samples	N 5
Arithmetic sample mean	X	936.000	Arithmetic sample mean	Y 2.959
Unbiased sample deviation	S	273.966	Unbiased sample deviation	Sy 0.111
value for 95th percentile	t	2.132	Maximum value	X 3.152
Confidence limit	n	2.236		
sqr.rt of number of samples				
therefore US95 =		1197	Maximum Value Test (T) =	1.750
S4UL in mg/kg			Critical Value =	1.600
Residential with plant uptake = 37				
US95 (upper bound): A number that can be equal to or greater than any number in given data set.				

8.3.2 Calculated Site Assessment Level (SAL/US95) For Arsenic - Topsoil Horizon (True Value)

Sample Identification: TOPSOIL/HEAP x 4 samples

US95 Evaluation - FAIL

A1599: Land at, Grove Vista, Trevarth Rd, Carharrack, Redruth.					
Arsenic		Data Set A		Logs	
Sample No.					
S1(H)		777			2.890
S3(H)		849			2.929
S4(H)		866			2.938
S5(H)		768			2.885
Total		3260		Total	11.642
Number of samples	N	4		Number of samples	N 4
Arithmetic sample mean	X	815.000		Arithmetic sample mean	Y 2.911
Unbiased sample deviation	S	49.699		Unbiased sample deviation	Sy 0.026
value for 95th percentile	t	2.353		Maximum value	X 2.938
Confidence limit					
sqr.rt of number of samples	n	2.000			
therefore US95 =		873		Maximum Value Test (T) =	1.018
S4UL in mg/kg				Critical Value =	1.420
Residential with plant uptake = 37					
US95 (upper bound): A number that can be equal to or greater than any number in given data set.					

8.3.3 Calculated Site Assessment Level (SAL/US95) For Arsenic - Subsoil Horizon (Outlier)

Note: Sample locations S8(L) and S10(L) have been identified as outliers or hotspots by failing the Maximum Value Test, i.e. not belonging to the same group or population. Samples S8(L) and S10(L) have subsequently been removed from the US95 calculation, with the true SAL/US95 value shown in section 8.3.4

Sample Identification: SUBSOIL HORIZON x 5 samples

US95 Evaluation - **FAIL**

A1599: Land at, Grove Vista, Trevarth Rd, Carharrack, Redruth.				
Arsenic		Data Set A		Logs
Sample No.				
S6(L)		53.4		1.728
S7(L)		54.1		1.733
S8(L)		82.7		1.918
S9(L)		50.9		1.707
S10(L)		268		2.428
Total		509.1	Total	9.513
Number of samples	N	5	Number of samples	N 5
Arithmetic sample mean	X	101.820	Arithmetic sample mean	Y 1.903
Unbiased sample deviation	S	93.803	Unbiased sample deviation	Sy 0.306
value for 95th percentile	t	2.132	Maximum value	X 2.428
Confidence limit	n	2.236		
sqr.rt of number of samples				
therefore US95 =		191	Maximum Value Test (T) = 1.718	
S4UL in mg/kg			Critical Value = 1.600	
Residential with plant uptake = 37				
US95 (upper bound): A number that can be equal to or greater than any number in given data set.				

8.3.4 Calculated Site Assessment Level (SAL/US95) For Arsenic - Subsoil Horizon (True Value)

Sample Identification: SUBSOIL HORIZON x3 samples

US95 Evaluation - FAIL

A1599: Land at, Grove Vista, Trevarth Rd, Carharrack, Redruth.					
Arsenic		Data Set A		Logs	
Sample No.					
S6(L)		53.4			1.728
S7(L)		54.1			1.733
S9(L)		50.9			1.707
Total		158.4		Total	5.167
Number of samples	N	3		Number of samples	N 3
Arithmetic sample mean	X	52.800		Arithmetic sample mean	Y 1.722
Unbiased sample deviation	S	1.682		Unbiased sample deviation	Sy 0.014
value for 95th percentile	t	2.920		Maximum value	X 1.733
Confidence limit					
sqr.rt of number of samples	n	1.732			
therefore US95 =		56		Maximum Value Test (T) =	0.768
S4UL in mg/kg				Critical Value =	1.420
Residential with plant uptake =		37			
US95 (upper bound): A number that can be equal to or greater than any number in given data set.					

8.3.5 Calculated Site Assessment Level (SAL/US95) For Lead - Topsoil Horizon

Sample Identification: TOPSOIL/HEAP x 5 samples

US95 Evaluation - FAIL

A1599: Land at, Grove Vista, Trevarth Rd, Carharrack, Redruth.					
Lead		Data Set A		Logs	
Sample No.					
S1(H)		366		2.563	
S2(H)		370		2.568	
S3(H)		359		2.555	
S4(H)		314		2.497	
S5(H)		215		2.332	
Total		1624	Total	12.516	
Number of samples	N	5	Number of samples	N	5
Arithmetic sample mean	X	324.800	Arithmetic sample mean	Y	2.503
Unbiased sample deviation	S	65.351	Unbiased sample deviation	Sy	0.100
value for 95th percentile	t	2.132	Maximum value	X	2.568
Confidence limit					
sqr.rt of number of samples	n	2.236			
therefore US95 =		387	Maximum Value Test (T) =		0.652
C4SL in mg/kg			Critical Value =		1.600
Residential with plant uptake = 210					
US95 (upper bound): A number that can be equal to or greater than any number in given data set.					

8.4 Identified Failing Substances

The following heavy metal contaminants have been identified to have an elevated result that exceeds current guidance limits and should be utilised to assess the level of contamination within the ground horizon at the site locality.

Sample Identification: ARSENIC - TOPSOIL/HEAP x 5 samples

Mean Value Test (US95)/Site Assessment Level for arsenic:

True Site Value	
SAL (US95)	873.00 mg/kg
S4UL guidance limit for arsenic	37.00 mg/kg
Risk classification	Medium
Outliers	
Sample S2(H)	1420.00 mg/kg
S4UL guidance limit for arsenic	37.00 mg/kg
Risk classification	Medium

Sample Identification: ARSENIC - SUBSOIL x 5 samples

Mean Value Test (US95)/Site Assessment Level for arsenic:

True Site Value	
SAL (US95)	56.00 mg/kg
S4UL guidance limit for arsenic	37.00 mg/kg
Risk classification	Low
Outliers	
Sample S8(L)	82.70 mg/kg
Sample S10(L)	268.00 mg/kg
S4UL guidance limit for arsenic	37.00 mg/kg
Risk classification	Low/Medium

Sample Identification: LEAD - TOPSOIL/HEAP x 5 samples

Mean Value Test (US95)/Site Assessment Level for lead:

SAL (US95)	387.00 mg/kg
C4SL guidance limit for lead	210.00 mg/kg
Risk classification	Low/Medium

8.5 Acid Soluble Sulphate Recommendations

Pyrite (iron sulphide) can occur naturally, or arise from industrial wastes and if slowly oxidised in the soil can give rise to sulphuric acid and sulphide ions in acid solution, in turn potentially affecting concrete for foundations.

Current guidance Specifying Concrete to BS EN 206-1/BS 8500 delineates various suitable grades of concrete that can be utilised for development foundations (if required), with the grade of concrete increasing in strength relative to the level of acid soluble sulphate (SO₄) detected. Generally, values exceeding 0.24% SO₄ would require a higher grade of concrete.

The sample analysis data has returned a site mean value obtained from the subsoil horizon as:

Acid Soluble Sulphate % level and pH unit for sample locations S6(L) to S10(L).

(SO₄) 0.03%, pH - 6.4

According to the guideline limits for Specifying Concrete to BS EN 206-1/BS 8500, a Design Sulphate Class (DS) of DS -1 and an Aggressive Chemical Environment for Concrete (ACEC) of AC -1 should be utilised at this site. We would consider as a precautionary measure that the developer consult with their designer and/or concrete supplier with respect to a suitable concrete design, with the information provided to be utilised for guidance purposes.

9. **Soil Analysis Conclusions & Recommendations**

Under the currently published Category 4 Screening Levels (C4SL) and Suitable 4 Use Levels (S4ULs), the resulting soil analysis data has determined that the site has an exceedance of the following heavy metal contaminants obtained from both the topsoil and subsoil horizons from within the site bounds:

Failing elements: Arsenic, Lead

The sample values are based upon total concentrations, i.e. an amount of contaminant contained within a kilogram of sample material and are used to gain an understanding of the overall contaminant levels and level of risk. Exposure to heavy metals from contaminated land can potentially cause human health risks if levels are determined to be high, generally over long term periods.

A risk categorisation is intended to convey to the client and Local Authorities that the ground horizon within the area of sampling would be considered a potential hazard to human health from the following exposure pathways: dermal (contact with skin), inhalation (dust/vapour) and ingestion (growing of home grown produce). In addition, dependant on concentrations, eco-systems can be affected, or groundwater water sources.

Determination for Arsenic: Topsoil Heap/Subsoil Horizon

Sample locations S1(H) to S10(L), have returned Site Assessment Levels (SAL/US95) of 873 mg/kg for arsenic within the topsoil horizon and 56 mg/kg within the subsoil elevation. These values exceed the S4UL value of 37 mg/kg for 'residential sites with homegrown produce'. Therefore, based upon the exceedance values, the site has been classified at medium risk within the topsoil horizon and at low risk within the subsoil horizon with respect to arsenic concentrations.

In addition, samples S2(H), S8(L) and S10(L) were identified as outliers or hotspots with values of 1440 mg/kg, 82.7 mg/kg and 268 mg/kg respectively and have consequently been considered within the overall risk assessment for the property. Please note that although the subsoil horizon has been classified as low risk, the S4UL value for arsenic has been exceeded and coupled with the recorded outliers at the property further action should be undertaken (see Remedial Recommendations).

Determination for Lead: Topsoil Heap

Sample locations S1(H) to S5(H), have returned a Site Assessment Level (SAL/US95) of 387 mg/kg for lead, which exceeds the C4SL value of 210 mg/kg for 'residential sites with homegrown produce'. Therefore, based upon the exceedance value, the site would be classified at low to medium risk with respect to lead concentrations.

Site Evaluation:

Having undertaken the site investigation at the property, we can confirm that no mine waste horizon was recorded within the property bounds, with the site being formally overlain by topsoil which had been stripped back and heaped at the time of collection. Underlying the topsoil elevation it was determined (within the sample locations) that the plot lies upon undisturbed subsoil. Therefore the levels of identified arsenic and lead at the site have been attributed to naturally occurring mineralised land prevalent throughout the general locality.

Other Tested Elements

All other tested samples were below threshold values.

Additional Laboratory Analysis

No further analytical testing would be recommended at the site locality, primarily due to the level of identified arsenic, with additional testing in the form of bioaccessibility analysis, with CLEA modelling (Contaminated Land Exposure Assessment) having a high probability of producing a negative result, with the site remaining contaminated. We therefore recommend remedial action for the property (see Remedial Recommendations).

Eco-systems

We do not believe the level of identified contamination would have an adverse impact upon local eco-systems or controlled water bodies at this site locality, with the values being consistent with background levels.

Excess Soil Disposal

Under government legislation a Waste Classification Assessment (WCA) has been undertaken for excess waste generated for landfill disposal. Following classification, the WCA report has subsequently classified sample locations S1(H) to S10(L) under the List of Waste (LoW) reference of 17 05 04 (construction and demolition waste/soil and stones) as 'non hazardous waste' for landfill disposal purposes, with the exception of sample S2(H) which was identified as potentially hazardous.

For reference the failing element within sample S2(H) was determined to be an elevated arsenic content, however these levels of arsenic are not uncommon within the locality and we would therefore advise that all excess soils be disposed of at a suitable licensed waste disposal facility capable of receiving elevated heavy metals. Please refer to Annex 3: Waste Classification Assessment for further details.

It should be noted that any removal of material, classified as contaminated or suitable for use must be by a licensed haulier. Please refer to Annex 3: Waste Classification Assessment for further details.

Remedial Recommendations

We would recommend that remediation methods be employed at the site locality. This would require the submission of a Site Remediation Strategy to the Local Authorities clearly defining the proposed site layout and remedial measures to be employed. Such measures would require the incorporation of suitable break layers over areas of exposed ground. This can be in the form of hardstanding, such as concrete, brick paviours, tarmacadam, etc or soft surfacing materials, such as clean imported soil, gravel or wood chippings underlain by suitable break layers. These methods can be employed singularly or in combination.

A site Verification and Completion Report will then be required as the final report. This will be issued upon completion of the development works in order to verify that the Site Remediation Strategy recommendations have been satisfied.

Potable water supply

We would recommend that suitable polyethylene 'blue' P.E water supply pipes are utilised when undertaking groundworks. The service pipes should be lain within a gravel surround service trench (pipe separated with at least 150mm of gravel on all sides), or within a ducting pipe to separate the service pipes from the surrounding ground horizon. The service pipes should be laid with a minimum cover from finished ground level to the crown of the pipe of 750mm to a maximum cover of 1200mm.

Unexpected Contamination

Should unrecorded contamination be encountered during the continued development of the site, in the form of buried tanks, buried waste material, olfactory odours or obvious pollutants, we would advise that all works must stop within the suspect area and contact with ourselves be established before work is initiated.

Following the above conclusions and recommendations we have no further comments to make within the scope of this report.

10. Notes

1. This report relates to the area defined within the report.
2. The report should not be used in any way in connection with adjacent properties.
3. The conclusions and recommendations sections of this site report only relate to the form and extent of development outlined herein for this specific property only and they should not be taken as suitable for any other form or extent of development within the boundaries of this property without further consultation with Approved Site Investigations Ltd.
4. This report is confidential to the named client(s) and we have no liability toward any person not party to commissioning this report.
5. This report may not be reproduced or distributed to third parties without our prior permission other than to directly facilitate the sale or development of the property concerned.
6. This report may not be resold without our prior permission.
7. Unless otherwise expressly stated, nothing in this report shall create or confer any rights or other benefits pursuant to the Contracts (Rights of Third Parties) Act 1999 in favour of any person other than the person commissioning this report.



Approved Site Investigations Ltd

Verified by:
Mr. J.R Williamson (Managing Director)
HND Science (Industrial Mining Geology)
Dip CSM

11. ANNEXES

Annex 1: Site Plan

Annex 2: Laboratory Results

Annex 3: Waste Classification Assessment

Annex 4: Site Photographs

Annex 5: References

Annex 1: Site Plan

SITE PLAN

<p>Sample location plan</p> <p>1.8m High Timber Panel Fence</p> <p>10.00m (approx)</p>	<p>North</p>
	<p>Land at:</p> <p>Land at, Grove Vista Trevarth Road Carharrack Redruth Cornwall TR16 5SE</p>
	<p>Sample collection date:</p> <p>31st March 2021</p>
	<p>Site inspected by:</p> <p>Mr J.R Williamson</p> <p>Position: Site Investigation Manager</p>
<p>Plan supplied TBS Planning</p>	
<p>Notes:</p> <ul style="list-style-type: none"> • Not to scale, for diagrammatic purposes only. • Site area indicated in red. • Soil heap defined by the brown broken line. • Sample location points indicated in yellow. 	

Annex 2: Laboratory Results



Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 21-33004

Issue: 1

Date of Issue: 12/04/2021

Contact: Jeremy Williamson

Customer Details: Approved Site Investigations Ltd.
Duchy Business Centre
Wilson Way
Redruth
Cornwall TR15 3RT

Quotation No: Q16-00764

Order No: A1599

Customer Reference: A1599

Date Received: 06/04/2021

Date Approved: 12/04/2021

Details: A1599 Carharrack

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.: 21-33004, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
232443	1H	31/03/2021	06/04/2021	Silty loam	
232444	2H	31/03/2021	06/04/2021	Silty loam	
232445	3H	31/03/2021	06/04/2021	Silty loam	
232446	4H	31/03/2021	06/04/2021	Silty loam	
232447	5H	31/03/2021	06/04/2021	Silty loam	
232448	6L	31/03/2021	06/04/2021	Silty loam	
232449	7L	31/03/2021	06/04/2021	Silty loam	
232450	8L	31/03/2021	06/04/2021	Silty loam	
232451	9L	31/03/2021	06/04/2021	Silty loam	
232452	10L	31/03/2021	06/04/2021	Silty loam	



2683



Results Summary

Report No.: 21-33004, issue number 1

ELAB Reference	232443	232444	232445	232446	232447	232448	232449	232450	232451	232452			
Customer Reference													
Sample ID													
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Location	1H	2H	3H	4H	5H	6L	7L	8L	9L	10L			
Sample Depth (m)													
Sampling Date	31/03/2021	31/03/2021	31/03/2021	31/03/2021	31/03/2021	31/03/2021	31/03/2021	31/03/2021	31/03/2021	31/03/2021			
Determinand	Codes	Units	LOD										
Soil sample preparation parameters													
Moisture Content	N	%	0.1	41.9	29.2	33.1	33.7	31.4	14.8	21.4	22.7	16.1	20.8
Material removed	N	%	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0	None	None	None	None	None	None	None	None	None	None
Metals													
Arsenic	M	mg/kg	1	777	1420	849	866	768	53.4	54.1	82.7	50.9	268
Cadmium	M	mg/kg	0.5	1.4	1.1	1.3	1.2	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	27.5	24.7	25.5	20.3	15.9	19.0	20.0	19.0	18.7	23.5
Copper	M	mg/kg	5	716	838	780	643	590	31.4	52.5	372	121	347
Lead	M	mg/kg	5	366	370	359	314	215	22.1	21.2	20.4	23.3	118
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	24.6	23.3	30.8	18.5	13.3	15.7	16.5	9.1	14.9	13.1
Selenium	M	mg/kg	1	< 1.0	1.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	5	807	452	762	588	506	57.9	74.5	38.4	56.3	100
Inorganics													
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Acid Soluble Sulphate (SO4)	U	%	0.02	0.10	0.08	0.08	0.09	0.08	0.02	0.02	0.02	< 0.02	0.03
Miscellaneous													
pH	M	pH units	0.1	6.8	6.8	6.8	7.3	7.3	7.3	6.4	6.3	6.0	6.0
Soil Organic Matter	U	%	0.1	12	9.5	8.7	10	9.1	0.6	1.6	2.5	0.6	2.5



Method Summary

Report No.: 21-33004, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Hexavalent chromium	N	As submitted sample	08/04/2021	110	Colorimetry
pH	M	Air dried sample	12/04/2021	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	08/04/2021	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	07/04/2021	300	ICPMS
Soil organic matter	U	Air dried sample	12/04/2021	BS1377:P3	Titrimetry

Tests marked N are not UKAS accredited



Report Information

Report No.: 21-33004, 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

Annex 3: Waste Classification Assessment

Waste Classification Report



8AHR7-UQKX4-M9EF7

Job name

A1599

Description/Comments

WASTE SOILS COLLECTED FROM WITHIN SITE BOUNDS AND COMPRISING OF NATURALLY OCCURING TOPSOIL AND SUBSOIL. ALL EXCESS SOIL TO BE DISPOSED OF AT A LICENSED LANDFILL FACILITY. HAULAGE AND DISPOSAL RECORDS TO BE RETAINED FOR FUTURE REFERENCE. PLEASE PROVIDE A COPY OF THIS REPORT TO YOUR HAULIER FOR THEIR RECORDS.

Project

LAND AT: GROVE VISTA - PLANNING REFERENCE: PA20/07024

Site

LAND AT: GROVE VISTA, TREVARTH ROAD, CARHARRACK, REDRUTH, CORNWALL. TR16 5SE

Related Documents

#	Name	Description
None		

Waste Stream Template

ASI suite 1

Classified by

Name:	Company:	HazWasteOnline™ Training Record:	
Jeremy Williamson	Approved Site Investigations Ltd	Course	Date
Date: 15 Apr 2021 15:26 GMT	Duchy Business Centre	Hazardous Waste Classification	-
Telephone: 01209 204744	Wilson Way, Pool	Advanced Hazardous Waste Classification	-
	Redruth, Cornwall		
	TR15 3RT		

Report

Created by: Jeremy Williamson
Created date: 15 Apr 2021 15:26 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	1H	0.0m	Non Hazardous		3
2	2H	0.0m	Hazardous	HP 7	5
3	3H	0.0m	Non Hazardous		7
4	4H	0.0m	Non Hazardous		9
5	5H	0.0m	Non Hazardous		11
6	6L	0.50m	Non Hazardous		13
7	7L	0.50m	Non Hazardous		15
8	8L	0.50m	Non Hazardous		17
9	9L	0.50m	Non Hazardous		19



#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
10	10L	0.50m	Non Hazardous		21

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	23
Appendix B: Rationale for selection of metal species	23
Appendix C: Version	24

Classification of sample: 1H

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

Sample details

Sample Name: 1H	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: 0.0m m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: 41.9% (dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 41.9% Dry Weight 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	pH		PH		6.8 pH		6.8 pH	6.8 pH		
2	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	777 mg/kg		547.569 mg/kg	0.0548 %	✓	
	033-002-00-5									
3	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	1.4 mg/kg		0.987 mg/kg	0.0000987 %	✓	
	048-001-00-5									
4	chromium in chromium(III) compounds { chromium(III) oxide }				27.5 mg/kg	1.462	28.325 mg/kg	0.00283 %	✓	
		215-160-9	1308-38-9							
5	copper { dicopper oxide; copper (I) oxide }				716 mg/kg	1.126	568.102 mg/kg	0.0568 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	080-002-00-6									
7	nickel { nickel }			7	24.6 mg/kg		17.336 mg/kg	0.00173 %	✓	
	028-002-00-7	231-111-4	7440-02-0							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	366 mg/kg		257.928 mg/kg	0.0258 %	✓	
	082-001-00-6									
9	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									
10	zinc { zinc oxide }				807 mg/kg	1.245	707.882 mg/kg	0.0708 %	✓	
	030-013-00-7	215-222-5	1314-13-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
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							
Total:								0.213 %		

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: 2H

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

Sample details

Sample Name:	LoW Code:	
2H	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 03 * (Soil and stones containing hazardous substances)
0.0m m		
Moisture content:		
29.2%		
(dry weight correction)		

Hazard properties

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

Hazard Statements hit:

Carc. 1A; 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:

arsenic compounds, with the exception of those specified elsewhere in this Annex: (Note 1 conc.: 0.11%)

Determinands

Moisture content: 29.2% Dry Weight 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	033-002-00-5				6.8	pH		6.8	pH	6.8 pH		
2	033-002-00-5			1	1420	mg/kg		1099.071	mg/kg	0.11 %	✓	
3	048-001-00-5			1	1.1	mg/kg		0.851	mg/kg	0.0000851 %	✓	
4		215-160-9	1308-38-9		24.7	mg/kg	1.462	27.942	mg/kg	0.00279 %	✓	
5	029-002-00-X	215-270-7	1317-39-1		838	mg/kg	1.126	730.259	mg/kg	0.073 %	✓	
6	080-002-00-6			1	<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
7	028-002-00-7	231-111-4	7440-02-0	7	23.3	mg/kg		18.034	mg/kg	0.0018 %	✓	
8	082-001-00-6			1	370	mg/kg		286.378	mg/kg	0.0286 %	✓	

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used	
	CLP index number	EC Number	CAS Number								
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1.2 mg/kg	1.405	1.305 mg/kg	0.00013 %	✓		
	034-002-00-8										
10	zinc { zinc oxide }				452 mg/kg	1.245	435.457 mg/kg	0.0435 %	✓		
	030-013-00-7	215-222-5	1314-13-2								
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								
Total:								0.26 %			

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: 3H

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

Sample details

Sample Name:	LoW Code:	
3H	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)
0.0m m		
Moisture content:		
33.1%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 33.1% Dry Weight 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	pH		PH		6.8 pH		6.8 pH	6.8 pH		
2	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	849 mg/kg		637.866 mg/kg	0.0638 %	✓	
	033-002-00-5									
3	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	1.3 mg/kg		0.977 mg/kg	0.0000977 %	✓	
	048-001-00-5									
4	chromium in chromium(III) compounds { chromium(III) oxide }				25.5 mg/kg	1.462	28.001 mg/kg	0.0028 %	✓	
		215-160-9	1308-38-9							
5	copper { dicopper oxide; copper (I) oxide }				780 mg/kg	1.126	659.799 mg/kg	0.066 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	080-002-00-6									
7	nickel { nickel }			7	30.8 mg/kg		23.14 mg/kg	0.00231 %	✓	
	028-002-00-7	231-111-4	7440-02-0							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	359 mg/kg		269.722 mg/kg	0.027 %	✓	
	082-001-00-6									
9	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									
10	zinc { zinc oxide }				762 mg/kg	1.245	712.601 mg/kg	0.0713 %	✓	
	030-013-00-7	215-222-5	1314-13-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
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							
Total:								0.234 %		

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: 4H

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

Sample details

Sample Name: 4H	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: 0.0m m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: 33.7% (dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 33.7% Dry Weight 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	pH		PH		7.3 pH		7.3 pH	7.3 pH		
2	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	866 mg/kg		647.719 mg/kg	0.0648 %	✓	
	033-002-00-5									
3	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	1.2 mg/kg		0.898 mg/kg	0.0000898 %	✓	
	048-001-00-5									
4	chromium in chromium(III) compounds { chromium(III) oxide }				20.3 mg/kg	1.462	22.191 mg/kg	0.00222 %	✓	
		215-160-9	1308-38-9							
5	copper { dicopper oxide; copper (I) oxide }				643 mg/kg	1.126	541.471 mg/kg	0.0541 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	080-002-00-6									
7	nickel { nickel }			7	18.5 mg/kg		13.837 mg/kg	0.00138 %	✓	
	028-002-00-7	231-111-4	7440-02-0							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	314 mg/kg		234.854 mg/kg	0.0235 %	✓	
	082-001-00-6									
9	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									
10	zinc { zinc oxide }				588 mg/kg	1.245	547.413 mg/kg	0.0547 %	✓	
	030-013-00-7	215-222-5	1314-13-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
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							
Total:								0.201 %		

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: 5H

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

Sample details

Sample Name: 5H	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: 0.0m m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: 31.4% (dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 31.4% Dry Weight 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	pH		PH		7.3 pH		7.3 pH	7.3 pH		
2	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	768 mg/kg		584.475 mg/kg	0.0584 %	✓	
	033-002-00-5									
3	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	0.9 mg/kg		0.685 mg/kg	0.0000685 %	✓	
	048-001-00-5									
4	chromium in chromium(III) compounds { chromium(III) oxide }				15.9 mg/kg	1.462	17.685 mg/kg	0.00177 %	✓	
		215-160-9	1308-38-9							
5	copper { dicopper oxide; copper (I) oxide }				590 mg/kg	1.126	505.536 mg/kg	0.0506 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	080-002-00-6									
7	nickel { nickel }			7	13.3 mg/kg		10.122 mg/kg	0.00101 %	✓	
	028-002-00-7	231-111-4	7440-02-0							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	215 mg/kg		163.623 mg/kg	0.0164 %	✓	
	082-001-00-6									
9	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									
10	zinc { zinc oxide }				506 mg/kg	1.245	479.319 mg/kg	0.0479 %	✓	
	030-013-00-7	215-222-5	1314-13-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
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							
Total:								0.176 %		

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: 6L

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

Sample details

Sample Name: 6L	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: 0.50m m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: 14.8% (dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 14.8% Dry Weight 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	pH		PH		7.3 pH		7.3 pH	7.3 pH		
2	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	53.4 mg/kg		46.516 mg/kg	0.00465 %	✓	
	033-002-00-5									
3	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	048-001-00-5									
4	chromium in chromium(III) compounds { chromium(III) oxide }				19 mg/kg	1.462	24.19 mg/kg	0.00242 %	✓	
		215-160-9	1308-38-9							
5	copper { dicopper oxide; copper (I) oxide }				31.4 mg/kg	1.126	30.795 mg/kg	0.00308 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	080-002-00-6									
7	nickel { nickel }			7	15.7 mg/kg		13.676 mg/kg	0.00137 %	✓	
	028-002-00-7	231-111-4	7440-02-0							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	22.1 mg/kg		19.251 mg/kg	0.00193 %	✓	
	082-001-00-6									
9	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									
10	zinc { zinc oxide }				57.9 mg/kg	1.245	62.778 mg/kg	0.00628 %	✓	
	030-013-00-7	215-222-5	1314-13-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
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							
Total:								0.0201 %		

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: 7L

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

Sample details

Sample Name: 7L	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: 0.50m m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: 21.4% (dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 21.4% Dry Weight 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	pH		PH		6.4 pH		6.4 pH	6.4 pH		
2	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	54.1 mg/kg		44.563 mg/kg	0.00446 %	✓	
	033-002-00-5									
3	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	048-001-00-5									
4	chromium in chromium(III) compounds { chromium(III) oxide }				20 mg/kg	1.462	24.078 mg/kg	0.00241 %	✓	
		215-160-9	1308-38-9							
5	copper { dicopper oxide; copper (I) oxide }				52.5 mg/kg	1.126	48.69 mg/kg	0.00487 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	080-002-00-6									
7	nickel { nickel }			7	16.5 mg/kg		13.591 mg/kg	0.00136 %	✓	
	028-002-00-7	231-111-4	7440-02-0							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	21.2 mg/kg		17.463 mg/kg	0.00175 %	✓	
	082-001-00-6									
9	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									
10	zinc { zinc oxide }				74.5 mg/kg	1.245	76.385 mg/kg	0.00764 %	✓	
	030-013-00-7	215-222-5	1314-13-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
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							
Total:								0.0229 %		

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: 8L

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

Sample details

Sample Name: 8L	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: 0.50m m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: 22.7% (dry weight correction)		

Hazard properties

None identified


Determinands

Moisture content: 22.7% Dry Weight 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	pH		PH		6.3 pH		6.3 pH	6.3 pH		
2	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5		1	82.7 mg/kg		67.4 mg/kg	0.00674 %	✓	
3	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	048-001-00-5		1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
4	chromium in chromium(III) compounds { chromium(III) oxide }	215-160-9	1308-38-9		19 mg/kg	1.462	22.632 mg/kg	0.00226 %	✓	
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7 1317-39-1		372 mg/kg	1.126	341.345 mg/kg	0.0341 %	✓	
6	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }	080-002-00-6		1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
7	nickel { nickel }	028-002-00-7	231-111-4 7440-02-0	7	9.1 mg/kg		7.416 mg/kg	0.000742 %	✓	
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6		1	20.4 mg/kg		16.626 mg/kg	0.00166 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8			<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5 1314-13-2		38.4 mg/kg	1.245	38.954 mg/kg	0.0039 %	✓	

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used	
	CLP index number	EC Number	CAS Number								
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								
Total:								0.0498 %			

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: 9L

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

Sample details

Sample Name: 9L	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: 0.50m m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: 16.1% (dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 16.1% Dry Weight 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	pH		PH		6 pH		6 pH	6pH		
2	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	50.9 mg/kg		43.842 mg/kg	0.00438 %	✓	
	033-002-00-5									
3	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	048-001-00-5									
4	chromium in chromium(III) compounds { chromium(III) oxide }				18.7 mg/kg	1.462	23.541 mg/kg	0.00235 %	✓	
		215-160-9	1308-38-9							
5	copper { dicopper oxide; copper (I) oxide }				121 mg/kg	1.126	117.341 mg/kg	0.0117 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	080-002-00-6									
7	nickel { nickel }			7	14.9 mg/kg		12.834 mg/kg	0.00128 %	✓	
	028-002-00-7	231-111-4	7440-02-0							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	23.3 mg/kg		20.069 mg/kg	0.00201 %	✓	
	082-001-00-6									
9	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									
10	zinc { zinc oxide }				56.3 mg/kg	1.245	60.36 mg/kg	0.00604 %	✓	
	030-013-00-7	215-222-5	1314-13-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
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							
Total:								0.0282 %		

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: 10L

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

Sample details

Sample Name: 10L	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: 0.50m m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: 20.8% (dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 20.8% Dry Weight 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	pH		PH		6 pH		6 pH	6pH		
2	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	268 mg/kg		221.854 mg/kg	0.0222 %	✓	
	033-002-00-5									
3	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	048-001-00-5									
4	chromium in chromium(III) compounds { chromium(III) oxide }				23.5 mg/kg	1.462	28.433 mg/kg	0.00284 %	✓	
		215-160-9	1308-38-9							
5	copper { dicopper oxide; copper (I) oxide }				347 mg/kg	1.126	323.413 mg/kg	0.0323 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	080-002-00-6									
7	nickel { nickel }			7	13.1 mg/kg		10.844 mg/kg	0.00108 %	✓	
	028-002-00-7	231-111-4	7440-02-0							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	118 mg/kg		97.682 mg/kg	0.00977 %	✓	
	082-001-00-6									
9	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									
10	zinc { zinc oxide }				100 mg/kg	1.245	103.039 mg/kg	0.0103 %	✓	
	030-013-00-7	215-222-5	1314-13-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
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							
Total:								0.0789 %		

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

Appendix A: Classifier defined and non CLP determinands

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

- **arsenic compounds, with the exception of those specified elsewhere in this Annex**

CLP index number: 033-002-00-5
Description/Comments: Worst Case: IARC considers arsenic compounds Group 1; Carcinogenic to humans
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):
03 Jun 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

- **cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex**

CLP index number: 048-001-00-5
Description/Comments: Worst Case: IARC considers cadmium compounds Group 1; Carcinogenic to humans
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

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

Description/Comments: Data from ECHA's C&L inventory database
Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>
Data source date: 30 Apr 2020
Hazard Statements: Acute Tox. 4 H302 , Skin Sens. 1 H317 , Eye Irrit. 2 H319

- **lead compounds with the exception of those specified elsewhere in this Annex**

CLP index number: 082-001-00-6
Description/Comments: Least-worst case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers many simple lead compounds to be Carcinogenic category 2
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
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 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html. Review date 29/09/2015

Appendix B: Rationale for selection of metal species

arsenic {arsenic compounds, with the exception of those specified elsewhere in this Annex}

Worst case species based upon site data.

cadmium {cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex}

Worst case species based upon site data.

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

Worst case species based upon site data.

copper {dicopper oxide; copper (I) oxide}

Worst case species based upon site data.

mercury {inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex}

Worst case species based upon site data.

nickel {nickel}

Worst case species based upon site data.

lead {lead compounds with the exception of those specified elsewhere in this Annex}

Worst case species based upon site data.

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

Worst case species based upon site data.

zinc {zinc oxide}

Worst case species based upon site data.

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

Worst case species based upon site data.

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.1, May 2018**
HazWasteOnline Classification Engine Version: 2021.77.4714.9046 (18 Mar 2021)
HazWasteOnline Database: 2021.77.4714.9046 (18 Mar 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

Annex 4: Site Photographs

Photograph 1.



View: northeast

Looking to the site sampling area with the topsoil heap as shown.

Photograph 2.



View: -

Soil Heap

Topsoil material from sample location S1(H).

Photograph 3.



View: -

Soil Heap

Topsoil material from sample location S2(H).

Photograph 4.



View: -

Soil Heap

Topsoil material from sample location S3(H).

Photograph 5.



View: east

Soil Heap

Topsoil material from sample location S4(H).

Photograph 6.



View: -

Soil Heap

Topsoil material from sample location S5(H).

Photograph 7.



View: southwest

Subsoil Horizon

Looking to sample location S6(L).

Photograph 8.



View: northwest

Subsoil Horizon

Sample material from sample location S6(L).

Photograph 9.



View: northwest

Subsoil Horizon

Sample location S7(L).

Photograph 10.



View: northeast

Subsoil Horizon

Sample material from sample location S8(L).

Photograph 11.



View: southwest

Subsoil Horizon

Looking to sample location S9(L).

Photograph 12.



View: -

Subsoil Horizon

Sample material from sample location S10(L).

Annex 5: References

- BS EN 206-1/BS 8500** Concrete for normal use (2004)
- BSI 10175:2011** Investigation of Potentially Contaminated Sites - Code of Practice
- BRE Special Digest 1** Concrete in Aggressive Ground (August 2001)
- Category 4 Screening Levels** (SP1010) for Assessment of Land Affected by Contamination (December 2014)
- CIRCA Report C552** Contaminated Land Risk Assessment, A Guide To Good Practice (2001)
- CL:AIRE Research Bulletin RB17**, A Pragmatic Approach To Ground Gas Risk Assessment (2012)
- CLR7** Assessment of Risks to Human Health from Land Contamination: An Overview of the Development of Soil Guideline Values and Related Research (Defra and Environment Agency, 2002a).
- CLR8** Potential Contaminants for the Assessment of Land (Defra and Environment Agency, 2002b)
- CLR9** Contaminants in Soil: Collation of Toxicological Data and Intake Values for Humans (Defra and Environment Agency, 2002c)
- CLR10/11** The Contaminated Land Exposure Assessment Model (CLEA): Technical Basis and Algorithms (Defra and Environment Agency, 2002d)
- CLR11** Model Procedures for the Management of Land Contamination (2004)
- CLEA Briefing Note 1** (Environment Agency 2004a)
- CLEA Briefing Note 3** (Environment Agency 2004c)
- EA** Guidance for the Safe Development of Housing on Land Affected by Contamination
- EA** Guidance Waste Destined for Disposal in Landfills (2002)
- EA** Using Soil Guideline Values, Science report: SC050021 /SGV introduction (March 2009)
- E.A** Soil Guideline Values
- E.A** (2020), Land Contamination Risk Management (LCRM)
- HPA Contaminated Land Information Sheet** Risk Assessment Approaches For Polycyclic Aromatic Hydrocarbons (PAHs) 2010
- LQM/CIEH GAC** Suitable 4 use levels (S4ULs) 2014
- PPG 5** Works In, Near or Liable to Affect Watercourses
- PPG 7:** Fueling Stations Construction & Operation
- Public Health England:** Contaminated Land Information Sheet: Risk Assessment Approaches For Polycyclic Aromatic Hydrocarbons (PAHs), (2017)
- Sampling Strategies for Contaminated Land**, DETR, 1994, (**CLR4**)
- SEPA** Special Waste Regulations (1996)



ASI Core Services:

- **Contaminated Land Surveys**
- **Soil & Water Analysis Reports**
- **Land Remediation Reports**
- **Site Verification & Completion Reports**
- **Drilling & Ground Profiling Investigations**
- **Trenching & Foundation Inspections**
- **Shaft & Mining Feature Securing Works**
- **Waste Classification Assessments**
- **Historic Mine Searches (arranged upon request)**
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