



London Borough of Haringey

STANHOPE ROAD BRIDGE, HARINGEY

Phase II Generic Quantitative Risk Assessment





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CONTENTS

1	INTRODUCTION	1
1.1	TERMS OF REFERENCE	1
1.2	PROPOSED SCHEME	1
1.3	AIMS AND OBJECTIVES	1
1.4	SCOPE OF WORKS	2
1.5	REGULATORY CONTEXT	2
1.6	SOURCES OF INFORMATION	3
1.7	CONFIDENTIALITY AND LIMITATIONS	3
2	SUMMARY OF SITE INFORMATION	4
2.1	SITE HISTORY	4
2.1.1	ON-SITE	4
2.1.2	OFF-SITE	4
2.2	SITE LOCATION AND SITE DESCRIPTION	5
2.3	HISTORICAL GROUND INVESTIGATIONS	7
2.4	GEOLOGY	9
2.5	HYDROGEOLOGY	10
2.6	HYDROLOGY	10
2.7	FLOOD RISK DATA	10
2.8	PRELIMINARY HYDROGEOLOGICAL MODEL	11
2.9	UNEXPLODED ORDNANCE (UXO)	12
2.10	ENVIRONMENTALLY SENSITIVE AREAS	12
2.11	REGULATORY INFORMATION	12
2.12	MINING AND GROUND STABILITY	12
2.13	RADON	13
2.14	LOCAL AUTHORITY CONSULTATION	13
2.14.1	LOCAL AUTHORITY ENVIRONMENTAL HEALTH OFFICER (EHO)	13

2.14.2	ENVIRONMENT AGENCY (EA)	13
2.15	PLANNING HISTORY	14
3	PRELIMINARY CONCEPTUAL SITE MODEL	15
3.1	INTRODUCTION	15
3.2	POTENTIAL CONTAMINANT SOURCES	15
3.3	POTENTIAL PATHWAYS	16
3.4	POTENTIAL RECEPTORS	16
3.5	PLAUSIBLE PRELIMINARY CONTAMINANT LINKAGES	17
4	SITE INVESTIGATION AND ASSESSMENT RATIONALE	21
4.1	SITE INVESTIGATION RATIONALE	21
4.2	COMPLETED WORKS	21
4.3	GENERAL SITE METHODOLOGY	22
4.3.1	SERVICE CLEARANCE	22
4.3.2	WINDOWLESS SAMPLE BOREHOLES	22
4.4	LABORATORY TESTING	22
4.4.1	GEO-ENVIRONMENTAL TESTING	22
4.5	GROUNDWATER	22
4.6	DEVIATIONS FROM ORIGINAL SCOPE OF WORKS	22
5	GROUND CONDITIONS	23
5.1	ENCOUNTERED GROUND CONDITIONS	23
5.1.1	TOPSOIL	23
5.1.2	MADE GROUND	23
5.1.3	REWORKED GROUND	24
5.1.4	RIVER TERRACE DEPOSITS	24
5.1.5	LONDON CLAY FORMATION	24
5.2	OBSERVATIONS OF VISUAL / OLFACTORY EVIDENCE OF CONTAMINATION	25
5.3	GROUNDWATER STRIKES DURING INVESTIGATION	25

5.4	UPDATED HYDROGEOLOGICAL MODEL	25
6	CONTAMINANT RISK ASSESSMENT	26
6.1	HUMAN HEALTH RISK ASSESSMENT	26
6.1.1	RATIONALE	26
6.2	GENERIC QUANTITATIVE RISK ASSESSMENT – HUMAN HEALTH	27
6.2.1	SOIL CONTAMINATION	27
6.2.2	ASBESTOS	27
6.2.3	HUMAN HEALTH RISK EVALUATION	27
6.3	CONTROLLED WATER RISK ASSESSMENT	28
7	REFINED CONCEPTUAL SITE MODEL	29
7.1	ON-SITE	29
7.2	OFF-SITE	31
8	PRELIMINARY WASTE ASSESSMENT	33
8.1	WASTE CHARACTERISATION ASSESSMENT	33
8.2	WASTE ACCEPTANCE CRITERIA ASSESSMENT	33
9	CONCLUSIONS	35
9.1	SITE SETTING	35
9.2	GROUND INVESTIGATION	35
9.3	RISK ASSESSMENT	36
9.3.1	HUMAN HEALTH	36
9.3.2	CONTROLLED WATERS	36
9.4	WASTE ASSESSMENT	36
10	REMEDIATION DESIGN TECHNICAL NOTE	38
10.1.1	ASBESTOS CONTAINING MATERIALS	38
10.1.2	MANAGING UNEXPECTED CONTAMINATION	38
10.2	ENVIRONMENTAL MONITORING AND CONTROL MEASURES	39

10.2.1	DUST AND PARTICULATES	39
10.2.2	VAPOURS AND ODOURS	39
10.2.3	WATER INGRESS AND CONTROL	39
10.3	HEALTH, SAFETY AND ENVIRONMENTAL CONSIDERATIONS	40
10.3.1	CONTAMINATION	40
10.3.2	ENVIRONMENTAL CONTROLS	40
11	RECOMMENDATIONS	41

TABLES

Table 2-1 – On Site History	4
Table 2-2 – Off Site History	4
Table 2-3 – Site Description	6
Table 2-4 – Summary of previous ground investigations	7
Table 2-5 – Ground conditions encountered in previous ground investigations	8
Table 2-6 – Summary of WAC testing undertaken during 2019 GIs	9
Table 2-7 – Geological Descriptions based on BGS logs	9
Table 2-8 – Risk of Flooding from Rivers and Sea	11
Table 2-9 – Risk of Flooding from Surface Waters	11
Table 2-10 – Ground Stability Hazards	12
Table 3-1 – Potential Sources of Contamination	15
Table 3-2 - Plausible Preliminary Contaminative Linkages	18
Table 5-1 – Encountered Ground Conditions	23
Table 7-1 – Potential Contaminant Linkages	29
Table 7-2 - Off Site Contaminant Linkages	31
Table 8-1 - Summary of Preliminary Waste Classification	33
Table 8-2 – Summary of WAC Testing	34

APPENDICES



APPENDIX A

FIGURES AND DRAWINGS

APPENDIX B

LIMITATIONS

APPENDIX C

BGS BOREHOLE LOGS

APPENDIX D

EXPLORATORY HOLE LOGS

APPENDIX E

UXO DESK STUDY

APPENDIX F

LABORATORY CERTIFICATES

APPENDIX G

HUMAN HEALTH ASSESSMENT METHODOLOGY

APPENDIX H

CONTAMINATION ASSESSMENT SCREENERS

APPENDIX I

HAZWASTE ONLINE RESULTS

1 INTRODUCTION

1.1 TERMS OF REFERENCE

WSP UK Ltd was instructed by London Borough of Haringey ('the Client') to undertake a Site investigation and subsequent Generic Quantitative Risk Assessment (GQRA) report to support a detailed planning application for the "Construction of a new footbridge with associated ramp access and steps, and landscaping, involving demolition of the existing bridge and abutments ("the Proposed Development") located at Stanhope Road, Haringey, N6 5DE ('the Site').

The Site comprises a disused railway line that is currently used as a public footbridge. The footbridge runs east to west and is constructed over Stanhope Road on manmade embankments.

The purpose of this report is to enable the discharge of Condition 8 (a,b and c) and Condition 9 of Planning Reference HGY/2021/2718.

A Site location plan and Site boundary is presented as in **Appendix A**.

1.2 PROPOSED SCHEME

The Proposed Scheme comprises:

- The demolition of the existing footbridge, bridge abutments and bridge abutment wingwalls;
- Construction of a new footbridge and abutments formed by TENSAR soil reinforced walls;
- Construction of a new pedestrian and cycle ramp and pedestrian stairway in the south-east and south-west of the Site, respectively; and,
- Reprofilling and landscaping of all existing embankments.

It is understood that demolition waste materials and any infilling soils encountered that cannot be reused will be taken off site for disposal. Any soils required to build up levels and form the new bridge abutments are likely to be imported from non-waste sources.

General Arrangement Drawings for the Proposed Development are presented in **Appendix A**.

1.3 AIMS AND OBJECTIVES

The aim of the works is to identify potential environmental constraints associated with the Proposed Scheme. WSP has identified the following objectives:

- Scope and undertake Site investigation work (environmental) to collect samples of Made Ground and the London Clay Formation bedrock for laboratory analysis and Waste Acceptance Criteria (WAC) classification;
- Using the results of the analytical testing, compile a GQRA to refine the Conceptual Site Model (CSM) provided in the WSP Phase 1 Desk Study Report 70077287-WSP-EGT-B-RP-LE-002 (dated September 2021) to enable discharge of Planning Conditions 8a and 8b;
- Input data into the Environmental Agency approved HazWaste Online template to classify the soils for the purposes of waste disposal; and,
- Incorporate recommendations into the GQRA for future remediation work that may be required (unforeseen contamination discovery strategy) for the works to enable discharge of Planning Conditions 8c and 9.

1.4 SCOPE OF WORKS

In order to meet the aims and objectives stated above in **Section 1.3**, the scope of works for the investigation comprised the following:

- Preparation of a Site-specific Construction Phase Plan to include risk assessments and detailed method statements for the proposed work in accordance with the Construction (Design and Management) Regulations 2015;
- Buried utility avoidance survey of proposed exploratory hole locations to minimise risk of service strikes and enable safe working practices;
- The advancement of 5 No. window sampling boreholes across the Site to a maximum depth of 5.0 metres below ground level (m bgl);
- Collection and laboratory analysis of up to 8 No. samples of Made Ground for the contaminants of concern included in the CSM to enable waste classification;
- Laboratory analysis of 2 No. samples of Made Ground for WAC analysis;
- Compilation of a GQRA to identify any relevant contaminant linkage with respect to the Proposed Development; and,
- Provision of recommendations with respect to the management and mitigation of any potential ground contamination constraints or liabilities which are identified.

1.5 REGULATORY CONTEXT

The assessment was undertaken in the legislative context of:

- Part 2A of the Environmental Act (1990); and,
- The National Planning Policy Framework (NPPF) 2021.

The assessment has been undertaken in accordance with the following good practice and statutory guidance:

- Environment Agency Land Contamination Risk Management (LCRM) April 2021;
- CIRIA 'Contaminated Land Risk Assessment: A Guide to Good Practice', C552 (2001);
- CIRIA 'Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risks', C733 (2014);
- British Standard 'Investigation of Potentially Contaminated Sites – Code of Practice', BS EN 10175:2011+A2:2017;
- Defra 'Environment Protection Act 1990: Part 2A Contaminated Land Strategy Guidance' PB13735 (2012);
- British Standard 'Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds (VOCs)' BS 8576:2013; and,
- British Standard 'Code of Practice for Ground Investigations', BS 5930:2015+A1:2020.

Legislation and guidance on the assessment of contaminated Sites acknowledges the need for a tiered risk-based approach. This assessment represents a GQRA being a comparison of Site contaminant levels against generic standards and compliance criteria including an assessment of risk using the source-pathway-receptor model.

1.6 SOURCES OF INFORMATION

The following sources of information were used in the production of this report:

- WSP, Combined Geotechnical Investigation and Design Report, dated August 2021 [Ref.: 70077287-WSP-GIDR-GEO-001];
- WSP, Parkland Walk Bridge at Stanhope Road Preliminary Risk Assessment, dated September 2021 [Ref.: 70077287-WSP-EGT-B-RP-LE-0002];
- WSP, Technical Memo - Stanhope Road – Preliminary Desk Study, dated May 2022;
- The British Geological Survey (BGS) Online Geology Viewer, [<https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/>], accessed 05 June 2023;
- The British Geological Survey (BGS) GeoIndex (onshore) [<https://www.bgs.ac.uk/map-viewers/geoindex-onshore/>] accessed 05 June 2023;
- Defra's Magic Map website [<https://magic.defra.gov.uk/>], accessed 05 June 2023;
- BGS map 'North London, England and Wales Sheet 256, Bedrock and Superficial Edition, 1:50,000', accessed 05 June 2023;
- EA Flood risk summary, [<https://check-long-term-flood-risk.service.gov.uk/risk>], accessed 05 June 2023;
- MAGIC, [<https://magic.defra.gov.uk/>], accessed 05 June 2023;
- UK Radon Maps, [<https://www.ukradon.org/information/ukmaps>], accessed 05 June 2023;
- The Coal Authority Interactive Map, [<https://mapapps2.bgs.ac.uk/coalauthority/home.html>], accessed 05 June 2023;
- Haringey Borough Council Planning Services, [<https://www.haringey.gov.uk/planning-and-building-control/planning>], accessed 05 June 2023; and,
- Zetica UXO, [<https://zeticauxo.com/downloads-and-resources/risk-maps/>], accessed 06 June 2023.

1.7 CONFIDENTIALITY AND LIMITATIONS

This report is addressed to and may be relied upon by London Borough of Haringey. The report may not be relied upon or transferred to any other parties without the express written authorisation of WSP. This report should be read in full. No responsibility will be accepted where this report is used, either in its entirety or in part by any other party.

Third party information used in the production of this report has been taken in good faith as being accurate. WSP cannot and will not accept any liability for errors and/or omissions in data provided by others and WSP cannot warrant the work of others.

General limitations of the assessment are included in **Appendix B**.

2 SUMMARY OF SITE INFORMATION

2.1 SITE HISTORY

2.1.1 ON-SITE

A review of historical maps was undertaken in the WSP PRA and WSP Preliminary Desk Study (PDS). A history of land uses at the Site is summarised in **Table 2-1** below:

Table 2-1 – On Site History

Map Date	Land use
1864	The Site is undeveloped agricultural land. A path crosses the central part of the Site in a north south orientation.
1870-1879	The Great Northern Railway (Edgware, Highgate and London Line) runs through the centre of the Site in an east-west orientation. The railway line appears to be raised on an embankment which falls on either side of the tracks towards the north and south. The railway line appears to cross a bridge in the same location as the present-day footbridge.
1894	Stanhope Road passes under the bridge and through the centre of the Site in its present-day alignment.
1974-1991	The railway is labelled as 'Dismantled Railway'.
1991 - 2003	Parkland Walk is labelled to run through the centre of the Site in its present-day alignment (following the orientation of the former railway).
2022	No significant changes.

Potentially contaminative former land uses identified at the Site have included agricultural land uses and the railway line.

2.1.2 OFF-SITE

A review of historical maps was undertaken as part of the WSP PRA and WSP PDS to identify potentially contaminative former land uses within a 750 m radius of the Site. **Table 2-2** below summarises relevant information as identified:

Table 2-2 – Off Site History

Map Date	Land use
1864	■ Agricultural land surrounds the Site in all directions; ■ Ponds are located 75 m north, 150 m north-east, 75 m south, 150 m south-west; ■ Hornsey Lane Farm is located 150 m south.

Map Date	Land use
1870-1879	- Great Northern Railway Line (Edgware, Highgate and London Line) runs through Site and adjacent to the east and west; - Brick Fields are located 250 m south-west; - Residential areas of Crouch End, Islington, and Highgate are located 500 m south, 650 m north-east, 750 m south-west, respectively.
1894	- Stanhope Road runs through Site and adjacent to the north and south; - Hornsey Lane Farm is labelled to be located adjacent to the south; - Residential properties are located adjacent to north, north-west, south and south-west; - Crouch Hall Park is located 250 m north; - The ponds formerly located 75 m north, 150 m north-east, 75 m south are no longer present and are assumed to have been infilled.
1914-1935	- Further residential development has occurred surrounding the Site; - Crouch End Station is located 500 m east.
1950-1958	- Hornsey Lane Farm is labelled as a milk depot; - A pond is located 150 m south.
1962-1974	- An electrical substation is located adjacent to the north-east; - The pond located 150 m to the south is no longer present and assumed to have been infilled.
1974-1991	The milk depot located adjacent to the south is no longer present.
1991 - 2003	- Parkland Walk runs through the Site and adjacent to the east and west in its present-day alignment; - Residential properties associated with Parkgate Mews are present adjacent to the south.
2022	No significant changes.

Potentially contaminative former land uses identified within a 250 m radius of the Site have included agricultural land uses, the railway line, brick manufacture, residential properties with gardens, infilled land resulting from the infilling of ponds, the milk depot and an electrical substation.

2.2 SITE LOCATION AND SITE DESCRIPTION

A Site location plan and exploratory hole plan are provided in **Appendix A**.

Table 2-3 provides details of the Site obtained from a review of previous reports and key observations made during a Site walkover conducted on 18 November 2020 as part of the Phase 1 Preliminary Risk Assessment (PRA) completed by WSP in September 2021.

An additional Site walkover was conducted on 29 March 2023 to assess access for the ground investigation (GI) works.

Further observations were identified during the GI works conducted between 17 May and 18 May 2023.

Table 2-3 – Site Description

Details	Description
Name and Address of Site	Stanhope Road, Haringey, N6 5DE
National Grid Reference	529331, 187828
Site Area	0.82 hectares (ha)
Site Description and Current Use	The Site is located in the Borough of Haringey, approximately 850 m south-east of Highgate underground tube station. The Site is irregular in shape and centred around a disused railway line that is currently used as a public footpath/cycle path known as Parkland Walk. Part of Parkland Walk extends as a footbridge which runs east to west and is constructed over Stanhope Road on manmade embankments. The land to the east and west of the footbridge is elevated approximately 5 m above the level of Stanhope Road. Two steel supports were noted under the footbridge. The Site is currently a part of Parkland Walk, a nature reserve and area of public open space. Pedestrian access steps from Stanhope Road to the Site are present to the east of the bridge over Stanhope Road.
Surrounding Area	The Site is located within a predominantly residential area. North – Residential properties with gardens. Stanhope Road runs beneath the centre of the Site in an approximately north-west south-east orientation. It is reported in the WSP PRA that an electrical substation is located at road level, adjacent to the north-east. East – Parkland Walk continues to the east of the Site. Residential properties with gardens are located to the north-east and south-east. South – Residential properties with gardens. Stanhope Road runs beneath the centre of the Site in an approximately north-west south-east orientation. West – Parkland Walk continues to the west of the Site. Residential properties with gardens are located to the north-west and south-west.
Topography and Ground Cover	Parkland Walk is relatively flat. The topography from the footbridge decreases towards the two parcels of land to the east and west along Parkland Walk. The manmade embankments were observed to be steep, with a fall of up to approximately 5 m towards the north and south. Extensive vegetation, mature trees and shrubs were noted on the embankments of the Site. Parkland Walk is surfaced with rubble hardcore. Localised areas of brick fragments were observed forming the path. Soft grass landscaping is present alongside Parkland Walk. The footbridge itself is surfaced with concrete and tarmacadam hardstanding.

Details	Description
Visual evidence of contamination	None observed during Site walkovers.
Waste	Occasional general litter was observed across the Site.
Invasive Species	None identified during Site walkovers.
Other observations	A large crack in the south-west wing wall is being subsidence tracked. A rock bolt is present in the south-west wing wall, adjacent (west) of the subsidence tracked crack.

2.3 HISTORICAL GROUND INVESTIGATIONS

The WSP Combined Geotechnical Investigation and Design Report (GIDR) includes a summary of three rounds of previous ground investigations carried out at the Site. Pertinent information from the ground investigations is summarised in **Table 2-4**.

Table 2-4 – Summary of previous ground investigations

Company and Date	Exploratory Hole Ref	Exploratory hole type	Depth hole terminated (m bgl)
Herts and Essex Site Investigations, May 2018	BH1	Cable Percussion	10
	BH2	Cable Percussion	10
	BH3	Cable Percussion	5
RSK Environment Ltd, October 2019	TP1	Trial pit	3.2
	TP2	Trial pit	1.8
	TP3	Trial pit	Not recorded
RSK Environment Ltd, November 2019	TP4	Trial pit	1.2
	TP5	Trial pit	1.2
	TP6	Trial pit	1.2

Appendix A of the GIDR contains the data from the three previous ground investigations. A summary of the ground conditions indicated by the exploratory hole logs completed in these ground investigations is summarised below in **Table 2-5**.

Table 2-5 – Ground conditions encountered in previous ground investigations

Stratum*	Depth to Base of Strata (m bgl)**	Thickness (m)**	Range	Typical Strata Descriptions as recorded
Made Ground / Embankment Fill	0.80 – excess of 5.00	0.80 – excess of 5.00		Compact black clinker, ash and brick. Loose dark brown/black crushed concrete/brick/clinker. Firm dark brown reworked clay with brick. Soft light brown slightly silty slightly gravelly clay with occasional rootlets. Gravel is fine subangular to subrounded of brick and black carbonaceous deposits (clinker).
Weathered London Clay Formation	8.90 – 9.00	7.8 – 8.1		Stiff orange brown mottled grey clay. Stiff to very stiff brown clay.
London Clay Formation	Base not proven. Boreholes terminated 10.00.	Base not proven. Minimum 1.00 – 1.10		Stiff to very stiff grey clay.

* Inferred from BGS Borehole log descriptions.

** Brackets indicate unproven depth / thickness due to borehole termination.

No gas or groundwater monitoring wells were installed as part of the ground investigations. Groundwater associated with claystones was encountered during the 2018 ground investigation in BH1 and BH2 at 8.00 m bgl and 9.50 m bgl.

As acknowledged in the WSP PDS, limited laboratory chemical soil analysis was carried out as part of these investigations. The 2018 ground investigation included testing of soluble sulphate content and pH. The 2019 ground investigations, the purpose of which were to establish specified construction details of the bridge, included testing for arsenic, cadmium, chromium, chromium VI, copper, lead, mercury, nickel, selenium, zinc, TPHs (Total Petroleum Hydrocarbons), PAHs (Poly Aromatic Hydrocarbons), pH, and asbestos identification. The ground investigation reports were factual and therefore did not provide any interpretation of the total soil concentrations reported by the laboratory.

When compared against WSP Generic Assessment Criteria (GAC) for a Park Public Open Space end land use, there were no exceedances of the GAC.

Asbestos was not detected in any of the tested soil samples.

The soil screening table for soil samples from historical ground investigations is presented in **Appendix H**.

The 2019 ground investigations included WAC testing of a total six soil samples obtained from exploratory holes to determine the type of landfill that the material at the Site can be disposed at (i.e. inert, non-hazardous or hazardous). A summary of the WAC testing results is provided in **Table 2-6**.

Table 2-6 – Summary of WAC testing undertaken during 2019 GIs

Location	Strata	Depth (m bgl)	Waste Classification	Hazard properties
TP1	Made Ground / Embankment Fill	0.40	Hazardous	Loss on Ignition Total Organic Carbon (TOC)
TP5	Made Ground / Embankment Fill	0.40		Loss on Ignition Total Organic Carbon (TOC)
TP1	Made Ground / Embankment Fill	1.50	Inert	Sulphate as SO ₄ Total Dissolved Solids
TP6	Made Ground / Embankment Fill	0.90		Lead
TP2	Made Ground / Embankment Fill	0.30	None	N/A
TP2	Made Ground / Embankment Fill	0.70		

2.4 GEOLOGY

The BGS map 'North London, England and Wales Sheet 256, Bedrock and Superficial Edition, 1:50,000' and BGS Online Geology Viewer indicate that the Site is underlain by a bedrock geology comprising the London Clay Formation. The London Clay Formation is underlain sequentially by the Lambeth Group, Thanet Formation and Chalk Group. No superficial deposits are mapped on the Site; however, the Site is located within an area denoted as having 'head propensity' on BGS mapping, meaning that there is the potential for quaternary head deposits to be present.

Table 2-7 below provides a summary of the nearby geology based on two BGS borehole logs located approximately 196m east (TQ28NE286) and 204 m east (TQ28NE332). Copies of the BGS borehole logs are presented in **Appendix C**.

Table 2-7 – Geological Descriptions based on BGS logs

Stratum*	Depth to Base of Strata (m bgl)**	Thickness (m)**	Range	Typical Strata Descriptions (BGS Borehole Logs)
Topsoil / Made Ground	0.40 – 0.46	1.82 – 2.13		Topsoil: <i>Not described</i> . Made Ground: Concrete, brick rubble.

Stratum*	Depth to Base of Strata (m bgl)**	Thickness (m)**	Range	Typical Strata Descriptions (BGS Borehole Logs)
London Clay Formation	(11.00) – (18.29)	(10.60) – (17.83)		Firm light and dark brown silty clay. Firm brown sandy silty clay. Stiff grey clay with partings of silt. Stiff dark grey fissured laminated silty clay.

* Inferred from BGS Borehole log descriptions.

** Brackets indicate unproven depth / thickness due to borehole termination.

As summarised in **Section 2.3** above, previous ground investigations also encountered Made Ground to a maximum unproven depth of 3.2 m bgl.

2.5 HYDROGEOLOGY

The London Clay Formation is classified as an Unproductive Strata as defined by the Environment Agency (EA). The deeper bedrock aquifers comprising the Lambeth Group and Thanet Sand Formation are defined as Secondary A Aquifers and the Chalk is defined as a Principal Aquifer.

The BGS borehole log for borehole TQ28NE286 records a groundwater level at 3.50 m bgl within the London Clay Formation. This is assumed to be perched water associated with a granular or claystone layer in the London Clay Formation.

Made Ground is not designated with an aquifer classification by the EA.

There are no records of groundwater abstractions within 2 km of the Site.

The Site is not located within an Environment Agency designated Groundwater Source Protection Zone (SPZ) and there are no SPZs located within 2 km of the Site.

2.6 HYDROLOGY

There are no surface water features located on Site.

The nearest surface water features to the Site are ponds associated with Waterlow Park located approximately 1 km south-west.

No current EA licensed surface water abstractions have been identified within a 2 km radius of the Site.

2.7 FLOOD RISK DATA

Site flood risk information is provided in **Table 2-8** and **Table 2-9** as identified by Environment Agency data held on the GOV.UK website.:

Table 2-8 – Risk of Flooding from Rivers and Sea

Classification of Fluvial (rivers and sea) Flood Risk	Probability of flooding (per annum)	Percentage of the Site affected (%)	Additional Comments
Very Low	< 1 in 1000 (0.1%)	100	N/A

Risk of flooding from surface waters

Surface water flooding occurs when rainwater does not drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead.

Table 2-9 – Risk of Flooding from Surface Waters

Classification of Surface Water Flood Risk	Probability of flooding (per annum)	Approximate percentage of the Site affected (%)	Additional Comments
Very Low	Less than 1 in 1000 (0.1%)	85	N/A
Low	Between 1 in 1000 (0.1%) and 1 in 100 (1%)	15	Beneath the centre of the Site along Stanhope Road. Additionally in localised areas along Parkland Walk.
Medium	Between 1 in 100 (1%) and 1 in 30 (3.3%).	5	Beneath the centre of the Site along Stanhope Road.

2.8 PRELIMINARY HYDROGEOLOGICAL MODEL

The Environment Agency does not provide an aquifer classification for Made Ground deposits. Although there is the potential for groundwater to be present within Made Ground deposits, it is considered unlikely to be as a continuous groundwater body, but rather localised pockets or perched water that are likely to be recharged via surface infiltration. However, infiltration to embankment soils directly underlying the hard surfacing areas of the bridge is expected to be minimal.

The London Clay Formation is classified as an unproductive stratum and therefore not anticipated to yield significant quantities of groundwater. As reviewed in **Section 2.3** and **Section 2.4**, historical ground investigations and BGS borehole logs indicate that groundwater may be present in granular and claystone layers within the London Clay Formation.

Groundwater is anticipated to be present within the Lambeth Group, Thanet Sand Formation and Chalk Group although is likely to be confined by the underlying cohesive London Clay Formation. It is considered likely to act as an aquitard, preventing the downward migration of shallow perched groundwater to the underlying aquifers within the Lambeth Group, Thanet Sand Formation and Chalk Group.

2.9 UNEXPLODED ORDNANCE (UXO)

A UXO desk study and risk assessment has been previously carried out by Zetica for the Site in March 2022 (Ref: P11633-22-R1). This desk study indicated the Site is at low risk from UXO and that no additional measures are considered essential to reduce the UXO risk on the Site. Further, there was not considered to be a requirement for further UXO supervision during ground investigation works.

A copy of the UXO desk study is presented in **Appendix E**.

2.10 ENVIRONMENTALLY SENSITIVE AREAS

The Site is located within the Parkland Walk Local Nature Reserve, which is also listed on the Priority Habitat Inventory due to its deciduous woodland.

The western part of the Site is located within Highgate Conservation Area.

2.11 REGULATORY INFORMATION

The Groundsure Report obtained as part of the WSP PRA (refer to Appendix E of the WSP PRA) includes information and data collected from several organisations including the Environment Agency, the Local Authority, the British Geological Survey, Department for Environment, Food and Rural Affairs (DEFRA) and Health & Safety Executives (HSE).

Pertinent information relating to the Site is summarised below:

- There are four records of licensed pollutant releases having occurred within 250 m – 500 m of the Site radius. The closest record is held by Archway Dry Cleaners, located 305 m to the south-west; and,
- There are four records of pollution incidents having occurred within 500 m of the Site. The nearest record was recorded 205 m to the west where inert materials and wastes were released causing no impact to water, land or air.

2.12 MINING AND GROUND STABILITY

No mining hazards are recorded within the Groundsure report obtained as part of the WSP PRA.

A review of the Coal Authority Interactive Map viewer indicates that the Site is not located within a coal mining reported area.

For potential ground stability hazards, risk levels for various subsidence hazards for the Site as are summarised in **Table 2-10**.

Table 2-10 – Ground Stability Hazards

Hazard	Risk
Collapsible Deposits	Very Low
Compressible Deposits	Negligible
Ground Dissolution	Negligible
Landslide	Very Low
Running Sands	Very Low

Hazard	Risk
Shrinking or Swelling Clay	Moderate

The Groundsure report does indicate that areas of surface ground workings are present adjacent to the south and east of the Site. They are recorded as 'unspecified ground workings' and 'cuttings', respectively to the south and east.

2.13 RADON

Public Health England radioactive mapping indicates that the Site is in a lower probability radon area where there are less than 1% of homes that are estimated to be at or above the Action Level. Therefore, no radon protective measures are necessary in the construction of new dwellings or extensions.

2.14 LOCAL AUTHORITY CONSULTATION

2.14.1 LOCAL AUTHORITY ENVIRONMENTAL HEALTH OFFICER (EHO)

The Environmental Health Officer (EHO) at London Borough of Haringey was contacted via email on 9 November 2020 regarding environmentally pertinent information relating to the Site. The EHO provided a written response indicating the following (refer to Appendix H of the WSP PRA):

- The local authority confirmed that the Site is partially on land identified as contaminated land of medium risk, relating to a railway.
- The Site is also located within 200 m of a contaminated site relating to unknown filled ground (pond, marsh, river, stream, docket) of medium risk to the north east of the Site.
- There is also record of a 'clay, bricks and tiles (manufacture)' site located 100m to the south west of the Site. No further details are given;
- The Site has not been designated as Contaminated Land under Part IIA of the Environmental Protection Act (EPA) 1990; and,
- The local authority was not aware of any records of landfills or waste transfer sites within 500m of the Site.

2.14.2 ENVIRONMENT AGENCY (EA)

The Environment Agency (EA) was contacted via email on 9 November 2020 regarding environmentally pertinent information relating to the Site. A written response indicated the following (refer to Appendix H of the WSP PRA):

- The EA had not performed any investigations on the Site or within 500 m of the Site. In addition, they were not aware of any land remediation works;
- It was noted that the Site is not designated as a Special Site under Part IIA of the EPA 1990;
- The EA were not aware of any oil tanks above / below ground in this area;
- No landfill sites of permitted waste sites were noted in the area; and,
- No pollution incidents were identified on the Site or within the immediate vicinity of the Site.

2.15 PLANNING HISTORY

A review of the Haringey Borough Council Planning Portal was carried out on 09 June 2023. No recent environmentally pertinent applications were identified.

3 PRELIMINARY CONCEPTUAL SITE MODEL

3.1 INTRODUCTION

The Conceptual Site Model (CSM) is based upon the environmental conditions of the Site as described in the previous sections. The methods used in this assessment followed a risk-based approach with the potential environmental risk assessed qualitatively using the 'source-pathway-receptor' contaminant linkages concept introduced in the guidance document (principally the Environment Agency's LCRM) on the practical implementation of the Environmental Protection Act 1990.

Environmental risk can be defined as the combination of the consequence of a harmful effect and the probability of its occurrence. The existing of a contaminant linkage is primarily dependant on Site usage and environmental conditions.

The environmental risk assessment has been carried out identifying and evaluating the significance of the following:

- **Potential Sources of Contamination:** these include any actual or potentially contaminating materials or activities, located either on or in the vicinity of the Site;
- **Potential Pathways of Contamination Migration:** these are the routes or mechanisms by which contaminants may migrate from the source to the receptor; and,
- **Potential Receptors of Contamination:** these include current or future land users, activities or persons at the Site.

3.2 POTENTIAL CONTAMINANT SOURCES

Table 3-1 presents a summary of the potential sources of contamination and the likely nature of such sources both on-Site and within the immediate surrounding area.

Table 3-1 – Potential Sources of Contamination

Potential Source	Potential Contaminants of Concern	Likely / Anticipated Distribution & Comment
ON-SITE		
Made Ground and Embankment Fill	Wide range of potential contaminants including PAHs, TPHs, heavy metals, BTEX (Benzene, Toluene, Ethyl Benzene and Xylene), solvents, inorganics, organic matter, VOCs, SVOCs, asbestos. Ground gases (carbon dioxide and methane).	Site wide
Historical railway line and railway land	Asbestos, heavy metals, inorganics (e.g. sulphates), TPHs, PAHs, solvents, herbicides, PCBs	Site wide
OFF-SITE		

Potential Source	Potential Contaminants of Concern	Likely / Anticipated Distribution & Comment
Made Ground and Embankment Fill	Wide range of potential contaminants including PAHs, TPHs, heavy metals, BTEX, solvents, inorganics, organic matter, VOCs, SVOCs, asbestos. Ground gases (carbon dioxide and methane).	Adjacent in all directions
Potentially infilled ponds		
Brick Fields		
Milk depot	Wide range of potential contaminants including asbestos, heavy metals, inorganics, TPHs, PAHs and organics.	South
Electrical substation	Mineral oils and PCBs	North-east

3.3 POTENTIAL PATHWAYS

Potential pathways include:

- Direct / dermal contact, ingestion or inhalation of soil bound contaminants / dust;
- Inhalation of vapours associated with volatile organic compounds;
- Inhalation of respirable asbestos fibres and windblown dust;
- Leaching of contaminants from soil into groundwater, followed by the lateral migration of groundwater to the wider groundwater environment;
- Direct / dermal contact with potentially impacted groundwater;
- Migration of ground gases and volatile compounds;
- Root uptake; and,
- Permeation of hydrocarbons through plastic pipes.

3.4 POTENTIAL RECEPTORS

In the context of the Proposed Scheme, the following potential receptors were identified:

Human Health

- Future Site users and visitors;
- Construction workers and maintenance workers; and,
- Third-party neighbours

Infrastructure

- Above ground services;
- Below ground services; and,
- Future infrastructure

Plant Life

- Flora



Controlled water receptors are not considered due to the presence of the London Clay acting as an aquitard, preventing the downward migration of contaminants in shallow groundwater into the deeper aquifers of the Lambeth Group, Thanet Sand Formation and Chalk Group. Further, there are no water surface water bodies present on Site or within 500 m of the Site radius.

3.5 PLAUSIBLE PRELIMINARY CONTAMINANT LINKAGES

Table 3-2 provides an evaluation of the potential contaminant linkages that were considered to be plausible on the basis of the information currently available for the Site and the proposed end use.

Table 3-2 - Plausible Preliminary Contaminative Linkages

Potential Contaminant Sources	Pathways	Receptor	Comments
ON-SITE			
■ Made Ground and Embankment Fill; and, ■ Historical railway line and railway land.	■ Dermal / direct contact; ■ Ingestion or inhalation of contaminants; ■ Inhalation of asbestos fibres; and, ■ Migration of ground gases and volatile vapours.	Human Health ■ Future Site users and visitors; ■ Construction workers and maintenance workers; and, ■ Third-party neighbours.	The Proposed Scheme is designed to maintain the large proportion of the Site which is occupied by soft landscaping and open ground. There is therefore the potential for direct contact pathways (i.e. dermal contact, ingestion, inhalation) to be present. However, landscaping will comprise a clean cover layer where direct contact pathways exist. Additionally, given that the Site is an area of public open space, the nature of Site users is considered to be transient. The risk from soil bound/groundwater contamination to future Site users and third-party neighbours is considered to be Low. Ground gases and vapours may be present, however given the nature of the proposed scheme the likelihood for confined spaces, in which ground gases and vapours can accumulate, to be present is minimal. Additionally, the Proposed Scheme includes the removal of site-won materials considered unsuitable for re-use. The risk from ground gases to future Site users and third-party neighbours is considered to be Low. Construction workers or maintenance workers may come in to contact with contaminated soils/groundwater during ground or maintenance works (e.g. dermal exposure or inhalation of vapours or ground gases). The risk is considered to be Low to Moderate. Risks to construction workers should be managed via Health and Safety protocols during the works.
	■ Direct contact with contaminated soils and groundwater; and, ■ Permeation through plastic pipes.	Infrastructure ■ Above ground services; ■ Below ground services; and, ■ Future infrastructure.	The Site is underlain by the London Clay Formation which has the potential to contain elevated sulphate levels, therefore, there is the potential for chemical attack on below ground concrete structures. Given the historical uses on the Site, there is the potential for hydrocarbons to be present in shallow soils which have the potential to permeate into plastic pipes. The risk to infrastructure is considered to be Low to Moderate.
	■ Root uptake;	Plant Life ■ Flora	There is the potential for contaminants present in shallow soils and groundwater to pose a risk to plant life in proposed areas of soft landscaping. The risk is considered to be Low to Moderate.

Potential Contaminant Sources	Pathways	Receptor	Comments
	Direct contact with contaminated soils/groundwater.		
OFF-SITE			
- Made Ground and Embankment Fill; - Potentially infilled ponds; - Brick Fields; - Milk depot; and, - Electrical substation.	- Dermal/direct contact/ingestion/inhalation of contaminants following: - Windblown migration of dust and fibres; - Below ground lateral migration of contaminants; and, - Below ground migration of ground gases and vapours.	Human Health - Future Site users and visitors; - Construction workers and maintenance workers; and, - Third-party neighbours.	Most of the areas surrounding the Site are covered with hardstanding, buildings or grass cover, therefore it is considered unlikely that windblown dust and fibres from off-site sources will impact receptors on the Site. The risk to human health receptors from windblown dust and fibres from off-Site is considered to be Low. Ground gas and vapours generated from Made Ground, embankment fill, infilled ponds and brick fields in the areas surrounding the Site may migrate laterally within the subsurface. However, confined spaces for ground gases and vapours to accumulate in are not anticipated to be a part of the proposed development works. The risk from ground gases and vapour migrating on to the Site from off-Site sources is considered to be Low.
	Lateral migration via contaminated groundwater	Infrastructure - Above ground services; - Below ground services; and, - Future infrastructure.	Given that the London Clay Formation (unproductive strata) underlies the Site and immediate area surrounding the Site, there is no laterally continuous groundwater body underlying the Site. Therefore, there is no active contamination pathway for contaminants to migrate in groundwater from off-Site sources and impact infrastructure and services. The risk is considered to be Very Low.
	Root uptake and direct contact with contaminated	Plant Life Flora	Most of the areas surrounding the Site are covered with hardstanding, buildings or grass cover, therefore it is considered unlikely that windblown dust and fibres from off-site sources will impact receptors on the Site. Given that the London Clay Formation (unproductive strata) underlies the Site and immediate area surrounding the Site, there is no laterally continuous



Potential Contaminant Sources	Pathways	Receptor	Comments
	soils/groundwater/fibres following: • Lateral migration via contaminated groundwater; and, • Windblown migration of contaminants		groundwater body underlying the Site. Therefore, there is no active contamination pathway for contaminants to migrate in groundwater from off-Site sources and impact plant life. The risk is considered to be Very Low.

4 SITE INVESTIGATION AND ASSESSMENT RATIONALE

4.1 SITE INVESTIGATION RATIONALE

The ground investigation works were undertaken following a review of available data. The exploratory hole location plan is presented in **Appendix A**.

Based on the findings of the Preliminary Conceptual Site Model, potential contaminant linkages were found to be **Low to Moderate** Risk with regard to construction workers, infrastructure (buried utility pipes) and new soft landscaping. However, it is understood that existing soils will require off-site disposal as part of the project's construction work. Exploratory hole locations were therefore positioned to primarily target Made Ground embankment fill located beneath the footpath that will require off-site disposal, and additionally to inform the Client on potential contaminated land liabilities, waste characterisation and potential remediation solutions for the Site.

The intrusive works undertaken by WSP comprised the advancement of 5 No. windowless sampling boreholes to a maximum depth of 5.0 m bgl, in order to target and obtain samples of Made Ground for laboratory chemical analysis and WAC analysis.

4.2 COMPLETED WORKS

The intrusive GI were undertaken by WSP between 18 May and 19 May 2023.

The works comprised the following:

- Site walkover to determine access constraints and Site layout on 29 March 2023;
- Preparation of a Site-specific Construction Phase Plan;
- Service clearance and surveying of exploratory hole locations by Midland Utilities Ltd;
- Advancement of hand dug service inspection pits to 1.50 m bgl at all window sampling borehole locations;
- Completion of five windowless sampling boreholes to 5.0 m bgl (**Section 4.3.2**);
- Logging and sampling of soils to British Standard (BS) BS 5930:2015+A1:2020 and BS 10175:2011+A2:2017 (exploratory hole logs included in **Appendix D**); and,
- Geo-environmental laboratory analysis of eight soil samples (Certificates of Analysis included in **Appendix H**).

As removal of the Made Ground / embankment fill at the Site is part of the Proposed Development, groundwater and gas assessments have not been undertaken. No groundwater and gas monitoring wells were installed as part of the intrusive works.

Further, the London Clay is considered to act as an aquitard preventing the downward migration of contaminants in shallow groundwater to the deeper aquifers of the Lambeth Group, Thanet Sand Formation and Chalk Group.

4.3 GENERAL SITE METHODOLOGY

4.3.1 SERVICE CLEARANCE

All exploratory hole locations were cleared for services by a specialist service clearance contractor (Midland Utilities Limited) using a Cable Avoidance Tool (CAT) & Genny and Ground Penetration Radar (GPR).

All service plans obtained were referred to prior to finalising the locations and all locations were surveyed, coordinates for which are included on the exploratory hole logs included within **Appendix E**.

4.3.2 WINDOWLESS SAMPLE BOREHOLES

Five boreholes (WS01 to WS05) were advanced using a Comacchio Geo 300 drilling rig.

Borehole drilling commenced from the base of the hand-dug service inspection pit at 1.50 m bgl.

Upon completion, each borehole was infilled with its arisings.

All boreholes were completed to their proposed depths of 5.00 m bgl.

Exploratory hole logs are presented in **Appendix E**.

4.4 LABORATORY TESTING

4.4.1 GEO-ENVIRONMENTAL TESTING

Eight soil samples were submitted for chemical analysis at ALS Laboratories (all UKAS and MCERTS accredited laboratories) for the following analytes:

- Metals – arsenic, barium, beryllium, cadmium, chromium, chromium VI, copper, lead, mercury, nickel, selenium, vanadium and zinc;
- Organic Compounds – TPHs (Total Petroleum Hydrocarbons), BTEX (Benzene, Toluene, Ethyl Benzene and Xylene), PAHs (Poly Aromatic Hydrocarbons), VOCs (Volatile Organic Compounds), phenols;
- Other – Dissolved Organic/Inorganic Carbon, Total Organic Carbon (TOC), PCBs (Polychlorinated Biphenyls), pH, fluoride, water soluble boron, water soluble sulphate and asbestos identification; and,
- Waste Acceptance Criteria.

The full results of the chemical analysis are presented in **Appendix F**.

4.5 GROUNDWATER

Groundwater was not encountered in any of the boreholes during the ground investigation.

4.6 DEVIATIONS FROM ORIGINAL SCOPE OF WORKS

During the site works there were no deviations from the original scope of works.

5 GROUND CONDITIONS

5.1 ENCOUNTERED GROUND CONDITIONS

Five exploratory hole locations were completed at the Site. A summary of the encountered ground conditions during the Site investigation is presented in **Table 5-1**.

Table 5-1 – Encountered Ground Conditions

Stratum	Depth to Base of Strata (m bgl)*	Elevation of Base of Strata (m AOD)*	Thickness (m)*
Topsoil	0.25 – 0.50	74.49 – 72.37	0.25 – 0.50
Made Ground	0.70 – 3.85	72.23 – 69.04	0.3 – 3.35
Reworked Ground	3.85 – 4.90	70.89 – 69.38	2.65 – 3.80
Relict Topsoil	4.10 – (5.00)	(69.28) – 68.76	(0.10) – 0.25
River Terrace Deposits	3.50 – (5.00)	69.43 – (67.89)	(0.9) – 3.80
London Clay Formation	(5.00)	(67.93)	(1.30)

* Brackets indicate unproven depth / thickness due to borehole termination.

5.1.1 TOPSOIL

Topsoil was encountered at the surface of all exploratory hole locations and was proven to depths between 0.25 m bgl and 0.50 m bgl. The topsoil was typically described as black organic very gravelly fine to coarse SAND with frequent rootlets. The gravel is described as angular to subrounded fine to coarse and comprising materials including brick, flint, coal, slag and plastic.

Relict topsoil was encountered in WS03 and WS04 between 3.85 m bgl and 4.10 m bgl; and in WS05 from 4.90 m bgl to the termination of the borehole at 5.00 m bgl.

The relict topsoil is described in WS03 and WS04 as brown/dark brown organic gravelly fine to coarse SAND with frequent rootlets, roots and wood fragments. The gravel component is described as subangular to very angular fine and medium and comprising materials of brick, flint and coal.

The relict topsoil is described in WS05 as dark brown organic clayey fine to coarse SAND with frequent rootlets.

5.1.2 MADE GROUND

Made Ground was present in all exploratory hole locations and proven to depths between 0.70 m bgl and 3.85 m bgl. The thickness of Made Ground is variable across the Site. The smallest thickness

was encountered in WS02 and the greatest in WS03, with thicknesses of 0.30 m and 3.35 m, respectively. The base of the Made Ground was proven at all locations.

The Made Ground varied in colour including brownish red, red, reddish brown and brown, yellowish brown and grey and its composition including sandy GRAVEL, sandy slightly clayey GRAVEL, slightly gravelly CLAY, and slightly sandy SILT. The gravel throughout comprised varying frequencies of very angular to rounded fine to coarse brick and flint.

5.1.3 REWORKED GROUND

The geology encountered underlying the Made Ground in boreholes WS04 and WS05 is considered to be Reworked Ground that likely consists of River Terrace Deposits. A relict topsoil layer was encountered at depth beneath this material in both boreholes and thus any soils above are considered to not be naturally occurring.

Within WS04 the material was initially encountered as stiff brown mottled grey slightly gravelly slightly sandy CLAY that changed to stiff yellowish brown and grey very sandy slightly gravelly CLAY from 3.40 m bgl.

Within WS05 the material was initially encountered as stiff brown mottled grey slightly sandy CLAY that changed to very stiff brown mottled grey slightly gravelly slightly sandy CLAY at 1.70 m bgl. Hard orangish brown mottled pale grey CLAY was encountered between 3.2 m to 4.9 m bgl.

The gravel fraction, where encountered, consisted of flint.

5.1.4 RIVER TERRACE DEPOSITS

The soils encountered in exploratory holes WS01 to WS04, either beneath the Made Ground or Relict Topsoil layer is interpreted as being 'probable' River Terrace Deposits (RTD). The RTD were encountered at a minimum depth of 0.70 m bgl in WS02 and proven in WS02 to 3.50 m bgl, below which the London Clay Formation was encountered. In boreholes WS01, WS03 and the base of the RTD was not proven. No naturally occurring RTD were encountered in WS05.

The RTD is described as consisting of clays with varying fractions of sand and gravel. Representative descriptions of the RTD include:

- Very stiff brown gravelly CLAY;
- Firm dark greyish brown friable CLAY;
- Stiff pale orangish friable CLAY; and,
- Stiff dark brown sandy slightly gravelly CLAY where the gravel component is subangular to subrounded fine and medium and composed of flint.

5.1.5 LONDON CLAY FORMATION

The London Clay Formation was encountered in one exploratory hole location, WS02, underlying the RTD. The London Clay was encountered at 3.50 m bgl and the base was not proven.

The London Clay Formation comprised soft pale brownish grey slightly sandy CLAY and firm brown CLAY.

5.2 OBSERVATIONS OF VISUAL / OLFACTORY EVIDENCE OF CONTAMINATION

Based on the general descriptions and ground model in **Section 5.1**, although there was evidence of anthropogenic inclusions throughout the Made Ground, there was no pertinent visual/olfactory evidence of contamination identified during the investigation.

5.3 GROUNDWATER STRIKES DURING INVESTIGATION

There were no water strikes encountered at any of the exploratory hole locations during the ground investigation.

5.4 UPDATED HYDROGEOLOGICAL MODEL

The updated hydrogeological model remains unchanged from the preliminary model as groundwater was not encountered during the ground investigation and the closest surface water body remains over 1 km away.

Made Ground including reworked material does not have an aquifer classification as defined by the EA. The River Terrace Deposits are classified as The London Clay Formation is classified as an Unproductive Strata and thought to be acting as an aquitard for the underlying Lambeth Group, Thanet Sand Formation and Chalk Group.

Historical ground investigations and BHS borehole logs encountered groundwater association with granular and claystone layers within the London Clay Formation. The London Clay Formation was only encountered in WS02 and neither granular nor claystone lithologies were present.

Due to the absence of shallow groundwater at the Site and presence of the London Clay Formation, there is not considered to be a controlled waters risk for the Proposed Development as no controlled water receptor is present.

6 CONTAMINANT RISK ASSESSMENT

6.1 HUMAN HEALTH RISK ASSESSMENT

6.1.1 RATIONALE

In the United Kingdom, the presence of contamination on a Site is generally only of concern if an actual or potentially unacceptable risk exists. Legislation and guidance on the assessment of contaminated Sites, consistent with the European Union best practice, acknowledges the need for a tiered risk-based approach. This report represents a Generic Quantitative Risk Assessment (GQRA), being a comparison of Site contaminant levels against highly conservative standards and compliance criteria including an assessment of the risk using the source-pathway-receptor model.

WSP has derived a set of Generic Assessment Criteria (GAC) for the CLEA generic land use scenarios using the CLEA Workbook v1.071 Excel modelling tool.

Further details on the assumptions and methodologies adopted by WSP are presented in **Appendix G**.

Where appropriate, exceedances of GACs are compared against published Category 4 Screening Levels (C4SLs). These are only applicable for ten compounds, namely arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI, lead, vinyl chloride, tetrachloroethene (PCE), trichloroethene and 1,2-dichloroethane. C4SLs are a set of generic screening criteria, which are more pragmatic, but represent a level of acceptable risk in the context of Part IIA of the 1990 Environmental Protection Act i.e. soil concentrations below a C4SL limit are considered to be 'definitely not contaminated' and pose at most a 'low level of toxicological concern'.

In assessing the risks to human health receptors, consideration has to be given to the depth of contaminant impacts and likelihood of exposure. Various guidance documents provide slightly differing advice on this, and pertinent information is summarised below.

Environment Agency Report SC050021/SR3 Updated Technical Background to the CLEA Model (2009):

- *"The generic CLEA model assumes that the source of outdoor air contamination is present as a continuous layer from the surface to a depth of 1.0 m. This is broadly consistent with the conceptual model for the other direct contact exposure pathways including soil ingestion and dermal contact"*

Environment Agency Report SC050021/SR4 CLEA Software (Version 1.05) Handbook (2009):

- *"The CLEA software assumes that the contaminant source is uniformly distributed from the soil surface to a depth of at least one metre in open ground."*
- *"The assumption in the development of SGVs is that soil contamination is uniformly distributed across the Site from the surface to a depth of at least one metre. This is consistent with the conceptual model for the other direct contact exposure pathways including soil ingestion and dermal contact."*

WSP has given due consideration to the above references and has concluded as follows with regards to influencing depths:

- The SC050021/SR3 & SR4 references to 1.0 m influencing depth are predominately concerned with estimation of the vapour generation rates for volatile contaminants (for calculating screening criteria within the CLEA software), as opposed to an endorsement that depths up to a full metre would be contributing to direct contact, ingestion, and dust inhalation pathways. In terms of our assessments, WSP considers that for volatile contaminants, all depths have to be considered to have the potential to affect receptors; however, if these contaminants are present deeper than 1.0 m, then the risk assessment may require further refinement due to the CLEA assumptions.

The proposed development is to maintain the Site as a public open space; therefore, the soil results have been screened against Parks Public Open Space GAC in order to determine the potential risks associated with the redevelopment of the Site.

The Proposed Scheme includes demolition of the existing footbridge, bridge abutments and bridge abutment wingwalls. The demolition waste materials and any infilling soils encountered that cannot be reused on-Site will be taken off site for disposal. A new footbridge is to be constructed and the abutments formed by TENSAR soil reinforced walls. In addition, a new pedestrian and cycle ramp and a pedestrian stairway will be constructed in the south-east and south-west of the site, respectively. All of the existing embankments are to be reprofiled and landscaped. Any soils required to build up levels and form the new bridge abutments are likely to be imported from non-waste sources.

General Arrangement drawings for the Proposed Scheme are presented in **Appendix A**.

Two soil samples were submitted for analysis of Total Organic Carbon (TOC) as a percentage (%). A maximum TOC of 0.252 % was determined from the samples. The Soil Organic Matter (SOM) value is estimated from the TOC using a conversion factor of 1.72 to give a SOM value of 0.433 %. As a result, an SOM value of 1 % was utilised to generate conservative screening criteria.

It should be noted that any changes to the proposed development plans and / or land-use would require a re-assessment of the data and the risks in line with the proposed masterplan for the Site.

6.2 GENERIC QUANTITATIVE RISK ASSESSMENT – HUMAN HEALTH

A total of thirteen soil samples were obtained from the WSP 2023 ground investigation.

6.2.1 SOIL CONTAMINATION

Soil screening tables are presented in **Appendix H**.

6.2.2 ASBESTOS

Eight soil samples were submitted for asbestos identification. No soil sample tested positive for the presence of asbestos containing materials or fibres.

6.2.3 HUMAN HEALTH RISK EVALUATION

No exceedances of the soil GAC for a Parks Public Open Space end land use were detected. As such there is considered to be a **Low** risk to future Site users across the Site both in areas of hardscaping and soft landscaping.

Asbestos containing materials were not identified during laboratory testing therefore, based on the proposed Site use, the risks to the Site users are considered to be **Low**. Given the heterogeneous nature of the Made Ground deposits, the potential for the presence of asbestos within Made Ground

across the Site cannot be discounted. The risk to construction workers and third-party neighbours should be considered during the removal of Made Ground across the Site.

To ensure that risks to human health are suitably assessed during earthworks, procedures to follow in the event of encountering unexpected contamination, including asbestos, are provided in **Section 10** of this report.

During the construction phases of the development, risks to construction workers should be considered and managed in line with CDM 2015 Regulations.

6.3 CONTROLLED WATER RISK ASSESSMENT

No groundwater was encountered during the ground investigation. Due to the absence of shallow groundwater at the Site and presence of the London Clay Formation, there is not considered to be a controlled waters risk for the Proposed Development as no controlled water receptor is present.

There is not considered to be a risk to controlled waters off-Site as the nearest surface water features are located 1 km from the Site at Waterlow Park.

7 REFINED CONCEPTUAL SITE MODEL

7.1 ON-SITE

Following the findings of the GQRA, the preliminary CSM has been revised. A revised list of potential contaminant linkages is presented in **Table 7-1** and is based upon an evaluation of the potential sources, future receptors and the environmental setting of the Site.

Table 7-1 – Potential Contaminant Linkages

Potential Contaminant Linkages (CL)	Source	Pathway	Receptor	Comments
PCL 1	Asbestos	Inhalation during construction/maintenance works	Site users, workers and visitors Construction/ maintenance workers Third party neighbours	Asbestos containing materials were not identified at any of the locations on Site therefore the risk to future site users, construction workers, visitors and third party neighbours is considered to be Low . It is noted that the existing soils are to be removed and disposed off-site and thus the risk to future maintenance workers is considered Low . However, the potential for the presence of asbestos within Made Ground in other areas of the Site cannot be discounted. . Risks can be mitigated through appropriate risk assessment and control measures. These are legal requirements under the Construction, Design and Management (CDM) Regulation 2015 to ensure suitable health and safety controls are in place during construction works.
PCL 2	Contaminants in soils	■ Dermal / direct contact; and, ■ Ingestion or inhalation of contaminants.	Site users, workers and visitors Construction/ maintenance workers Third party neighbours	No exceedances of the GAC for a Parks Public Open Space end land use were detected. Nevertheless, existing soils are to be removed and disposed off-site and thus the risk to future site users, construction workers, maintenance workers and third party neighbours is considered to be Very Low . During the construction phase of the project, an Environmental Management Plan is expected to be prepared to mitigate against

Potential Contaminant Linkages (CL)	Source	Pathway	Receptor	Comments
				uncontrolled surface water and silt runoff from the Site. Any new soils imported to Site are expected to be certified clean and suitable for use. A Discovery Strategy will be in place during the construction works for the unexpected discovery of unknown contamination. Further details are provided within Section 10.
PCL 3	Ground gas Made within Ground	Migration of ground gases and volatile vapours	Site users, workers and visitors Construction / maintenance workers Third party neighbours	Given the nature of the Proposed Development, the potential for ground gases and volatile vapours to accumulate is minimal. The risk from ground gases and volatile vapours for future site users, workers and third party neighbours is considered to be Very Low. No source of ground gas has been identified and existing soils are to be disposed off-site. Therefore the risk to construction workers or maintenance workers from inhaling ground gases and vapours during groundworks is considered to be Very Low. Risks to construction workers should be managed via Health and Safety protocols during the works.
PCL 4	Contaminants in soils	- Direct contact with impacted soils; - Permeation through plastic pipes.	- Above ground services; - Below ground services; and, - Future infrastructure.	Based on the removal of the existing soils for disposal off-site, the risk to new below ground services is considered to be Very Low . It is anticipated that new buried services would be placed in clean service trenches.
PCL 5	Metals in soil	Root uptake and direct contact with contaminated soils/groundwater/fibres following:	Flora	Based on the removal of the existing soils for disposal off-site, the risk to new soft landscaping areas is considered Very Low . Certified clean soils will need used for any proposed soft landscaping areas.

Potential Contaminant Linkages (CL)	Source	Pathway	Receptor	Comments
		- Lateral migration via contaminated groundwater; and, - Windblown migration of contaminants		

7.2 OFF-SITE

Based on the findings of the ground investigation and subsequent GQRA, a potential risk from off-site sources has been identified details of which have been summarised in **Table 7-2**.

Table 7-2 - Off Site Contaminant Linkages

Off-Site Contaminant Sources	Pathway	Receptor	Comments
- Made Ground and Embankment Fill; - Potentially infilled ponds; - Brick Fields; - Milk depot; and,	- Dermal/direct contact/ingestion/inhalation of contaminants following: - Windblown migration of dust and fibres; - Below ground lateral migration of contaminants; and, - Below ground migration of ground gases and vapours.	Human Health - Future Site users and visitors; - Construction workers and maintenance workers; and, - Third-party neighbours.	Most of the areas surrounding the Site are covered with hardstanding, buildings or grass cover therefore it is considered unlikely that windblown dust and fibres from off-Site sources will impact receptors on the Site. The risk is considered to be Low. Ground gas and vapours generated from Made Ground, embankment fill, infilled ponds and brick fields in the areas surrounding the Site may migrate laterally within the subsurface. However, confined spaces for ground gases and vapours to accumulate in are not anticipated to be a part of the proposed development works. The risk from ground gases and vapour migrating on to the Site from off-Site sources is considered to be Low.

Off-Site Contaminant Sources	Pathway	Receptor	Comments
Electrical substation.	Lateral migration via contaminated groundwater	Infrastructure - Above ground services; - Below ground services; and, - Future infrastructure.	Given that the London Clay Formation (unproductive strata) underlies the Site and immediate area surrounding the Site, there is no laterally continuous groundwater body underlying the Site. Therefore, there is no active contamination pathway for contaminants to migrate in groundwater from off-Site sources and impact infrastructure and services. The risk is considered to be Very Low.
	- Root uptake and direct contact with contaminated soils/groundwater/fibres following: - Lateral migration via contaminated groundwater; and, - Windblown migration of contaminants	Plant Life Flora	Most of the areas surrounding the Site are covered with hardstanding, buildings or grass cover, therefore it is considered unlikely that windblown dust and fibres from off-site sources will impact receptors on the Site. Given that the London Clay Formation (unproductive strata) underlies the Site and immediate area surrounding the Site, there is no laterally continuous groundwater body underlying the Site. Therefore, there is no active contamination pathway for contaminants to migrate in groundwater from off-Site sources and impact plant life. The risk is considered to be Very Low.

8 PRELIMINARY WASTE ASSESSMENT

8.1 WASTE CHARACTERISATION ASSESSMENT

A Waste Characterisation Assessment to support off-site disposal of existing soils to landfill was completed for selected soil samples using the HazWasteOnline™ software tool. The HazWasteOnline™ tool assumes a worst-case scenario to provide an indicative assessment of the material that may be excavated during the development. The results of the assessment are included within **Appendix I**.

As summarised in **Table 8-1**, all eight samples submitted for assessment fell within the non-hazardous waste classification.

Table 8-1 - Summary of Preliminary Waste Classification

Strata	No. of Samples	Preliminary Classification	Depth Range (m bgl)
Topsoil	1	Non-Hazardous	0.0 – 0.50
Made Ground	4	Non-Hazardous	0.80 – 3.50
Made Ground/ Reworked Ground	1	Non-Hazardous	1.0 – 1.40
Reworked Ground /Relict Topsoil	1	Non-Hazardous	4.00 – 4.50
RTD	1	Non-Hazardous	2.00 – 2.50

It should be noted that the above assessment is preliminary and only provides an indication of the likely waste category as hazardous or non-hazardous. Further Waste Acceptance Criteria (WAC) analysis has been undertaken to determine which landfill can receive the waste and the results are assessed in **Section 8.2** below.

8.2 WASTE ACCEPTANCE CRITERIA ASSESSMENT

WAC testing has been undertaken to confirm the type of landfill that material at the Site can be disposed at (i.e. inert, non-hazardous or hazardous). Two of the eight soil samples submitted for laboratory analysis were submitted for WAC testing. The full results of the WAC testing are included in **Appendix F**.

The results of the WAC analyses indicate that for waste disposal the soils could fall within the inert classification.

Table 8-2 – Summary of WAC Testing

Strata	Depth Range (m bgl)	Number of Exceedances of Landfill WAC Limits	Eluate Exceedances
Made Ground	1.50 – 1.80	1 of Inert Waste Landfill	Fluoride
Made Ground	0.50 – 0.80	0	N/A

It is recommended that to facilitate the disposal of Site materials, the ground investigation laboratory data should be provided to the waste receiver to confirm the final classification. The responsibility for classification of waste for disposal lies with the ‘waste producer’ and it will be their responsibility to agree the final classification and acceptability of the material for disposal with the receiving landfill.

9 CONCLUSIONS

9.1 SITE SETTING

Historical maps indicate that the Site was undeveloped agricultural land with a path crossing the central part of the Site until the 1870s. In the 1870s, the Great Northern Railway line was constructed through the centre of the Site in an east west orientation. From the mid-1970s the railway has been dismantled. From the 1990s the Site has been redeveloped as a nature reserve with the present-day Parkland Walk located along the former railway line.

Off-Site, historical land uses include agricultural land/farmland, residential properties, the railway line, a milk depot and brick fields. Current land uses surrounding the Site are primarily residential. Maps dated between 1962-1974 indicate that an electrical substation was located adjacent to the north-east of the Site, though at road level.

Made Ground is present across the Site, underlying Parkland Walk and forming the embankments to the east and west sides of the footbridge. Superficial deposits interpreted as either naturally occurring River Terrace Deposits or 'Reworked Material' were encountered underlying the Made Ground. There is a relict topsoil layer encountered at depth within WS04 and WS05, which suggests that the soil lying above it within these locations was not formed naturally.

The bedrock geology comprising the London Clay Formation was encountered in one borehole during the ground investigation and is anticipated to underlie the superficial deposits across the Site. Additionally, the Site is underlain by bedrock members comprising of the Lambeth Group, Thanet Sand Formation and the Chalk Group at greater depths.

The Site is not located within an Environment Agency designated Groundwater Source Protection Zone (SPZ).

There are no current Environment Agency surface water abstractions within a 2 km radius of the Site.

There are no surface water features located on-Site. The nearest surface water features are ponds associated with Waterlow Park located approximately 1 km to the south-west.

Groundwater was not encountered at the Site during the ground investigation. Deeper aquifers are not considered potential controlled waters receptors due to the underlying London Clay acting as an aquitard preventing the downward migration of contaminants.

The ponds at Waterlow Park are not considered to be controlled waters receptors due to their distance from the Site.

9.2 GROUND INVESTIGATION

The intrusive ground investigation works were undertaken by WSP between 18 May and 19 May 2023.

The ground investigation included the advancement of five windowless sample boreholes (WS01 to WS05) to depths of 5.00 m bgl.

Based on the ground model, although there were anthropogenic brick inclusions throughout the Made Ground and reworked soils were present; no visual or olfactory evidence of contamination was identified during the investigation.

9.3 RISK ASSESSMENT

A Generic Quantitative Risk Assessment (GQRA) was undertaken considering potential proposed development of the Site as a Parks Public Open Space end use with the potential future receptors.

Based on the findings of the assessment the following conclusions are made:

9.3.1 HUMAN HEALTH

The Proposed Scheme includes demolition of the existing footbridge, bridge abutments and bridge abutment wingwalls. The demolition waste materials and any infilling soils encountered that cannot be reused on-Site will be taken off site for disposal. A new footbridge is to be constructed and the abutments formed by TENSAR soil reinforced walls. In addition, a new pedestrian and cycle ramp and a pedestrian stairway will be constructed in the south-east and south-west of the site, respectively. All the existing embankments are to be reprofiled and landscaped. Any soils required to build up levels and form the new bridge abutments are likely to be imported from non-waste sources.

When compared against Parks Public Open Space screening criteria, there were no exceedances of the Generic Assessment Criteria (GAC). Based on the Proposed Scheme, there is considered to be a **Low** risk to future Site users in both areas of hardstanding and soft landscaping. It is understood that existing soils are to be removed to facilitate the project's construction. It is anticipated that new areas of soft landscaping will be provided with certified clean imported subsoil / topsoil as a suitable growing medium.

Asbestos was not identified in any of the eight soil samples tested therefore, based on the proposed Site use, the risks from exposure to asbestos contaminated soils to future Site users are considered to be **Low**. However, the potential for the presence of unknown asbestos within Made Ground in other areas of the Site cannot be discounted. Therefore, construction and maintenance workers and potentially third-party neighbours could potentially be at risk of exposure during construction ground works. Risks can be mitigated through appropriate risk assessment and control measures. These are legal requirements under the Construction, Design and Management (CDM) Regulation 2015 to ensure suitable health and safety controls are in place during construction works.

During the construction phases of the development, risks to construction workers should be considered and managed in line with CDM 2015 Regulations.

9.3.2 CONTROLLED WATERS

No groundwater was encountered during the ground investigation. Due to the absence of shallow groundwater at the Site and presence of the London Clay Formation, there is not considered to be a controlled waters risk for the Proposed Scheme as no controlled water receptor is present.

9.4 WASTE ASSESSMENT

A preliminary waste classification assessment undertaken using the HazWasteOnline[™] tool assessed all eight soil samples submitted for analysis as non-hazardous.

WAC testing undertaken on two soil samples indicates that for waste disposal to landfill, the soils on Site could fall within the inert classification.

It should be noted that to facilitate the disposal of Site materials, laboratory data should be provided to the waste receiver to confirm the final classification. The responsibility for classification of waste for



disposal lies with the 'waste producer' and it will be their responsibility to agree the final classification and acceptability of the material for disposal with the receiving landfill.

10 REMEDIATION DESIGN TECHNICAL NOTE

It is understood that existing soils will require removal from the Site to facilitate construction of the Proposed Development. Therefore, this will remove potential risks to future site users from unknown contamination. However, a potential risk of exposure remains to construction workers who could encounter undiscovered contamination during the ground works phase of construction. In addition, neighbouring land users could potentially be exposed to dust and emissions from the Site during ground works.

An outline of procedures to follow in the event of encountering unexpected contamination including asbestos during earthworks is provided below.

10.1.1 ASBESTOS CONTAINING MATERIALS

Although asbestos has not been identified at the Site to date, there remains a risk of asbestos containing material (ACM) and / or fibres within Made Ground associated with the existing embankments and footpath. Based on the presence of Made Ground at the Site, the presence of asbestos within the ground cannot be dismissed and should be considered as a part of the Proposed Development.

If asbestos is identified during the earthworks at the Site, this material will require careful management in accordance with Control of Asbestos Regulations 2012. Asbestos exposure risk assessment, mitigation such as dust suppression and air monitoring would be required.

As general site management good practice, earthworks operatives should be given a toolbox talk on potential contaminated land risks in particular the possibility of encountering ACM prior to excavation.

If suspected ACM is identified then the following is required:

Stop works in the vicinity of the suspected location;

- i. Inform Site manager;
- ii. Inform the environmental consultant;
- iii. Operatives to be provided with appropriate PPE;
- iv. Damp and cover the location to prevent release of asbestos fibres;
- v. Fence off the area to prevent tracking of fibres across the Site by vehicle / people movements; and,
- vi. Collection of soil sample by the Contractor for asbestos quantification testing.

10.1.2 MANAGING UNEXPECTED CONTAMINATION

Excavations should be undertaken with an appropriately skilled banksman overseeing excavation works. The banksman should be aware of the different types of material 'expected' and 'not expected' on this Site. In the event that unexpected contamination is encountered then the following action is proposed.

Immediately stop excavations to assess the immediate risks to the environment to include:

- Inhalation of hazardous dust such as asbestos;
- Inhalation of vapour or gas; and,

- Spread of liquid contamination such as liquids / oils leaking from pipes or tanks.

If there is an immediate risk to human health and construction workers then evacuate to a safe distance and follow site emergency procedures.

If no immediate risk to human health then undertake an assessment to determine:

- The source of contamination; and,
- Appropriate method of containment.

A specialist Environmental consultant must be appointed to further assess the risks and develop an appropriate Remediation Strategy. With assistance from the specialist consultant, a risk-based assessment and strategy will be developed to assess the potential source / pathway / receptor pollutant linkages. If a significant pollutant linkage that requires supplementary remediation works is identified, then notification will be made to the local planning authority along with the mitigation approach for managing the identified contamination risk.

10.2 ENVIRONMENTAL MONITORING AND CONTROL MEASURES

As part of construction works at the Site there will be a requirement for environmental controls and monitoring.

Typical considerations will focus on perched groundwater, air, noise and vibration and odour. The requirement for detailed information on the methodologies and controls should be detailed in a Construction Environmental Management Plan or Construction Code of Practice document by the building contractor.

10.2.1 DUST AND PARTICULATES

Dust and particulates can potentially be generated during excavation and haulage activities. The haulage requirements should be minimised and haulage routes kept free from mud where possible and sufficiently dampened down to minimise dust generation.

It is recommended that dust generation should be monitored on a visual basis and potential dust and asbestos fibres should also be monitored via frisbee gauges on the boundary of the Site at agreed locations. Damping down is recommended to be undertaken where any excessive dust was observed or where monitored dust levels exceed a value of 200 mg/m³.

10.2.2 VAPOURS AND ODOURS

Vapours and odours are not expected to be released during the excavation and / or transport of soil. However, it would be prudent for the Environmental Specialist to periodically monitor the works with the aid of a portable Photo-Ionisation Detector (PID). It is anticipated that any vapours encountered will rapidly disperse and that measurable concentrations will not extend beyond the dig boundary. Should measurable concentrations (>1 ppm total VOC's) be found outside the dig area limits it is recommended that works should cease pending assessment.

Should excessive vapours or odours be generated the works shall be temporarily suspended and reassessed. The findings of all monitoring will be clearly communicated to other site users.

10.2.3 WATER INGRESS AND CONTROL

Groundwater and perched water is not anticipated to be encountered during excavation. In the event that water ingress does occur however; it has the potential to be contaminated and will require

management through either dewatering and/or disposal under Duty of Care or discharge via consent to foul sewer. Similarly, buried pipelines or underground structures may contain contaminated liquids. Measures should be taken to ensure that when emptying and/or excavating such structures, contaminated liquids do not contaminate the surrounding soil or other materials or enter groundwater or any surface water feature.

10.3 HEALTH, SAFETY AND ENVIRONMENTAL CONSIDERATIONS

The health and safety management scheme operated during earthworks should take into account all relevant health and safety documentation, policy and methodology applicable to such works. The works should also comply with the Construction Design Management Regulations (CDM) 2015.

10.3.1 CONTAMINATION

Construction workers involved in excavations at the Site will be exposed to concentrations of contamination in soils that are likely to present a **Low** risk to human health. Nonetheless, it will be necessary to ensure that construction workers are adequately protected and that a suitable health and safety management scheme is operated during construction and remediation activities.

As a minimum the health and safety plan should address the following potential health and safety issues:

- Potential for vapours in excavations;
- Dermal contact;
- Ingestion; and,
- Dust and (asbestos) fibre inhalation.

Earthworks and construction contractors should be aware of the potential for asbestos containing materials in soils and be vigilant to its presence. If potential asbestos containing materials are identified during redevelopment professional advice should be sought.

10.3.2 ENVIRONMENTAL CONTROLS

The Contractor should be responsible for the provision of all necessary environmental controls during the remediation works. These measures will include:

- Protection of surface water drains and catchments of surface run-off to reduce the risk of contaminated run-off and high-suspended solids moving off-site;
- Management of stockpiles of recycled (crushed) construction aggregates and soils awaiting off-site disposal to minimise the potential for generation of silty run-off and dust;
- Use of dust and odour suppression techniques during development to minimise off-site impacts; and,
- Storage of all fuels, oils and chemicals will be stored in appropriate containers within bunded compounds.

11 RECOMMENDATIONS

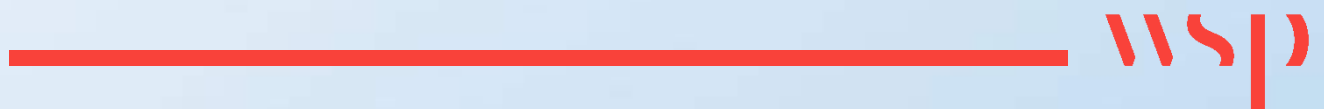
Based on the findings of the GQRA and that no contaminants of concern have been reported and thus no relevant contaminant linkage has been identified no formal remediation strategy is required at this stage. However, the following recommendations are made in order to mitigate potential risks associated with the encountering unexpected contamination during earthworks.

- Reference should be made to Section 10 of this report regarding suitable control measures for the management of excavated soils; and,
- During the construction phases of the development, risks to construction workers should be considered and managed in line with CDM 2015 Regulations.

Should development plans change or be altered, an update of the assessments undertaken within this report are likely to be required.

Appendix A

FIGURES AND DRAWINGS







TITLE:
Stanhope Road Bridge

FIGURE No:
Site Location Plan





Scale 1:200



NOTES

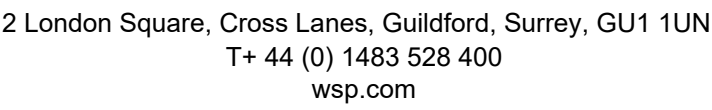
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2. ALL LEVELS ARE IN METRES A.O.D. UNLESS STATED OTHERWISE.

LEGEND

-  PERMANENT WORKS BOUNDARY
-  RAILINGS AT STANHOPE ROAD LEVEL
-  PARKLAND WALK ACCESS
-  BRIDGE DECK
-  LANDSCAPED AREAS / EMBANKMENT RE-PROFILING
-  REINFORCED EARTH EMBANKMENT FACE (TENSARTECH NATURALGREEN SLOPE) / LANDSCAPED AREAS
-  REINFORCED EARTH EMBANKMENT FACE (BAGWORK WRAPAROUND SLOPE) / LANDSCAPED AREAS
-  FILTER DRAIN INSTALLED TO TOE OF SLOPE
-  POND
-  LANDINGS

P03	27/04/2023	AC	POND ARRANGEMENT UPDATED	BH	BH
P02	06/04/2023	AC	UPDATED FOLLOWING COMMENTS FROM LBH	BH	BH
P01	20/03/2023	AC	FIRST ISSUE	BH	BH
REV	DATE	BY	DESCRIPTION	CHK	AP

DRAWING STATUS: **FOR COMMENT AND REVIEW**



CLIENT:



SITE/PROJECT:

STANHOPE ROAD BRIDGE

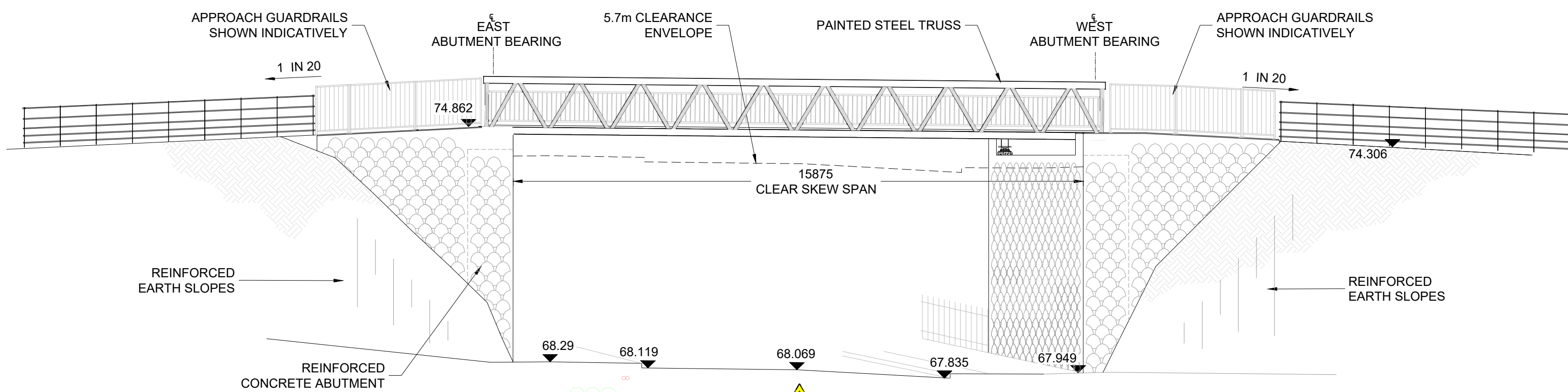
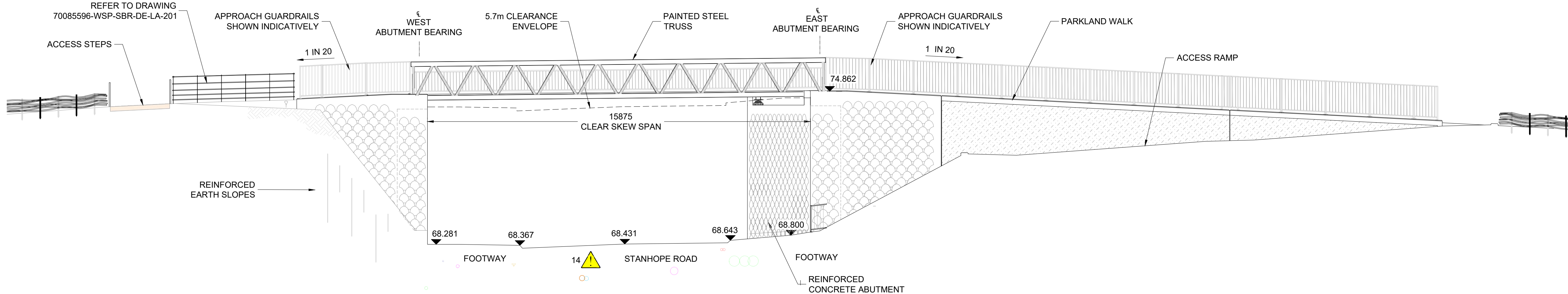
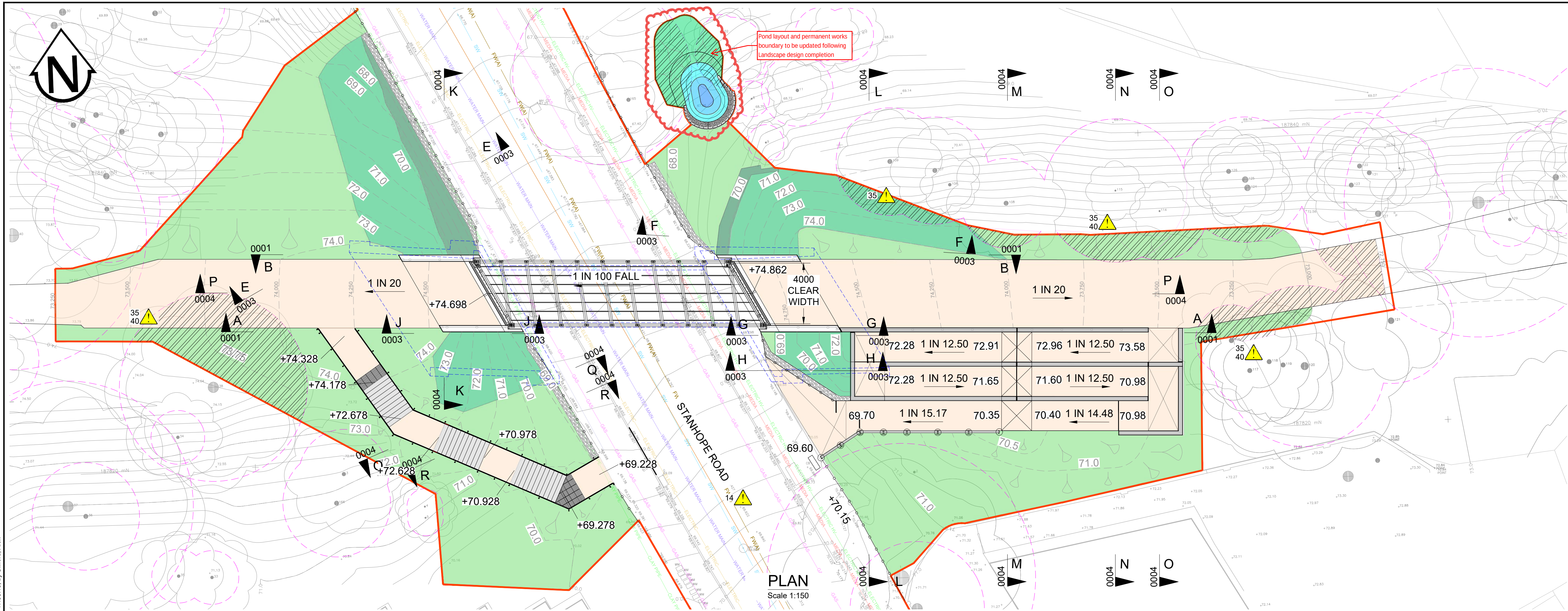
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PERMANENT WORKS BOUNDARY

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				DATE:	APRIL 2023
DRAWING No:	70085596-WSP-SBR-DR-BR-0000				REV:
					P03

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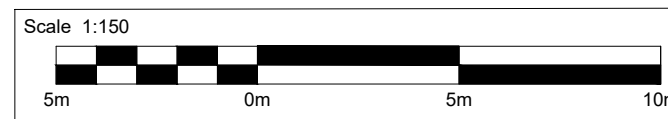
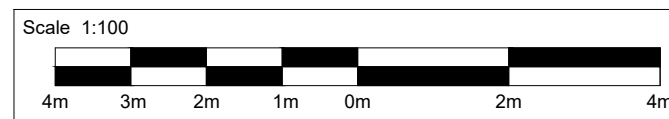
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SIGNIFICANT RESIDUAL RISKS

HEALTH AND SAFETY RISKS ARE IDENTIFIED IN THE T446: DESIGN RISK MANAGEMENT SCHEDULE, SIGNIFICANT RESIDUAL RISKS ARE LISTED BELOW:

- 14. SERVICES/UTILITIES BENEATH CARRIAGEWAY SURFACE, NOTABLY GAS MAIN UNDER THE WEST FOOTWAY AND EAST EXTENT OF CARRIAGEWAY, AND HV CABLES UNDER THE EAST FOOTWAY. THAMES WATER PIPES AND COMMUNICATIONS CABLES ARE ALSO PRESENT.
- 35. EXCAVATIONS DISTURBING ROOTS, IMPACTING TREE STABILITY. CONTRACTOR TO MINIMISE OVER EXCAVATING DURING CONSTRUCTION.
- 40. TREES TO BE SURCHARGED DUE TO INCREASE IN LEVEL TO BRIDGE APPROACHES, ROOT PROTECTION MEASURES TO BE INSTALLED.



DO NOT SCALE

NOTES

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
- ALL LEVELS ARE IN METRES A.O.D. UNLESS STATED OTHERWISE.
- FOR LANDSCAPE FEATURES, REFER TO LANDSCAPE PLAN 70085596-WSP-XX-XX-DR-LA-0001.
- FOR SUBSTRUCTURE AND FOUNDATION DETAILS REFER TO DRAWINGS 70085596-WSP-SBR-DR-BR-1700 TO 1721.
- FOR SUPERSTRUCTURE DETAILS REFER TO DRAWINGS 70085596-WSP-SBR-DR-BR-1800 TO 1803.
- FOR DRAINAGE DESIGN DETAILS REFER TO DRAWING 70085596-WSP-SBR-DR-BR-0500.
- REINFORCED EARTH EMBANKMENTS DESIGN, REFER TO TENSAR DETAILED DESIGN DRAWINGS TD/23/002/D1_SH1, SH2 AND SH3 FOR DETAILS.

LEGEND

- EXISTING STRUCTURE OUTLINE
- RAILINGS AT STANHOPE ROAD LEVEL
- PERMANENT WORKS BOUNDARY
- PARKLAND WALK ACCESS
- BRIDGE DECK
- TREE ROOT PROTECTION
- ROOT PROTECTION MEASURES REQUIRED FOR PERMANENT WORKS INSTALLATION
- LANDSCAPED AREAS / EMBANKMENT RE-PROFILING
- REINFORCED EARTH EMBANKMENT FACE (TENSARTECH NATURALGREEN SLOPE) / LANDSCAPED AREAS
- REINFORCED EARTH EMBANKMENT FACE (BAGWORK WRAPAROUND SLOPE) / LANDSCAPED AREAS
- FILTER DRAIN INSTALLED TO TOE OF SLOPE
- LANDINGS
- FW(A) FOUL WATER
- ABANDONED SEWER
- SW SURFACE WATER SEWER
- WATER MAIN MAINS WATER
- CLAY PIPE CLAY PIPE
- ELECTRIC HV ELECTRIC HV
- ELECTRIC LV ELECTRIC LV
- GAS GAS
- MEDIA MEDIA

P05	02/05/2023	AC	MINOR AMENDMENTS	BH	BH
P04	06/04/2023	DR	MINOR AMENDMENTS	AC	BH
P03	10/01/2023	DR	MINOR AMENDMENTS	GW	BH
P02	19/12/2022	DR	REVISED BASED ON COMMENTS RECEIVED FROM LBH	GW	BH
P01	15/07/2022	DR	FOR REVIEW AND COMMENT	GW	BH
REV	DATE	BY	DESCRIPTION	CHK	APP

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CLIENT:



LONDON BOROUGH OF HARINGEY

SITE/PROJECT:

STANHOPE ROAD BRIDGE

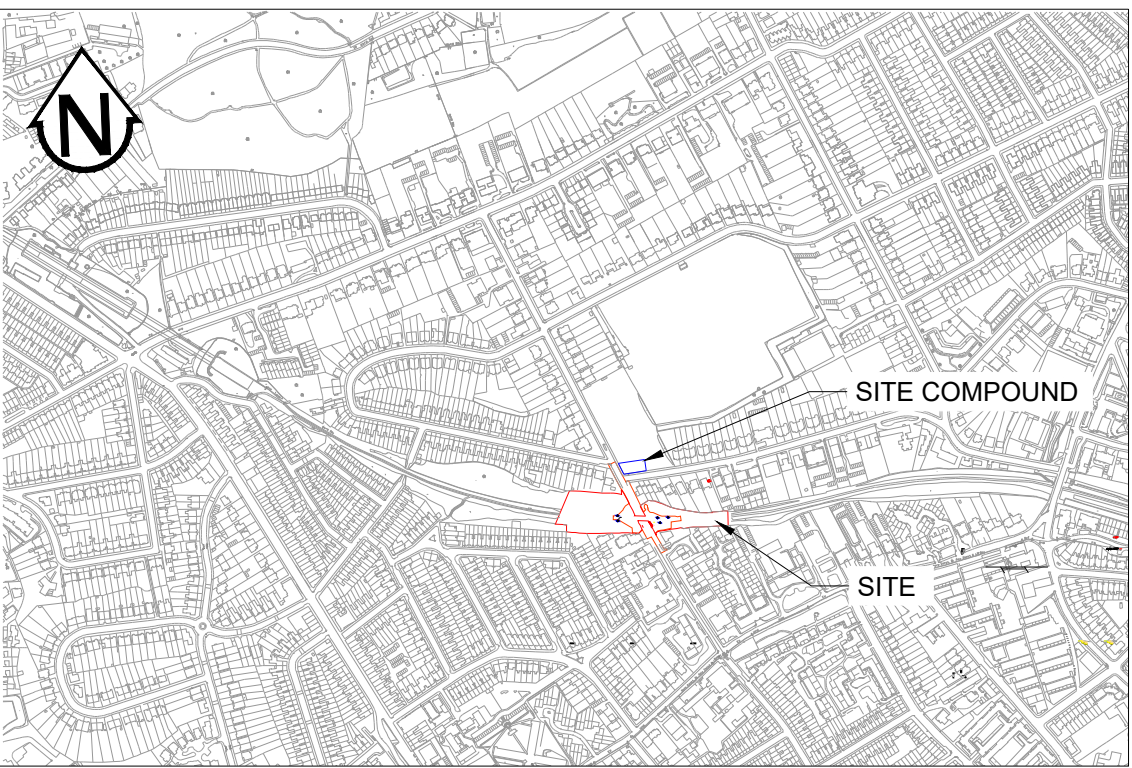
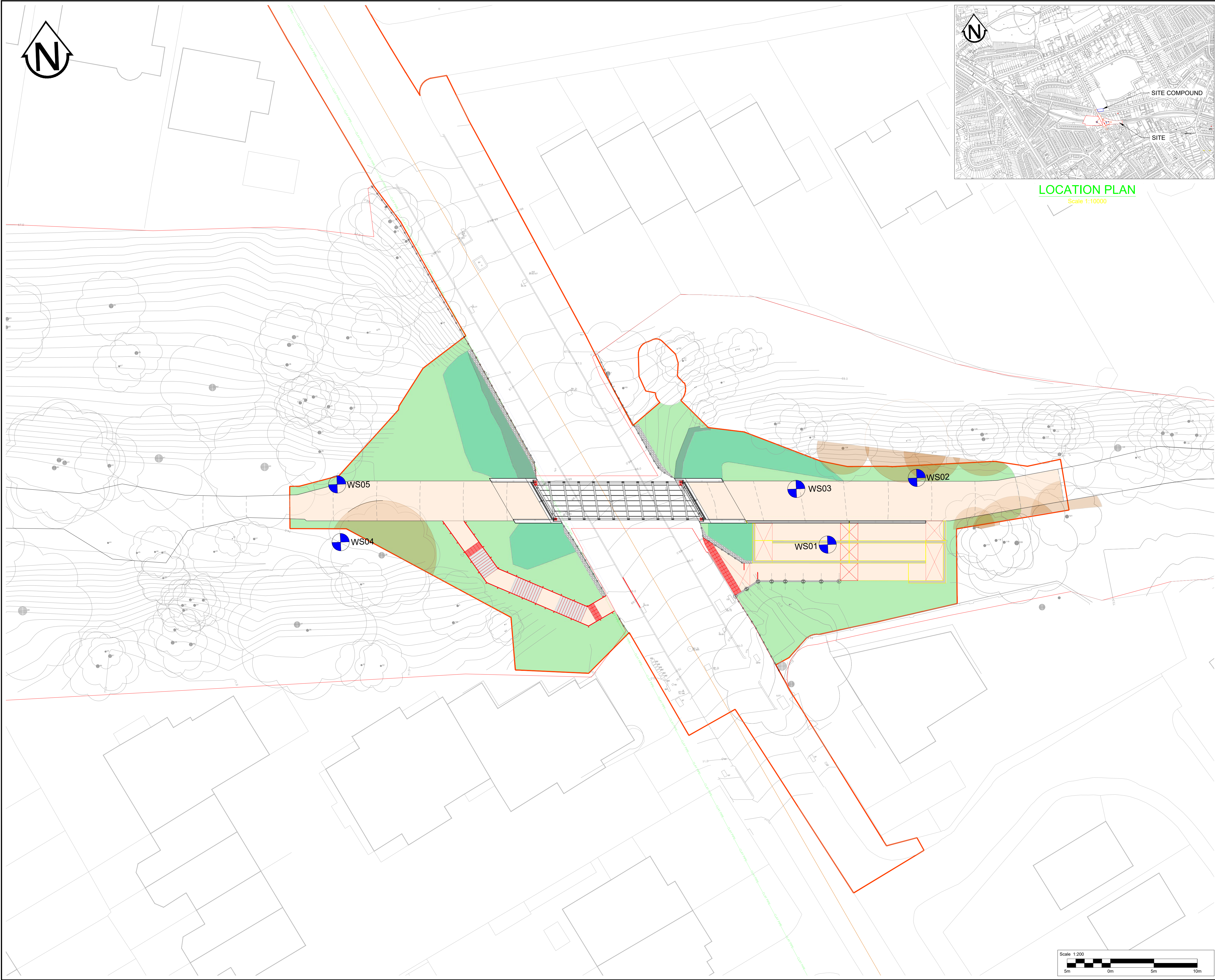
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GENERAL ARRANGEMENT
BRIDGE AND ABUTMENTS

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DATE:		DATE:		DATE:	MAY 2023
DRAWING NO:	70085596-WSP-SBR-DR-BR-0001	REV:	P05		

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LOCATION PLAN
Scale 1:10000

DO NOT SCALE

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
2. ALL LEVELS ARE IN METRES A.O.D. UNLESS STATED OTHERWISE.
3. FOR LANDSCAPE FEATURES, REFER TO LANDSCAPE PLAN 70085596-WSP-XX-XX-DR-LA-0001.
4. LOCATION OF SERVICES FROM C2 RETURNS AND TRIAL PITS UNDERTAKEN IN 2019. CONTRACTOR TO SURVEY LOCATIONS OF ALL SERVICES PRIOR TO WORKS AND IMPLEMENT APPROPRIATE PROTECTION MEASURES.
5. SITE COMPOUND LOCATION AND EXTENTS SHOWN INDICATIVELY AND TO BE CONFIRMED WITH THE OVERSEEING ORGANISATION.

LEGEND

- PERMANENT WORKS BOUNDARY
- INDICATIVE SITE COMPOUND
- PARKLAND WALK AND ACCESS
- BRIDGE DECK
- ROOT PROTECTION MEASURES REQUIRED FOR PERMANENT WORKS INSTALLATION
- LANDSCAPED AREAS / EMBANKMENT RE-PROFILING
- REINFORCED EARTH (TENSARTECH NATURALGREEN SLOPE) / LANDSCAPED AREAS
- REINFORCED EARTH (BAGWORK WRAPAROUND SLOPE) / LANDSCAPED AREAS
- FILTER DRAIN INSTALLED TO TOE OF SLOPE
- WINDOW SAMPLE HOLES

P03	06/04/2023	DR	UPDATED FOLLOWING COMMENTS FROM LBH	AC	BH
P02	17/03/2023	DR	PROPOSED UPDATED	AC	BH
C01	01/11/2022	DR	REVISED FOLLOWING T463 COMMENTS	GW	BH
P01	15/07/2022	DR	FOR REVIEW AND COMMENT	GW	BH
REV	DATE	BY	DESCRIPTION	CHK	APP

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SITE/PROJECT:

STANHOPE ROAD BRIDGE

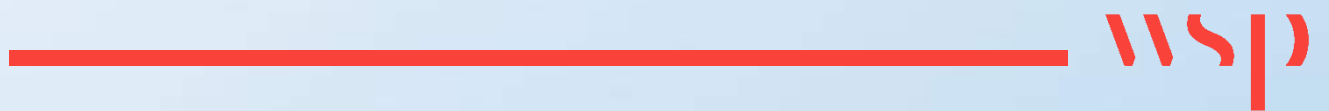
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EXPLORATORY HOLE LOCATION PLAN

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PROJECT NO:	70085596	DESIGNED:	GW	DRAWN:	DR
DRAWING No:	70085596-WSP-SBR-DR-BR-2700	DATE:	APRIL 2023	REV:	P03
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Appendix B

LIMITATIONS



REPORT LIMITATIONS - GROUND AND WATER

GENERAL

1. WSP UK Limited has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed and outlined in the body of the report.
2. Unless explicitly agreed otherwise, in writing, this report has been prepared under WSP UK Limited standard Terms and Conditions as included within our proposal to the Client.
3. Project specific appointment documents may be agreed at our discretion and a charge may be levied for both the time to review and finalise appointments documents and also for associated changes to the appointment terms. WSP UK Limited reserves the right to amend the fee should any changes to the appointment terms create an increase risk to WSP UK Limited.
4. The report needs to be considered in the light of the WSP UK Limited proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

PHASE 1 GEO ENVIRONMENTAL AND PRELIMINARY RISK ASSESSMENTS

Coverage: *This section covers reports with the following titles or combination of titles: phase 1; desk top study; geo environmental assessment; development appraisal; preliminary environmental risk assessment; constraints report; due diligence report; geotechnical development review; environmental statement; environmental chapter; project scope summary report (PSSR), program environmental impact report (PEIR), geotechnical development risk register; and, baseline environmental assessment.*

5. The works undertaken to prepare this report comprised a study of available and easily documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the Site and correspondence with relevant authorities and other interested parties. Due to the short timescales associated with these projects responses may not have been received from all parties. WSP UK Limited cannot be held responsible for any disclosures that are provided post production of our report and will not automatically update our report.
6. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only for 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 this report, WSP UK Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.
7. 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 intrusive investigations of the site.
8. WSP UK Limited does not warrant work / data undertaken / provided by others.

REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

INTRUSIVE INVESTIGATION REPORTS

Coverage: *The following report titles (or combination) may cover this category of work: geo environmental site investigation; geotechnical assessment; GIR (Ground Investigation reports); preliminary environmental and geotechnical risk assessment; and, geotechnical risk register.*

9. The investigation has been undertaken to provide information concerning either:
 - i. The type and degree of contamination present at the site in order to allow a generic quantitative risk assessment to be undertaken; or
 - ii. Information on the soil properties present at the site to allow for geotechnical development constraints to be considered.
10. The scope of the investigation was selected on the basis of the specific development and land use scenario proposed by the Client and may be inappropriate to another form of development or scheme. If the development layout was not known at the time of the investigation the report findings may need revisiting once the development layout is confirmed.
11. For contamination purposes, the objectives of the investigation are limited to establishing the risks associated with potential contamination sources with the potential to cause harm to human health, building materials, the environment (including adjacent land), or controlled waters.
12. For geotechnical investigations the purpose is to broadly consider potential development constraints associated with the physical property of the soils underlying the site within the context of the proposed future or continued use of the site, as stated within the report.
13. The amount of exploratory work, soil property testing and chemical testing undertaken has necessarily been restricted by various factors which may include accessibility, the presence of services; existing buildings; current site usage or short timescales. The exploratory holes completed assess only a small percentage of the area in relation to the overall size of the Site, and as such can only provide a general indication of conditions.
14. The number of sampling points and the methods of sampling and testing do not preclude the possible existence of contamination where concentrations may be significantly higher than those actually encountered or ground conditions that vary from those identified. In addition, there may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.
15. The inspection, testing and monitoring records relate specifically to the investigation points and the timeframe that the works were undertaken. They will also be limited by the techniques employed. As part of this assessment, WSP UK Limited has used reasonable skill and care to extrapolate conditions between these points based upon assumptions to develop our interpretation and conclusions. The assumption made in forming our conclusions is that the ground and groundwater conditions (both chemically and physically) are the same as have been encountered during the works undertaken at the specific points of investigation. Conditions can change between investigation points and these interpretations should be considered indicative.
16. The risk assessment and opinions provided are based on currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values. Specific assumptions associated

REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

with the WSP UK Limited risk assessment process have been outlined within the body or associated appendix of the report.

17. Additional investigations may be required in order to satisfy relevant planning conditions or to resolve any engineering and environmental issues.
18. Where soil contamination concentrations recorded as part of this investigation are used for commentary on potential waste classification of soils for disposal purposes, these should be classed as indicative only. Due consideration should be given to the variability of contaminant concentrations taken from targeted samples versus bulk excavated soils and the potential variability of contaminant concentrations between sampling locations. Where major waste disposal operations are considered, targeted waste classification investigations should be designed.
19. The results of the asbestos testing are factually reported and interpretation given as to how this relates to the previous use of the site, the types of ground encountered and site conceptualisation. This does not however constitute a formal asbestos assessment. These results should be treated cautiously and should not be relied upon to provide detailed and representative information on the delineation, type and extent of bulk ACMs and / or trace loose asbestos fibres within the soil matrix at the site.
20. If costs have been included in relation to additional site works, and / or site remediation works these must be considered as indicative only and must be confirmed by a qualified quantity surveyor.

EUROCODE 7: GEOTECHNICAL DESIGN

21. On 1st April 2010, BS EN 1997-1:2004 (Eurocode 7: Geotechnical Design – Part 1) became the mandatory baseline standard for geotechnical ground investigations.
22. In terms of geotechnical design for foundations, slopes, retaining walls and earthworks, EC7 sets guidance on design procedures including specific guidance on the numbers and spacings of boreholes for geotechnical design, there are limits to methods of ground investigation and the quality of data obtained and there are also prescriptive methods of assessing soil strengths and methods of design. Unless otherwise explicitly stated, the work has not been undertaken in accordance with EC7. A standard geotechnical interpretative report will not meet the requirements of the Geotechnical Design Report (GDR) under Eurocode 7. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. The report is likely to represent a Ground Investigation Report (GIR) under the Eurocode 7 guidance.

DETAILED QUANTITATIVE RISK ASSESSMENTS AND REMEDIAL STRATEGY REPORTS

23. These reports build upon previous report versions and associated notes. The scope of the investigation, further testing and monitoring and associated risk assessments were selected on the basis of the specific development and land use scenario proposed by the Client and may not be appropriate to another form of development or scheme layout. The risk assessment and opinions provided are based on currently available approaches in the generation of Site Specific Assessment Criteria relating to contamination concentrations and are not considered to represent a risk in a specific land use scenario to a specific receptor. No liability can be accepted for the retrospective effects of any future changes or amendments to these values, associated models or associated guidance.



REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

- 24. The outputs of the Detailed Quantitative Risk Assessments are based upon WSP UK Limited manipulation of standard risk assessment models. These are our interpretation of the risk assessment criteria.
- 25. Prior to adoption on site they will need discussing and agreeing with the Regulatory Authorities prior to adoption on site. The regulatory discussion and engagement process may result in an alternative interpretation being determined and agreed. The process and timescales associated with the Regulatory Authority engagement are not within the control of WSP UK Limited. All costs and programmes presented as a result of this process should be validated by a quantity surveyor and should be presumed to be indicative.

GEOTECHNICAL DESIGN REPORT (GDR)

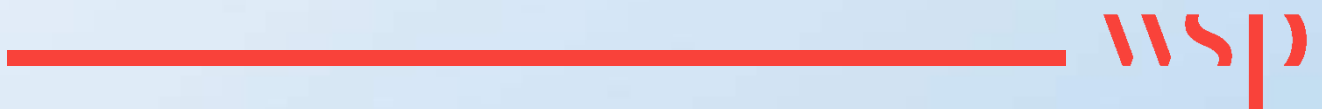
- 26. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. All the relevant information needs to be provided to allow for a GDR to be produced.

MONITORING (INCLUDING REMEDIATION MONITORING REPORTS)

- 27. These reports are factual in nature and comprise monitoring, normally groundwater and ground gas and data provided by contractors as part of an earthworks or remedial works.
- 28. The data is presented and will be compared with assessment criteria.

Appendix C

BGS BOREHOLE LOGS



TO 28NE 286

Contract Name HORNSEY LANE						Borehole No. 1	
Method of boring Shell and Auger						Ground level	
Diameter 8"						Start 6.2.73	
British Geological Survey						Finish 7.2.73	
British Geological Survey						2966 8780	

Daily progress	Water levels	In-situ tests	Samples	Depth (ft)	Reduced level (ft OD)	Thickness (ft)	Description of Strata
				1'6"		1'6"	Made Ground (concrete, brick rubble)
			U				
			J				
			U				
	▽			12'6"		11'0"	Firm mottled light and dark brown silty clay
	7/2		U				
			J			4'6"	Firm brown sandy silty clay
			U	17'0"			
			J				
			U			10'0"	Soft to firm dark grey sandy silty clay
			U	27'0"			
			U				
6/2			U			33'0"	Stiff grey clay with partings of silt
			U				
			U				
			U				

Contd...

British Geological Survey	British Geological Survey	British Geological Survey
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Terresearch Limited	Report No. S.23/606	Appendix 1 Sheet 1
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[illegible]

FOUNDATION ENGINEERING LIMITED

HORNSEY LANE - HARINGEY

JOB NO OAP	CF 669/1382
FIG NO.	
MADE BY CH	
DATE MAY 1975	

RECORD OF BOREHOLE NO: 1...1... Sheet 1... of 2...

DAILY PROGRESS	DEPTH TO WATER	DEPTHS OF CASING	SAMPLES			LEG. END	DEPTH	REDUCED LEVEL O.D.	DESCRIPTION OF STRATA
			DEPTH		TYPE				
			FROM	TO					
	m.	m.	m.	m.			m.	m.	Ground Level 75.570 m. O.D.
25.4.75							0.00	75.57	Topsoil
							0.40	75.17	Soft to firm brown fissured laminated silty CLAY (CLAYGATE BEDS)
		0.00	0.75	1.05	U102	x			
		0.00	1.35	1.65	S(10)	x			
					DS	x			
						x			
		2.00			D	x			
		0.00	2.25	2.65	U102	x			
						x			
		0.00	3.05	3.35	S(10)	x			
					DS	x			
		0.00	3.75	4.20	U102	x			
						x			
		0.00	4.42	4.72	S(11)	x			
					DS	x			
		0.00	5.25	5.70	U102	x	5.20	70.37	Firm to stiff grey brown silty CLAY
						x	5.90	69.67	
		0.00	6.05	6.35	S(10)	x			Stiff dark grey fissured laminated silty CLAY
					DS	x			
		0.00	6.75	7.20	U102	x			
						x			
		0.00	7.55	7.85	S(11)	x			
					DS	x			
		0.00	8.25	8.70	U102	x			
						x			
		0.00	9.21	9.51	S(13)	x			
					DS	x			
		0.00	9.75	10.20	U102	x			

REMARKS

Piezometer installed at 3m

TYPE OF BORING

Shell & Auger to 11.00 m.

DIAMETER OF BORING

150 mm. to 11.00 m.

mm. to mm.

mm. to mm.

CASING TUBES

mm. to mm.

mm. to mm.

mm. to mm.

BOREHOLE

RECORD OF BOREHOLE NO: ...1

Sheet ..2.. of ..2..:

FIG NO.

MADE BY

CH

DATE MAY 1975

REMARKS

TYPE OF BORING

Shell & Auger to 11.00 m.

DIAMETER OF BORING

150 mm. to 11.00 m.

.....mm. to in.

..... mm. to m.

CASING TUBES

..... 1000 to 1000

.....

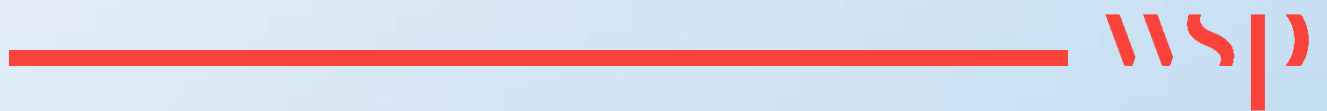
..... from to m

BOREHOLE

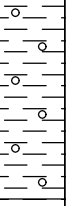
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Appendix D

EXPLORATORY HOLE LOGS



 WSP Telephone: Email:	BOREHOLE LOG		Hole No. WS01	
	Project Stanhope Road Bridge		Sheet 1 of 1	
Job No 70085596	Client Haringey Borough Council		Date Start: 18-05-23 End: 18-05-23	
Contractor/Driller Jacksons	Method/Plant Used Comacchio Geo 300	Logged By Rebecca Hoyle	Co-Ordinates () E: 529368.78 N: 187824.64	Ground Level (m) 74.714

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (m)	Depth (Thickness)	Description	Legend	Geology	Install / Backfill
0.00-0.40	ES						74.46	0.25	Black organic very gravelly fine to coarse SAND with frequent rootlets and roots. Gravel is angular to subrounded fine to coarse of brick, flint, slag and coal. (TOPSOIL)		TS	
							74.16	0.55			MG	
							74.01	0.70	MADE GROUND comprising: Brownish red organic sandy very angular to subrounded fine to coarse gravel of brick.		MG	
1.00-1.50	ES							(0.90)	MADE GROUND comprising: Red sandy slightly clayey subangular to very angular fine to coarse gravel of brick.		MG	
							73.11	1.60	MADE GROUND comprising: Reddish brown slightly gravelly clay. Gravel is subangular to very angular fine and medium of brick.			
								(1.20)	MADE GROUND comprising: Stiff brown slightly gravelly slightly sandy silt. Gravel is subangular fine and medium of brick.		MG	
							71.91	2.80	2.50 - 3.00 Tree root present			
								(2.20)	Very stiff brown gravelly CLAY. Gravel is subangular to subrounded fine and medium of flint. (PROBABLE RIVER TERRACE DEPOSITS)		RT	
							69.71	5.00	Reached scheduled depth			

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks 1. Exploratory hole location cleared of services by GPR and CAT before excavation; 2. Hand excavated service inspection pit GL to 1.50 m BGL; 3. No groundwater encountered; 4. No olfactory evidence of contamination.					
From	To	Hours	Tool	From	To						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP Telephone: Email:	BOREHOLE LOG		Hole No. WS02	
	Project Stanhope Road Bridge		Sheet 1 of 1	
Job No 70085596	Client Haringey Borough Council		Date Start: 18-05-23 End: 18-05-23	
Contractor/Driller Jacksons	Method/Plant Used Archway Competitor Dart	Logged By Rebecca Hoyle	Co-Ordinates () E: 529379.34 N: 187831.90	Ground Level (m) 72.933

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (m)	Depth (Thickness)	Description	Legend	Geology	Install / Backfill
0.50-0.80	ES						72.53	0.40	Dark brown gravelly clayey fine to coarse SAND with frequent rootlets and roots. Gravel is very angular to subrounded fine and medium of brick, concrete, flint and glass and plastic. (TOPSOIL)		TS	
							72.43	0.50			MG	
							72.23	0.70	MADE GROUND comprising: Brown slightly sandy slightly clayey angular to subangular fine to coarse gravel of brick and flint.		MG	
								(0.90)	MADE GROUND comprising: Red friable very sandy slightly clayey angular to subangular fine and medium gravel of brick. Sand is of weathered brick, Firm pale orange and grey CLAY. (PROBABLE RIVER TERRACE DEPOSITS)		RT	
							71.33	1.60				
							71.13	1.80	Dark greyish brown friable CLAY. (PROBABLE RIVER TERRACE DEPOSITS)		RT	
								(0.50)				
							70.63	2.30	Stiff pale orangish grey CLAY. (PROBABLE RIVER TERRACE DEPOSITS)		RT	
							70.53	2.40	Firm dark greyish brown friable CLAY. (PROBABLE RIVER TERRACE DEPOSITS)		RT	
							70.13	2.80				
								(0.70)	Stiff brown mottled grey slightly gravelly CLAY. Gravel is subangular to rounded fine and medium of flint. (PROBABLE RIVER TERRACE DEPOSITS)		RT	
							69.43	3.50	Firm orangish brown CLAY. (PROBABLE RIVER TERRACE DEPOSITS)		LC	
							69.23	3.70	Soft pale brownish grey slightly sandy CLAY. (LONDON CLAY FORMATION)		LC	
								(1.30)	Firm brown CLAY. (LONDON CLAY FORMATION)		LC	
							67.93	5.00	Reached scheduled depth			

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks 1. Exploratory hole location cleared of services by GPR and CAT before excavation; 2. Hand excavated service inspection pit GL to 1.50 m BGL; 3. No groundwater encountered; 4. No olfactory evidence of contamination.					
From	To	Hours	Tool	From	To						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP Telephone: Email:	BOREHOLE LOG		Hole No. WS03	
	Project Stanhope Road Bridge		Sheet 1 of 1	
Job No 70085596	Client Haringey Borough Council		Date Start: 18-05-23 End: 18-05-23	
Contractor/Driller Jacksons	Method/Plant Used Comacchio Geo 300	Logged By Rebecca Hoyle	Co-Ordinates () E: 529365.42 N: 187831.19	Ground Level (m) 72.886

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (m)	Depth (Thick-ness)	Description	Legend	Geology	Install / Backfill
0.00-0.50	ES							(0.50)	Black organic very gravelly fine to coarse SAND with frequent rootlets and roots. Gravel is angular to subrounded fine to coarse of brick, flint and coal and glass. (TOPSOIL)		TS	
							72.39	0.50	MADE GROUND comprising: Brown and black sandy slightly clayey very angular to subrounded fine to coarse gravel of brick. MADE GROUND comprising: Red sandy very angular to angular fine to coarse gravel of brick.		MG	
							72.24	0.65				
1.50-1.80	ES							(1.15)			MG	
							71.09	1.80				
								(1.70)	MADE GROUND comprising: Firm brown slightly gravelly slightly sandy clay. Gravel is subangular fine of brick and flint.		MG	
3.00-3.50	ES											
							69.39	3.50				
							69.04	3.85	MADE GROUND comprising: Stiff yellowish brown and grey very sandy slightly gravelly clay with low cobble content. Cobbles are subangular of brick. Gravel is subangular to well rounded fine of flint.		MG	
							68.79	4.10				
								(0.90)	Brown organic gravelly fine to coarse SAND with frequent rootlets, roots and wood fragments. Gravel is subangular to very angular fine and medium of brick, flint and coal (RELICT TOPSOIL).		RT	
							67.89	5.00	Stiff dark brown sandy slightly gravelly CLAY. Gravel is subrounded to well rounded fine and medium of flint. (PROBABLE RIVER TERRACE DEPOSITS)			
									Reached scheduled depth			

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks 1. Exploratory hole location cleared of services by GPR and CAT before excavation; 2. Hand excavated service inspection pit GL to 1.50 m BGL; 3. No groundwater encountered; 4. No olfactory evidence of contamination.					
From	To	Hours	Tool	From	To						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP Telephone: Email:	BOREHOLE LOG		Hole No. WS04	
	Project Stanhope Road Bridge		Sheet 1 of 1	
Job No 70085596	Client Haringey Borough Council		Date Start: 18-05-23 End: 18-05-23	
Contractor/Driller Jacksons	Method/Plant Used Comacchio Geo 300	Logged By Rebecca Hoyle	Co-Ordinates () E: 529312.73 N: 187827.18	Ground Level (m) 74.742

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (m)	Depth (Thickness)	Description	Legend	Geology	Install / Backfill
0.00-0.50	ES						74.49	0.25	Black organic very gravelly fine to coarse SAND with frequent rootlets. Gravel is angular to subrounded fine to coarse of brick, flint and coal and glass. (TOPSOIL)		TS	
							74.34	0.40				
							74.04	0.70				
							73.94	0.80				
1.00-1.40	ES						73.54	1.20	MADE GROUND comprising: Red and black sandy slightly clayey very angular to subrounded fine to coarse gravel of brick.		MG	
									MADE GROUND comprising: Reddish brown sandy clay.			
									MADE GROUND comprising: Red sandy very angular to angular fine to coarse gravel of brick. Sand is comprised of weathered brick.			
									MADE GROUND comprising: Firm brown slightly gravelly slightly sandy clay. Gravel is subangular fine of brick and flint.			
4.00-4.50	ES						(2.20)		Stiff brown mottled grey slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine and medium of flint. (REWORKED GROUND)		RT	
							71.34	3.40				
							70.89	3.85	Stiff yellowish brown and grey very sandy slightly gravelly CLAY. Gravel is subangular to well rounded fine of flint. (REWORKED GROUND)			
							70.64	4.10	Dark brown organic gravelly fine to coarse SAND with roots and rootlets. Gravel is subangular to very angular fine and medium of brick, flint and coal. (RELICT TOPSOIL)			
							(0.90)		Orangish brown friable sandy slightly gravelly CLAY. Gravel is subrounded to well rounded fine and medium of flint. (PROBABLE RIVER TERRACE DEPOSITS)		RT	
							69.74	5.00				
							Reached scheduled depth					

Boring Progress						Water Strikes						
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt	Date	Time	Strike	Minutes	Standing	Casing	
Chiselling					Water Added		General Remarks 1. Exploratory hole location cleared of services by GPR and CAT before excavation; 2. Hand excavated service inspection pit GL to 1.50 m BGL; 3. No groundwater encountered; 4. No olfactory evidence of contamination.					
From	To	Hours	Tool	From	To							
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.										

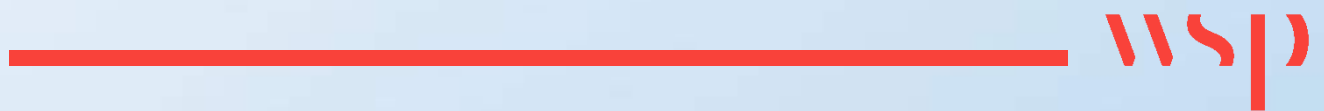
 WSP Telephone: Email:	BOREHOLE LOG		Hole No. WS05	
	Project Stanhope Road Bridge		Sheet 1 of 1	
Job No 70085596		Client Haringey Borough Council		Date Start: 18-05-23 End: 18-05-23
Contractor/Driller Jacksons	Method/Plant Used Archway Competitor Dart	Logged By Rebecca Hoyle	Co-Ordinates () E: 529312.60 N: 187833.84	Ground Level (m) 74.277

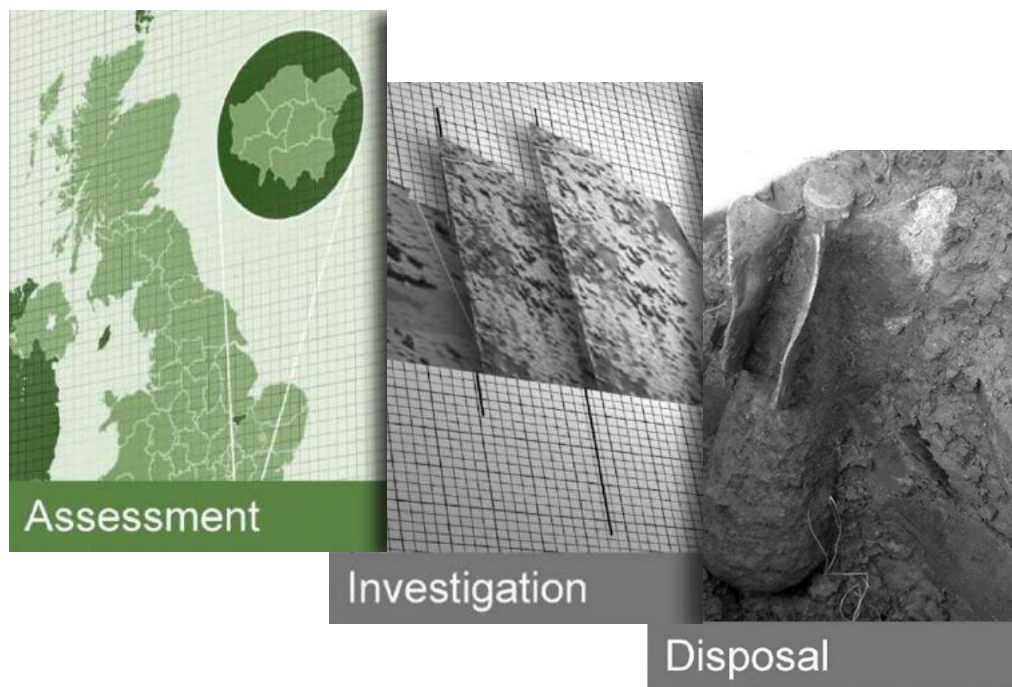
SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (m)	Depth (Thickness)	Description	Legend	Geology	Install / Backfill
0.30-0.60	ES						73.98	0.30	Brownish black organic gravelly clayey fine to coarse SAND with frequent roots and rootlets. Gravel is very angular to well rounded fine to coarse of brick and flint (TOPSOIL)		TS	
							73.78	0.50				
							73.48	0.80				
							73.18	1.10				
							(0.60)					
2.00-2.50	ES						72.58	1.70	MADE GROUND comprising: Hard reddish brown very gravelly slightly sandy clay. Gravel is very angular to subangular fine and medium of brick. Stiff brown mottled grey slightly sandy CLAY. (REWORKED GROUND)		RT	
									Very stiff brown mottled grey slightly gravelly slightly sandy CLAY. Gravel is subangular fine of flint. (REWORKED GROUND)		RT	
									Hard orangish brown mottled pale grey CLAY. (REWORKED GROUND)		RT	
							69.38	4.90	Dark brown organic clayey fine to coarse SAND with frequent rootlets. (RELICT TOPSOIL)		TS	
							69.28	5.00				
Reached scheduled depth												

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Dpt	Dia. (mm)	Water Dpt	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks 1. Exploratory hole location cleared of services by GPR and CAT before excavation; 2. Hand excavated service inspection pit GL to 1.50 m BGL; 3. No groundwater encountered; 4. No olfactory evidence of contamination.					
From	To	Hours	Tool	From	To						
Scale 1:62.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

Appendix E

UXO DESK STUDY





Stanhope Road, Hornsey - UXO Desk Study & Risk Assessment

Drafted by William Holford
Checked by Joe Lingard
Authorised by Stefan Lang

Document Title UXO Desk Study & Risk Assessment
Document Ref. P11633-22-R1
Revision A
Project Location Stanhope Road, Hornsey
Client WSP
Date 31st March 2022

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UXO DESK STUDY & RISK ASSESSMENT

EXECUTIVE SUMMARY

Key findings: No significant sources of Unexploded Ordnance (UXO) hazard have been identified.

Key actions: Proceed with works.

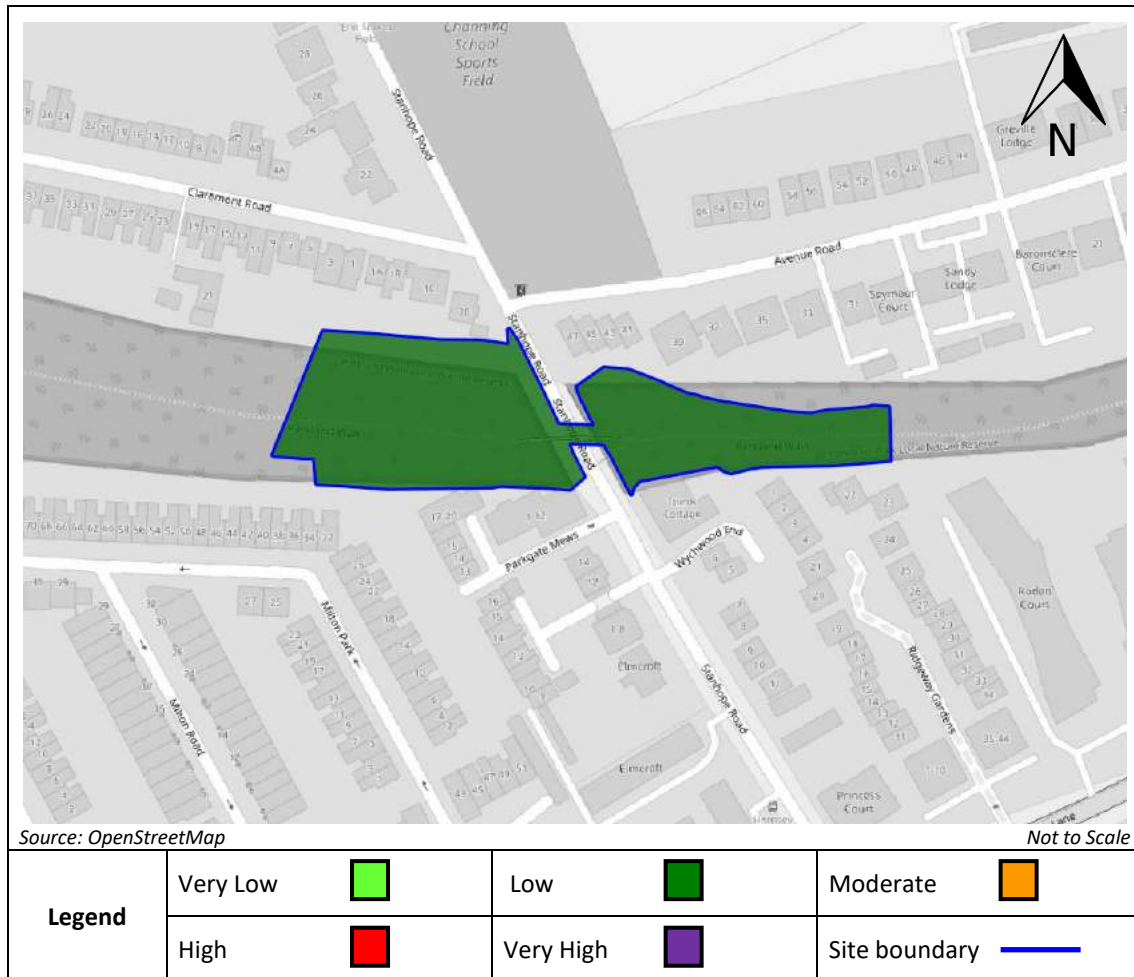
UXO Hazard Assessment

No records have been found indicating that the Site was bombed and no other significant sources of UXO hazard have been identified on the Site.

Given this, it is considered that the Site has a low UXO hazard level, as shown in the following Figure, reproduced as Figure 4 in the main report.

The UXO hazard zone plan of the Site is also given in the accompanying P11633-22-R1-MAP01-A.

UXO hazard zone plan of the Site



The main findings of the report are summarised below.

- No records of bombing or military activity on the Site during World War One (WWI) have been found.
- During World War Two (WWII) the main strategic targets in the vicinity of the Site included docks wharves and warehouses along the River Thames, industries important to the war effort and major transport infrastructure and public utilities.

- No records have been found indicating that the Site was bombed during WWII. Records indicate the nearest High Explosive (HE) bomb fell approximately 0.1km northwest of the Site on the 21st October 1940.
- No records of military activity on the Site post-WWII have been found.

Data Confidence Level

The findings of this report were based on good corroborative evidence of the military activity and bombing on the Site.

Proposed Works

Works on the Site are associated with the replacement of a footbridge.

The bridge will be supported on piled foundations and the existing railway embankment will be regraded and ramps and stairs constructed for access.

Risk Assessment

The Table below, reproduced as Table 4 in the main report, provides a UXO risk assessment for the proposed works on the Site.

Further details on the methodology for the risk assessment are provided in Section 7.2 of the main report.

UXO risk assessment for the Site

Potential UXO Hazard	Anticipated Works	PE	PD	P = PE x PD	Likelihood	Severity	Risk Rating	UXO Risk
UXB	Shallow Excavations	1	1	1	1	5	5	Low
	Deep Excavations	1	1	1	1	5	5	Low
	Piling	1	1	1	1	4	4	Low
Other UXO	Shallow Excavations	1	1	1	1	4	4	Low
	Deep Excavations	1	1	1	1	4	4	Low
	Piling	1	1	1	1	3	3	Low
PE (Probability of Encounter), PD (Probability of Detonation), P (Overall Probability)								
Shallow Excavations defined as <1.0m below ground level (bgl.)								

Risk Mitigation Plan

The Table below, reproduced as Table 5 in the main report, summarises the UXO risk for proposed works on the Site and recommended actions.

Summary of UXO risk and mitigation recommendations

Proposed Works	UXO Risk	Recommended Mitigation
Excavations		Proceed with works – if additional comfort is required to address the residual UXO hazard, a formal UXO awareness briefing can be provided.
Piling		Proceed with works

In summary, no additional measures are considered essential to reduce the UXO risk on the Site to As Low As is Reasonably Practicable (ALARP).

What Do I Do Next?

If you have any comments or require further assistance, contact us via phone (01993 886682) or email (uxo@zetica.com) and we can help.

If you have requirements to identify other buried hazards (such as mapping utilities or obstructions) we can provide these surveys.

If proposed works on the Site change, or additional works are planned, contact Zetica for a re-assessment of the UXO risk and the risk mitigation requirements.

CONTENTS

EXECUTIVE SUMMARY

ABBREVIATIONS 7

1 INTRODUCTION 8

- 1.1 Project Outline
- 1.2 Sources of Information
- 1.3 Data Confidence Level

2 THE SITE 10

- 2.1 Site Location

3 MILITARY ACTIVITY 12

- 3.1 Defences
- 3.2 Military Airfields
- 3.3 Aircraft Crashes
- 3.4 Explosives Factories, Munitions Depots and Disposal Areas
- 3.5 Firing Ranges and Military Training Areas
- 3.6 Other Military Establishments

4 BOMBING 15

- 4.1 WWI Bombing
- 4.2 WWII Bombing

5 EXPLOSIVE ORDNANCE CLEARANCE ACTIVITIES 22

- 5.1 Abandoned Bombs
- 5.2 EOC Tasks

6 UXO HAZARD ASSESSMENT 23

- 6.1 UXO Hazard Level

7 UXO RISK ASSESSMENT 24

- 7.1 Proposed Works
- 7.2 Risk Assessment Methodology
- 7.3 UXO Risk Level

8 RISK MITIGATION PLAN 26

- 8.1 UXO Risk Summary
- 8.2 Risk Mitigation Techniques
- 8.3 What Do I Do Next?

APPENDICES 28

- Appendix 1 Anticipated Ordnance Types
- Appendix 2 Sources of UXO Hazard
- Appendix 3 Recent UXO Finds
- Appendix 4 Glossary and Definitions

Appendix 5 WWII Bombing Incident List

Appendix 6 Bibliography

Figures, Plates & Tables

Figure 1 Site location map	10
Figure 2 Compiled bomb impact map for the vicinity of the Site	18
Figure 3 Extract from the Middlesex Bomb Damage Map	19
Figure 4 UXO hazard zone plan of the Site	23
Plate 1 Recent aerial photograph of the Site	11
Plate 2 Luftwaffe target photograph of Hornsey, 3 rd September 1939	16
Plate 3 Aerial photograph, 10 th April 1946.....	20
Table 1 Bombing statistics	17
Table 2 Estimated average maximum bomb penetration depths (rail ballast).....	21
Table 3 Estimated average maximum bomb penetration depths (open ground)	21
Table 4 UXO risk assessment for the Site.....	25
Table 5 Summary of UXO risk and mitigation recommendations.....	26

Accompanying GIS Data

P11633-22-R1-MAP01-A (UXO Desk Study)

ABBREVIATIONS

AA	Anti-Aircraft
ALARP	As Low As Reasonably Practicable
ARP	Air Raid Precaution
AXO	Abandoned Explosive Ordnance
BD	Bomb Disposal
BDO	Bomb Disposal Officer
BDU	Bomb Disposal Unit
CMD	Conventional Munitions Disposal
DAB	Delayed Action Bomb
DCLG	Department of Communities and Local Government
EO	Explosive Ordnance
EOC	Explosive Ordnance Clearance
EOR	Explosive Ordnance Reconnaissance
ERW	Explosive Remnants of War
ESA	Explosive Substances and Articles
FFE	Free From Explosives
HAA	Heavy Anti-Aircraft
HE	High Explosive
HSE	Health and Safety Executive
IB	Incendiary Bomb
IED	Improvised Explosive Device
IEDD	Improvised Explosive Device Disposal
JSEODOC	Joint Services EOD Operations Centre
LAA	Light Anti-Aircraft
MoD	Ministry of Defence
OB	Oil Bomb
PM	Parachute Mine
PUCA	Pick Up and Carry Away
RAF	Royal Air Force
RFC	Royal Flying Corps
TEP	Time Expired Pyrotechnics
UXAA	Unexploded Anti-Aircraft
UXB	Unexploded Bomb
UXO	Unexploded Ordnance
WWI	World War One
WWII	World War Two

UXO DESK STUDY & RISK ASSESSMENT

Please read: Zetica has colour coded each paragraph. Paragraphs with black text on a white background are paragraphs that provide site-specific information or information specifically researched as part of this project.

Boxed paragraphs in a dark green text with a green background are paragraphs providing general information and, where appropriate, links to online resources giving further detail. These are all available at www.zeticauxo.com. If you cannot gain access to these resources, Zetica can forward them on request.

1 INTRODUCTION

1.1 Project Outline

Zetica Ltd was commissioned by WSP to carry out a detailed Unexploded Ordnance (UXO) Desk Study and Risk Assessment for an area of approximately 0.8 hectares (ha) along the Parkland Walk in the London Borough of Haringey (the 'Site').

The aim of this report is to gain a fair and representative view of the UXO hazard for the Site and its immediate surrounding area in accordance with the Construction Industry Research and Information Association (CIRIA) C681 'Unexploded Ordnance (UXO), a Guide for the Construction Industry'.

Where appropriate, this hazard assessment includes:

- Likelihood of ordnance being present.
- Type of ordnance (size, filling, fuze mechanisms).
- Quantity of ordnance.
- Potential for live ordnance.
- Probable location.
- Ordnance condition.

It should be noted that some military activity providing a source of UXO hazard may not be recorded and therefore there cannot be any guarantee that all UXO hazards affecting the Site have been identified in this report.

1.2 Sources of Information

Zetica Ltd researched the military history of the Site and its surrounding area using a range of information sources. The main sources of information are detailed in the following sections and referenced at the end of this report.

1.2.1 Zetica Ltd Defence Related Site Records

Zetica Ltd's in-house records were consulted, including reference books and archived materials from past work in the region. Relevant documents have been cited within the bibliography of this report.

1.2.2 Zetica Ltd Bombing Density Records and Maps

Reference has been made to the Zetica Ltd bomb risk maps located on Zetica's website (<http://zeticauxo.com/downloads-and-resources/risk-maps/>)

1.2.3 Ministry of Defence and Government Records

Government departments and units within the Ministry of Defence (MoD) were approached for information of past and present military activity in the area. These included the Department of Communities and Local Government (DCLG) records of abandoned bombs.

1.2.4 Other Historical Records, Maps and Drawings

Numerous reference documents including historical maps, aerial photographs and drawings have been consulted from sources such as the National Archives, the US National Archives & Records Administration (NARA), the Imperial War Museum (IWM), Historic England and the Defence of Britain Project.

The British Geological Survey (BGS) was consulted for borehole information.

1.2.5 Local Authority Records

Information was obtained from Haringey Borough Council and Islington Borough Council.

1.2.6 Local Record Offices and Libraries

Haringey Archive Service and Islington Local History Centre were consulted for records.

1.2.7 Local Historical and Other Groups

Local history groups and archaeological bodies were consulted, including the Greater London Historic Environment Record (HER).

1.3 Data Confidence Level

In general, there is a high level of confidence in the researched information sources used for this report. Exceptions to this are specifically detailed in the text of the report.

2 THE SITE

2.1 Site Location

The Site is centred on Ordnance Survey National Grid Reference (OSNGR) TQ 293878. It is located approximately 7km north of central London.

The Site comprises open land and 1No. bridge. It is bounded to the north and south by residential property and to the east and west by the Parkland Walk Nature Reserve.

Figure 1 is a Site location map and Plate 1 is a recent aerial photograph of the Site.

Figure 1 Site location map

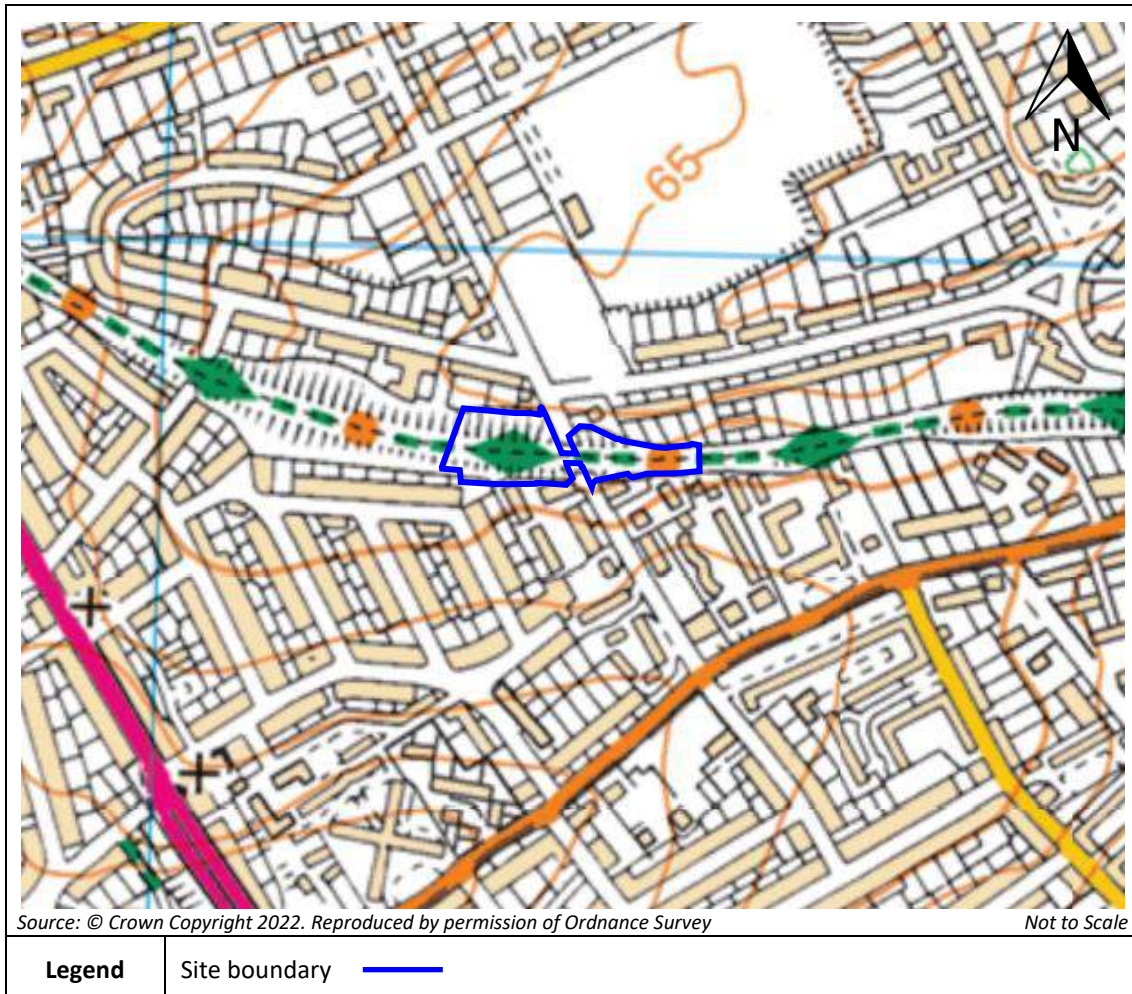


Plate 1 Recent aerial photograph of the Site



Source: Google Earth

Not to Scale

Legend

Site boundary —

3 MILITARY ACTIVITY

The following sections outline the recorded military activity in the vicinity of the Site. The potential UXO hazard from WWI and WWII bombing is detailed in Section 4.

Each sub-section provides hyperlinks to further information on potential sources of UXO hazard. These are also available at www.zeticauxo.com. If you cannot gain access to these resources, Zetica can forward them on request.

3.1 Defences

For further information on military defences, and the potential UXO hazards associated with them, follow the links below:

- [Anti-Aircraft Guns](#)
- [Anti-Invasion Defences](#)
- [Barrage Balloons](#)
- [Bombing Decoys](#)
- [Home Guard](#)
- [Mined Locations](#)
- [Mortar & Gun Emplacements](#)
- [Pillboxes](#)

No military defences have been identified on the Site. The nearest are described below.

3.1.1 Anti-Aircraft Guns

During WWI there were 23No. Anti-Aircraft (AA) batteries within 10km of the Site. The nearest was located at Finsbury Park (TQ 316874), approximately 2.4km southeast of the Site. It was armed with 1No. 3-inch (") gun.

During WWII there were 26No. Heavy AA (HAA) and ZAA batteries within 10km of the Site. The nearest was located at Hampstead Heath (TQ 277864), approximately 2.2km southwest of the Site. It was armed with 64No. Unrotated Projectiles (UP).

The nearest recorded WWII AA shell incidents to the Site are described below.

23rd September 1940

1No. AA shell fell on 8 Hornsey Lane, approximately 0.2km southeast of the Site. This was recorded as an Unexploded AA (UXAA) shell.

17th January 1943

1No. AA shell fell on Stanhope Road, approximately 0.1km south of the Site.

2nd September 1943

1No. AA shell fell on 53 Hornsey Lane Gardens, approximately 0.3km southwest of the Site. This was recorded as an UXAA shell.

Potential UXO Hazard

Given the number of HAA gun batteries in the surrounding area during WWII, the potential for a UXAA shell to have fallen on the Site unnoticed, whilst unlikely, cannot be totally discounted.

3.1.2 Bombing Decoys

The nearest recorded bombing decoy was located at Barnet (TQ 234980), approximately 11.9km northwest of the Site.

Bombing decoys are not considered to provide a source of UXO hazard to the Site.

3.2 Military Airfields

For further information on military airfields, and the potential UXO hazards associated with them, follow the link below:

- [Military Airfields](#)

No records of any military airfields on or in close proximity to the Site have been found.

During WWI, there was an airfield at Cricklewood (TQ 238870), approximately 5.5km west of the Site. Cricklewood was a factory airfield for the Handley Page company, an important manufacturer of British military and civilian aircraft. It closed in 1930.

During WWII the nearest operational airfield was Royal Air Force (RAF) Hendon (TQ 215905), approximately 7.7km northwest of the Site. Hendon served as a base for fighter squadrons, as well as transport and communications aircraft during WWII.

RAF Hendon continued in use until its closure in 1957. It is currently the site of the RAF Museum.

Military airfields are not considered to provide a source of UXO hazard to the Site.

3.3 Aircraft Crashes

For further information on military aircraft crashes, and the potential UXO hazards associated with them, follow the link below:

- [Aircraft Crashes](#)

No records of any aircraft crashes on or in close proximity to the Site have been found.

3.4 Explosives Factories, Munitions Depots and Disposal Areas

For further information on explosives factories, munitions depots and disposal areas, and the potential UXO hazards associated with them, follow the links below:

- [Explosives Factories](#)
- [Munitions Depots](#)
- [Munitions Disposal Areas](#)

No records of any explosives factories, munitions depots or munitions disposal areas on or in close proximity to the Site have been found.

3.5 Firing Ranges and Military Training Areas

For further information on firing ranges and military training areas, and the potential UXO hazards associated with them, follow the links below:

- [Artillery Ranges](#)
- [Bombing Ranges](#)
- [Military Training Areas](#)

- Small Arms Ranges

No records of any firing ranges or military training areas on or in close proximity to the Site have been found.

3.6 Other Military Establishments

No other military establishments have been identified on or in close proximity to the Site.

4 BOMBING

4.1 WWI Bombing

For further information on WWI bombing in the UK, and the potential UXO hazard associated with it, see Appendix 2.1. Alternatively, use the following link.

- [WWI Bombing](#)

No records have been found indicating that the Site was bombed during WWI.

4.2 WWII Bombing

For further information on WWII bombing in the UK, and the potential UXO hazard associated with it, see Appendix 2.2. Alternatively, use the following link.

- [WWII Bombing](#)

No records have been found indicating that the Site was bombed during WWII. Details of WWII bombing in the vicinity of the Site are provided in the following sections.

4.2.1 Bombing in North London

From prior to the declaration of war in 1939, Britain was subject to reconnaissance flights by the Luftwaffe which was building up a photographic record of potential targets. London was the principal target of Luftwaffe bombing during the Blitz. The first air raid of the Blitz on London took place on the 7th September 1940 when a large German force bombed the docks and surrounding areas.

The aim was to paralyse the commercial life of the capital by bombing the docks, warehouses, wharves, railway lines, factories and power stations of the East End. The Port of London was the most heavily bombed civilian target in the UK.

From mid-September until the end of that year, London was raided on all but 3No. nights. The raids continued through the early months of 1941 becoming less frequent, although often more intense. Heavier bombs, including Parachute Mines (PMs) and Oil Bombs (OBs), were now used and major incendiary raids on the 29th December 1940 and the 10th May 1941 caused widespread fire damage across the city.

From July 1941 the bombing campaign against London entered a period of relative inactivity. Raids still took place but tended to be relatively minor in severity. Manned bomber raids returned to London in the first four months of 1944 and, after a brief respite, were followed by the start of the V1 (Pilotless Aircraft) offensive against the capital in June 1944.

These weapons arrived at any time of day and caused massive blast damage (although little fire damage). The V1 offensive on London was all but over by September 1944, although some V1s continued to fall on the capital until March 1945.

In September 1944 the V2 (Long Range Rocket) offensive on London began. Falling from a height of some 50 miles (80km) above the city, these ballistic missiles caused larger craters and greater damage to underground utilities than the V1s, but their surface blast effect was generally less.

Heavy air raids in the region were largely concentrated against central London, approximately south of the Site, with bombing densities generally decreasing towards the residential suburbs of north London.

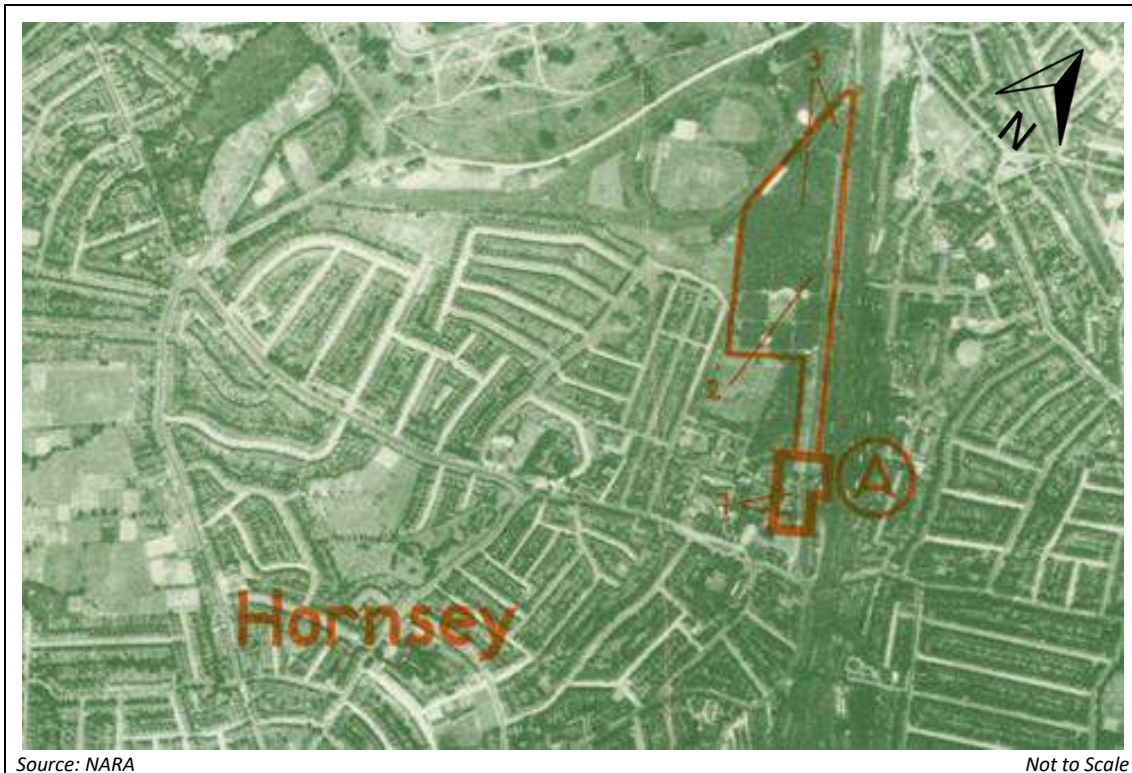
4.2.2 Strategic Targets

The Site was located in an area which contained numerous potential strategic targets, including docks, wharves and warehouses along the River Thames, industries important to the war effort and major transport infrastructure and public utilities.

Plate 2 is a Luftwaffe target photograph of Hornsey, dated the 3rd September 1939.

This shows Hornsey Waterworks (Target A), located approximately 2.5km northeast of the Site. It also identifies pumphouses (1), filter pools (2), and collection pools (3).

Plate 2 Luftwaffe target photograph of Hornsey, 3rd September 1939



4.2.3 Bombing Densities and Incidents

Table 1 gives details of the overall bombing statistics recorded for the Local Authority Districts of the Site (highlighted by bold text) and surrounding districts. These were categorised as Rural Districts (RD), Urban Districts (UD), Municipal or Metropolitan Boroughs (MB) and County Boroughs (CB). WWII bomb density levels are defined below:

<5 bombs per 405ha is a Very Low regional bombing density.

5-15 bombs per 405ha is Low.

15-50 bombs per 405ha is Moderate.

50-250 bombs per 405ha is High.

>250 bombs per 405ha is Very High.

Table 1 Bombing statistics

Area	Bombs Recorded				Bombs per 405ha (1000 acres)
	High Explosive	Parachute Mines	Other	Total	
Hornsey MB	292	9	28	329	114.6
Stoke Newington MB	193	9	21	223	258.1
St. Pancras MB	641	8	14	663	246.1
Islington MB	568	7	24	599	193.7
Hampstead MB	321	7	31	358	158.1
Wood Green MB	176	0	19	195	121.3
Tottenham MB	283	4	18	305	101.2
Friern Barnet UD	101	1	4	106	79.1
Finchley MB	220	4	11	235	67.6

Note that Table 1 excludes the figures for V1s, V2s and Incendiary Bombs (IBs). Discrepancies between this list and other records, such as bomb clearance records, demonstrate that this data is likely to under-represent actual bombing.

Details of the nearest recorded bombing incidents to the Site are given in the following section. Appendix 5 provides further details of recorded bombing incidents in the immediate vicinity of the Site.

30th September 1940

Several IBs fell on Stanhope Road, within approximately 0.1km north of the Site.

Several IBs fell on Avenue Road, within approximately 0.1km north of the Site.

Several IBs fell on Claremont Road, within approximately 0.1km northwest of the Site.

21st October 1940

1No. HE bomb fell on Claremont Road, approximately 0.1km northwest of the Site.

22nd October 1940

1No. Delayed Action Bomb (DAB) fell on Claremont Road, approximately 0.1km northwest of the Site.

28th October 1940

Several IBs fell on Hornsey Lane and Milton Road, within approximately 0.1km southwest of the Site.

Date unspecified

1No. HE bomb fell on Stanhope Road, approximately 0.1km south of the Site.

It should be noted that during WWII, many Unexploded Bombs (UXBs) were mapped and subsequently removed as and when conditions and demands on Bomb Disposal teams allowed. Their removal was not always accurately recorded and sometimes records were later destroyed. In practice, most UXB were probably removed and only a much smaller number were actually registered as officially abandoned bombs.

Figure 2 is a map showing the approximate location of recorded bomb impacts in the immediate vicinity of the Site. IBs shown are indicative of larger numbers of similar devices that fell within the given area.

The map has been compiled from a number of different sources, including air raid incident reports, historical aerial photographs and bomb census maps.

The bomb map is also given in the accompanying P11633-22-R1-MAP01-A.

Figure 2 Compiled bomb impact map for the vicinity of the Site

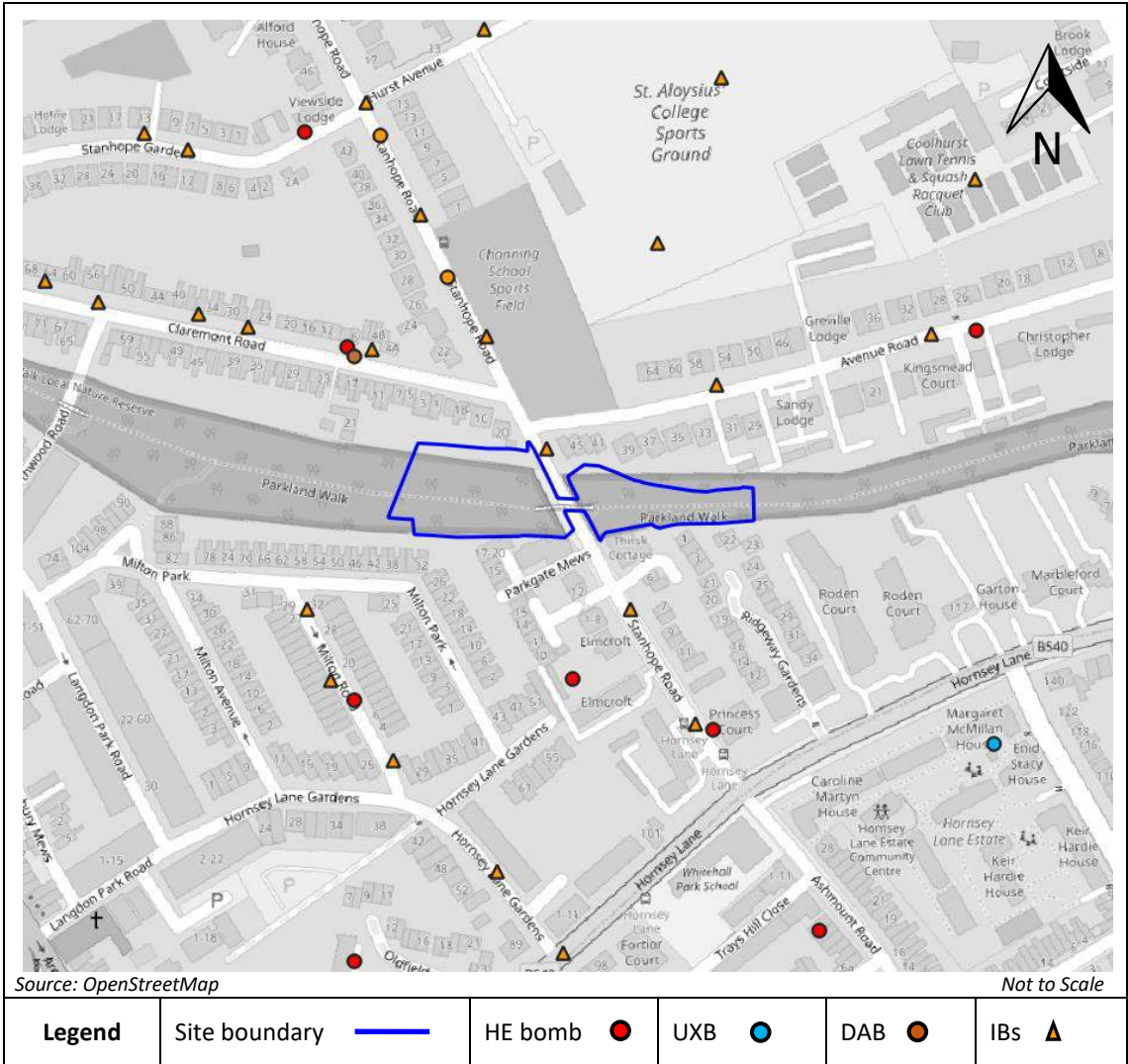
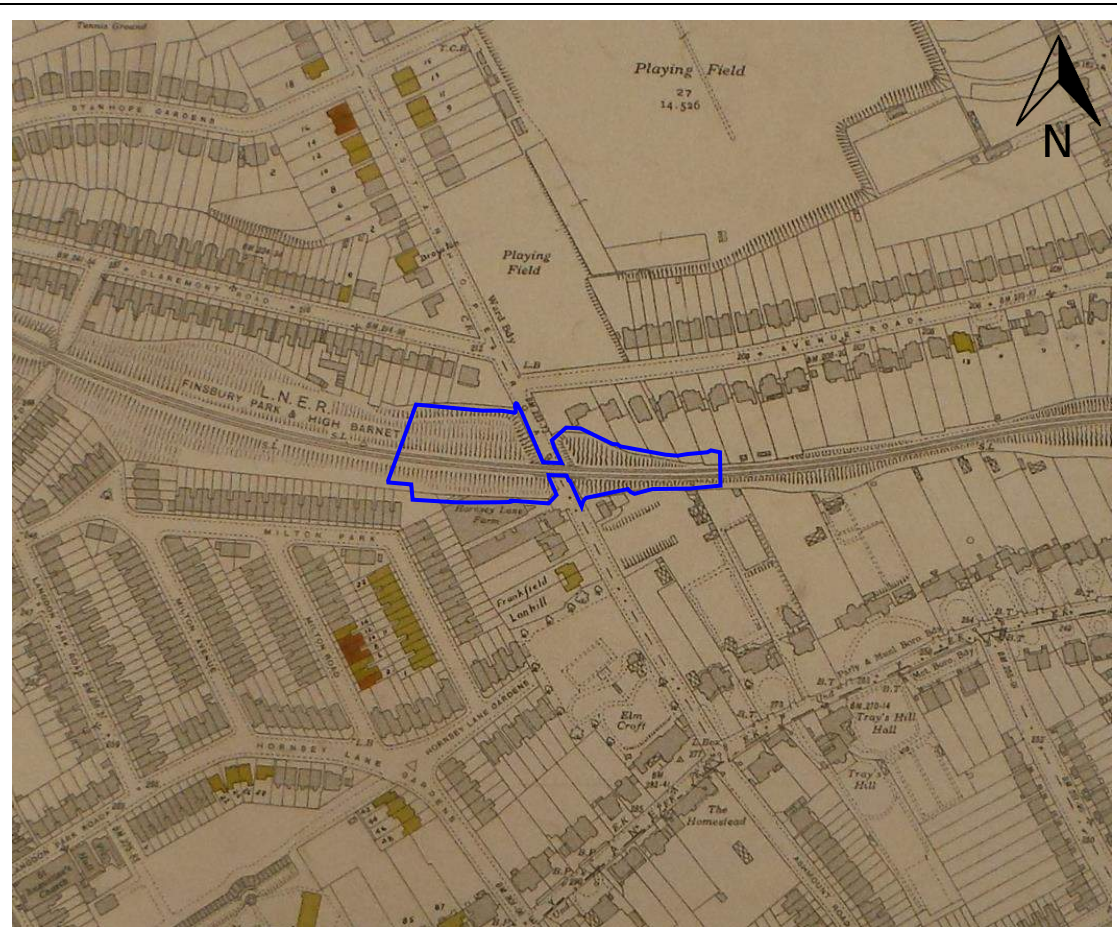


Figure 3 is an extract from the Middlesex Bomb Damage map, compiled at the end of WWII, on which the colouring denotes the severity of damage to buildings. Yellow equates to blast damage, orange to moderate damage, and red to severe damage.

No bomb damage is shown on the Site. Some blast damage can be seen to houses in the vicinity of the Site.

Figure 3 Extract from the Middlesex Bomb Damage Map



Source: Middlesex County Council

Not to Scale

Legend

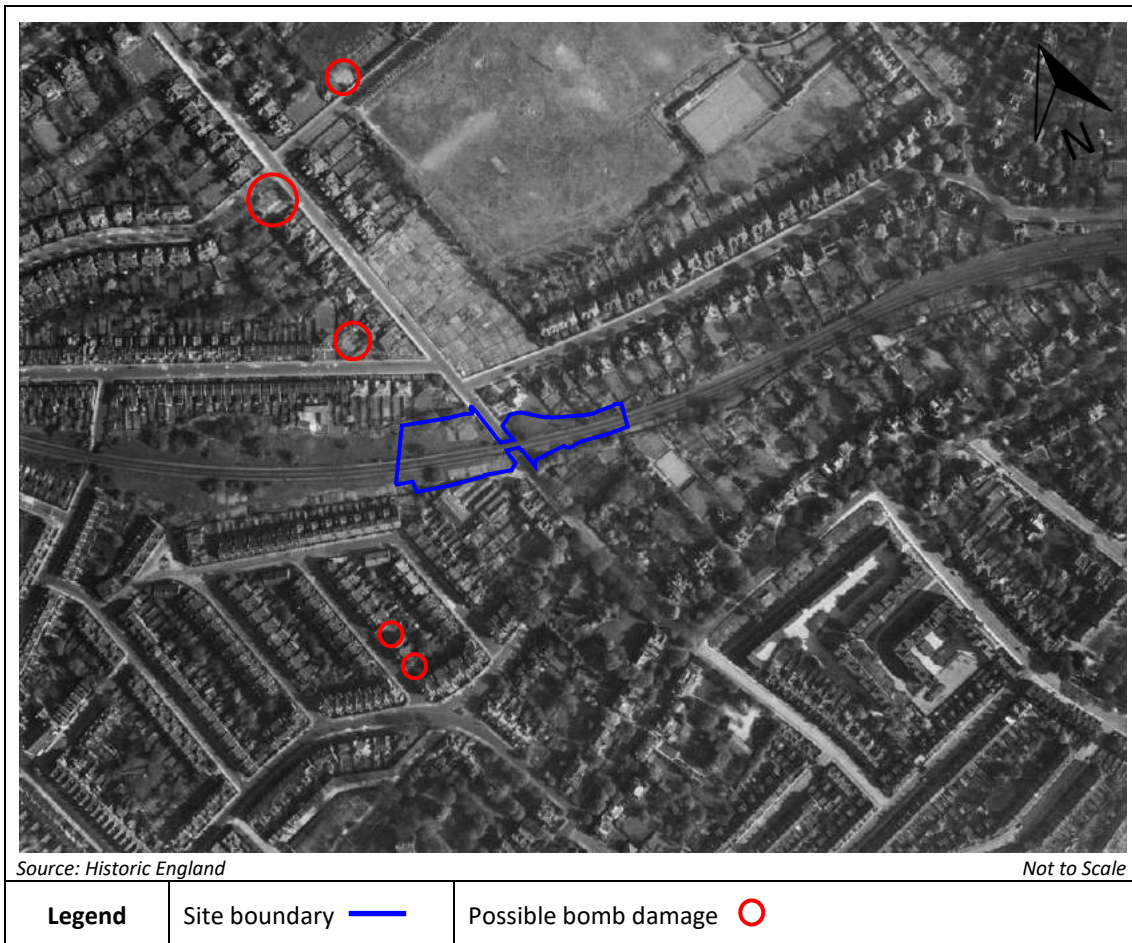
Site boundary



Plate 3 is an aerial photograph dated the 10th April 1946. No bomb damage has been identified on the Site.

Some possible bomb damage has been identified in the vicinity of the Site.

Plate 3 Aerial photograph, 10th April 1946



Potential UXO Hazard

No records have been found indicating that the Site was bombed and no bomb damage has been identified on the Site on historical aerial photography.

WWII bombing is not considered to provide a source of UXO hazard to the Site.

4.2.4 Geology and Bomb Penetration Depths

It is important to consider the geological materials present at the time that a bomb was dropped in order to establish its maximum penetration depth.

British Geological Survey (BGS) 1:50,000 Sheet 256 North London (Bedrock & Superficial) and BGS borehole records from nearby investigations have been consulted to get an indicative overview of the Site geology.

The geology of the Site is understood to consist of open ground, railway ballast, Made Ground, overlying the London Clay Formation.

Table 2 provides an estimate of average maximum bomb penetration depths for the parts of the Site formerly comprising railbed, assuming WWII ground conditions of 1m of rail ballast and 1m of Made Ground (modelled as gravel), overlying more than 20m of stiff clay.

Table 2 Estimated average maximum bomb penetration depths (rail ballast)

Estimated average bomb penetration depths for anticipated geology		
Bomb Weight	50kg	3.0m
	250kg	5.5m
	500kg	11.0m

Table 3 provides an estimate of average maximum bomb penetration depths for the parts of the Site comprising open ground, assuming WWII ground conditions of top soil, overlying more than 20m of stiff clay.

Table 3 Estimated average maximum bomb penetration depths (open ground)

Estimated average bomb penetration depths for anticipated geology		
Bomb Weight	50kg	5.5m
	250kg	8.0m
	500kg	13.5m

These calculations can be refined on receipt of further Site-specific information.

The estimated bomb penetration depths given in Table 2 and 3 are from the WWII ground level and are based on the following assumptions:

- High level release of the bomb resulting in an impact velocity of 260m/s (>5,000m altitude).
- A strike angle of 10 to 15 degrees to the vertical.
- That the bomb is stable, both in flight and on penetration.
- That no retarding units are fitted to the bomb.
- That the soil type is homogenous.

A high altitude release of a bomb will result in ground entry at between 10° and 15° to the vertical with the bomb travelling on this trajectory until momentum is nearly lost. The bomb will then turn abruptly to the horizontal before coming to rest. The distance between the centre of the entry hole and the centre of the bomb at rest is known as the 'offset'. A marked lateral movement from the original line of entry is common.

Low-level attacks may have an impact angle of 45° or more, which will frequently lead to a much greater amount of offset movement during soil penetration.

The average offset is one third of the penetration depth, i.e. an offset of 2m may be expected for a 50kg bomb in dry silts and clays. If hard standings or Made Ground were present during WWII, bomb penetration depths would have been significantly reduced but offset distances may have been up to four times greater.

5 EXPLOSIVE ORDNANCE CLEARANCE ACTIVITIES

Official UK bombing statistics have been compiled from both British and German sources. There were differences in the way the figures were originally reported and collated which has led to discrepancies in the summary data.

Based on data from 1939 to 1945, War Office statistics indicate that 200,195No. HE bombs exploded within Great Britain. Additionally, 25,195No. HE bombs (representing 11%) were recorded as UXBs. However, records from the Royal Engineers who were responsible for bomb disposal at the time indicate that as of 27th February 1946 upwards of 45,000No. UXBs were disposed of.

On average 8.5% of UXBs later self-exploded. In some cases the bombs had delayed action fuzes or were never intended to explode, their purpose being to cause inconvenience and fear. Given the discrepancy in records and the fact that UXBs are still being found unexpectedly, it is clear that the original figures are understated and provide only an approximation of the number of potential UXBs in the UK.

War Office statistics also show that between October 1940 and May 1941 most of the UXBs (93%) were either 50kg or 250kg. It should be noted that details of the recovery and the size of the UXB were not always accurately reported.

The larger WWII UXBs are often difficult to recover due to both penetration depths and the presence of two or more fuzes, combined with more sensitive fillings of explosive mixtures including Amatol and Trialen.

5.1 Abandoned Bombs

For further information on abandoned bombs, and the potential UXO hazard associated with them, follow the link below:

- [Abandoned Bombs](#)

No records have been found indicating that any officially abandoned bombs are located on the Site.

5.2 EOC Tasks

Zetica holds records of the following post-WWII EOC tasks having taken place in the vicinity of the Site.

2nd October 1969

1No. 1,200kg Unexploded PM (UXPM) was discovered on a building site in Burghley Road, approximately 2km south of the Site. It was made safe and destroyed.

6 UXO HAZARD ASSESSMENT

6.1 UXO Hazard Level

The definitions for the levels of UXO hazard are provided below.

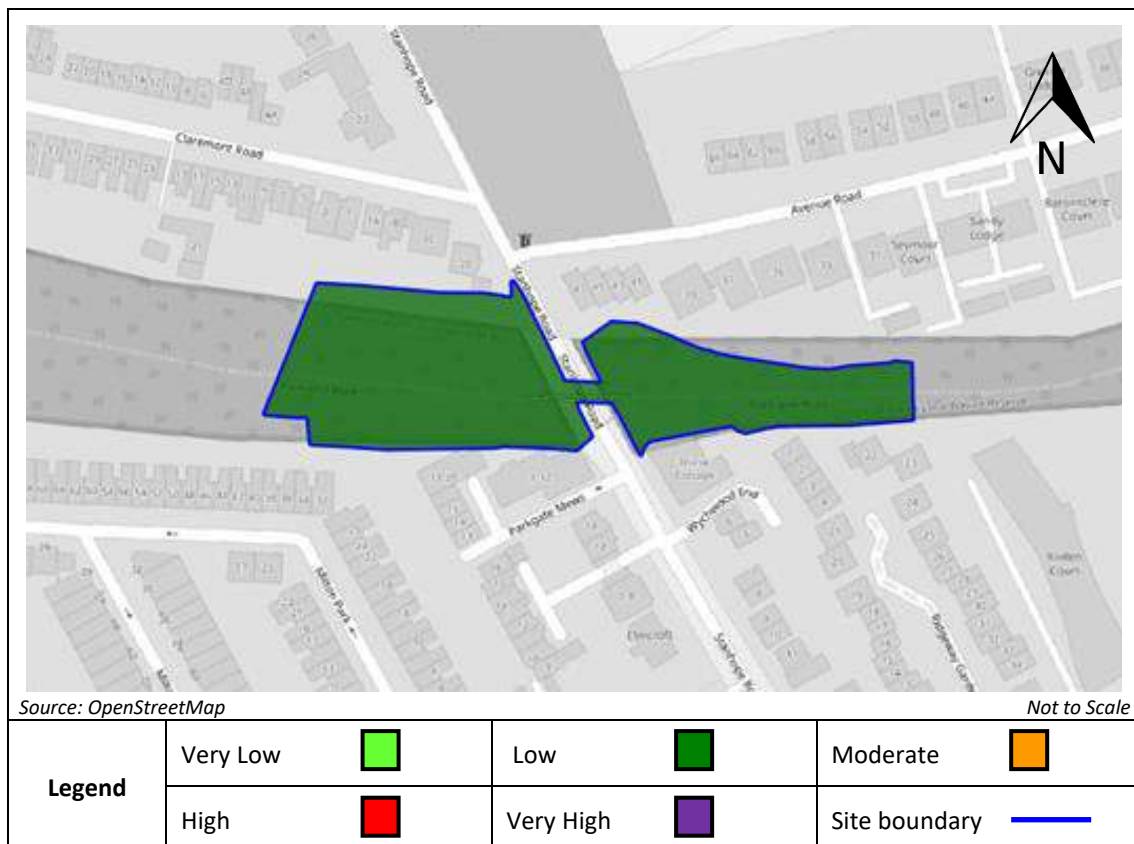
Definitions of UXO Hazard Level for a Site	
Hazard Level	Definition
Very Low	There is positive evidence that UXO is not present, e.g. through physical constraints or removal.
Low	There is no positive evidence that UXO is present, but its occurrence cannot be totally discounted.
Moderate	There is positive evidence that ordnance was present or that other uncharted ordnance may be present as UXO.
High	There is positive evidence that UXO is present.
Very High	As high, but requires immediate or special attention due to the potential hazard.

No records have been found indicating that the Site was bombed and no other significant sources of UXO hazard have been identified on the Site.

Given this, it is considered that the Site has a low UXO hazard level, as shown in Figure 4.

The UXO hazard zone plan of the Site is also given in the accompanying P11633-22-R1-MAP01-A.

Figure 4 UXO hazard zone plan of the Site



7 UXO RISK ASSESSMENT

7.1 Proposed Works

Works on the Site are associated with the replacement of a footbridge.

The bridge will be supported on piled foundations and the existing railway embankment will be regraded and ramps and stairs constructed for access.

7.2 Risk Assessment Methodology

A UXO risk assessment has been undertaken for the proposed works, taking into consideration the identified UXO hazard.

Firstly, the probability of encountering UXO (PE) has been considered and rated for the different construction techniques, as detailed below.

Probability of Encounter (PE)	Rating
Frequent, highly likely, almost certain.	5
Probable, more likely to happen than not.	4
Occasional, increased chance or probability.	3
Remote, unlikely to happen but could.	2
Improbable, highly unlikely.	1
Impossible	0

Secondly, the probability of detonating a UXO (PD) has been considered and rated for the different construction techniques, as detailed below.

Probability of Detonation (PD)	Rating
Frequent, highly likely, almost certain.	5
Probable, more likely to happen than not.	4
Occasional, increased chance or probability.	3
Remote, unlikely to happen but could.	2
Improbable, highly unlikely.	1
Impossible	0

Next, the probability of encountering and detonating the UXO (PE x PD) have been used to generate an overall likelihood rating (P).

P = PE x PD	LIKELIHOOD of Encounter and Detonation	Rating
21 to 25	Frequent, highly likely, almost certain.	5
16 to 20	Probable, more likely to happen than not.	4
6 to 15	Occasional, increased chance or probability.	3
2 to 5	Remote, unlikely to happen but could.	2
1	Improbable, highly unlikely.	1
0	Impossible	0
P ranges from 25, a certainty of UXO being encountered and detonated on the Site by engineering activity, to 0, a certainty that UXO does not occur on the Site and will not be detonated by engineering activity.		

The likelihood of encountering and detonating UXO during site works is multiplied by the severity of such an event occurring (P x S), in order to provide a risk level using the following matrix.

Severity (S)	Rating
Multiple fatalities	5
Major injury, long term health issues, single fatality.	4
Minor injury, short term health issues, no fatalities.	3
First aid case but no lost time or ill health.	2
Minor injuries, no first aid.	1
No injuries.	0

UXO Risk Matrix							
LIKELIHOOD (P)	SEVERITY (S)						
		5	4	3	2	1	0
	5	25	20	15	10	5	0
	4	20	16	12	8	4	0
	3	15	12	9	6	3	0
	2	10	8	6	4	2	0
	1	5	4	3	2	1	0
	0	0	0	0	0	0	0

7.3 UXO Risk Level

The UXO risk assessment for proposed works on the Site is given in Table 4.

Table 4 UXO risk assessment for the Site

Potential UXO Hazard	Anticipated Works	PE	PD	P = PE x PD	Likelihood	Severity	Risk Rating	UXO Risk
UXB	Shallow Excavations	1	1	1	1	5	5	Low
	Deep Excavations	1	1	1	1	5	5	Low
	Piling	1	1	1	1	4	4	Low
Other UXO	Shallow Excavations	1	1	1	1	4	4	Low
	Deep Excavations	1	1	1	1	4	4	Low
	Piling	1	1	1	1	3	3	Low
PE (Probability of Encounter), PD (Probability of Detonation), P (Overall Probability)								
Shallow Excavations defined as <1.0m below ground level (bgl.)								

8 RISK MITIGATION PLAN

Key findings: No significant sources of UXO hazard have been identified.

Key actions: Proceed with works.

8.1 UXO Risk Summary

Table 5 summarises the UXO risk for proposed works on the Site and recommended actions.

Table 5 Summary of UXO risk and mitigation recommendations

Proposed Works	UXO Risk	Recommended Mitigation
Excavations		Proceed with works – if additional comfort is required to address the residual UXO hazard, a formal UXO awareness briefing can be provided.
Piling		Proceed with works

In summary, no additional measures are considered essential to reduce the UXO risk on the Site to As Low As is Reasonably Practicable (ALARP).

8.2 Risk Mitigation Techniques

Should you wish to provide staff involved in excavations with increased awareness regarding the potential (albeit low) for UXO encounter, this can be done through a formal briefing.

8.2.1 UXO Awareness Briefing

Typically ~1hour in duration, these briefings will be expected to provide site workers with:-

- Background to the potential UXO hazards that could be encountered.
- Awareness of how the UXO hazard could present a risk.
- Knowledge of what to do in the event that a suspect item is encountered.

The briefing is to be provided along with back-up materials such as UXO awareness posters, emergency contact numbers and other background information to assist site workers in becoming familiar with what potential UXO can look like.

The materials can also be used by key staff to pass on the relevant points of the induction to others who visit or work on the Site.

By providing the UXO awareness briefing, it ensures that in the unlikely event that UXO is encountered:-

- All site staff take appropriate action.
- A support mechanism and points of contact are established.
- The likelihood of harm to people or property is reduced.
- Significant delays to site work are prevented.

8.3 What Do I Do Next?

If you have any comments or require further assistance, contact us via phone (01993 886682) or email (uxo@zetica.com) and we can help.

If you have requirements to identify other buried hazards (such as mapping utilities or obstructions) we can provide these surveys.

If proposed works on the Site change, or additional works are planned, contact Zetica for a re-assessment of the UXO risk and the risk mitigation requirements.

APPENDICES

Appendix 1 Anticipated Ordnance Types

The probability of encountering UXO on the Site is considered to be low. As with any similar site in the UK, there is always a background risk of finding ordnance and potential types to be encountered are detailed below. For a more comprehensive set of ordnance data sheets, see <http://zeticauxo.com/downloads-and-resources/ordnance-data-sheets/>.

Information Data Sheet

Category Bomb (Luftwaffe)

Type Sprengbombe-Cylindrisch (SC) 50kg

Variants 8

Body Dimensions 762 x 200mm (30" x 7.9")

Weight 55kg (122lbs)

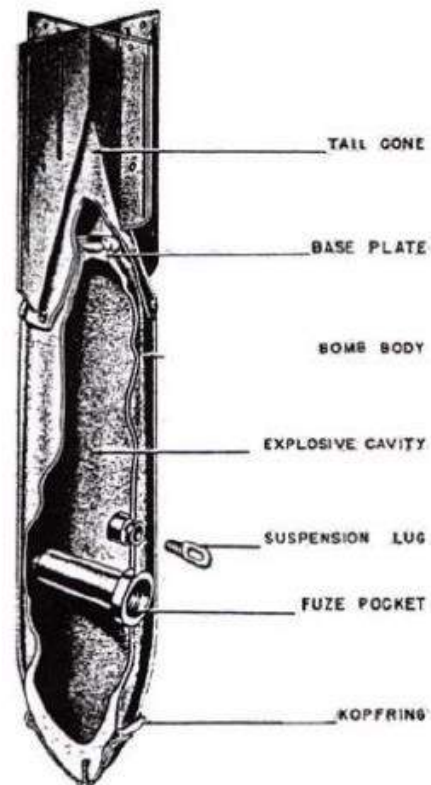
Charge Weight 25kg (54lbs)

Fuze Single electric impact fuze. Some have short time delay

Composition Sheet steel

Description Thick nose welded to a steel body. Nose may be attached to Kopfring (a triangular section steel ring) or spike. Suspension bolt in eye/body and sheet metal tail attached to body with rivets/screws. Originally painted green-grey with a yellow stripe on the tail. Cast TNT, Amatol or Trialen filling.

Function Designed to maximise shock waves through air, water and earth and for general demolition. Used against easily damageable targets, including roads, aircraft hangars, rolling stock and small buildings. Spike bombs/ 'Stabo' (SC 50 with spikes attached to nose) were used against rail lines and country roads, with Kopfring used against naval targets.



Information Data Sheet

Category Bomb
Type Sprengbombe-Cylindrisch (SC) 250kg

Variants 8

Body Dimensions 1194mm x 368mm (47" x 14.5")

Weight 249-264 kg (548-582lbs)

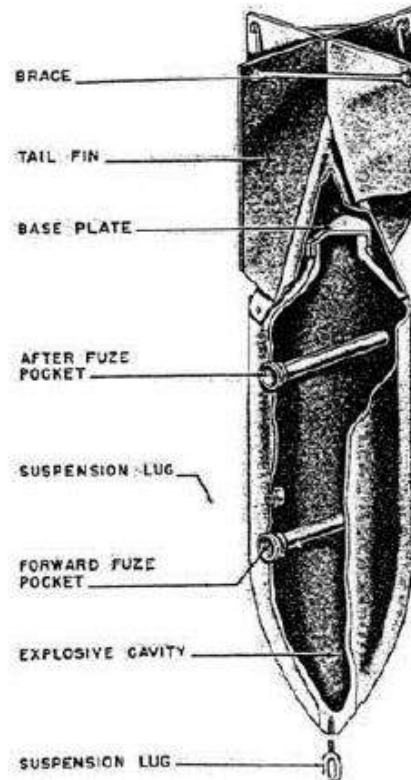
Charge Weight 130-145 kg (287-320lbs)

Fuze Electric impact fuze/electric clockwork time fuse & electric anti-disturbance fuze

Composition Sheet steel with stays

Description Thick nose welded to steel body. Nose may be attached to Kopfring (triangular section steel ring) or spike. Sheet metal tail attached to body with rivets/screws. Suspension eye bolt in the nose/body. Originally painted green-grey with a yellow stripe on the tail. TNT; amatol; TNT and aluminium powder, naphthalene, ammonium nitrate and wax/ wood meal filling.

Function Designed to maximise shock waves through air, water and earth and general demolition. Used against railway installations, large buildings, ammunition depots and below-ground installations (to 8m). Spike bombs/ 'Stabo' (SC 50 with spikes attached to nose) used against rail lines and country roads.



Information Data Sheet

Category Bomb

Type Sprengbombe-Cylindrisch (SC) 500kg

Variants -

Body Dimensions 1414-1486mm x 470mm (55.7-58.5" x 18.5")

Weight 500kg (1,100lbs)

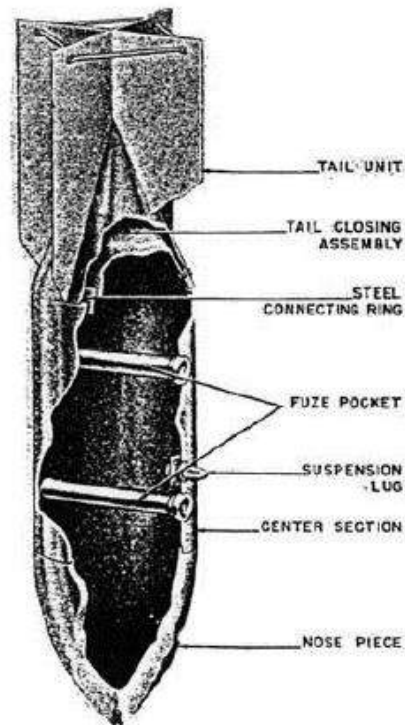
Charge Weight 220kg (484lbs)

Fuze Electric impact fuze/electric clockwork time fuze & electric anti-disturbance fuze.

Composition Sheet steel with stays or drum

Description Thick nose welded to steel body. Nose may be attached to Kopfring (triangular section steel ring). Tail either steel sheet or drum-shaped. Suspension band. Originally painted green-grey/ buff (some later versions sky blue) with yellow stripe on tail. Filled with amatol, TNT or trialen.

Function Designed to maximise shock waves through air, water and earth and for general demolition. Used against railway property, large buildings, shipping and below-ground installations.



Information Data Sheet

Category Bomb

Type Sprengbombe-Cylindrisch (SC) 1,000kg (HERMANN)

Variants 3

Body Dimensions 1742-1905mm x 648-660mm (68.6-75" x 25.5-26")

Weight 1,000-1,088kg (2,204-2,398lbs)

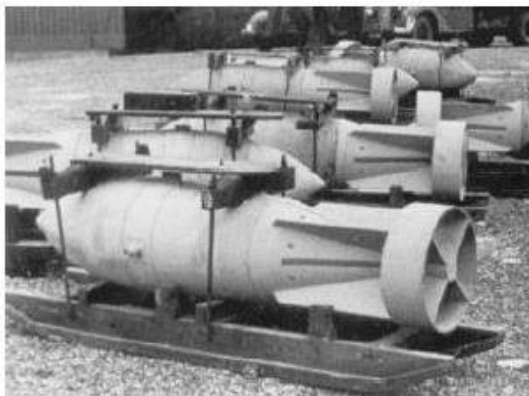
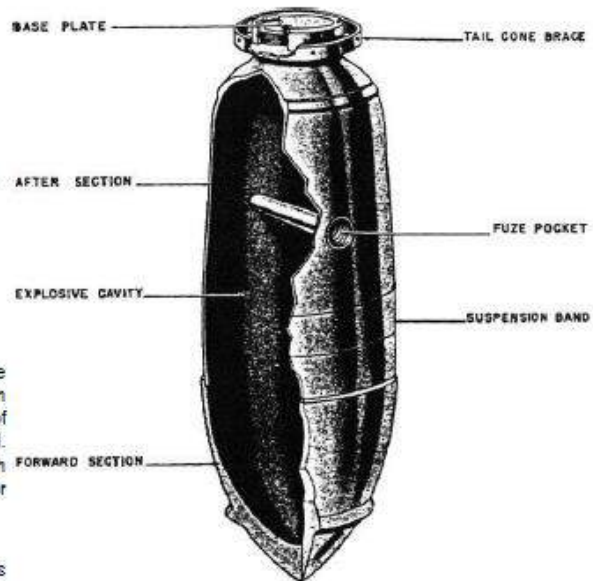
Charge Weight 529-619kg (1,166-1,364lbs)

Fuze Electric impact fuze/ electric clockwork time fuze & electric anti-disturbance fuze

Composition Magnesium alloy with drum

Description Thick nose welded to steel body. Nose attached to Kopfring (triangular section steel ring). Drum-shaped tail made of magnesium alloy. Suspension band. Originally painted sky-blue. Filled with amatol, TNT/aluminium/wood meal or trialen.

Function Designed to maximise shock waves through air, water and earth and for general demolition.



Information Data Sheet

Category Projectile
Type 3.7" Anti-Aircraft Shell

Variants 6

Body Dimensions 94mm x 360mm (3.7 x 14.7")

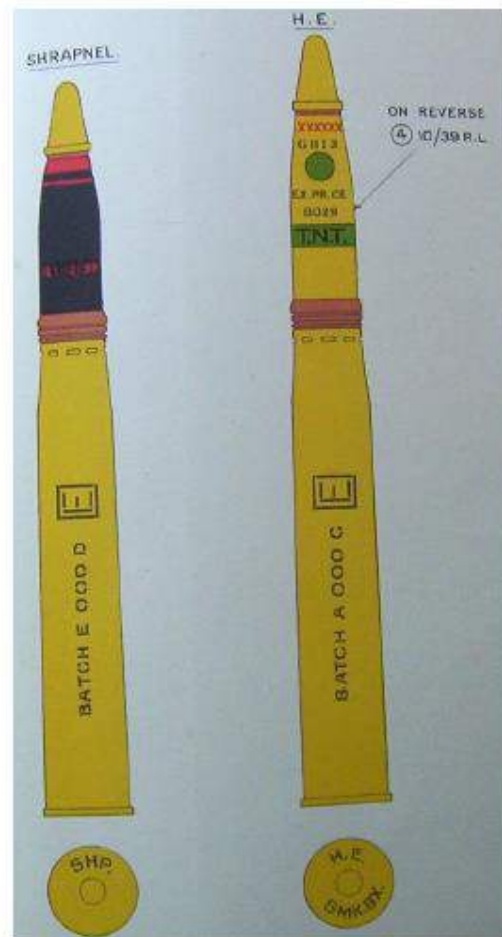
Weight 12.7kg (28lb)

Fuze Mechanical time fuze

Composition Cast steel

Description Brass cartridge case. Square-based shell with tapered nose, filled with Amatol, TNT or RDX/TNT. MK6 had forward centring bands and a wider driving band.

Function Used as a defence against enemy aircraft, fired from fixed batteries and mobile mountings. Could fire approximately 20 rounds per minute with a maximum ceiling of 41,000ft and horizontal range of 20,600 yards.



Information Data Sheet

Category Projectile
Type 4.5" Shell (Mark II – Anti-Aircraft)

Variants -

Body Dimensions 114mm x 566mm (4.5" x 21.9")

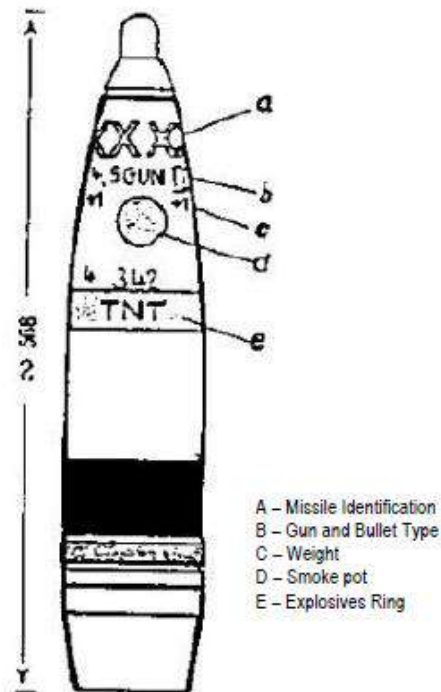
Weight 24.9kg (55lb)

Fuze Mechanical time fuze

Composition Cast steel

Description Square-based, tapered-nosed shell filled with TNT or Amatol. Steel casing, rotating band of either copper or gilding metal located 3.5" in front of the base end with single groove.

Function Used as field artillery and adapted for use in anti-aircraft defence from fixed batteries. Rate of fire of 8 rounds per minute, maximum ceiling of 44,000ft and horizontal range of 22,800 yards.



Appendix 2 Sources of UXO Hazard

The sections below provide background information on the potential sources of UXO hazard (albeit low) affecting the Site. For a more comprehensive set of UXO information sheets, see <http://zeticauxo.com/downloads-and-resources/uxo-information-sheets/>.

Appendix 2.1 WWI Bombing

It is not generally realised that during World War One (WWI) significant bombing took place across some areas of the UK. An estimated 9,000No. German bombs were dropped on Britain during the course of 51No. airship and 52No. aircraft raids. It was the first time that strategic aerial bombardment had been used. More than 1,400No. people were killed during these raids.

Most air raids were carried out on London and Southeast England. Areas along the East Coast were also targeted regularly due to their proximity to the European continent. Bombing raids further inland were rare and West England and Wales were out of reach for German aircraft of the time.

Aerial bombing during WWI initially relied on visual aiming, with bombsights not developed until later in the war. The inaccuracy inherent in this method meant that bombs often fell some way from their intended targets.

The first recorded raid against England occurred on the 21st December 1914 when 2No. high explosive bombs fell near the Admiralty Pier at Dover. Zeppelin raids intensified during 1915 and 1916, with aircraft raids becoming more frequent after 1917. The last raid of WWI took place on the 19th May 1918, when 38 Gotha and 3 Giant aircraft bombed London and surrounding districts, dropping a total of more than 2,500lbs of bombs.



The potential of coming across an Unexploded Bomb (UXB) from WWI is far less likely than a WWII UXB given the lower bombing densities during raids in the Great War.

Some areas which were subjected to sustained bombing raids, such as parts of London and coastal towns, recorded a higher number of UXB. In these areas, where there has been no significant development for the last century, the potential of a UXB remaining from WWI cannot be totally discounted.

Appendix 2.2 WWII Bombing

Bombing raids began in the summer of 1940 and continued until the end of WWII. Bombing densities generally increased towards major cities or strategic targets such as docks, harbours, industrial premises, power stations and airfields. In addition to London, industrial cities and ports, including Birmingham, Coventry, Southampton, Liverpool, Hull and Glasgow, were heavily targeted, as well as seaside towns such as Eastbourne and cathedral cities such as Canterbury.

The German bombing campaign saw the extensive use of both High Explosive (HE) bombs and Incendiary Bombs (IBs). The most common HE bombs were the 50kg and 250kg bombs, although 500kg were also used to a lesser extent. More rarely 1,000kg, 1,400kg and 1,800kg bombs were dropped.

The HE bombs tended to contain about half of their weight in explosives and were fitted with one or sometimes two fuzes. Not all HE bombs were intended to explode on impact. Some contained timing mechanisms where detonation could occur more than 70 hours after impact.

Incendiary devices ranged from small 1kg thermite filled, magnesium bodied Incendiary Bombs (IBs) to a 250kg 'Oil Bomb' (OB) and a 500kg 'C300' IB. In some cases the IBs were fitted with a bursting charge. This exploded after the bomb had been alight for a few minutes causing burning debris to be scattered over a greater area. The C300 bombs were similar in appearance to 500kg HE bombs, although their design was sufficiently different to warrant a specially trained unit of the Royal Engineers to deal with their disposal.



Anti-Personnel (AP) bombs and Parachute Mines (PMs) were also deployed. 2No. types of anti-personnel bombs were in common use, the 2kg and the 12kg bomb. The 2kg bomb could inflict injury across an area up to 150m away from the impact. PMs (which were up to 4m in length) could be detonated either magnetically or by noise/vibration.

Anti-shipping parachute mines were commonly dropped over navigable rivers, dockland areas and coastlines. The Royal Navy was responsible for ensuring that the bombs were made safe. Removal and disposal was still the responsibility of the Bomb Disposal Unit of the Royal Engineers.

In 1944, the Germans introduced new weapons; the V1, a 'flying bomb' and guided missile, and the V2, a ballistic missile rocket that travelled at such speed that no one could see or hear its approach. London was the main target for these attacks.

WWII bomb targeting was inaccurate, especially in the first year of the war. A typical bomb load of 50kg HE bombs mixed with IBs which was aimed at a specific location might not just miss the intended target but fall some considerable distance away.



It is understood that the local Civil Defence authorities in urban areas had a comprehensive system for reporting bomb incidents and dealing with any Unexploded Bombs (UXB) or other UXO. In more rural areas, fewer bombing raids occurred. It is known that Air Raid Precaution (ARP) records under-represent the number and frequency of bombs falling in rural and coastal areas. Bombs were either released over targets or as part of 'tip and run' raids where bomber crews would drop their bombs to avoid anti-aircraft fire or Allied fighter aircraft on the route to and from other strategic targets. Bombs dropped as a result of poor targeting or 'tip and run' raids on rural and coastal areas often went unrecorded or entered as 'fell in open country' or 'fell in the sea'. The Luftwaffe are thought to have dropped approximately 75,000 tons of bombs on Britain throughout the Second World War and an estimated 11% of all bombs dropped during the war failed to detonate.

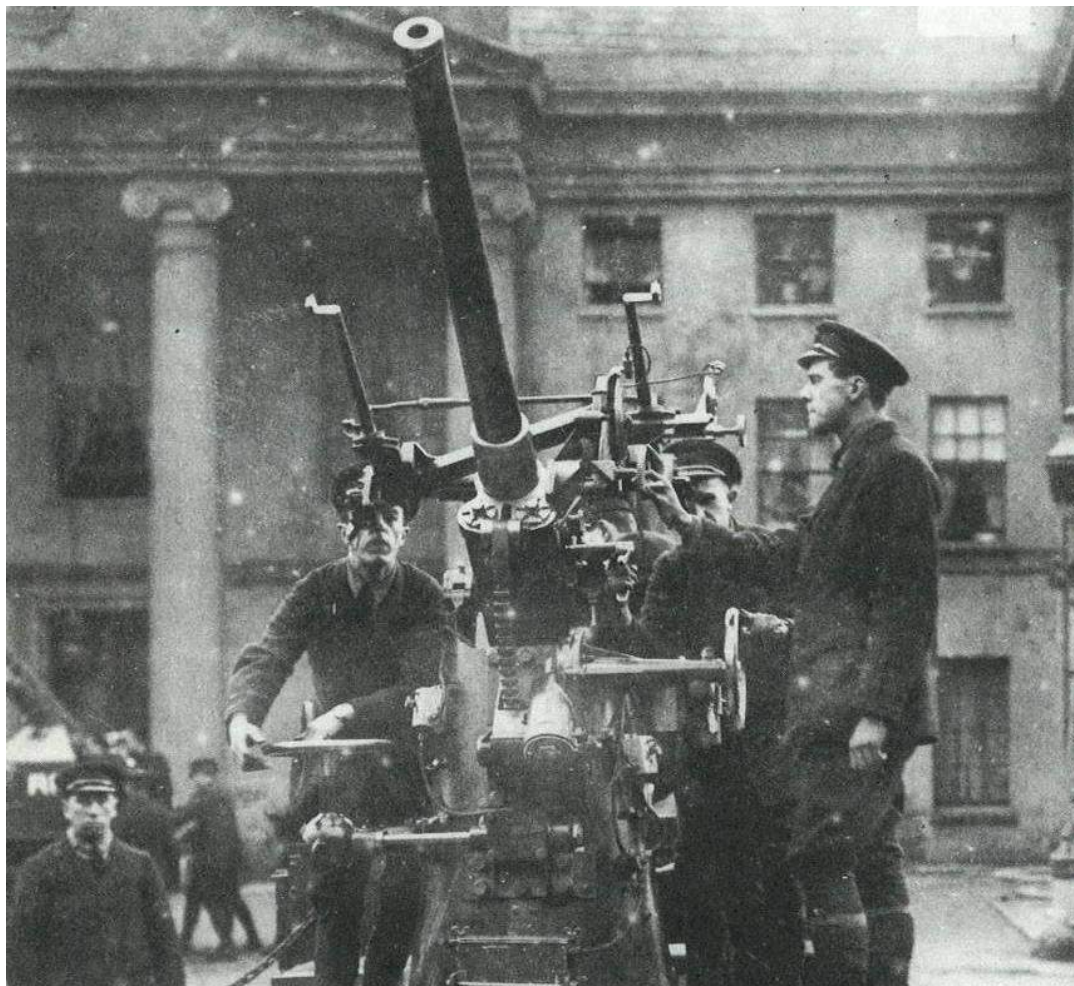
The potential for a UXB hazard to exist on a site depends on a variety of factors. Were there strategic targets in the surrounding area? Was the site bombed? Could a UXB impact have been missed? Even in rural areas, the potential for UXB cannot be totally discounted and therefore it is essential that detailed local bombing records are obtained when assessing the UXB hazard on any site.

Appendix 2.3 Anti-Aircraft Guns

As aerial bombardment first began during WWI, Anti-Aircraft (AA) gun batteries were established were gradually established throughout much of England to counter German bombing raids. By June 1916, there were approximately 271No. AA guns and 258No. searchlight installations defending London alone.

Common AA defences during WWI included 3-inch, 75 millimetre, 6-pounder and 1-pounder guns. Many of these guns were mobile, being mounted on lorry chassis. They were driven about following the course of an airship and fired from any area of open land.

During WWI, Unexploded AA (UXAA) shells, could land up to 13km from the firing point, although more typically fell within 10km.



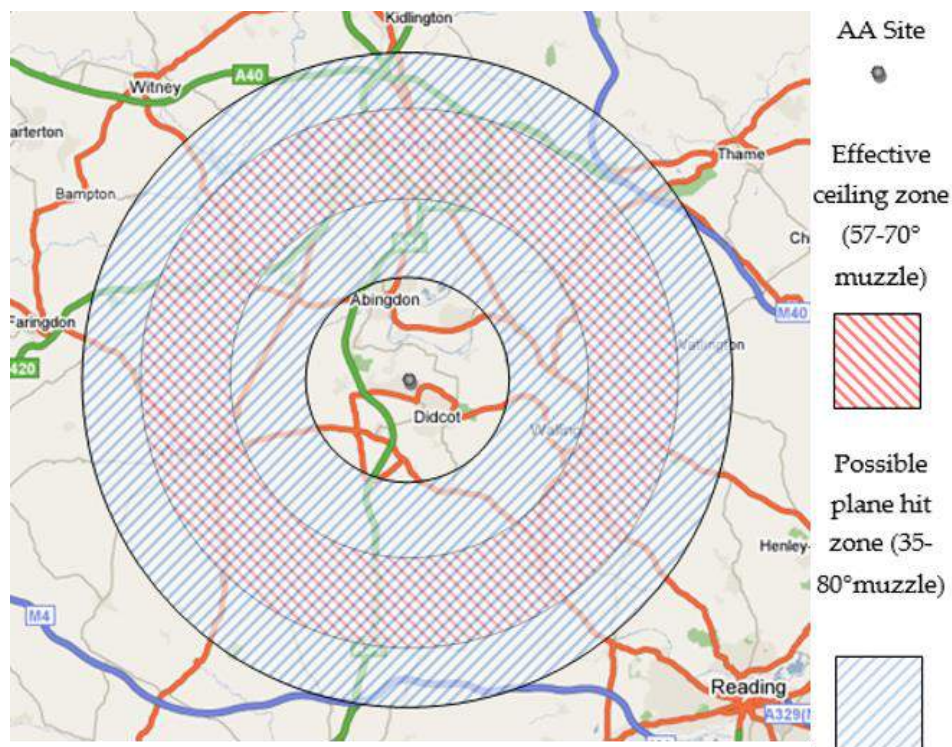
AA gun batteries were used extensively during WWII to counter the threat posed by enemy aircraft. In many instances, AA shells caused damage to Allied territory and in some areas caused significant numbers of civilian fatalities.

During WWII, AA shells could land up to 27km from the firing point, although more typically fell within 15km. These could be distributed over a wide area.

3No. types of AA batteries existed:

- **Heavy Anti-Aircraft (HAA)** batteries of large guns (typically 3.7", 4.5" and 5.25" calibre) designed to engage high flying bomber aircraft. These tended to be relatively permanent gun emplacements.
- **Light Anti-Aircraft (LAA)** weaponry, designed to counter low flying aircraft. These were often mobile and were moved periodically to new locations around strategic targets such as airfields. They typically fired 40mm shells and machine gun ammunition.
- **Rocket batteries (ZAA)** firing 3" or 3.7" AA rockets with a maximum altitude of 5,800m and a ground range of 9km were typically permanent emplacements.

Unexploded AA (UXAA) shells were a common occurrence during WWII. As the figure below demonstrates, shells were unlikely to fall in the immediate vicinity of a gun battery but in the surrounding area. This would be dependent upon the angle of fire and the flight height of the attacking aircraft.



AA batteries were deliberately targeted by the Luftwaffe and therefore areas surrounding a gun battery may have a greater risk of UXB being present.

Munitions stores were also established around AA batteries. These stored the shells for the batteries and small arms ammunition for troops manning the position. Such stores were typically removed at the end of WWII, although some disposal may have occurred in the immediate vicinity of the gun battery.

Appendix 3 Recent UXO Finds

UXO finds in the UK are a regular occurrence, although they almost never result in an accidental detonation.

It is still important to note that explosives rarely lose effectiveness with age. In some instances, mechanisms such as fuzes and gaines can become more sensitive and more prone to detonation, regardless of whether the device has been submersed in water or embedded in silt, clay or similar materials.

The effects of an accidental UXO detonation are usually extremely fast, often catastrophic and invariably traumatic to any personnel involved. Such occurrences are largely restricted to current theatres of war and overseas minefields, with occasional events in mainland Europe.

Zetica, and other commercial EOD companies, uncover and make safe thousands of items of UXO each year, though details are rarely made public knowledge.

Publicly-recorded discoveries do also occur regularly, as demonstrated by the list of recent significant UXO finds in the UK below. To keep up to date with the latest UXO finds, visit <http://zeticauxo.com/news/>.

On the 3rd February 2020, a 500kg German UXB was found on a building site in Soho, London. It was removed by an EOD team.

On the 18th April 2020, a 500lb British UXB was discovered by a farmer near Drayton in Oxfordshire. The area had been used as an RAF practice bombing range during WWII and after an in-situ disposal was completed the item was found to have contained no explosives.

On the 4th May 2020, a UXB was discovered by builders at Kings Hill on the former RAF West Malling airfield, the fourth found since 2017. It was destroyed in a controlled explosion.

On the 1st December 2020, a research vessel discovered an unexploded marine mine containing 350kg of explosives in Wemyss Bay in the Firth of Clyde. RN divers investigated the item and destroyed it.

On the 4th February, 2No. anti-tank mines were discovered on Slapton Sands in Devon. They had been uncovered by recent storms and were destroyed.

On the 26th February 2021, a 1,000kg German “Hermann” UXB was discovered by builders at Exeter University campus (see plate below). It was investigated and detonated in-situ following the evacuation of nearby properties and University halls of residence.



On the 29th March 2021, 1No. 250lb UXB was discovered on the seabed near Hinkley Point C harbour, Bristol. A maritime exclusion was imposed while the item was investigated and then destroyed in a controlled explosion.

On the 10th May 2021, 1No. Anti-Aircraft shell dating from WWII was found by a member of the public in Horsham, Surrey. It was destroyed in-situ by a bomb disposal unit.

On the 17th May 2021, 1No. Sea Wolf missile was brought onboard a fishing vessel near Brixham in Devon. A Royal Navy EOC team destroyed the missile in a controlled explosion.

On the 1st June 2021, a cache of approximately 100No. hand grenades dating from WWII were found in a Nottinghamshire forest, a possible relic from nearby wartime camps. They were destroyed.

On the 23rd July 2021, 1No. 18lb artillery shell dating from WWI was discovered in a private garden in Bloxham, Oxfordshire. It was transported to a nearby field where it was destroyed in a controlled explosion.

On the 24th July 2021, 1No. 500lb British UXB was uncovered during construction works in Goole, East Yorkshire. Reports indicated that the UXB had been jettisoned by a Lancaster bomber aircraft prior to crashing nearby in WWII. The item was investigated and destroyed.

On the 18th August 2021, 1No. UXB was found by construction workers on a Site in Earl Sterndale, Derbyshire. Upon inspection the UXB was deemed to be dangerous and a controlled detonation was undertaken.

On the 10th September 2021, EOD teams destroyed 25No. mortars which had been washed up onto beaches around Nairn and Ardersier in Morayshire. These beaches had been used during WWII for training prior to the D-Day landings in Normandy.

On the 18th October, 1No. 18.5lb artillery shell was discovered during the clearing-out of a farmyard barn near Aberfeldy in Perthshire. The shell dated from WWI and was removed.

On the 12th November 2021, 1No. unexploded artillery shell was found on a housing development site in Wrexham, Wales. It was destroyed in controlled explosion.

On the 15th December 2021, approximately 200No. artillery shells were discovered at a construction site located within the former Royal Ordnance Factory at Swynnerton in Staffordshire. The shells were removed and destroyed.

On the 15th December 2021, 1No. apparent UXB was snagged by a fishing trawler off the Norfolk Coast and then detonated, causing significant damage to the vessel. Upon further investigation, it was concluded that the UXB had been dropped in the water during WWII.

On the 2nd January 2022, 1No. heavily deteriorated 105mm artillery shell was discovered by dogwalkers on a beach in Cumbria. This may have originated on one of the several offshore ranges which have been operational along the nearby coastline since WWII.

Between the 24th and 27th January 2022, 5No. empty artillery shells were uncovered at a construction site in Manchester. These were likely linked to a shell-production factory which had been active on the site during WWII.

On the 17th February 2022, 1No. WWI-era Mk1 Mills hand grenade was found in the River Frome in Dorset by magnet fishermen. This was the third grenade to be pulled from the same stretch of the river over the past year. It was inspected by local police and destroyed.

Appendix 4 Glossary and Definitions

Abandoned Explosive Ordnance (AXO)	Abandoned Explosive Ordnance is explosive ordnance that has not been used during an armed conflict, that has been left behind or disposed of by a party to an armed conflict, and which is no longer under control of that party. Abandoned explosive ordnance may or may not have been primed, fuzed, armed or otherwise prepared for use.
Close Combat Munitions	Items of ordnance thrown, propelled or placed during land warfare, to include grenades, mortars, projectiles, rockets and land mines.
Demil	Derived from the term 'Demilitarisation', it refers to the break down and the recycling or disposal of ordnance components.
Detonation	The high-speed chemical breakdown of an energetic material producing heat, pressure, flame and a shock wave.
Device	This term is used for any component, sub-assembly or completed ordnance, which may or may not have an explosive risk. It can apply to detonators, primers, gaines, fuzes, shells or bombs.
Explosive	The term explosive refers to compounds forming energetic materials that under certain conditions chemically react, rapidly producing gas, heat and pressure. Obviously, these are extremely dangerous and should only be handled by qualified professionals.
Explosive Ordnance (EO)	Explosive Ordnance is all munitions containing explosives, nuclear fission or fusion materials and biological and chemical agents. This includes bombs and warheads, guided and ballistic missiles, artillery, mortar, rocket, small arms ammunition, mines, torpedoes, depth charges, pyrotechnics, cluster bombs & dispensers, cartridge & propellant actuated devices, electro-explosive devices, clandestine & improvised explosive devices, and all similar or related items or components explosive in nature.
Explosive Ordnance Clearance (EOC)	Explosive Ordnance Clearance is a term used to describe the operation of ordnance detection, investigation, identification and removal, with EOD being a separate operation.
Explosive Ordnance Disposal (EOD)	Explosive Ordnance Disposal is the detection, identification, on-site evaluation, rendering safe, recovery and final disposal of unexploded explosive ordnance.
Explosive Ordnance Reconnaissance (EOR)	Explosive Ordnance Reconnaissance is the detection, identification and on-site evaluation of unexploded explosive ordnance before Explosive Ordnance Disposal.
Explosive Remnants of War (ERW)	Explosive Remnants of War are Unexploded Ordnance (UXO) and Abandoned Explosive Ordnance (AXO), excluding landmines.

Explosive Substances and Articles (ESA)	Explosive substances are solid or liquid substances (or a mixture of substances), which are either: - capable by chemical reaction in itself of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. - designed to produce an effect by heat, light, sound, gas or smoke, or a combination of these as a result of a non-detonative, self-sustaining, exothermic reaction. Explosive article is an article containing one or more explosive substances.
Fuze	A fuze is the part of an explosive device that initiates the main explosive charge to function. In common usage, the word fuze is used indiscriminately, but when being specific (and in particular in a military context), fuze is used to mean a more complicated device, such as a device within military ordnance.
Gaine	Small explosive charge that is sometimes placed between the detonator and the main charge to ensure ignition.
Geophysical survey	A geophysical survey is essentially a range of methods that can be used to detect objects or identify ground conditions without the need for intrusive methods (such as excavation or drilling). This is particularly suited to ordnance as disturbance of ordnance items is to be avoided where ever possible.
Gold line	This is the estimated limit of blast damage from an explosive storage magazine. It usually means that development within this zone is restricted.
High Explosive	Secondary explosives (commonly known as High Explosives (HE)) make up the main charge or filling of an ordnance device. They are usually less sensitive than primary explosives. Examples of secondary explosives are: Nitro glycerine (NG), Trinitrotoluene (TNT), AMATOL (Ammonia nitrate + TNT), Gunpowder (GP), and Cyclotrimethylenetrinitramine (RDX).
Munition	Munition is the complete device charged with explosives, propellants, pyrotechnics, initiating composition, or nuclear, biological or chemical material for use in military operations, including demolitions. This includes those munitions that have been suitably modified for use in training, ceremonial or non-operational purposes. These fall into three distinct categories:- - inert - contain no explosives whatsoever. - live - contain explosives and have not been fired. - blind - have fired but failed to function as intended.

Primary Explosive	Primary explosives are usually extremely sensitive to friction, heat, and pressure. These are used to initiate less sensitive explosives. Examples of primary explosives are: Lead Azide, Lead Styphnate, and Mercury Fulminate. Primary explosive are commonly found in detonators.
Propellants	Propellants provide ordnance with the ability to travel in a controlled manner and deliver the ordnance to a predetermined target. Propellants burn rapidly producing gas, pressure and flame. Although usually in solid form they can be produced in liquid form. Examples of propellants are: Ballistite often found in a flake form and Cordite used in small arms ammunition.
Pyrotechnic	A pyrotechnic is an explosive article or substance designed to produce an effect by heat, light, sound, gas or smoke, or a combination of any of these, as a result of non-detonative, self-sustaining, exothermic chemical reactions.
Small Arms Ammunition (SAA)	SAA includes projectiles around 12mm or less in calibre and no longer than approximately 100mm. They are fired from a variety of weapons, including rifles, pistols, shotguns and machine guns.
Unexploded Anti-Aircraft (UXAA) Shell	UXAA shells are army ordnance commonly containing HE, though they can also contain pyrotechnic compounds that produce smoke. Most commonly, these were 3.7" and 4.5" HE shells, although they ranged from 2" to 5.25" calibre.
Unexploded Bomb (UXB)	UXB is a common term for unexploded air-dropped munitions.
Unexploded Ordnance (UXO)	UXO is explosive ordnance that has been either primed, fuzed, armed or prepared for use and has been subsequently fired, dropped, launched, projected or placed in such a manner as to present a hazard to operations, persons or objects and remains unexploded either by malfunction or design.
V1	The Vergeltungswaffe-1, V-1, also designated Fieseler Fi 103/FZG-76, known colloquially in English as the Flying Bomb, Buzz Bomb or Doodlebug, was the first guided missile used in WWII and the forerunner of today's cruise missile.
V2	The Vergeltungswaffe 2 (V-2) ('Reprisal Weapon 2') was the first ballistic missile. It was used by the German Army primarily against Belgian and British targets during the later stages of WWII. The V-2 was the first man-made object launched into space, during test flights that reached an altitude of 189km (117 miles) in 1944.

Appendix 5 WWII Bombing Incident List

23rd September 1940

1No. HE bomb fell in the back garden of 8 Hornsey Lane, approximately 0.3km southeast of the Site. This was recorded as UXB.

27th September 1940

1No. HE bomb fell on 135 Hornsey Lane, approximately 0.3km east of the Site.

1No. HE bomb fell outside 133 Hornsey Lane, approximately 0.3km east of the Site.

30th September 1940

Several IBs fell on Stanhope Road, within approximately 0.1km north of the Site.

Several IBs fell on Avenue Road, within approximately 0.1km north of the Site.

Several IBs fell on Claremont Road, within approximately 0.1km northwest of the Site.

Several IBs fell on playing fields between Coolhurst Avenue and Avenue Road, approximately 0.2km north of the Site.

Several IBs fell on Stanhope Gardens, approximately 0.3km northwest of the Site.

Several IBs fell on Coolhurst Avenue, approximately 0.3km north of the Site.

11th October 1940

1No. HE bomb fell on 105 Hornsey Lane, approximately 0.2km south of the Site.

1No. HE bomb fell on Milton Road, approximately 0.2km southwest of the Site.

14th October 1940

Bombs (type and number unspecified) fell on Hornsey Lane, approximately 0.3km south of the Site.

21st October 1940

1No. HE bomb fell on Claremont Road, approximately 0.1km northwest of the Site.

2No. OBs fell on Stanhope Road, approximately 0.2km north of the Site.

1No. HE bomb fell on Stanhope Gardens, approximately 0.3km northwest of the Site.

22nd October 1940

1No. DAB fell on Claremont Road, approximately 0.1km northwest of the Site.

28th October 1940

Several IBs fell on Hornsey Lane and Milton Road, within approximately 0.1km southwest of the Site.

Several IBs fell on Claremont Road and Stanhope Gardens, within approximately 0.2km northwest of the Site.

7th November 1940

2No. HE bombs fell on Stanhope Gardens, approximately 0.3km northwest of the Site.

16th November 1940

1No. HE bomb fell on Avenue Road, approximately 0.2km northeast of the Site.

19th March 1941

2No. HE bombs fell on Hornsey Lane, approximately 0.3km south of the Site.

Date unspecified

1No. HE bomb fell on Stanhope Road, approximately 0.1km south of the Site.

Bombs (type and number unspecified) fell on Ashmount Road, approximately 0.3km south of the Site.

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Established for over 30 years, Zetica's services include

- ☑ Desk studies
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- ☑ Transport infrastructure surveys
- ☑ Pipeline & cable route surveys
- ☑ Intrusive ground investigations

More details are available at

www.zetica.com

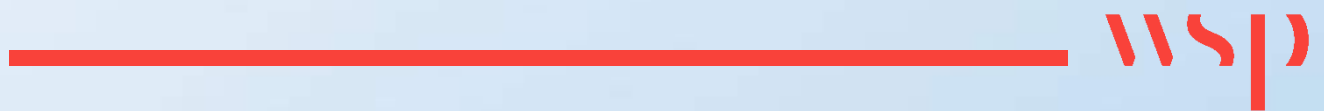




zeticauxo

Appendix F

LABORATORY CERTIFICATES





WSP UK Limited
8 First Street
Manchester
Lancashire
M15 4RP

Attention: Rebecca Hoyle

Units 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US

Tel: (01244) 528777

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:	26 May 2023
Customer:	WSP UK Limited
Sample Delivery Group (SDG):	230519-135
Your Reference:	70085596
Location:	Stanhope Road Bridge GI
Report No:	690448
Order Number:	70085596-P01

We received 11 samples on Friday May 19, 2023 and 8 of these samples were scheduled for analysis which was completed on Friday May 26, 2023. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



1291



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
28023998	WS01	ES	0.00 - 0.40	18/05/2023
28024015	WS01	ES	1.00 - 1.50	18/05/2023
28024020	WS02	ES	0.50 - 0.80	18/05/2023
28024056	WS03	ES	0.00 - 0.50	18/05/2023
28024004	WS03	ES	1.50 - 1.80	18/05/2023
28024010	WS03	ES	3.00 - 3.50	18/05/2023
28024039	WS04	ES	0.00 - 0.50	18/05/2023
28024045	WS04	ES	1.00 - 1.40	18/05/2023
28024050	WS04	ES	4.00 - 4.50	18/05/2023
28024026	WS05	ES	0.30 - 0.60	18/05/2023
28024033	WS05	ES	2.00 - 2.50	18/05/2023

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

Results Legend	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	Test		No Determination Possible									
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	28024033	WS05	ES	2.00 - 2.50	60g VOC (ALE215)	S						
	28024050	WS04	ES	4.00 - 4.50	250g Amber Jar (ALE210)	S						
	28024045	WS04	ES	1.00 - 1.40	1kg TUB with Handle (ALE260)	S						
	28024010	WS03	ES	3.00 - 3.50	60g VOC (ALE215)	S						
	28024004	WS03	ES	1.50 - 1.80	250g Amber Jar (ALE210)	S						
	28024056	WS03	ES	0.00 - 0.50	1kg TUB with Handle (ALE260)	S						
	28024015	WS01	ES	1.00 - 1.50	250g Amber Jar (ALE210)	S						
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 2										
Anions by Kone (soil)	All	NDPs: 0 Tests: 8										
Anions by Kone (w)	All	NDPs: 0 Tests: 2										
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 8										
Boron Water Soluble	All	NDPs: 0 Tests: 8										
CEN Readings	All	NDPs: 0 Tests: 2										
Coronene	All	NDPs: 0 Tests: 2										
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2										
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2										
EPH by GCxGC-FID	All	NDPs: 0 Tests: 2										
EPH CWG GC (S)	All	NDPs: 0 Tests: 8										
Fluoride	All	NDPs: 0 Tests: 2										
GRO by GC-FID (S)	All	NDPs: 0 Tests: 8										
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 8										
Loss on Ignition in soils	All	NDPs: 0 Tests: 2										



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

Results Legend



Test

No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	28024033		WS05		ES		2.00 - 2.50		60g VOC (ALE215)	S		
	28024050		WS04		ES		4.00 - 4.50		250g Amber Jar (ALE210)	S		
	28024045		WS04		ES		1.00 - 1.40		1kg TUB with Handle (ALE280)	S		
	28024010		WS03		ES		3.00 - 3.50		60g VOC (ALE215)	S		
	28024004		WS03		ES		1.50 - 1.80		250g Amber Jar (ALE210)	S		
	28024015		WS01		ES		1.00 - 1.50		1kg TUB with Handle (ALE280)	S		
Mercury Dissolved	All	NDPs: 0 Tests: 2										
Metals in solid samples by OES	All	NDPs: 0 Tests: 8										
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 2										
PAH by GCMS	All	NDPs: 0 Tests: 8										
PCBs by GCMS	All	NDPs: 0 Tests: 4										
pH	All	NDPs: 0 Tests: 8										
pH Value of Filtered Water	All	NDPs: 0 Tests: 2										
Phenols by HPLC (S)	All	NDPs: 0 Tests: 8										
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2										
Sample description	All	NDPs: 0 Tests: 7										
Total Organic Carbon	All	NDPs: 0 Tests: 2										
TPH CWG GC (S)	All	NDPs: 0 Tests: 8										
VOC MS (S)	All	NDPs: 0 Tests: 8										



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
28024015	WS01	1.00 - 1.50	Dark Brown	Clay	Vegetation	None
28024020	WS02	0.50 - 0.80	Dark Brown	Sand	Stones	Crushed Brick
28024004	WS03	1.50 - 1.80	Dark Brown	Sandy Silt Loam	Stones	None
28024010	WS03	3.00 - 3.50	Dark Brown	Sandy Clay	Vegetation	Stones
28024056	WS03	0.00 - 0.50	Dark Brown	Sand	Vegetation	Brick
28024045	WS04	1.00 - 1.40	Dark Brown	Silty Clay Loam	None	None
28024050	WS04	4.00 - 4.50	Dark Brown	Silty Clay Loam	Vegetation	None
28024033	WS05	2.00 - 2.50	Dark Brown	Silty Clay Loam	Vegetation	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

Results Legend		Customer Sample Ref.	WS01	WS02	WS03	WS03	WS03	WS04
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 1.50	0.50 - 0.80	0.00 - 0.50	1.50 - 1.80	3.00 - 3.50	1.00 - 1.40
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq	Aqueous / settled sample.		18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023
diss.filt	Dissolved / filtered sample.		19/05/2023	19/05/2023	19/05/2023	19/05/2023	19/05/2023	19/05/2023
tot.unfilt	Total / unfiltered sample.		230519-135	230519-135	230519-135	230519-135	230519-135	230519-135
+	Subcontracted - refer to subcontractor report for accreditation status.		28024015	28024020	28024056	28024004	28024010	28024045
..	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		ES	ES	ES	ES	ES	ES
(F)	Trigger breach confirmed							
1-4+5@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	18	9.3	13	16	13	15
Loss on ignition	<0.7 %	TM018		1.25 M		2.63 M		
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Organic Carbon, Total	<0.2 %	TM132		0.252 M		<0.2 M		
pH	1 pH Units	TM133	7.51 M	8.74 M	7.89 M	8.58 M	7.31 M	4.09 M
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 M	<0.6 M	<0.6 M	<0.6 M	<0.6 M	<0.6 M
PCB congener 28	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M		
PCB congener 52	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M		
PCB congener 101	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M		
PCB congener 118	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M		
PCB congener 138	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M		
PCB congener 153	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M		
PCB congener 180	<0.003 mg/kg	TM168	<0.003 M	<0.003 M	<0.003 M	<0.003 M		
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168	<0.021 M	<0.021 M	<0.021 M	<0.021 M		
Arsenic	<0.6 mg/kg	TM181	12.5 M	18.4 M	19.8 M	18.8 M	10 M	11.2 M
Barium	<0.6 mg/kg	TM181	32 #	38.2 #	172 #	97.5 #	46 #	29.3 #
Beryllium	<0.01 mg/kg	TM181	1.13 M	0.766 M	1.77 M	1.24 M	0.936 M	0.732 M
Cadmium	<0.02 mg/kg	TM181	0.0239 M	0.101 M	0.269 M	0.153 M	0.0599 M	0.047 M
Chromium	<0.9 mg/kg	TM181	32.3 M	10.2 M	9.26 M	27 M	31.1 M	27.1 M
Copper	<1.4 mg/kg	TM181	14.5 M	19.1 M	291 M	18.9 M	14.1 M	11.5 M
Lead	<0.7 mg/kg	TM181	13 M	15.4 M	100 M	24.9 M	14.1 M	15.1 M
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Nickel	<0.2 mg/kg	TM181	24.2 M	16.4 M	32.1 M	27.9 M	27.1 M	18.3 M
Selenium	<1 mg/kg	TM181	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vanadium	<0.2 mg/kg	TM181	62 #	36.7 #	41.5 #	63.6 #	56.6 #	50.3 #
Zinc	<1.9 mg/kg	TM181	44.1 M	30.7 M	140 M	64.9 M	48.2 M	43.6 M
ANC @ pH 4	<0.03 mol/kg	TM182		<0.03		0.0463		
ANC @ pH 6	<0.03 mol/kg	TM182		<0.03		<0.03		
Boron, water soluble	<1 mg/kg	TM222	<1 M	<1 M	<1 M	<1 M	<1 M	<1 M
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243	0.22 M	0.0105 M	0.0201 M	0.0216 M	2.37 M	1.76 M
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410		<10		<10		
Coronene	<0.2 mg/kg	TM410		<0.2		<0.2		

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448

Superseded Report:

Location: Stanhope Road Bridge GI

[illegible]

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448

Superseded Report:

Location: Stanhope Road Bridge GI

[illegible]

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448

Superseded Report:

Location: Stanhope Road Bridge GI

PAH by GCMS

[illegible]

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448

Superseded Report:

Location: Stanhope Road Bridge GI

PAH by GCMS

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

TPH CWG (S)

Results Legend		Customer Sample Ref.	WS01	WS02	WS03	WS03	WS03	WS04
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00 - 1.50	0.50 - 0.80	0.00 - 0.50	1.50 - 1.80	3.00 - 3.50	1.00 - 1.40
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq	Aqueous / settled sample.		18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023
diss.filt	Dissolved / filtered sample.		19/05/2023	19/05/2023	19/05/2023	19/05/2023	19/05/2023	19/05/2023
tot.unfilt	Total / unfiltered sample.		230519-135	230519-135	230519-135	230519-135	230519-135	230519-135
*	Subcontracted - refer to subcontractor report for accreditation status.		28024015	28024020	28024056	28024004	28024010	28024045
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		ES	ES	ES	ES	ES	ES
(F)	Trigger breach confirmed							
1-4	Sample deviation (see appendix)							
Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM089	101	106	90.8	104	115	112
			2					
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			2					
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			2					
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			2					
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Aliphatics >C16-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1	<1	8	<1	<1	<1
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1	<1	7.47	<1	<1	<1
			#	#	#	#	#	#
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414	<5	<5	8.93	<5	<5	<5
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414	<10	<10	21.1	<10	<10	<10
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			2					
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			2					
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			2					
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1	1.57	<1	<1	<1
			#	#	#	#	#	#
Aromatics > EC16-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1	11.2	1.52	<1	<1
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1	9.59	1.05	<1	<1
			#	#	#	#	#	#
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414	<5	<5	12.2	<5	<5	<5
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414	<10	<10	21.1	<10	<10	<10
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			2					
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			2					
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
			2					



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

TPH CWG (S)

Results Legend		Customer Sample Ref.	WS04	WS05				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	4.00 - 4.50	2.00 - 2.50				
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)				
aq	Aqueous / settled sample.		18/05/2023	18/05/2023				
diss,filtr	Dissolved / filtered sample.		19/05/2023	19/05/2023				
tot,unfiltr	Total / unfiltered sample.		230519-135	230519-135				
*	Subcontracted - refer to subcontractor report for accreditation status.		28024050	28024033				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		ES	ES				
(F)	Trigger breach confirmed							
1-4	Sample deviation (see appendix)							
Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM089	106	108				
Aliphatics >C5-C6 (HS_1D_AL)	<0.01 mg/kg	TM089	<0.01	<0.01				
Aliphatics >C6-C8 (HS_1D_AL)	<0.01 mg/kg	TM089	<0.01	0.017				
Aliphatics >C8-C10 (HS_1D_AL)	<0.01 mg/kg	TM089	<0.01	0.035				
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1 #	<1 #				
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1 #	<1 #				
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1 #	<1 #				
Aliphatics >C16-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414	2.09	<1				
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1 mg/kg	TM414	2.09 #	<1 #				
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1 mg/kg	TM414	<1	<1				
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5 mg/kg	TM414	<5	<5				
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10 mg/kg	TM414	<10	<10				
Aromatics >EC5-EC7 (HS_1D_AR)	<0.01 mg/kg	TM089	<0.01	<0.01				
Aromatics >EC7-EC8 (HS_1D_AR)	<0.01 mg/kg	TM089	<0.01	<0.01				
Aromatics >EC8-EC10 (HS_1D_AR)	<0.01 mg/kg	TM089	<0.01	0.0237				
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1 #	<1 #				
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1 #	<1 #				
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1 #	<1 #				
Aromatics > EC16-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414	1.36	1.38				
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1 mg/kg	TM414	1.12 #	1.07 #				
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1				
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1 mg/kg	TM414	<1	<1				
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5 mg/kg	TM414	<5	<5				
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10 mg/kg	TM414	<10	<10				
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<0.05 mg/kg	TM089	<0.05	0.052				
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<0.05 mg/kg	TM089	<0.05	<0.05				
GRO >C5-C10 (HS_1D_TOTAL)	<0.02 mg/kg	TM089	<0.02	0.052				

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448

Superseded Report:

Location: Stanhope Road Bridge GI

VOC MS (S)

[illegible]

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448

Superseded Report:

Location: Stanhope Road Bridge GI

VOC MS (S)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&*S@ Sample deviation (see appendix)

Subcontracted test. (F) Trigger breach confirmed 1-5&\$@ (see appendix)		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS01ES 1.00 - 1.50 SOLID 18/05/2023 00:00:00 19/05/2023 05:00:00 230519-135 28024015 TM048	25/05/2023	Paul Poynton	N/A	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS02ES 0.50 - 0.80 SOLID 18/05/2023 00:00:00 19/05/2023 05:00:00 230519-135 28024020 TM048	25/05/2023	Renata Bozhkov	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS03ES 0.00 - 0.50 SOLID 18/05/2023 00:00:00 19/05/2023 05:00:00 230519-135 28024056 TM048	25/05/2023	Odhran McLernon	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS03ES 1.50 - 1.80 SOLID 18/05/2023 00:00:00 19/05/2023 05:00:00 230519-135 28024004 TM048	25/05/2023	Odhran McLernon	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS03ES 3.00 - 3.50 SOLID 18/05/2023 00:00:00 19/05/2023 05:00:00 230519-135 28024010 TM048	25/05/2023	Odhran McLernon	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS04ES 1.00 - 1.40 SOLID 18/05/2023 00:00:00 19/05/2023 05:00:00 230519-135 28024045 TM048	25/05/2023	Odhran McLernon	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS04ES 4.00 - 4.50 SOLID 18/05/2023 00:00:00 19/05/2023 05:00:00 230519-135 28024050 TM048	26/05/2023	Odhran McLernon	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS05ES 2.00 - 2.50 SOLID 18/05/2023 00:00:00 19/05/2023 05:00:00 230519-135 28024033 TM048	25/05/2023	Renata Bozhkov	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg) 0.143

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site Location

Stanhope Road Bridge GI

Natural Moisture Content (%) 58.6

Dry Matter Content (%) 63.1

Case

SDG 230519-135

Lab Sample Number(s) 28024004

Sampled Date 18-May-2023

Customer Sample Ref. WS03 ESZ

Depth (m) 1.50 - 1.80

Landfill Waste Acceptance
Criteria Limits

Solid Waste Analysis

Result

Total Organic Carbon (%) <0.2

Loss on Ignition (%) 2.63

Sum of BTEX (mg/kg) <0.4

Sum of 7 PCBs (mg/kg) <0.021

Mineral Oil (mg/kg) (EH_2D_AL) <5

PAH Sum of 17 (mg/kg) <10

pH (pH Units) 8.58

ANC to pH 6 (mol/kg) <0.03

ANC to pH 4 (mol/kg) 0.0463

Inert Waste
LandfillStable
Non-reactive
Hazardous Waste
in Non-
Hazardous
LandfillHazardous
Waste Landfill

3

5

6

-

-

10

6

-

-

1

-

-

500

-

-

100

-

-

-

>6

-

-

-

-

-

-

-

Eluate Analysis

C₂Concⁿ in 10:1 eluate (mg/l)A₂10:1 concⁿ leached (mg/kg)Limit values for compliance leaching test
using BS EN 12457-3 at L/S 10 l/kg

Result

Limit of Detection

Result

Limit of Detection

Arsenic

0.0301

<0.0005

0.301

<0.005

0.5

2

25

Barium

0.0041

<0.0002

0.041

<0.002

20

100

300

Cadmium

<0.00008

<0.00008

<0.0008

<0.0008

0.04

1

5

Chromium

<0.001

<0.001

<0.01

<0.01

0.5

10

70

Copper

0.000776

<0.0003

0.00776

<0.003

2

50

100

Mercury Dissolved (CVAF)

<0.00001

<0.00001

<0.0001

<0.0001

0.01

0.2

2

Molybdenum

<0.003

<0.003

<0.03

<0.03

0.5

10

30

Nickel

0.000657

<0.0004

0.00657

<0.004

0.4

10

40

Lead

0.000337

<0.0002

0.00337

<0.002

0.5

10

50

Antimony

<0.001

<0.001

<0.01

<0.01

0.06

0.7

5

Selenium

<0.001

<0.001

<0.01

<0.01

0.1

0.5

7

Zinc

0.00259

<0.001

0.0259

<0.01

4

50

200

Chloride

<2

<2

<20

<20

800

15000

25000

Fluoride

1.19

<0.5

11.9

<5

10

150

500

Sulphate (soluble)

2.5

<2

25

<20

1000

20000

50000

Total Dissolved Solids

-

-

-

-

4000

60000

100000

Total Monohydric Phenols (W)

<0.016

<0.016

<0.16

<0.16

1

-

-

Dissolved Organic Carbon

<3

<3

<30

<30

500

800

1000

Leach Test Information

Date Prepared 23-May-2023

pH (pH Units) 8.60

Conductivity (µS/cm) 88

Volume Leachant (Litres) 0.847

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)

Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

26/05/2023 15:53:38



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg) 0.101

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site Location

Stanhope Road Bridge GI

Natural Moisture Content (%) 12.9

Dry Matter Content (%) 88.5

Case

SDG 230519-135

Lab Sample Number(s) 28024020

Sampled Date 18-May-2023

Customer Sample Ref. WS02 ESZ

Depth (m) 0.50 - 0.80

Landfill Waste Acceptance

Criteria Limits

Solid Waste Analysis

Result

Total Organic Carbon (%) 0.252

Loss on Ignition (%) 1.25

Sum of BTEX (mg/kg) <0.04

Sum of 7 PCBs (mg/kg) <0.021

Mineral Oil (mg/kg) (EH_2D_AL) <5

PAH Sum of 17 (mg/kg) <10

pH (pH Units) 8.74

ANC to pH 6 (mol/kg) <0.03

ANC to pH 4 (mol/kg) <0.03

Inert Waste
LandfillStable
Non-reactive
Hazardous Waste
in Non-
Hazardous
LandfillHazardous
Waste Landfill

3

5

6

-

-

10

6

-

-

1

-

-

500

-

-

100

-

-

-

>6

-

-

-

-

Eluate Analysis

C₂Concⁿ in 10:1 eluate (mg/l)A₂10:1 concⁿ leached (mg/kg)Limit values for compliance leaching test
using BS EN 12457-3 at L/S 10 l/kg

Result

Limit of Detection

Result

Limit of Detection

Arsenic

0.0106

<0.0005

0.106

<0.005

0.5

2

25

Barium

0.0029

<0.0002

0.029

<0.002

20

100

300

Cadmium

<0.00008

<0.00008

<0.0008

<0.0008

0.04

1

5

Chromium

<0.001

<0.001

<0.01

<0.01

0.5

10

70

Copper

0.00239

<0.0003

0.0239

<0.003

2

50

100

Mercury Dissolved (CVAF)

<0.00001

<0.00001

<0.0001

<0.0001

0.01

0.2

2

Molybdenum

<0.003

<0.003

<0.03

<0.03

0.5

10

30

Nickel

0.00094

<0.0004

0.0094

<0.004

0.4

10

40

Lead

0.000398

<0.0002

0.00398

<0.002

0.5

10

50

Antimony

<0.001

<0.001

<0.01

<0.01

0.06

0.7

5

Selenium

<0.001

<0.001

<0.01

<0.01

0.1

0.5

7

Zinc

0.00315

<0.001

0.0315

<0.01

4

50

200

Chloride

<2

<2

<20

<20

800

15000

25000

Fluoride

<0.5

<0.5

<5

<5

10

150

500

Sulphate (soluble)

<2

<2

<20

<20

1000

20000

50000

Total Dissolved Solids

-

-

-

-

4000

60000

100000

Total Monohydric Phenols (W)

<0.016

<0.016

<0.16

<0.16

1

-

-

Dissolved Organic Carbon

5.55

<3

55.5

<30

500

800

1000

Leach Test Information

Date Prepared 21-May-2023

pH (pH Units) 7.71

Conductivity (µS/cm) 47

Volume Leachant (Litres) 0.889

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)

Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

26/05/2023 15:53:38



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg) 0.143

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site Location

Stanhope Road Bridge GI

Natural Moisture Content (%) 58.6

Dry Matter Content (%) 63.1

Case

SDG 230519-135

Lab Sample Number(s) 28024004

Sampled Date 18-May-2023

Customer Sample Ref. WS03 ESZ

Depth (m) 1.50 - 1.80

Eluate Analysis

C₂ Concⁿ in 10:1 eluate (mg/l)A₂ 10:1 concⁿ leached (mg/kg)

Result

Limit of Detection

Result

Limit of Detection

Dissolved solids, Total (meter)

67.3

<10

673

<100

-

-

-

Leach Test Information

Date Prepared 23-May-2023

pH (pH Units) 8.60

Conductivity (µS/cm) 88

Volume Leachant (Litres) 0.847

Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Stanhope Road Bridge GI
Mass Sample taken (kg)	0.101	Natural Moisture Content (%)	12.9
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	88.5
Particle Size <4mm	>95%		

Case

SDG	230519-135
Lab Sample Number(s)	28024020
Sampled Date	18-May-2023
Customer Sample Ref.	WS02 ESZ
Depth (m)	0.50 - 0.80

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)		
	Result	Limit of Detection	Result	Limit of Detection	
Dissolved solids, Total (meter)	36.3	<10	363	<100	- - -

Leach Test Information

Date Prepared	21-May-2023
pH (pH Units)	7.71
Conductivity (µS/cm)	47
Volume Leachant (Litres)	0.889

Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

Table of Results - Appendix

Method No	Description
PM024	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115	Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	Determination of Loss on Ignition
TM048	Identification of Asbestos in Bulk Material
TM062 (S)	Determination of Phenols in Soils by HPLC
TM089	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Determination of Fluoride using the Kone Analyser
TM116	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	ELTRA CS800 Operators Guide
TM133	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Determination of Hexavalent Chromium using Kone analyser
TM152	Analysis of Aqueous Samples by ICP-MS
TM168	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	The determination of PAH in soil samples by GC-MS
TM222	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
TM243	Mixed Anions In Soils By Kone
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM259	Determination of Phenols in Waters and Leachates by HPLC
TM410	Determination of Coronene in soils by GCMS
TM414	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

Test Completion Dates

Lab Sample No(s)	28024015	28024020	28024004	28024010	28024056	28024045	28024050	28024033
Customer Sample Ref.	WS01	WS02	WS03	WS03	WS03	WS04	WS04	WS05
AGS Ref.	ES	ES	ES	ES	ES	ES	ES	ES
Depth	1.00 - 1.50	0.50 - 0.80	1.50 - 1.80	3.00 - 3.50	0.00 - 0.50	1.00 - 1.40	4.00 - 4.50	2.00 - 2.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
ANC at pH4 and ANC at pH 6		24-May-2023	23-May-2023					
Anions by Kone (soil)	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023
Anions by Kone (w)		24-May-2023	25-May-2023					
Asbestos ID in Solid Samples	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	26-May-2023	25-May-2023
Boron Water Soluble	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023
CEN 10:1 Leachate (1 Stage)		21-May-2023	23-May-2023					
CEN Readings		24-May-2023	25-May-2023					
Coronene		26-May-2023	25-May-2023					
Dissolved Metals by ICP-MS		25-May-2023	25-May-2023					
Dissolved Organic/Inorganic Carbon		25-May-2023	25-May-2023					
EPH by GCxGC-FID		23-May-2023	23-May-2023					
EPH CWG GC (S)	24-May-2023	24-May-2023	23-May-2023	24-May-2023	24-May-2023	24-May-2023	24-May-2023	23-May-2023
Fluoride		25-May-2023	25-May-2023					
GRO by GC-FID (S)	24-May-2023	23-May-2023	23-May-2023	25-May-2023	25-May-2023	23-May-2023	23-May-2023	23-May-2023
Hexavalent Chromium (s)	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023
Loss on Ignition in soils		25-May-2023	25-May-2023					
Mercury Dissolved		25-May-2023	25-May-2023					
Metals in solid samples by OES	24-May-2023	24-May-2023	24-May-2023	26-May-2023	26-May-2023	24-May-2023	25-May-2023	24-May-2023
Moisture at 105C		21-May-2023	23-May-2023					
PAH 16 & 17 Calc		26-May-2023	25-May-2023					
PAH by GCMS	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	24-May-2023	24-May-2023	24-May-2023
PCBs by GCMS	26-May-2023	26-May-2023	26-May-2023		26-May-2023			
pH	23-May-2023	23-May-2023	23-May-2023	25-May-2023	25-May-2023	23-May-2023	23-May-2023	23-May-2023
pH Value of Filtered Water		24-May-2023	25-May-2023					
Phenols by HPLC (S)	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023	25-May-2023
Phenols by HPLC (W)		25-May-2023	26-May-2023					
Sample description	20-May-2023	20-May-2023	20-May-2023	23-May-2023	23-May-2023	20-May-2023	20-May-2023	20-May-2023
Total Organic Carbon		25-May-2023	26-May-2023					
TPH CWG GC (S)	24-May-2023	24-May-2023	23-May-2023	25-May-2023	25-May-2023	24-May-2023	24-May-2023	23-May-2023
VOC MS (S)	26-May-2023	23-May-2023	23-May-2023	25-May-2023	25-May-2023	23-May-2023	23-May-2023	23-May-2023



CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

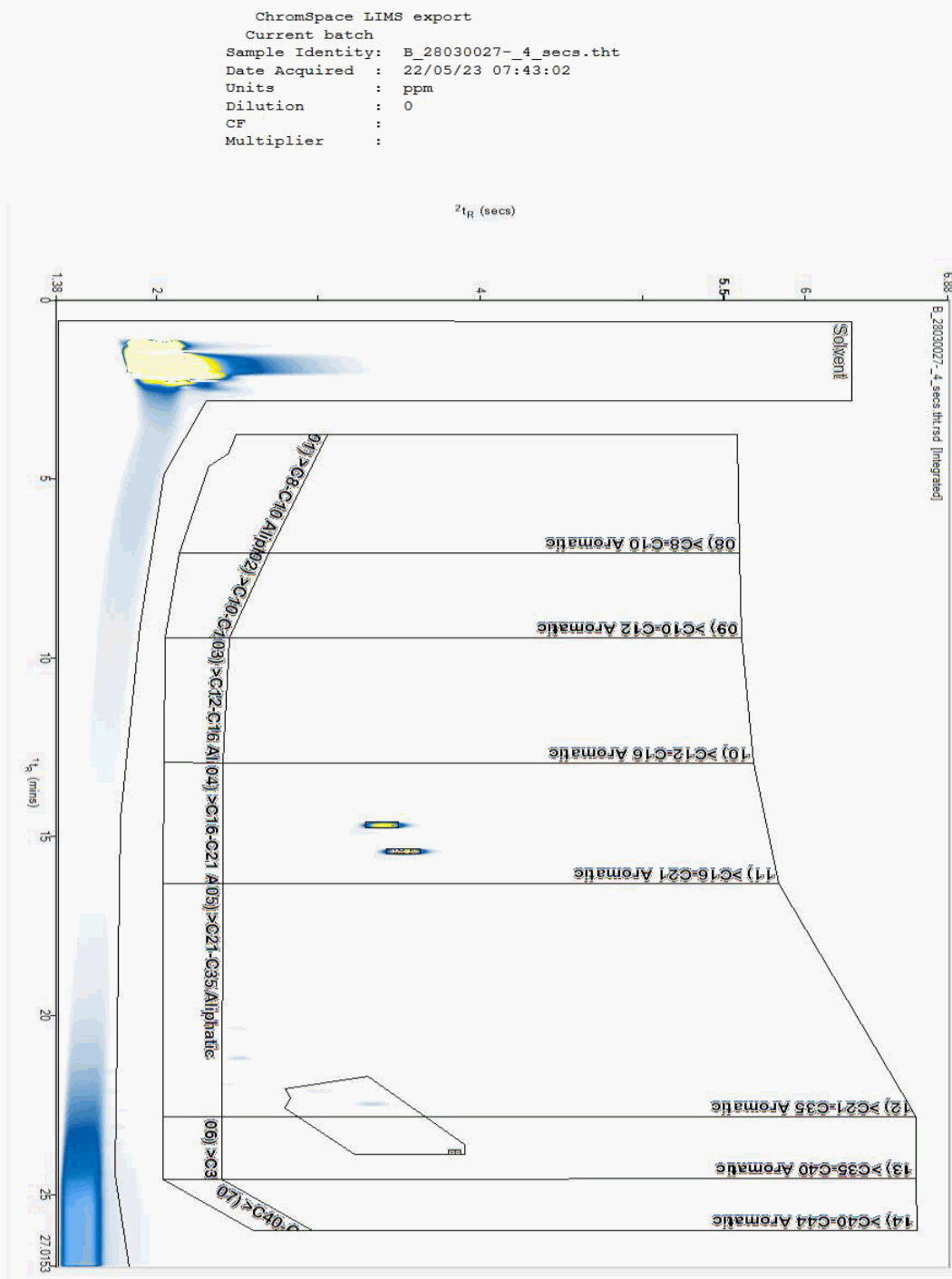
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 28030027
Sample ID : WS03

Depth : 1.50 - 1.80





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

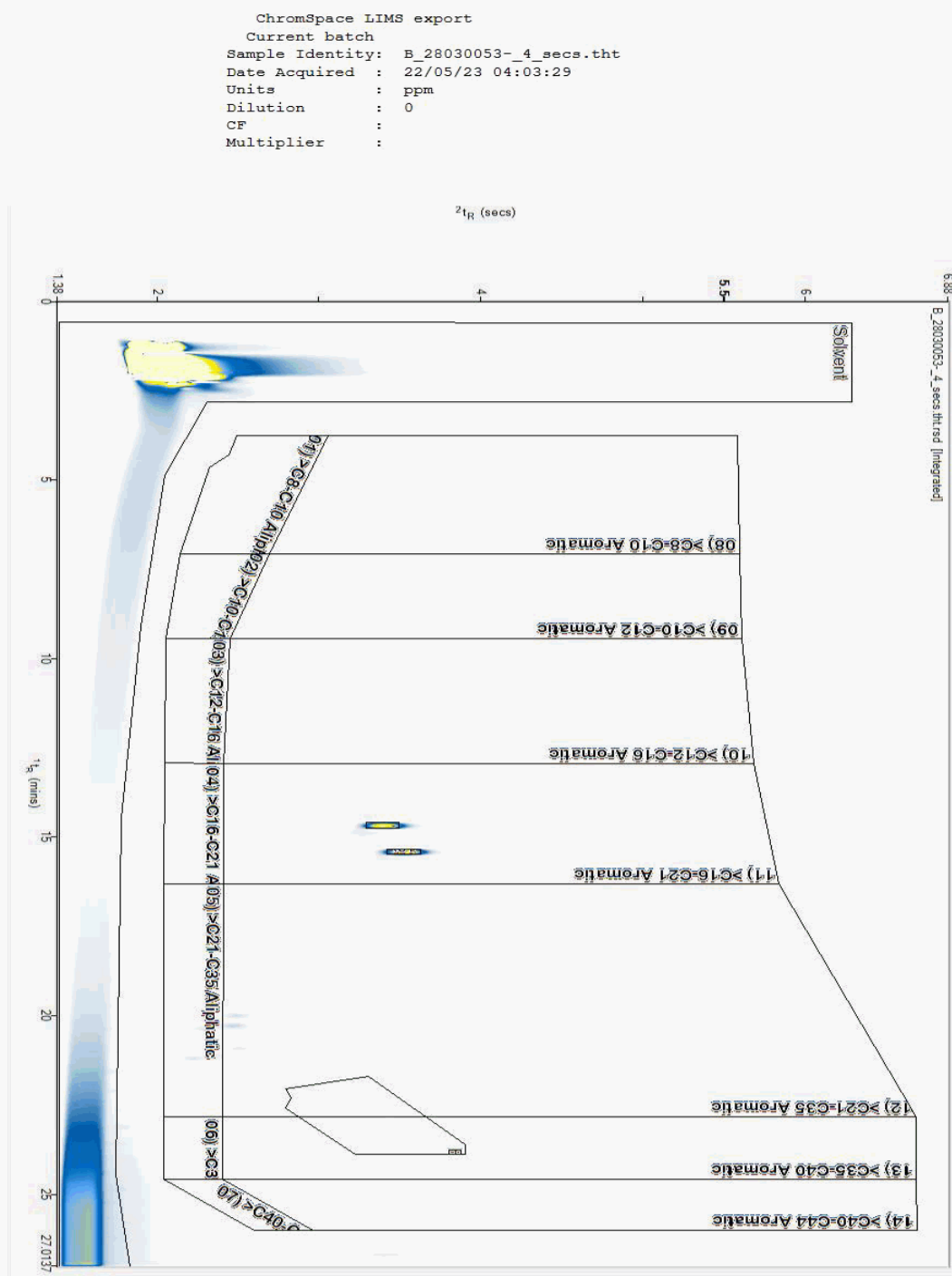
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 28030053
Sample ID : WS05

Depth : 2.00 - 2.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

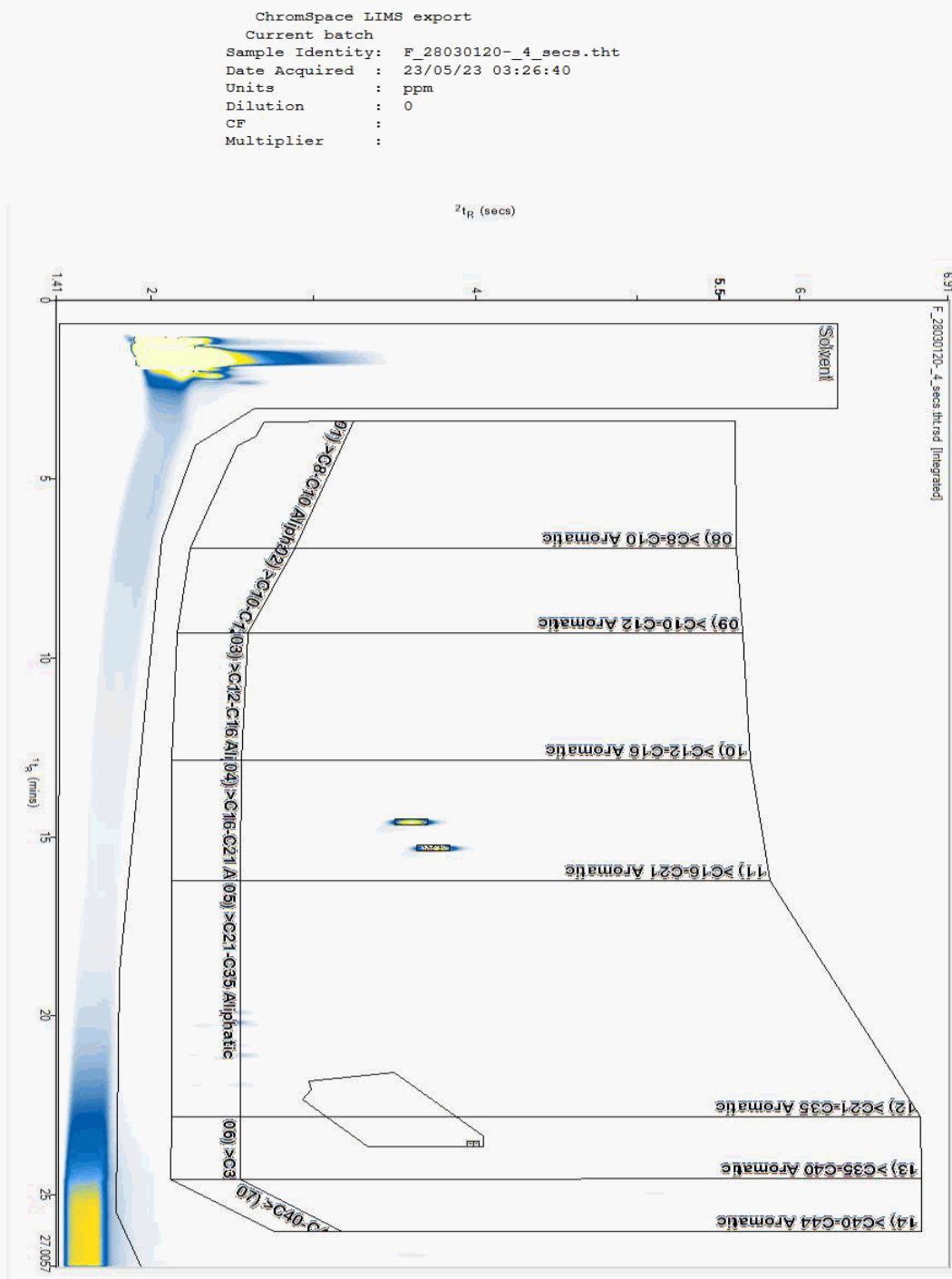
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 28030120
Sample ID : WS04

Depth : 4.00 - 4.50



SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

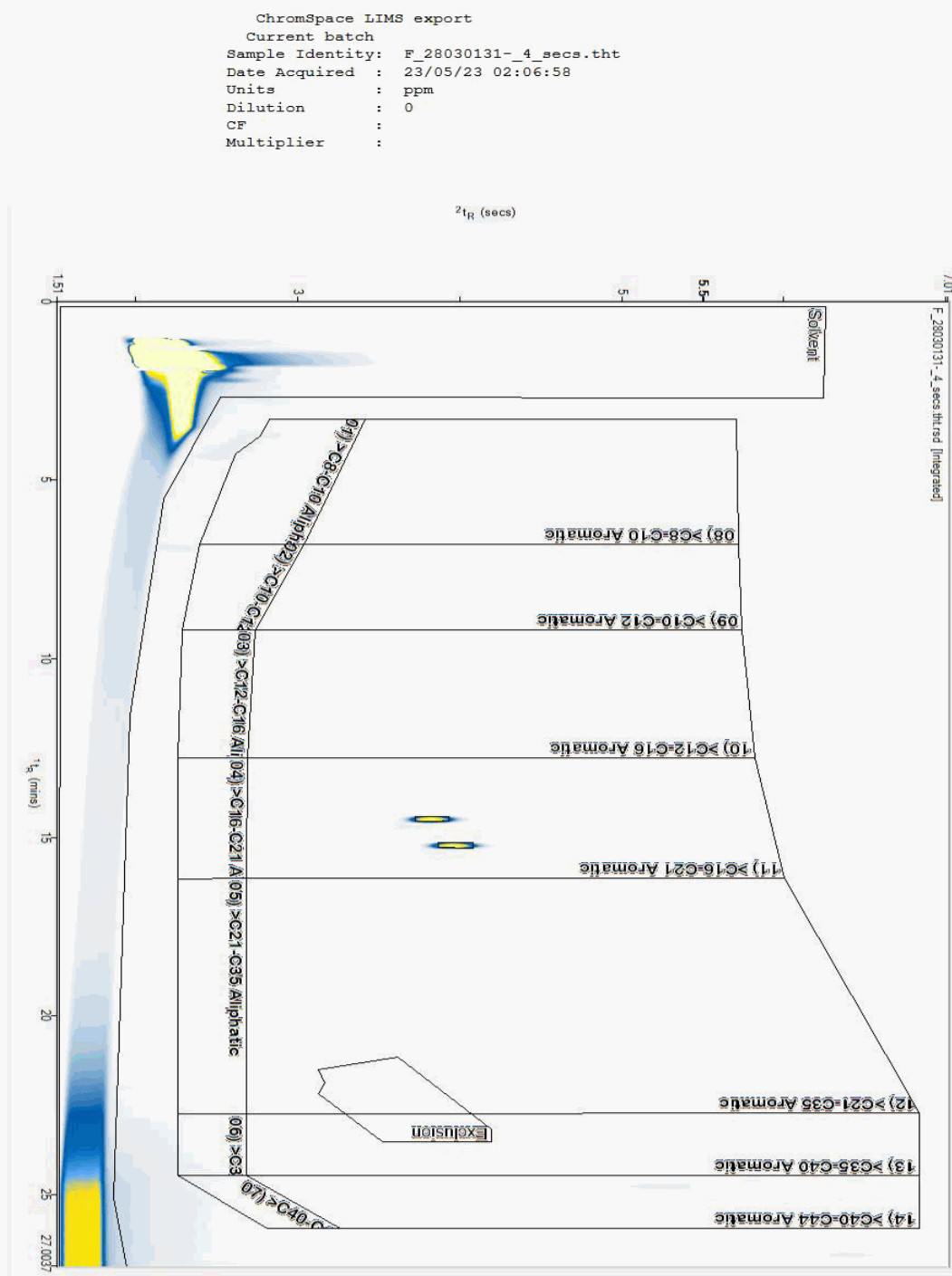
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 28030131
Sample ID : WS04

Depth : 1.00 - 1.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

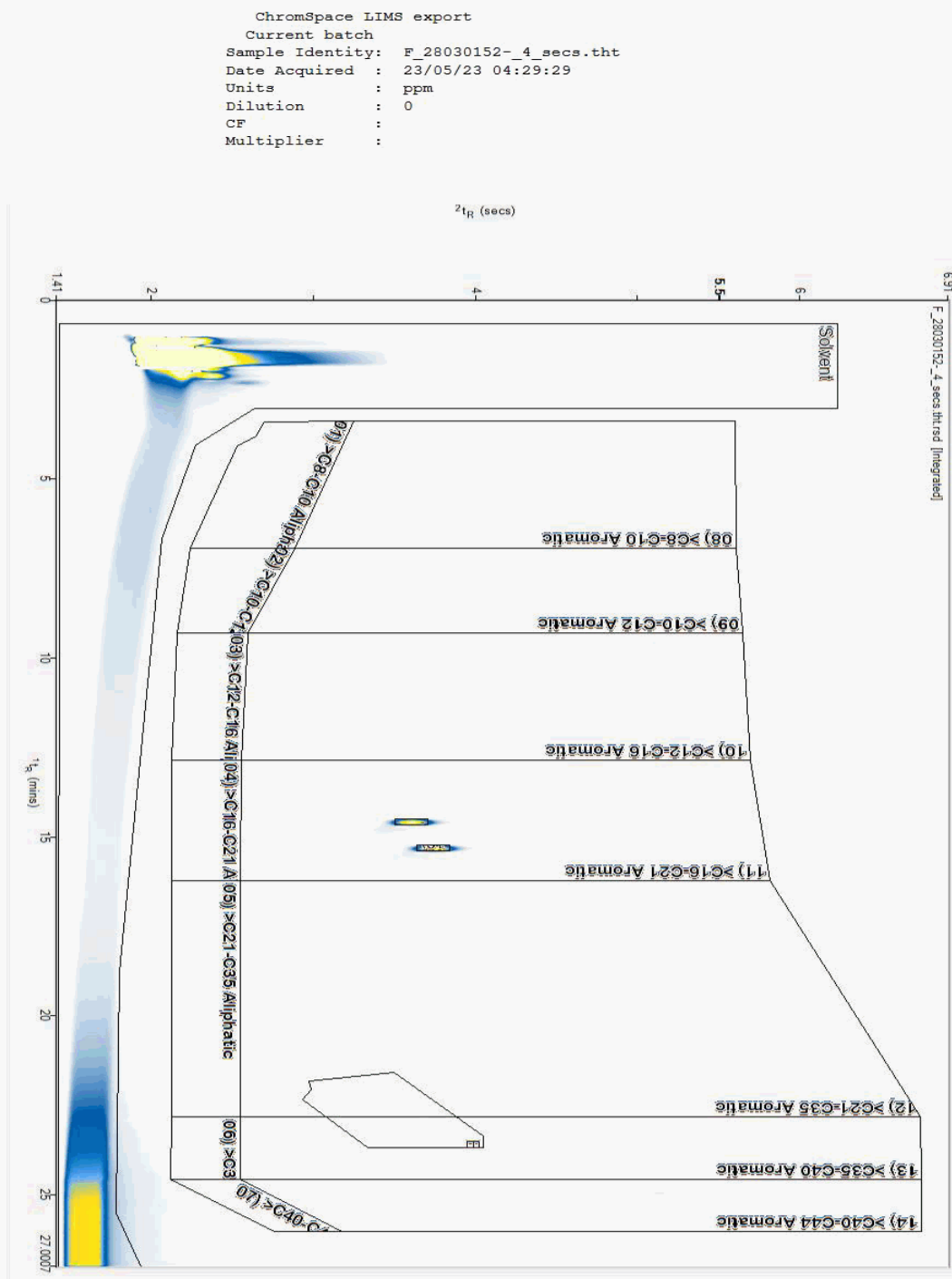
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 28030152
Sample ID : WS01

Depth : 1.00 - 1.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

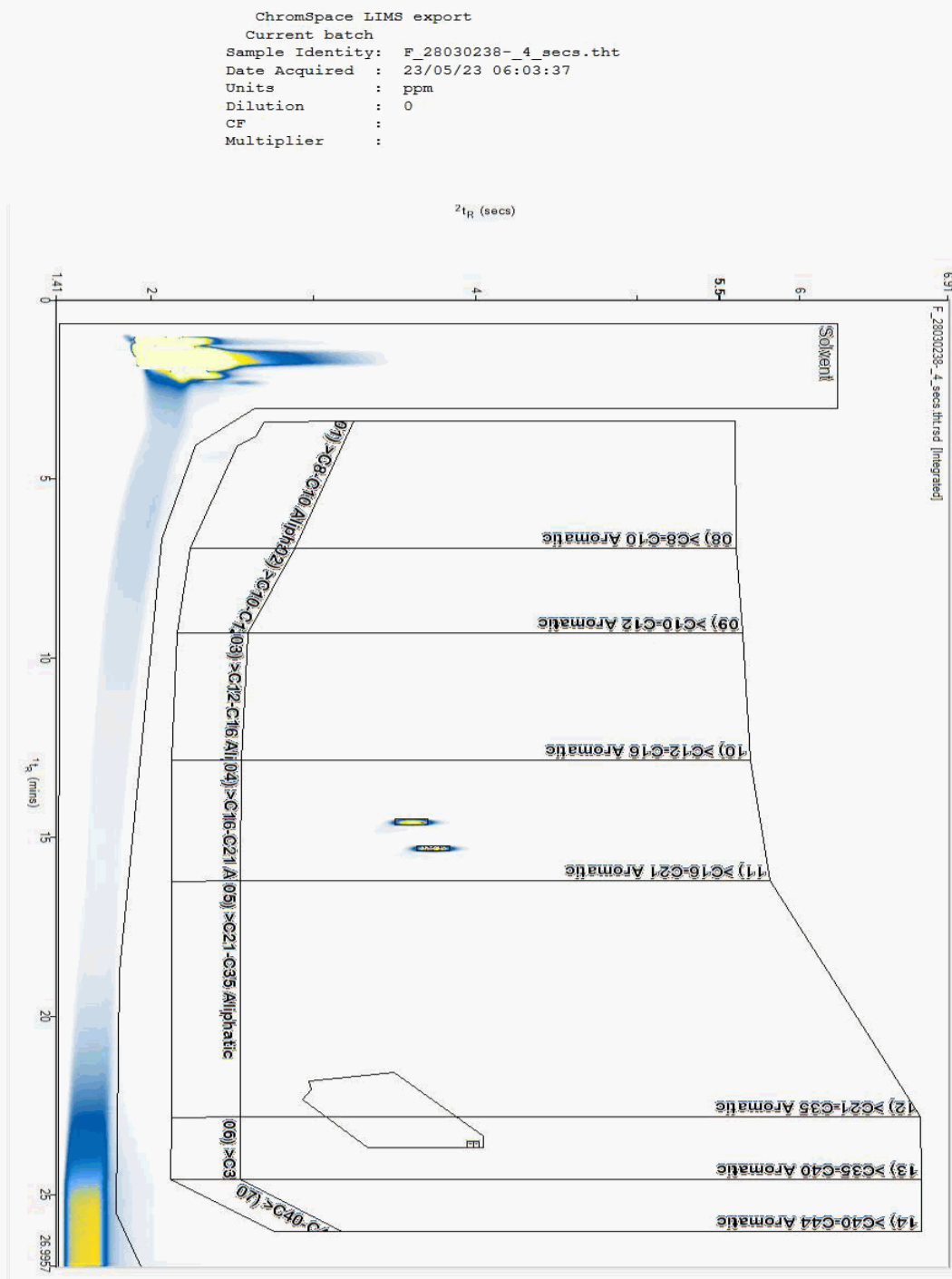
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 28030238
Sample ID : WS02

Depth : 0.50 - 0.80





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

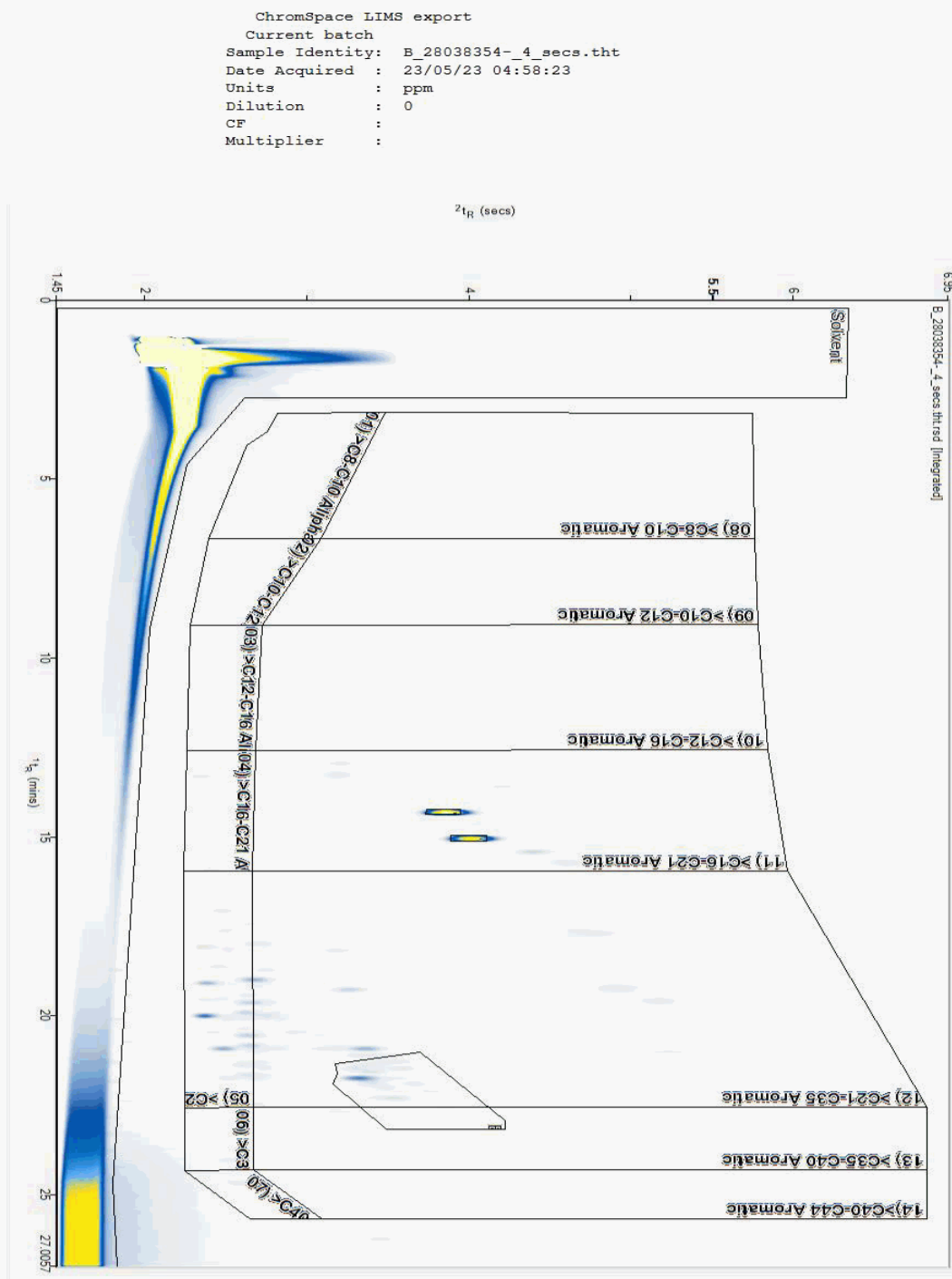
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 28038354
Sample ID : WS03

Depth : 0.00 - 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

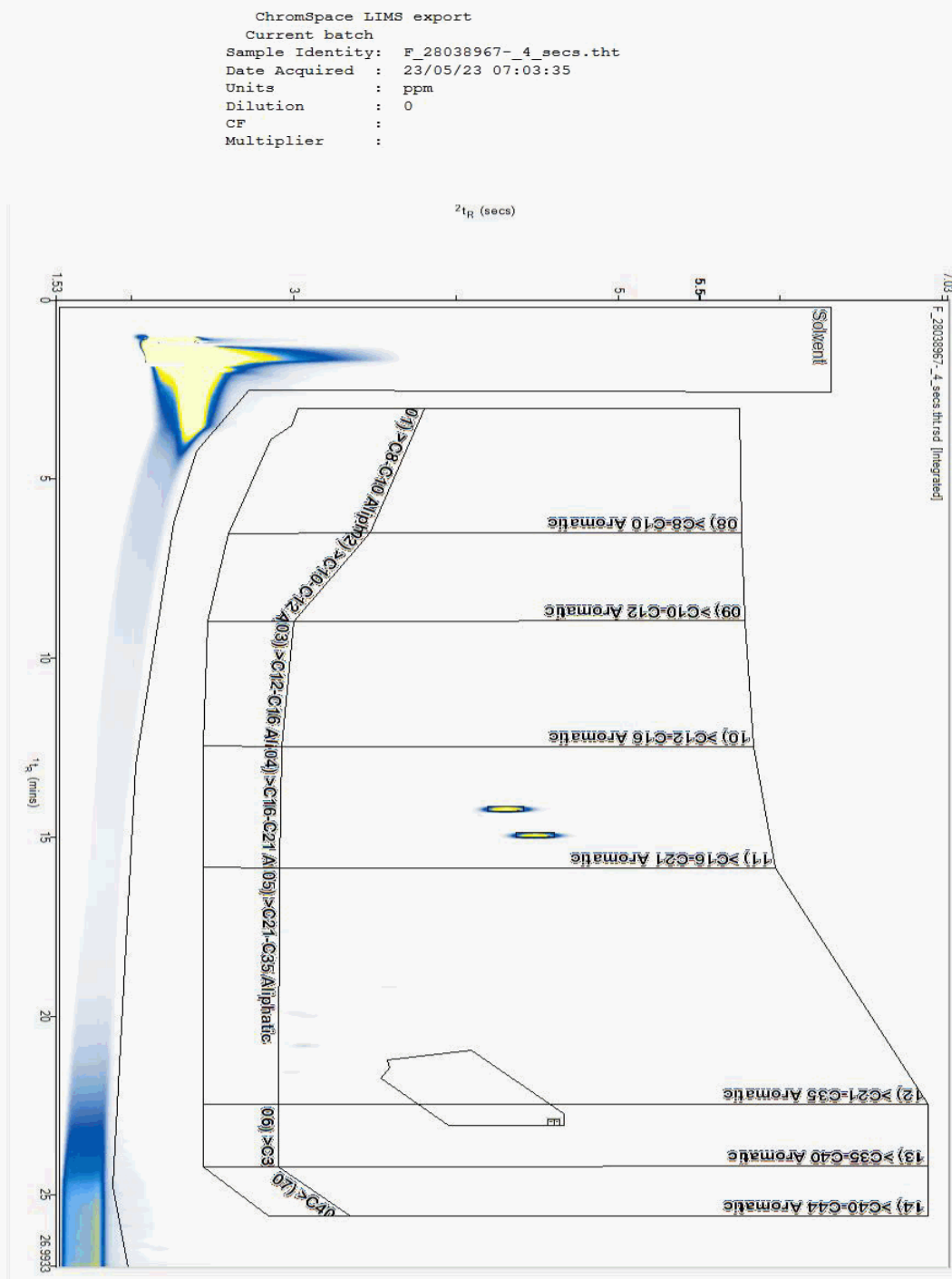
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 28038967
Sample ID : WS03

Depth : 3.00 - 3.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

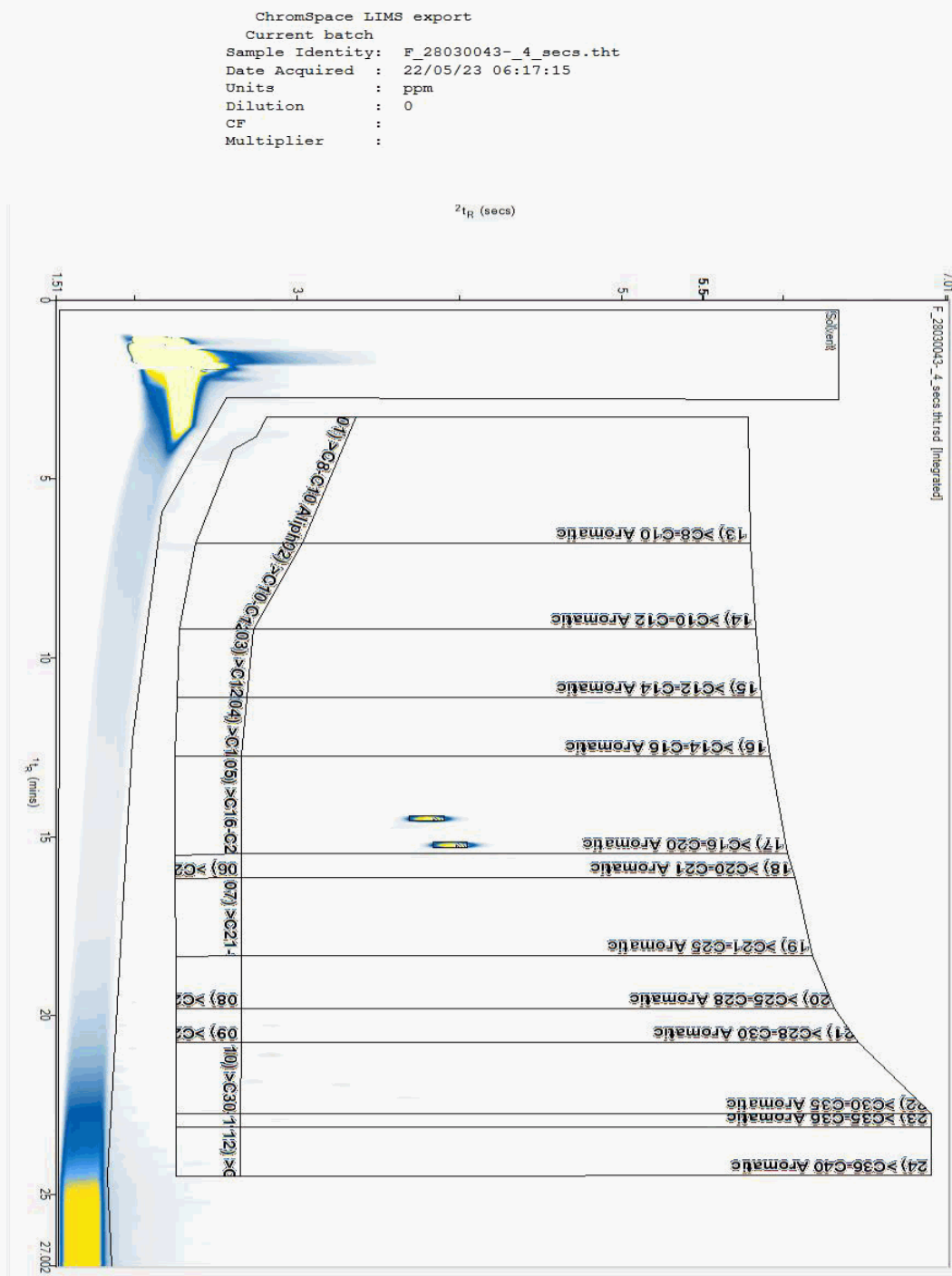
Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID

Sample No : 28030043
Sample ID : WS03

Depth : 1.50 - 1.80





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

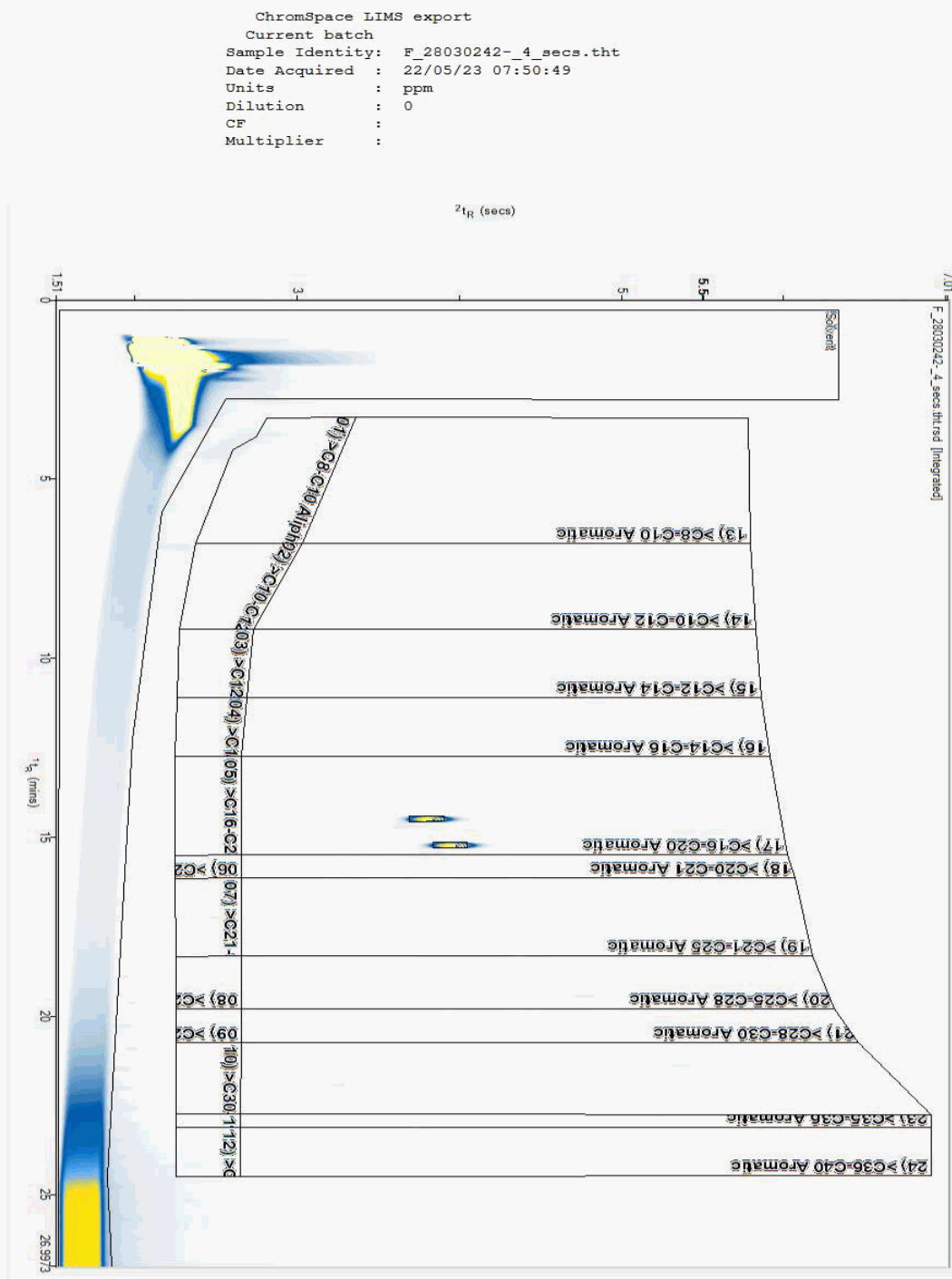
Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID

Sample No : 28030242
Sample ID : WS02

Depth : 0.50 - 0.80





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

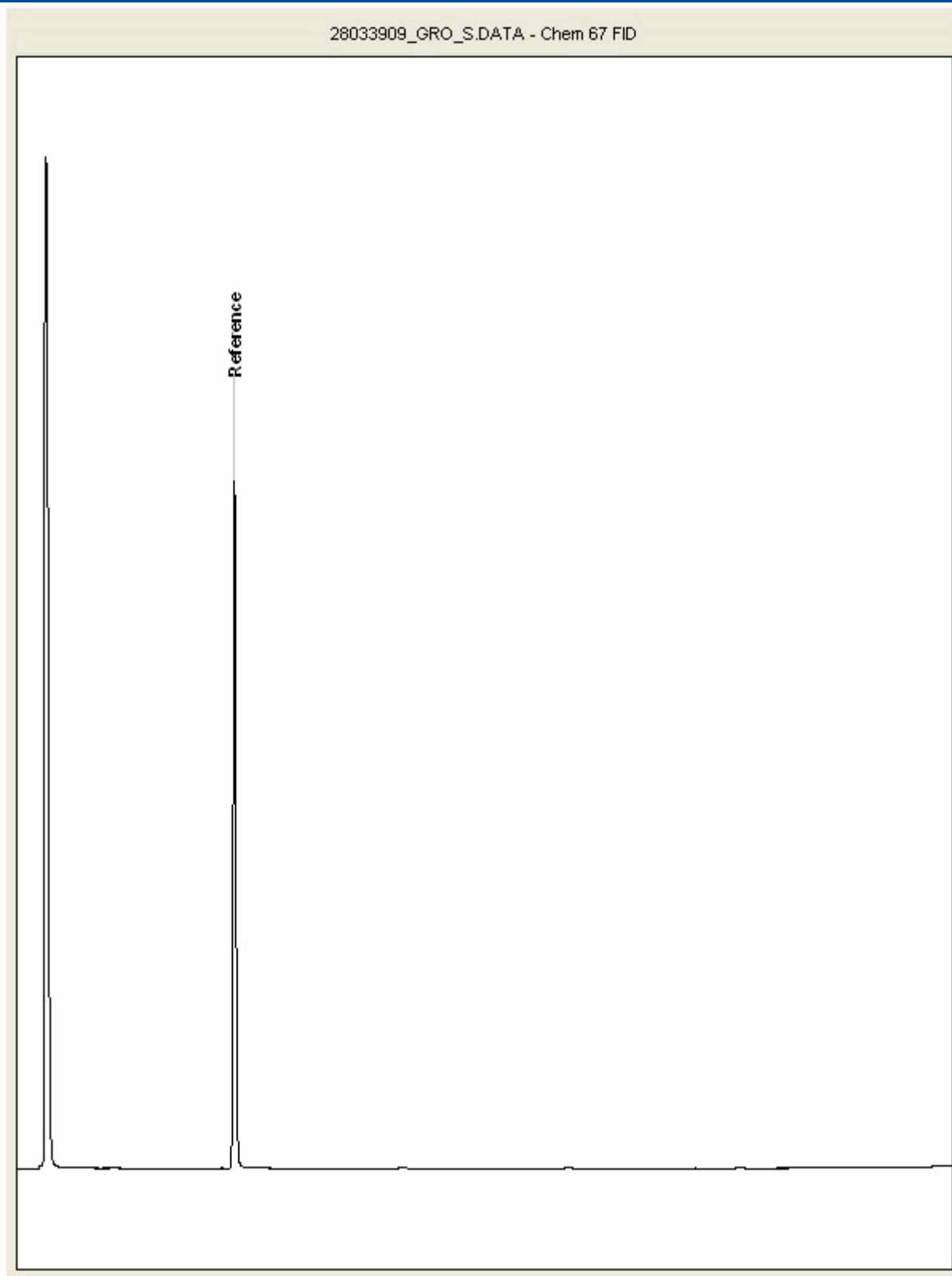
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 28033909
Sample ID : WS04

Depth : 1.00 - 1.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

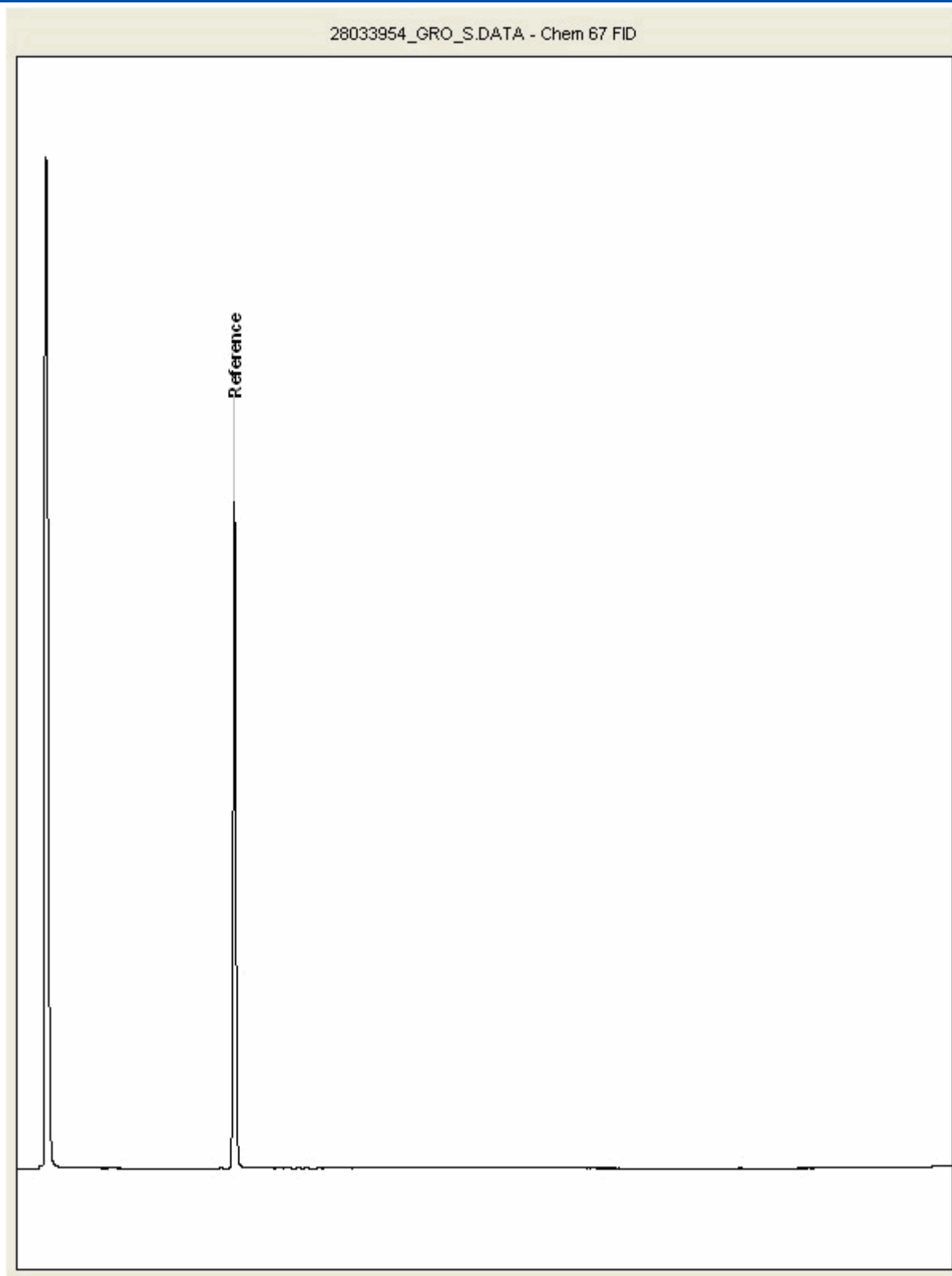
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 28033954
Sample ID : WS05

Depth : 2.00 - 2.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

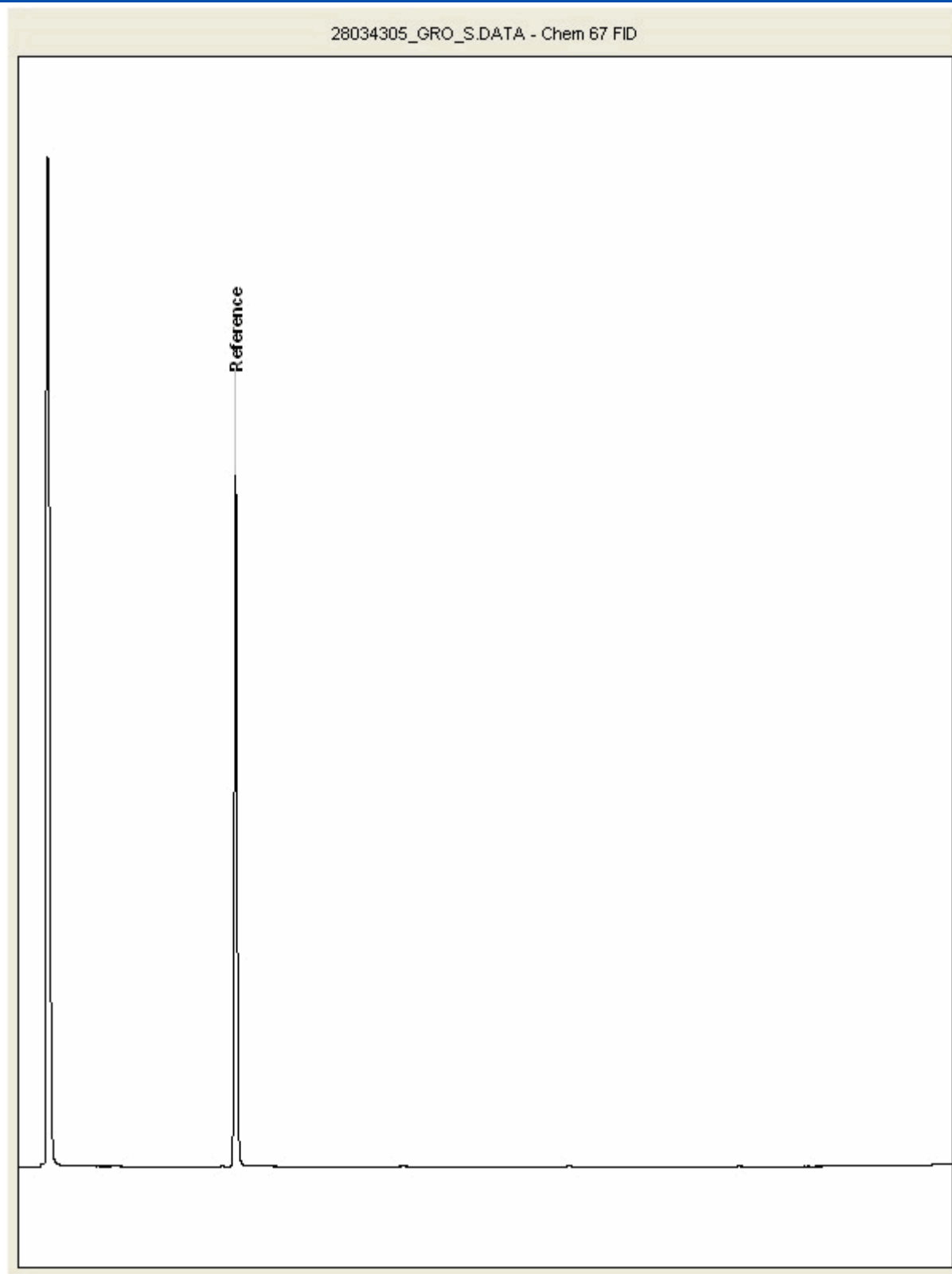
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 28034305
Sample ID : WS04

Depth : 4.00 - 4.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

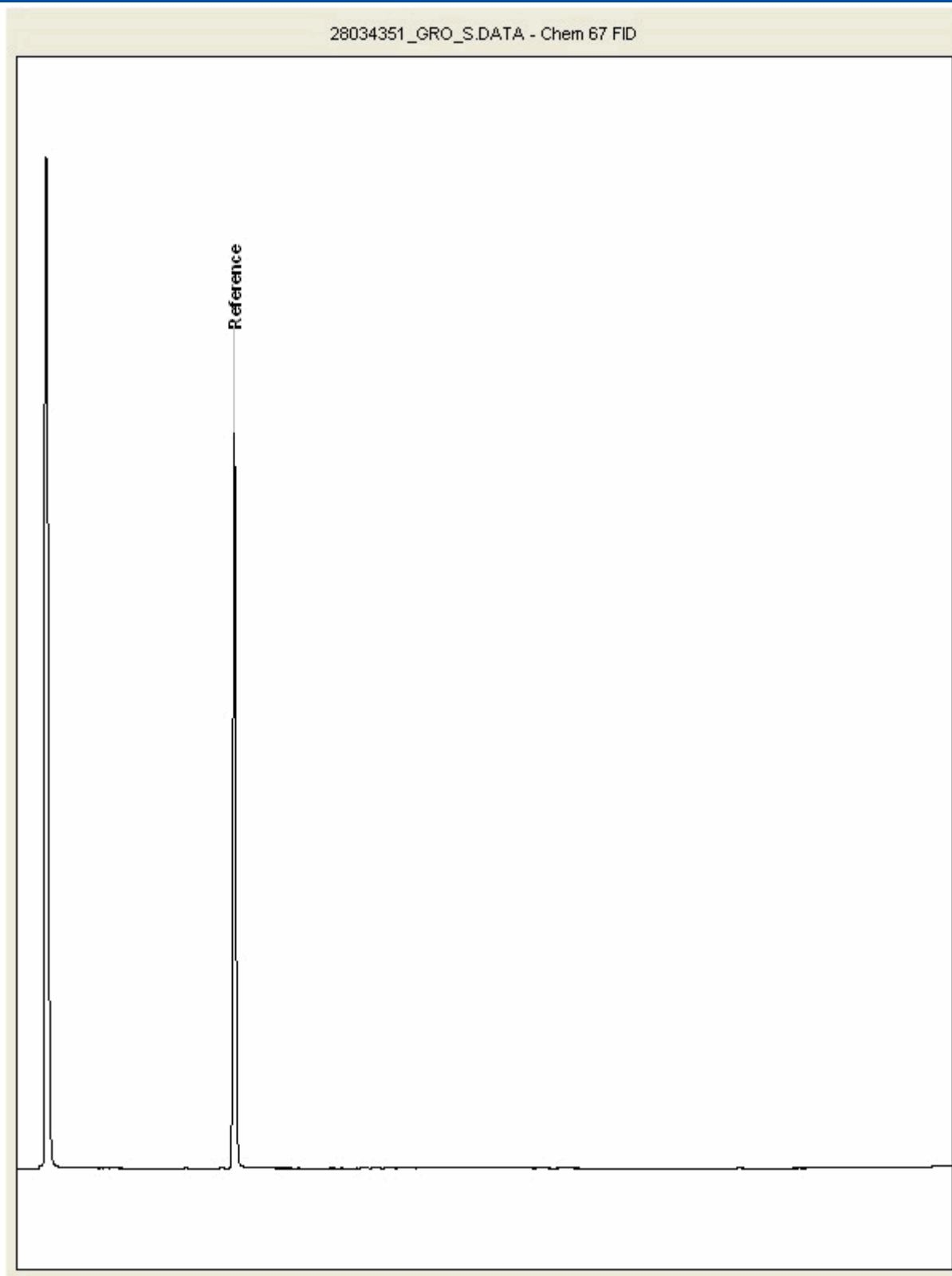
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 28034351
Sample ID : WS03

Depth : 3.00 - 3.50

28034351_GRO_S.DAT - Chem 67 FID





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

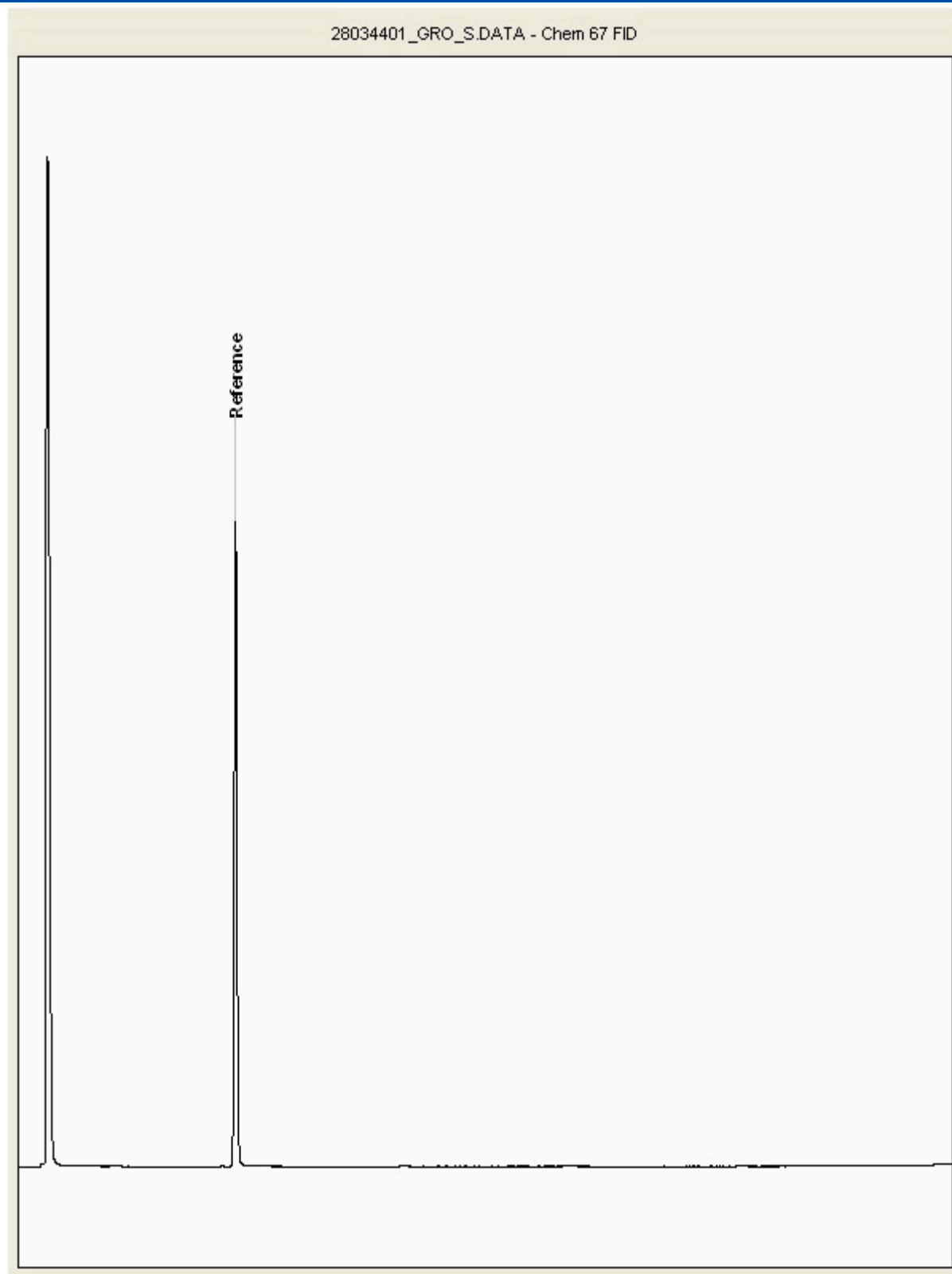
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 28034401
Sample ID : WS02

Depth : 0.50 - 0.80





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

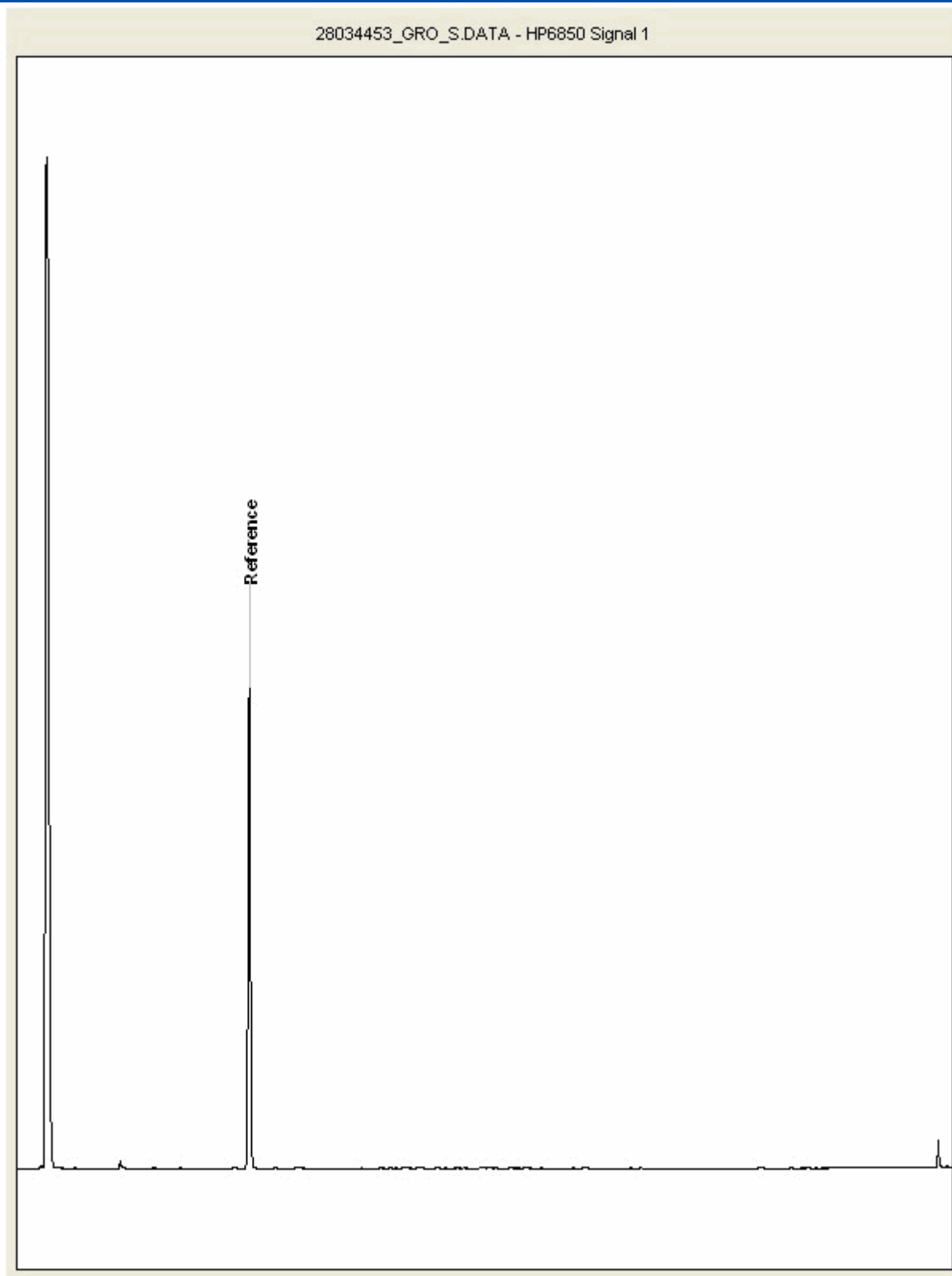
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 28034453
Sample ID : WS03

Depth : 0.00 - 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

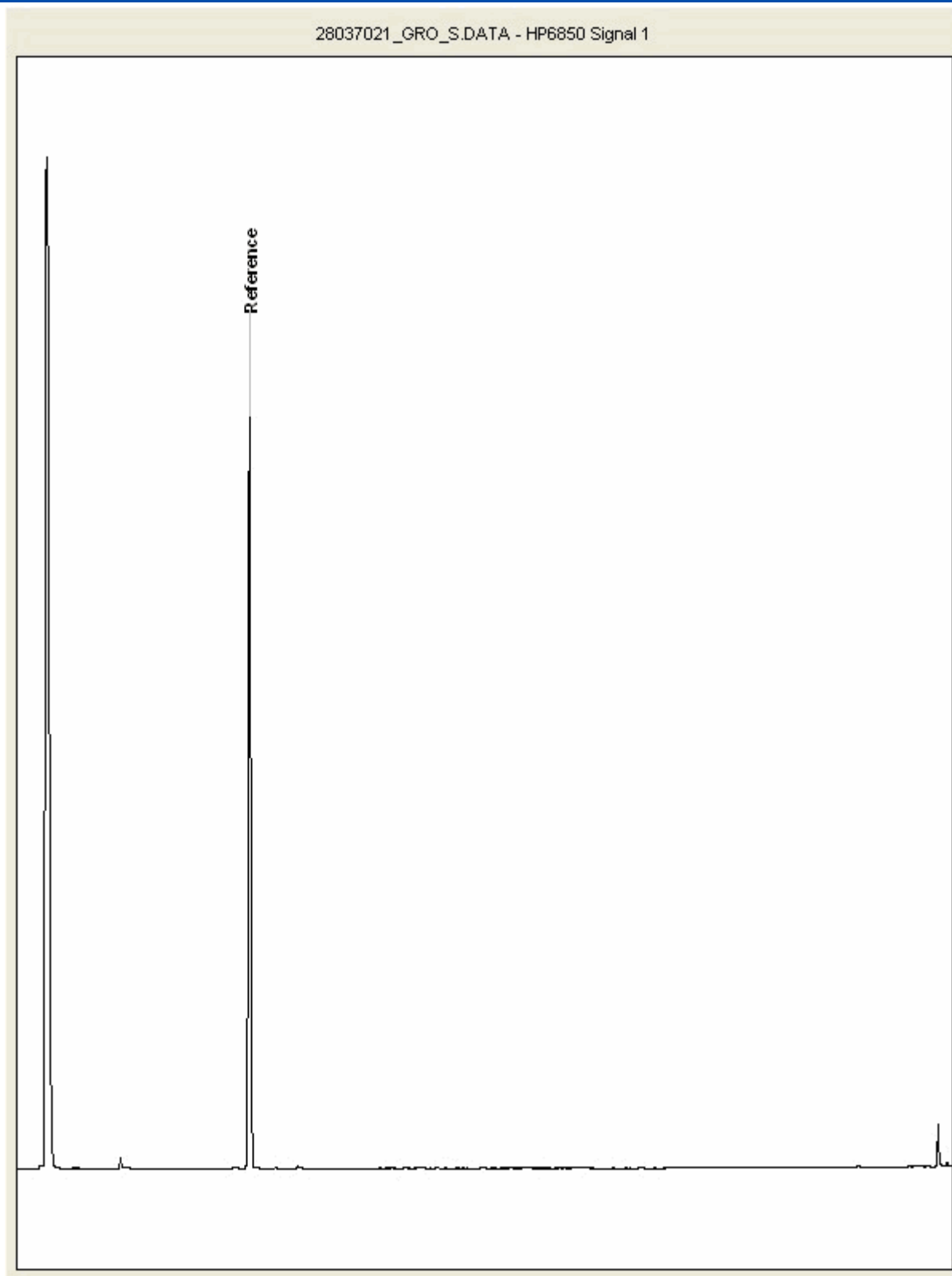
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 28037021
Sample ID : WS03

Depth : 1.50 - 1.80





CERTIFICATE OF ANALYSIS

Validated

SDG: 230519-135
Client Ref.: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

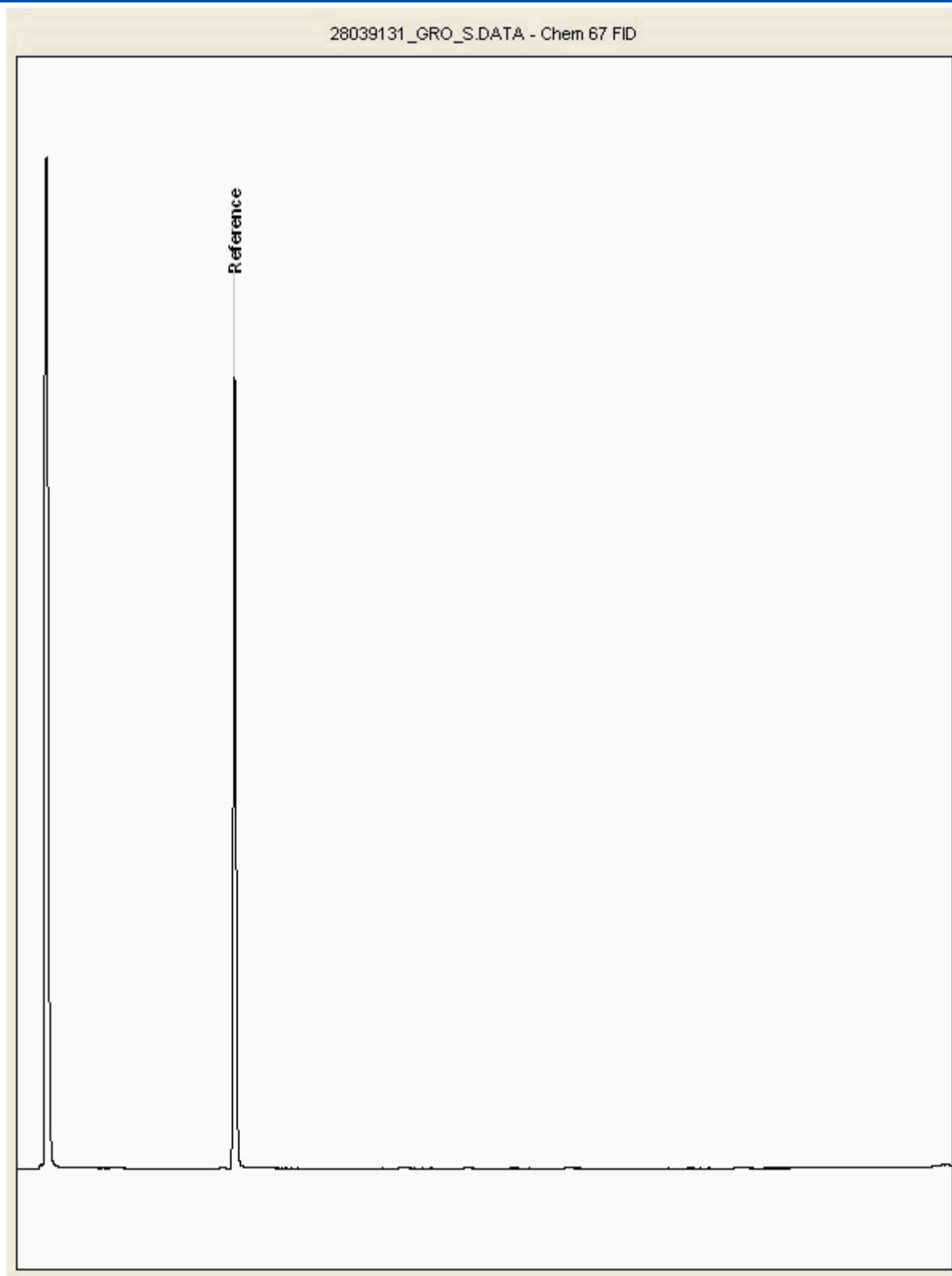
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 28039131
Sample ID : WS01

Depth : 1.00 - 1.50

28039131_GRO_S.DATA - Chem 67 FID





CERTIFICATE OF ANALYSIS

SDG: 230519-135
Client Ref: 70085596

Report Number: 690448
Location: Stanhope Road Bridge GI

Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

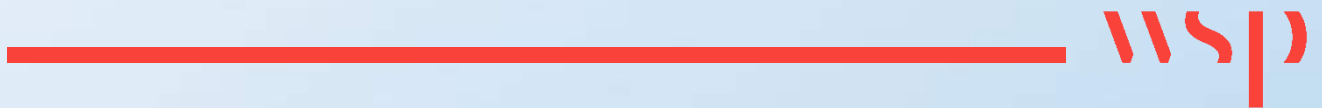
Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Appendix G

HUMAN HEALTH ASSESSMENT METHODOLOGY



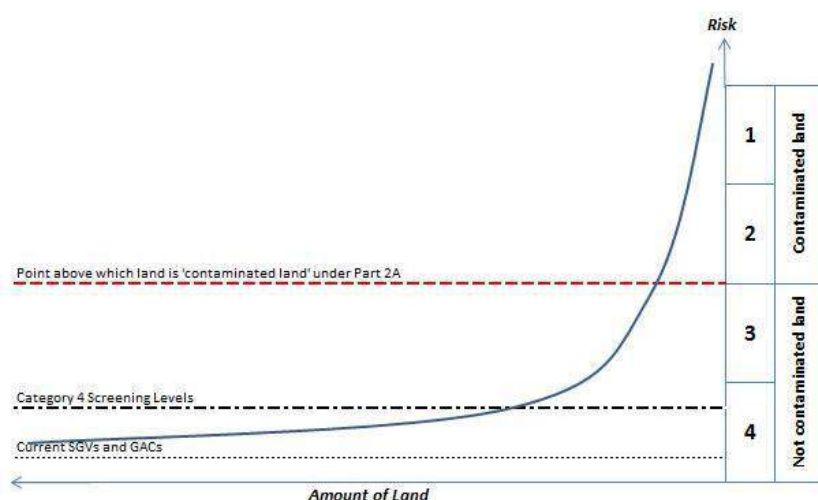
METHODOLOGY FOR THE DERIVATION OF GENERIC QUANTITATIVE ASSESSMENT CRITERIA TO EVALUATE RISKS TO HUMAN HEALTH FROM SOIL & GROUNDWATER CONTAMINATION

UK APPROACH

In the UK, the potential risks to human health from contamination in the ground are usually evaluated through a generic quantitative risk assessment (GQRA) approach. This allows generic and conservative exposure assumptions to be readily applied to risk assessments, and can be a useful tool for rapidly screening data and to identify those contaminants or scenarios that could benefit from further investigation and/or site-specific detailed quantitative risk assessment (DQRA). Current industry good practice is to use the approach presented in the Environment Agency (EA) publications SR2¹ and SR3². This approach allows the derivation of Generic Assessment Criteria (GACs), primarily for chronic exposure.

In April 2012, the Department of Environment, Food and Rural Affairs (Defra) published updated statutory guidance³ which introduced a four category approach to determining whether land in England and Wales is contaminated or not on the grounds of significant possibility of significant harm (SPOSH). **Figure 1** presents a graphical representation of the categories.

Figure 1: Four Categories for Determining if Land Represent a SPOSH



Cases classified as Category 1 are considered to be SPOSH based on actual evidence or an unacceptably high probability of harm existing. Category 4 cases are those where there is no risk, or a low risk of SPOSH.

¹ Environment Agency 'Human Health Toxicological Assessment of Contaminants in Soil', Report SC050021/SR2. January 2009.

² Environment Agency 'Updated Technical Background to the CLEA Model,' Report SC050021/SR3. January 2009.

³ Defra 'Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance'. April 2012.

GACs represent a minimal risk level, well within Category 4. A 2014 publication by Contaminated Land: Applications in Real Environments (CL:AIRE), SP1010⁴ and endorsed by Defra⁵ provided an approach to determine Category 4 Screening Levels (C4SLs) which are higher than the GACs whilst being “more pragmatic but still strongly precautionary”. It also provided C4SLs for six contaminants of concern. Although the C4SLs were designed to support Part 2A assessments to determine ‘contaminated land’ they are specifically mentioned, along with reference to the Part 2A statutory guidance, by the Department for Communities and Local Government (DCLG) for use in a planning context⁶.

An updated version the Contaminated Land Exposure Assessment (CLEA) Workbook (v1.071) was released by the EA in September 2015 to take into account the publication of SP1010. The updates comprised: additional toxicity data for the six chemicals for which C4SLs were derived; two new public open space land use scenarios; updated exposure parameters; options to run the model using C4SL exposure assumptions; and increased functionality. There were no changes to algorithms, so it is still possible to replicate the withdrawn SGVs using the input parameters held within v1.071.

It should be noted that the four category approach has not been adopted in Scotland under Part 2A or the planning regime. The Part 2A statutory guidance applicable in Scotland (Paper SE/2006/44 dated May 2006) does not reflect the changes introduced by Defra in April 2012 which allow for the use of C4SLs within Part 2A risk assessments. Additionally, it is considered that the principal of ‘minimal risk’ should still apply under planning in Scotland, based on current guidance.

WSP APPROACH

Following the withdrawal of the SGVs, and in the absence of an industry-wide, accepted set of GACs it is down to individual practitioners to derive their own soil assessment criteria. WSP has used the approach provided within SR2, SR3, SP1010, CLEA Workbook v1.071 and SR4⁷ to produce a set of minimal risk GACs. The chemical-specific data within two key publications were considered during their production: CL:AIRE 2010⁸ and LQM 2015⁹. Both documents provide comprehensive sets of GACs for different contaminants of concern.

The LQM Suitable For Use Levels (S4ULs) have selected exposure parameters consistent with the C4SL exposure scenarios. This approach was rejected by WSP as not representing minimal risk. However, the LQM S4UL document was critically reviewed and the approach and chemical input parameters were utilised where considered to be appropriate.

An industry-led C4SL Working Group is in the process of deriving a larger set of C4SLs in the near future, for approximately 20 contaminants. This will include a critical review of the chemical input data for all selected substances, and may therefore lead to further amendments to the chemical input data used in the WSP in-house screening values. It is considered likely that the contaminant list will

⁴ CL:AIRE ‘Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination’ SP1010, Final Project Report (Revision 2). September 2014.

⁵ Defra ‘SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document’. December 2014.

⁶ DCLG Planning Practice Guidance ‘Land Affected by Contamination’, particularly Paragraphs 001 and 007. Ref IDs: 33-001-20140306 & 33-007-20140612.

⁷ Environment Agency ‘CLEA Software (Version 1.05) Handbook (and Software)’, Report SC050021/SR4. September 2009.

⁸ CL:AIRE ‘The EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment’. ISBN 978-1-05046-20-1. January 2010.

⁹ Nathanail et al ‘The LQM/CIEH S4ULs for Human Health Risk Assessment’, Land Quality Press, ISBN 978-0-9931084-0-2. 2015.

crossover with the 2009 EIC/AGS/CL:AIRE GACs. As such, this document was not critically reviewed by WSP.

WSP's current approach to the assessment of risks to human health is to continue to evaluate minimal risk through the use of in-house derived GACs, and to use the published C4SLs as a secondary tier of assessment until such time as additional C4SLs are published and/or in-house values are derived.

EXPOSURE MODELS

LAND USES

WSP has largely adopted the exposure assumptions of the generic land use scenarios included within SR3, with two additional public open space scenarios included from within SP1010 and two bespoke exposure scenarios (highways):

- à Residential with homegrown produce consumption;
- à Residential without homegrown produce consumption;
- à Allotments;
- à Commercial;
- à Public open space near residential housing (POS_{resi});
- à Public park (POS_{park});
- à Highways (surface soils); and
- à Highways (subsurface soils).

Exceptions are described in the following Sections.

SOIL PROPERTIES

SR3 assumes a sandy loam soil with a pH of 7 and a Soil Organic Matter (SOM) content of 6% for its generic land uses, based on the geographical spread of topsoils in the UK. WSP has adopted these default values. In addition, GACs based on an SOM of 1% and 2.5% have been derived, based on common experience of the nature of Made Ground and lack of topsoil on many brownfield sites.

RECEPTOR CHARACTERISTICS AND BEHAVIOURS

SP1010 provides some updated exposure parameters for long-term inhalation rates¹⁰ and the consumption rates for homegrown produce¹¹ compared to those provided in SR3. This data was used to derived WSP's GACs.

The changes in inhalation rates do not apply to the allotment generic land use scenario, as these are based on the breathing rates for short-term exposure of light to moderate intensity activity which were derived from a study that was not updated in USEPA 2011, so the SR3 rates were retained.

¹⁰ USEPA, National Centre for Environmental Assessment 'Exposure Factors Handbook: 2011 Edition' EPA/600/R-09/052F. September 2011.

¹¹ National Diet and Nutrition Survey 2008/2009 to 2010/2011.

HIGHWAYS EXPOSURE SCENARIOS

Human health GAC for a Highways exposure scenario have been derived. The site area is defined by publicly accessible land adjacent to highways, comprising both hard and soft landscaped areas. Exposure is considered to be largely transitory.

There are no publicly available GAC for this exposure scenario. Consequently, WSP have derived GAC for the following exposure scenarios:

- à Highways (surface soils); and
- à Highways (sub-surface soils).

Surface soils GAC are for soil at ground level and within 300mm of the surface. Conversely, subsurface GAC are for soils at a depth exceeding 0.3m bgl. These GAC are not to be used as import criteria.

The critical receptor is a young female child, CLEA age classes 4-9. This is consistent with the critical receptor for the POS(resi) exposure scenario, and considered to be appropriate for a child potentially playing outside without direct adult supervision.

For all GAC, a sandy loam soil and a soil organic matter content of 1% is assumed. There is no building on site.

Exposure scenarios for surface and subsurface soils are detailed below. These are considered to be conservative estimates, due to the mostly transitory use of publically accessible lands adjacent to highways.

HIGHWAYS GAC (SURFACE SOILS)

The relevant exposure pathways include direct soil and dust ingestion, dermal contact (outdoors) and the inhalation of outdoor dust and vapour.

The exposure frequency is 170 days per annum, and the occupancy period outdoors is 1 hour per day (as per the POS (resi) exposure scenario). The soil and dust ingestion rate has been set at 50 mg/day, consistent with a POS(park) exposure scenario.

HIGHWAYS GAC (SUBSURFACE SOILS)

The single relevant exposure pathway is the inhalation of outdoor vapour. Direct exposure pathways are not viable due to the depth of the soils below ground level.

The exposure frequency is 170 days per annum, and the occupancy period outdoors is 1 hour per day (as per the POS (resi) exposure scenario). The soil and dust ingestion rate has been set to zero, as direct exposure pathways to soils at this depth are not viable.

CHEMICAL DATA

PHYSICO-CHEMICAL PARAMETERS

Physico-chemical properties for the contaminants for which GACs have been derived have been obtained following critical review of the following hierarchy of data sources:

1. Environment Agency/Defra SGV reports where available;
2. Environment Agency '*Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values*', Report SC050021/SR7, November 2008; and
3. Published fate and transport reviews within Nathanail et. al 2015 and CL:AIRE 2010.

Where appropriate, and where sufficient data is available, values were adjusted to reflect a UK soil temperature of 10°C (e.g. K_{aw}).

TOXICOLOGICAL DATA

Toxicological data for the derivation of minimal risk Health Criteria Values (HCV) for each contaminant was selected with due regard to the approach presented in SR2. Where appropriate, the following hierarchy of data sources was used:

1. UK toxicity reviews published by authoritative bodies including:
 - < EA;
 - < Public Health England (PHE);
 - < Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT); and
 - < Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (COC).
2. Authoritative European sources such as European Food Standards Agency (EFSA)
3. International organisations including:
 - < World Health Organisation (WHO); and
 - < Joint FAO/WHO Expert Committee on Food Additives (JECFA).
4. Authoritative country-specific sources including:
 - < United States Environmental Protection Agency (USEPA);
 - < US Agency for Toxic Substances and Disease Registry (ATSDR);
 - < US Integrated Risk Information System (IRIS); and
 - < Netherlands National Institute for Public Health and the Environment (RIVM).

Factors such as the applicability of the data to human health (e.g. epidemiological vs. animal studies), the quality of the data, the level of uncertainty in the results and the age of the data were also taken into account in the final selection. Details for specific substances are available on request.

MEAN DAILY INTAKES

Estimations of background exposure for each threshold substance have been updated. In line with the SR2 approach, the exposure from non-threshold substances in the soil does not take into account exposure from other sources, and as such GACs were derived without consideration of the Mean Daily Intake (MDI) for those substances.

The data published by the EA in its series of TOX reports between 2002 and 2009 was evaluated to determine whether the values were considered to remain valid today. Values from these current UK published sources were not amended unless they were considered to be significantly different so that the GACs remained as comparable as possible with the revoked SGVs.

ORAL MEAN DAILY INTAKES

Oral MDI were generally estimated as the sum of exposure via the ingestion of food and drinking water using the default adult physiological parameters presented in Table 3.3 of SR2.

Data on the exposure of substances from food ingestion was generally obtained from UK Total Diet Studies (TDS) published by the Food Standards Agency (FSA) and its predecessor the Ministry of Agriculture, Fisheries and Food (MAFF) and from studies commissioned by COT. Where no UK-specific data was available, MDI were derived from the European Food Safety Authority (EFSA), Health Canada and US sources. This was a rare occurrence, and in these instances, the data was evaluated to determine its applicability to the UK.

Data on the concentrations of substances in tap water was obtained from a variety of sources. UK data was used where available, with preference given to Drinking Water Inspectorate (DWI) 2014 data from water company tap water testing (LOD, 1st and 99th percentile data is available). Where the substance was not included in tap water testing, other UK sources of information were considered including:

- à DWI data from water company tap water testing from previous years;
- à COT; and
- à FSA.

Where UK data was not available, a number of other data sources were considered, largely WHO International Programme on Chemical Safety (IPCS) Concise International Chemical Assessment Documents (CICADs) and background documents for the development of Guidelines for Drinking Water Quality, using professional judgement on the relevance of the data to the UK. The final decision on the MDI from drinking water was made using professional judgement on the balance of relevance and probability, taking into account the detection limit where not detected, Koc and solubility, reduction in use of the substance, banned substances, tight controls (e.g. on explosives) and with due consideration to the SR2 instruction that “if no data or information in background exposure are available, background exposure should be assumed to be negligible and the MDI set to zero....”.

Data from other countries was generally not used because it was considered that the hydrogeology of these countries along with industrial practices were unlikely to be reflective of the UK.

INHALATION MEAN DAILY INTAKES

Inhalation MDIs were based on estimates of average daily exposure by the inhalation pathway and calculated using the default adult physiological parameters presented in Table 3.3 of SR2.

The inhalation MDIs were generally estimated using background exposure data from the UK, derived from Defra's UK-AIR: Air Information Resource¹², which provides ambient air quality data from a number of sites forming a UK-wide monitoring network. The MDIs for heavy metals were based on rolling annual average metal mass concentration data from Defra's UK Heavy Metals Monitoring Network from the period October 2009 to September 2010¹³.

Information for some substances was obtained from UK sources including Environment Agency TOX reports and data from the UK Expert Panel on Air Quality Standards (EPAQS). Where recent UK data was not available, data was sourced from the International Programme on Chemical Safety (IPCS), the World Health Organisation (WHO), the Agency for Toxic Substances and Diseases Registry (ATSDR), Health Canada, and various other peer-reviewed sources summarised by LQM/CIEH¹⁴.

For other substances, where no data or information on background exposure was available, background exposure was assumed to be negligible and the MDI set at 0.5*TDI in accordance with guidance in SR2.

PLANT UPTAKE

Soil to plant concentration factors are available in CLEA v1.071 for arsenic, cadmium, hexavalent chromium, lead, mercury, nickel and selenium. For all remaining inorganic chemicals, concentration factors were obtained using the PRISM model. Substance-specific correction factors have been selected in accordance with the guidance established within SR3. This is consistent to the approach utilised in the derivation of the LQM S4UL and the EIC/AGS/CL:AIRE GAC.

Where there is a lack of appropriate data to enable the derivation of specific soil to plant concentrations factors for organic chemicals, plant uptake was modelled within CLEA v1.071 using the generic equations recommended within SR3, as follows:

- à Green Vegetables – Ryan et al. (1988);
- à Root Vegetables – Trapp (2002);
- à Tuber Vegetables – Trapp et al. (2007); and
- à Tree Fruit – Trapp et al. (2003).

There are no suitable models available for modelling uptake for herbaceous fruit or shrub fruit. Exposure is considered negligible.

¹² Crown 2016 copyright Defra via uk-air.defra.gov.uk, licenced under the Open Government Licence (OGL).

¹³ Defra, 2013 Spreadsheet of historic data for multiple years for the Metals network. Available online at: <http://uk-air.defra.gov.uk/data/metals-data>. [Accessed 13/03/2016].

¹⁴ LQM/CIEH, 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment.

SOIL SATURATION LIMITS

GACs are not limited to their theoretical soil saturation within CLEA, although where either the aqueous or the vapour-based saturation is exceeded, this is highlighted within the Workbook (compared with the lower of the two values). This affects pathways which depend on partitioning calculations so in reality this only affects the vapour pathways and is relevant to organic substances and other substances, such as elemental mercury, that have a significant volatile component. However, the Workbook highlights saturation for direct contact pathways to indicate to the user where further qualitative consideration of free phase contamination at the surface may be required.

Where the lower of the two saturation limits is exceeded and the vapour pathway is the only exposure route being considered, the chronic risks to human health are likely to be negligible. Further evaluation could be undertaken using an alternative model suitable for evaluating non-aqueous phase liquids (NAPLs), such as the Johnson & Ettinger (J&E) approach described in USEPA 2003. However, WSP considers that if NAPLs are suspected, given the known limitations and over-simplifications of J&E, soil vapour monitoring is a more accurate way of assessing potential risks.

Where the lower saturation limit is exceeded for the vapour pathway and a number of exposure routes are being considered, then the contribution from the NAPL via vapour inhalation to the overall exposure can be evaluated using the procedure provided in SR4. WSP would evaluate this as part of a DQRA process or through soil vapour monitoring on-site to determine site-specific soil vapour concentrations.

CHEMICAL SPECIFIC ASSUMPTIONS

CYANIDES

Cyanide has high acute toxicity, and short term exposure is an important consideration when assessing the risks from soils contaminated with cyanide. The primary risk to human receptors from free cyanide in soils is an acute risk.

There is no current UK guidance available for calculating acute risks from free cyanide. Consequently, GAC for acute exposure were derived using the algorithms presented in MADEP 1992¹⁵ and assuming a one-off ingestion of 10g of soil (this conservative value has been taken as an upper bound estimate for a one-off soil ingestion rate amongst children). Receptor body weights have been selected according to the critical receptor for each exposure scenario. The lowest of the chronic and acute GAC for each land use scenario were adopted by WSP.

LEAD

The SGV for lead was withdrawn by the EA in 2009, and in 2011 the EA withdrew their published TOX report in light of new scientific evidence. The C4SL for lead was derived using the latest scientific evidence from a large human dataset. As such, no chemical-specific margin was applied in the derivation of the C4SL for lead. It may be possible for WSP to derive a GAC for lead using the same dataset and applying a chemical-specific margin, but the value is likely to be lower than UK natural background concentrations. Therefore, WSP has adopted the toxicological data used to derive the C4SLs in deriving the GAC for lead until such time as alternative GACs are published by an authoritative body. The relative bioavailability was set at 100% in line with the approach taken for other GACs, whereas the C4SL assumes 60% for soil and 64% for airborne dust. Thus, the WSP GAC are lower than the C4SLs.

¹⁵ MADEP 'Background Documentation for the Development of an "Available Cyanide" Benchmark Concentration' 1992. http://www.mass.gov/dep/toxics/cn_soil.htm

POLYCYCLIC AROMATIC HYDROCARBONS

WSP's approach to the assessment of polycyclic aromatic hydrocarbons (PAHs) uses the surrogate marker approach. BaP was used as a surrogate marker for all genotoxic PAHs in line with the Health Protection Agency 2010¹⁶ recommendations and SP1010. This assumes that the PAH profile of the data is similar to that of the coal tars used in the Culp *et al* oral carcinogenicity study from which the toxicity data for BaP was produced. In reality, this profile has been shown by HPA to be applicable on the majority of contaminated sites based on assessment of sites across the country.

The alternative is the Toxic Equivalency Factor (TEF) approach which uses a reference compound and assigns TEFs for other compounds based on estimates of potency. Key uncertainties with this approach include the assumption that all compounds have the same toxic mechanism of action within the body and that no compounds with a greater potency than the reference compound are present. It is considered by the HPA that the TEF approach is likely to under predict the true carcinogenicity of PAHs and therefore favours the surrogate marker approach.

For these reasons, WSP considers that the adoption of BaP as a surrogate marker for genotoxic PAHs, as opposed to the TEF approach, is reasonable. In rare cases where the PAH profile may differ from the wide definitions of the Culp *et al* study the user should discuss their project with an experienced risk assessor. In addition, WSP has derived a GAC for naphthalene, which is commonly a risk driver due to its high volatility, relative to other PAH compounds.

TRIMETHYLBENZENES

The GAC for trimethylbenzenes can be used for the assessment of any individual isomer (1,2,3-trimethylbenzene, 1,2,4-trimethylbenzene or 1,3,5-trimethylbenzene), or a mixture of the three isomers.

CHEMICAL GROUPS

For a number of chemical groups, the available toxicity data is for combinations of chemicals. Given that the physico-chemical parameters may differ between the chemicals, the GACs for the chemicals within the groups have been calculated and then the lowest GAC selected to represent the entire group. This was the approach taken by the EA for m-, o- and p-xylenes, and has also been adopted by WSP for:

- à 2-chlorophenol, 2,4-dichlorophenol, 2,4,6-trichlorophenol and 2,3,4,6-tetrachlorophenol;
- à 2-, 3- and 4-methylphenol (total cresols);
- à aldrin and dieldrin; and
- à α - and β -endosulphan.

¹⁶ HPA Contaminated Land Information Sheet 'Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs) 2010

EXPOSURE TO VAPOURS

INHALATION OF MEASURED VAPOURS

WSP has derived a set of soil vapour GACs (GAC_{sv}) that allow for the assessment of measured site soil vapour concentrations, using J&E, in order to establish potential risks via indoor inhalation of vapours. This methodology enables a more robust assessment of exposure via the inhalation of soil vapours indoors than using CLEA-derived soil GAC, as it is based upon measured soil vapour concentrations beneath the site. It also allows for the assessment of vapours from all source terms (i.e. groundwater, soil or NAPL). Outdoor inhalation was not included. WSP considers that the indoor inhalation pathway is the significantly dominant risk-driver.

The generic land use scenarios within CLEA (residential and commercial) that were used to derive the soil GAC were used to define the receptor and building characteristics for the soil vapour GAC. Only residential and commercial generic land use scenarios include the indoor inhalation of vapours pathway.

The GAC_{sv} were derived for three different soil types; sand, sandy loam and clay, reflecting the importance of this parameter within the J&E model. A depth to contamination of 0.85 m below the base of the building foundation was assumed (i.e. 1 m below ground level). This differs from the depth assumed for the soil GAC (0.5 m bgl), but was selected by WSP as a reasonable worst case scenario.

It is acknowledged that the J&E commonly over-predicts indoor vapour concentrations. In particular, it will significantly over-predict vapour concentrations for suspended floor slabs, which many new builds are constructed with, it does not take into account lateral migration and assumes an infinite source of contamination at steady state conditions. In addition, it is common for soil gas/vapour wells to be installed with at least 1 m of plain riser at the surface and this equates to a total depth of 0.85 m below the building foundation plus a 0.15 m thick foundation, and so is more representative of the depth that samples will be taken from.

The TDSIs and IDs for each substance were converted from $\mu g kg^{-1} bw day^{-1}$ to $\mu g m^{-3}$ using the standard conversions quoted in Table 3.3 of SR2, thereby replacing the need to model C_{air} in the equation:

$$C_{air} = \alpha \cdot C_{vap} \cdot 1,000,000 cm^3 m^{-3}$$

Where:

C_{air} is the concentration of vapours within the building, $mg m^{-3}$

α is the steady state attenuation coefficient between soil and indoor air, dimensionless

C_{vap} is the soil vapour concentration, $mg cm^{-3}$

The target concentrations within indoor air for each substance (C_{air}) are a function of receptor inhalation rates and occupancy periods, as defined by the site conceptual exposure model (assuming standard CLEA occupancy periods and receptors).

The attenuation factor was calculated using J&E (Equation 10.4 in SR3) and the resulting C_{vap} is equivalent to the GAC_{sv} for the modelled exposure scenario.

Where reported soil vapour concentrations exceed the relevant saturated vapour concentration, free product may occur, and the user should discuss their project with an experienced risk assessor.

INHALATION OF GROUNDWATER-DERIVED VAPOURS

WSP has derived a set of groundwater GACs (GAC_{gw}) to evaluate the potential risks through the indoor inhalation of groundwater-derived vapours by first applying the approach described above for the derivation of the WSP GAC_{sv} to determine the acceptable concentration in soil vapour directly above the water table.

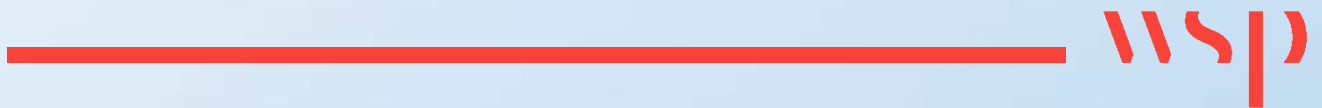
The depth to groundwater was assumed to be 1 m bgl (i.e. 0.85 m below the base of the building foundation). This depth was considered to be more representative of commonly encountered groundwater conditions than the 0.5 m below the base of the building foundation (i.e. 0.65 m bgl) that is used by CLEA for an unsaturated source present in the overlying soil.

The GAC_{gw} was then back-calculated from the GAC_{sv} using the air-water partition coefficient (K_{aw}) for each substance.

The WSP Groundwater Vapour GAC are protective against a dissolved phase contaminant source only. If the presence of NAPL is suspected, the risks from this source will need to be assessed. Where reported groundwater concentrations exceed the relevant solubility limit, free product may occur, and the user should discuss their project with an experienced risk assessor.

Appendix H

CONTAMINATION ASSESSMENT SCREENERS



PRE-REPORT DATA CHECK



All GEOL_GEO2 codes are complete.



All GEOL_GEO2 codes are recognised and suitable for this report.



All Test Types are valid and Sample Matrix can be calculated.



All result and screening units match



All TPH fractions are present for all samples to enable the calculation of the TPH Hazard Index

Stanhope Road Bridge



Parks Public Open Space, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Unrecognised analytes

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
WAC (Unrecognised code)	10.0	10.0	10.0	0.0000	-	0.0000	-	mg/kg	2	2	2	0	

Aliphatics and Aromatics

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Aliphatic C05-C06	0.010	0.005	0.010	0.010	0.005	0.010	94,700	mg/kg	5	8	0	0	
Aliphatic C06-C08	0.010	0.007	0.017	0.010	0.005	0.010	146,000	mg/kg	5	8	1	0	
Aliphatic C08-C10	0.010	0.010	0.035	0.010	0.005	0.010	14,300	mg/kg	5	8	1	0	
Aliphatic C10-C12	1.00	0.50	1.00	1.00	0.50	1.00	20,900	mg/kg	5	8	0	0	
Aliphatic C12-C16	1.00	0.50	1.00	1.00	0.50	1.00	24,700	mg/kg	5	8	0	0	
Aliphatic C16-C21	1.00	0.50	1.00	1.00	0.50	1.00	-	mg/kg	5	8	0	0	
Aliphatic C16-C35	1.00	0.50	1.00	2.09	5.05	8.00	525,000	mg/kg	5	8	2	0	
Aliphatic C21-C35	1.00	0.50	1.00	2.09	4.78	7.47	-	mg/kg	5	8	2	0	

Stanhope Road Bridge



Parks Public Open Space, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Aliphatics and Aromatics

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Aliphatic C35-C44	1.00	0.50	1.00	1.00	0.50	1.00	525,000	mg/kg	5	8	0	0	
Aliphatics C05-C10	0.050	0.030	0.052	0.050	0.025	0.050	-	mg/kg	5	8	1	0	
Aliphatics C10-C44	5.00	2.50	5.00	5.00	5.72	8.93	-	mg/kg	5	8	1	0	
Aromatic C06-C07	0.010	0.005	0.010	0.010	0.005	0.010	-	mg/kg	5	8	0	0	
Aromatic C07-C08	0.010	0.005	0.010	0.010	0.005	0.010	86,800	mg/kg	5	8	0	0	
Aromatic C08-C10	0.010	0.008	0.024	0.010	0.005	0.010	7,220	mg/kg	5	8	1	0	
Aromatic C10-C12	1.00	0.50	1.00	1.00	0.50	1.00	9,240	mg/kg	5	8	0	0	
Aromatic C12-C16	1.00	0.50	1.00	1.00	0.50	1.00	10,200	mg/kg	5	8	0	0	
Aromatic C16-C21	1.00	0.50	1.00	1.00	1.04	1.57	7,880	mg/kg	5	8	1	0	
Aromatic C16-C35	1.00	0.82	1.52	1.36	6.28	11.2	-	mg/kg	5	8	4	0	
Aromatic C21-C35	1.00	0.69	1.07	1.12	5.36	9.59	7,880	mg/kg	5	8	4	0	
Aromatic C35-C44	1.00	0.50	1.00	1.00	0.50	1.00	7,880	mg/kg	5	8	0	0	
Aromatic C40-C44	1.00	0.50	1.00	1.00	0.50	1.00	-	mg/kg	5	8	0	0	
Aromatics C05-C10	0.050	0.025	0.050	0.050	0.025	0.050	-	mg/kg	5	8	0	0	
Aromatics C10-C44	5.00	2.50	5.00	5.00	7.35	12.2	-	mg/kg	5	8	1	0	
Total Aliphatics & Aromatics (C10-C44)	10.00	5.00	10.00	10.0	13.1	21.1	-	mg/kg	5	8	1	0	

Stanhope Road Bridge



Parks Public Open Space, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Aliphatics and Aromatics

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Total Aliphatics and Aromatics (C05-C44)	10.00	5.00	10.00	10.0	13.1	21.1	-	mg/kg	5	8	1	0	
TPH Hazard Index	0.0003	0.0004	0.0004	0.0004	0.001	0.002	1.00	mg/kg	5	8	N/A	0	

Alkali and Alkaline Earth Metals

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Barium	24.9	44.7	97.5	36.3	104	172	5,770	mg/kg	5	8	8	0	
Beryllium	0.73	0.97	1.24	0.70	1.24	1.77	63.0	mg/kg	5	8	8	0	

Stanhope Road Bridge



Parks Public Open Space, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

BTEX and Fuel Additives

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Benzene	0.009	0.046	0.180	0.090	0.045	0.090	90.0	mg/kg	5	8	0	0	
BTEX	0.04	0.20	0.80	0.40	0.20	0.40	-	mg/kg	5	8	0	0	
Ethylbenzene	0.004	0.020	0.080	0.040	0.020	0.040	16,500	mg/kg	5	8	0	0	
Methyl t-butylether (MTBE)	0.010	0.051	0.200	0.10	0.050	0.10	98,400	mg/kg	5	8	0	0	
TAME	0.010	0.051	0.200	0.10	0.050	0.10	-	mg/kg	5	8	0	0	
Toluene	0.007	0.036	0.140	0.070	0.035	0.070	87,200	mg/kg	5	8	0	0	
Xylene - Total (Summed)	0.01	0.10	0.20	0.10	0.10	0.10	16,600	mg/kg	5	8	8	0	
Xylene-m & p	0.010	0.051	0.200	0.10	0.050	0.10	16,600	mg/kg	5	8	0	0	
Xylene-o	0.010	0.051	0.200	0.10	0.050	0.10	16,600	mg/kg	5	8	0	0	

Stanhope Road Bridge



Parks Public Open Space, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

General Chemistry

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Acid Neutralisation Capacity at pH 6	0.030	0.015	0.030	0.0000	-	0.0000	-	mol/kg	2	2	0	0	
Acid Neutralisation Capacity pH4	0.030	0.031	0.046	0.0000	-	0.0000	-	mol/kg	2	2	1	0	
pH	4.09	6.84	8.74	4.70	6.30	7.89	-	pH units	5	8	8	0	

Inorganics

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Sulphate as SO4	10,500	746,883	2,370,000	20,100	272,550	525,000	-	ug/l	5	8	8	0	

Stanhope Road Bridge



Parks Public Open Space, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Metals

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Arsenic	10.0	13.7	18.8	13.6	16.7	19.8	168	mg/kg	5	8	8	0	
Boron	1.00	0.50	1.00	1.00	0.50	1.00	46,000	mg/kg	5	8	0	0	
Cadmium	0.024	0.072	0.153	0.035	0.15	0.27	555	mg/kg	5	8	8	0	
Chromium	10.2	26.3	32.3	9.26	16.0	22.8	-	mg/kg	5	8	8	0	
Copper	11.5	15.0	19.1	31.4	161	291	44,400	mg/kg	5	8	8	0	
Hexavalent Chromium	0.60	0.30	0.60	0.60	0.30	0.60	69.0	mg/kg	5	8	0	0	
Lead	12.3	15.8	24.9	65.6	82.8	100	808	mg/kg	5	8	8	0	
Mercury	0.100	0.050	0.100	0.10	0.47	0.89	242	mg/kg	5	8	1	0	
Nickel	16.4	22.2	27.9	13.8	23.0	32.1	804	mg/kg	5	8	8	0	
Selenium	1.00	0.50	1.00	1.00	0.50	1.00	1,850	mg/kg	5	8	0	0	
Vanadium	36.7	54.0	63.6	41.5	44.7	47.9	5,030	mg/kg	5	8	8	0	
Zinc	30.7	45.5	64.9	38.9	89.5	140	173,000	mg/kg	5	8	8	0	

Stanhope Road Bridge



Parks Public Open Space, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Other

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Total organic carbon (TOC)	0.20	0.18	0.25	0.0000	-	0.0000	-	%	2	2	1	0	

Stanhope Road Bridge



Parks Public Open Space, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

PAHs

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Acenaphthene	0.008	0.004	0.008	0.008	0.008	0.012	-	mg/kg	5	8	1	0	
Acenaphthylene	0.012	0.006	0.012	0.012	0.022	0.038	-	mg/kg	5	8	1	0	
Anthracene	0.016	0.010	0.019	0.016	0.041	0.074	-	mg/kg	5	8	2	0	
Benzo (a) anthracene	0.014	0.009	0.017	0.014	0.17	0.34	-	mg/kg	5	8	2	0	
Benzo (a) pyrene	0.015	0.011	0.029	0.015	0.14	0.27	11.0	mg/kg	5	8	2	0	
Benzo (b) fluoranthene	0.015	0.013	0.041	0.015	0.21	0.41	-	mg/kg	5	8	2	0	
Benzo (ghi) perylene	0.024	0.016	0.037	0.024	0.084	0.16	-	mg/kg	5	8	2	0	
Benzo (k) fluoranthene	0.014	0.007	0.014	0.014	0.089	0.17	-	mg/kg	5	8	1	0	
Chrysene	0.010	0.005	0.010	0.010	0.18	0.35	-	mg/kg	5	8	1	0	
Coronene	0.20	0.10	0.20	0.0000	-	0.0000	-	mg/kg	2	2	0	0	
Dibenzo (ah) anthracene	0.023	0.012	0.023	0.023	0.025	0.038	-	mg/kg	5	8	1	0	
Fluoranthene	0.017	0.012	0.031	0.017	0.29	0.58	-	mg/kg	5	8	2	0	
Fluorene	0.010	0.005	0.010	0.010	0.010	0.015	-	mg/kg	5	8	1	0	
Indeno (1,2,3-cd) pyrene	0.018	0.013	0.031	0.018	0.081	0.15	-	mg/kg	5	8	2	0	
Naphthalene	0.009	0.005	0.009	0.009	0.034	0.064	1,240	mg/kg	5	8	1	0	
PAH Total (EPA 16)	0.118	0.095	0.274	0.12	1.74	3.43	-	mg/kg	5	8	2	0	

Stanhope Road Bridge



Parks Public Open Space, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

PAHs

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
PAH Total (EPA 17)	10.00	5.00	10.00	0.0000	-	0.0000	-	mg/kg	2	2	0	0	
Phenanthrene	0.015	0.013	0.039	0.015	0.14	0.27	-	mg/kg	5	8	2	0	
Pyrene	0.015	0.011	0.031	0.015	0.25	0.49	-	mg/kg	5	8	2	0	

Stanhope Road Bridge



Parks Public Open Space, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

PCBs

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
PCB101	0.003	0.002	0.003	0.003	0.002	0.003	-	mg/kg	3	4	0	0	
PCB118	0.003	0.002	0.003	0.003	0.002	0.003	-	mg/kg	3	4	0	0	
PCB138	0.003	0.002	0.003	0.003	0.002	0.003	-	mg/kg	3	4	0	0	
PCB153	0.003	0.002	0.003	0.003	0.002	0.003	-	mg/kg	3	4	0	0	
PCB180	0.003	0.002	0.003	0.003	0.002	0.003	-	mg/kg	3	4	0	0	
PCB28	0.003	0.002	0.003	0.003	0.002	0.003	-	mg/kg	3	4	0	0	
PCB52	0.003	0.002	0.003	0.003	0.002	0.003	-	mg/kg	3	4	0	0	
Total PCB Congeners ICES 7	0.021	0.011	0.021	0.021	0.011	0.021	2.60	mg/kg	3	4	0	0	

Phenols

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Phenol	0.010	0.005	0.010	0.010	0.005	0.010	760	mg/kg	5	8	0	0	

Stanhope Road Bridge



Parks Public Open Space, SOM=1%

Site Area(s) Selected: Whole site
Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

Physical													
ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
Loss on ignition	1.25	1.94	2.63	0.0000	-	0.0000	-	%	2	2	2	0	

Stanhope Road Bridge



Parks Public Open Space, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

QA Standard

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
4-Bromofluorobenzene	94.5	96.7	98.8	0.0000	-	0.0000	-	%	2	2	2	0	
Acenaphthene-d10	91.3	95.9	99.5	87.8	91.0	94.2	-	%	5	8	8	0	
Chrysene-d12	86.1	98.5	111.0	97.4	98.4	99.3	-	%	5	8	8	0	
Dibromofluoromethane	104	109	113	0.0000	-	0.0000	-	%	2	2	2	0	
EPH Surrogate % recovery**	92.0	94.3	96.6	0.0000	-	0.0000	-	%	2	2	2	0	
Naphthalene-d8	90.5	94.9	98.4	90.0	91.3	92.5	-	%	5	8	8	0	
Perylene-d12**	81.9	94.2	108.0	76.9	86.0	95.0	-	%	5	8	8	0	
Phenanthrene-d10 IS	94.1	98.4	105.0	84.9	90.6	96.3	-	%	5	8	8	0	
Toluene-d8 Surrogate	97.2	97.7	98.2	0.0000	-	0.0000	-	%	2	2	2	0	

Stanhope Road Bridge



Parks Public Open Space, SOM=1%

Site Area(s) Selected: Whole site

Phase(s): All phases

Notes: * For results below LOD, a value of half LOD is used in the calculation of the mean

TPH/EPH

ANALYTE	MADEGROUND			NATURAL GROUND			ASSESSMENT CRITERIA (AC)	UNITS	NO. OF LOCATIONS	NO. OF SAMPLES	NO. OF SAMPLES > LOD	NO. OF LOCATIONS > AC	LOCATIONS FAILING SCREENING
	MIN	MEAN*	MAX	MIN	MEAN*	MAX							
GRO Surrogate	101	108	115	90.8	98.4	106	-	%	5	8	8	0	
Mineral oils	5.00	2.50	5.00	0.0000	-	0.0000	-	mg/kg	2	2	0	0	
PRO (>C5-C10)	0.020	0.017	0.052	0.020	0.010	0.020	-	mg/kg	5	8	1	0	

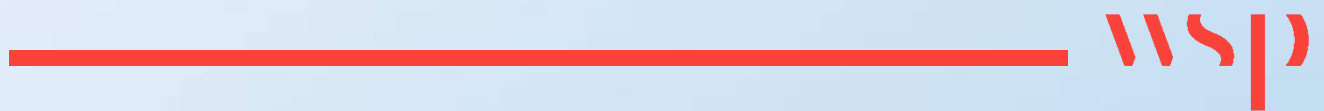
THERE WERE NO EXCEEDANCES OF Parks Public Open Space, SOM=1%

Soil Analytical Results Screening Sheet Site Name: Stanhope Road Historical Gis Job Number: 70085596 Screening Criteria: Parks POS 1% SOM															
Determinant	No. Samples	Min mg/kg	Mean mg/kg	Max mg/kg	GAC mg/kg	# GAC Exceeds	HESI BH1 1.0	HESI BH1 7.0	HESI BH2 5.0	RSK TP01 0.4	RSK TP01 1.5	RSK TP02 0.3	RSK TP02 0.7	RSK TP05 0.4	RSK TP06 0.9
Sulphate as SO4	3	< 0	0.91	1.18	No GAC	0	0.42	1.18	1.14						
pH	6	< 0	8.20	8.93	No GAC	0				7.91	7.66	8.93	8.89	7.86	7.93
Arsenic	6	< 0	12.17	22	168	0				20.00	6.00	11.00	8.00	22.00	6
Cadmium	6	< 0	1.23	1.8	555	0				1.80	1.00	1.00	1.20	1.60	0.80
Copper	6	< 0	98.33	300	44400	0				224.00	17.00	6.00	10.00	300.00	33.00
Chromium	6	< 0	24.33	35	No GAC	0				14.00	30.00	19.00	28.00	20.00	35.00
Chromium, Hexavalent	6	< 1	< 1	< 1	69	0				<1	<1	<1	<1	<1	<1
Lead	6	< 0	146.50	559	808	0				184.00	18.00	7.00	17.00	559.00	94.00
Mercury	6	< 0.17	0.19	0.26	242	0				<0.17	<0.17	<0.17	<0.17	<0.17	0.26
Nickel	6	< 0	22.00	31	804	0				25.00	20.00	15.00	25.00	31.00	16.00
Selenium	6	< 1	1.17	2	1850	0				<1	<1	<1	<1	2.00	<1
Zinc	6	< 0	105.00	268	173000	0				102.00	41.00	40.00	36.00	268.00	143.00
Acenaphthene	6	< 0.01	0.02	0.05	B(a)P-S.A.	0				0.04	<0.01	<0.01	<0.01	0.05	0.01
Acenaphthylene	6	< 0.01	0.03	0.08	B(a)P-S.A.	0				0.08	<0.01	<0.01	<0.01	0.07	0.02
Anthracene	6	< 0.02	0.11	0.27	B(a)P-S.A.	0				0.23	<0.02	<0.02	0.05	0.27	0.09
Benzo(a)anthracene	6	< 0.04	0.36	0.99	B(a)P-S.A.	0				0.78	<0.04	<0.04	0.05	0.99	0.27
Benzo(a)pyrene	6	< 0.04	0.32	0.81	11	0				0.81	<0.04	<0.04	0.05	0.76	0.21
Benzo(b)fluoranthene	6	< 0.05	0.51	1.37	B(a)P-S.A.	0				1.37	<0.05	<0.05	0.07	1.19	0.32
Benzo(ghi)perylene	6	< 0.05	0.20	0.56	B(a)P-S.A.	0				0.56	<0.05	<0.05	<0.05	0.38	0.11
Benzo(k)fluoranthene	6	< 0.07	0.20	0.46	B(a)P-S.A.	0				0.46	<0.07	<0.07	<0.07	0.42	0.11
Chrysene	6	< 0.06	0.44	1.16	B(a)P-S.A.	0				0.93	<0.06	<0.06	<0.06	1.16	0.35
Dibenzo(ah)anthracene	6	< 0.04	0.07	0.16	B(a)P-S.A.	0				0.16	<0.04	<0.04	<0.04	0.10	<0.04
Fluoranthene	6	< 0.08	0.76	2.29	B(a)P-S.A.	0				1.37	<0.08	<0.08	<0.08	2.29	0.66
Fluorene	6	< 0.01	0.02	0.03	B(a)P-S.A.	0				0.02	<0.01	<0.01	<0.01	0.03	0.01
Indeno(123-cd)pyrene	6	< 0.03	0.23	0.67	B(a)P-S.A.	0				0.67	<0.03	<0.03	0.04	0.49	0.13
Naphthalene	6	< 0.03	0.06	0.13	1240	0				0.13	<0.03	<0.03	<0.03	0.08	<0.03
Phenanthrene	6	< 0.03	0.27	0.75	B(a)P-S.A.	0				0.46	<0.03	<0.03	0.04	0.75	0.33
Pyrene	6	< 0.07	0.67	2.01	B(a)P-S.A.	0				1.24	<0.07	<0.07	0.07	2.01	0.56
PAH, Total Detected USEPA 16	6	< 0.08	4.00	11	No GAC	0				9.31	<0.08	<0.08	0.37	11.00	3.18
TPH >C6-C40	6	< 10	90.00	288	No GAC	0				177.00	<10	<10	17.00	288.00	38

B(a)P-S.A. - Benzo(a)pyrene used as surrogate for nonvolatile PAH risks

Appendix I

HAZWASTE ONLINE RESULTS





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)



UFDRY-D0MBW-1ZQ4T

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

Job name

Stanhope Road Bridge

Description/Comments

This is a preliminary conservative assessment based on a data set from the following ALS report ref: 230519-135. The site comprises a disused railway line that is currently used as a public footbridge. The footbridge runs east to west and is constructed over Stanhope Road on manmade embankments. It is proposed to construct a new footbridge and abutments; a new pedestrian and cycle ramp and pedestrian stairway; and reprofile landscaping of all existing embankments.

The demolition waste materials and any infilling soils encountered that cannot be re-used will be taken for off-site disposal. This is an initial assessment to support a ground investigation report.

It should be noted that any waste accepted into a landfill is at the landfill operators discretion, and that additional sampling and analysis may be required should materials be designated for off-site disposal.

Project

70085596

Site

Stanhope Road Bridge

Classified by

Name: Alice Waylett
Date: 09 Jun 2023 07:17 GMT
Telephone: 01992 526 000
Company: WSP
Unit 9 The Chase, John Tate Road, Foxholes Business Park, Hertford
SG13 7NN

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:

CERTIFIED

Course

Hazardous Waste Classification

Date

06 Oct 2022

Next 3 year Refresher due by Oct 2025

Purpose of classification

2 - Material Characterisation

Address of the waste

Stanhope Road Bridge, Haringey, N6 5DE

Post Code N6 5DE

SIC for the process giving rise to the waste

41100 Development of building projects

Description of industry/producer giving rise to the waste

Redevelopment of existing footbridge, bridge abutments and bridge wingwalls. Reprofilling and landscaping of all existing embankments.

Description of the specific process, sub-process and/or activity that created the waste

Demolition waste materials and any infilling soils that cannot be re-used will be taken off site for disposal.

Description of the waste

Made Ground comprising slightly gravelly clays with brick and flint, gravels of brick and sands with brick, coal and glass.



Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01-180523-1.50-1.00		Non Hazardous		3
2	WS02-180523-0.80-0.50		Non Hazardous		6
3	WS03-180523-1.80-1.50		Non Hazardous		9
4	WS03-180523-3.50-3.00		Non Hazardous		12
5	WS03-180523-0.50-0.00		Non Hazardous		15
6	WS04-180523-1.40-1.00		Non Hazardous		18
7	WS04-180523-4.50-4.00		Non Hazardous		21
8	WS05-180523-2.50-2.00		Non Hazardous		24

Related documents

#	Name	Description
1	230519-135.hwol	ALS Hawarden .hwol file used to populate the Job
2	WM3 v1.2 template with asbestos	waste stream template used to create this Job

Report

Created by: Alice Waylett

Created date: 09 Jun 2023 07:17 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	27
Appendix B: Rationale for selection of metal species	29
Appendix C: Version	29

Classification of sample: WS01-180523-1.50-1.00

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

Sample details

Sample name:	LoW Code:
WS01-180523-1.50-1.00	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
18% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

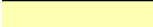
#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	 arsenic { arsenic trioxide }				12.5	mg/kg	1.32	13.533	mg/kg	0.00135 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	 beryllium { beryllium oxide }				1.13	mg/kg	2.775	2.572	mg/kg	0.000257 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	 boron { diboron trioxide; boric oxide }				<1	mg/kg	3.22	<3.22	mg/kg	<0.000322 %		<LOD
	005-008-00-8	215-125-8	1303-86-2									
4	 cadmium { cadmium oxide }				0.0239	mg/kg	1.142	0.0224	mg/kg	0.00000224 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	 chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				32.3	mg/kg	1.462	38.711	mg/kg	0.00387 %	✓	
		215-160-9	1308-38-9									
6	 chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.6	mg/kg	2.27	<1.362	mg/kg	<0.000136 %		<LOD
	024-017-00-8											
7	 copper { dicopper oxide; copper (I) oxide }				14.5	mg/kg	1.126	13.387	mg/kg	0.00134 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	 lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	13	mg/kg		10.66	mg/kg	0.00107 %	✓	
	082-001-00-6											
9	 mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	 nickel { nickel sulfate }				24.2	mg/kg	2.637	52.322	mg/kg	0.00523 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	 selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	 zinc { zinc sulphate }				44.1	mg/kg	2.469	89.295	mg/kg	0.00893 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	 TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
			TPH									
14	 tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	 benzene				<0.18	mg/kg		<0.18	mg/kg	<0.000018 %		<LOD
	601-020-00-8	200-753-7	71-43-2									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene 601-021-00-3	203-625-9	108-88-3		<0.14 mg/kg		<0.14 mg/kg	<0.000014 %			<LOD
17	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.08 mg/kg		<0.08 mg/kg	<0.000008 %			<LOD
18	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]		<0.4 mg/kg		<0.4 mg/kg	<0.00004 %			<LOD
19	pH		PH		7.51 pH		7.51 pH	7.51 pH			
20	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %			<LOD
21	acenaphthylene 205-917-1	208-96-8			<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %			<LOD
22	acenaphthene 201-469-6	83-32-9			<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %			<LOD
23	fluorene 201-695-5	86-73-7			<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
24	phenanthrene 201-581-5	85-01-8			<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
25	anthracene 204-371-1	120-12-7			<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %			<LOD
26	fluoranthene 205-912-4	206-44-0			<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %			<LOD
27	pyrene 204-927-3	129-00-0			<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
28	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %			<LOD
29	chrysene 601-048-00-0	205-923-4	218-01-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
30	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
31	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %			<LOD
32	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
33	indeno[123-cd]pyrene 205-893-2	193-39-5			<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %			<LOD
34	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %			<LOD
35	benzo[ghi]perylene 205-883-8	191-24-2			<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %			<LOD
36	phenol 604-001-00-2	203-632-7	108-95-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
37	polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %			<LOD
38	barium { barium sulphide } 016-002-00-X	244-214-4	21109-95-5		32 mg/kg	1.233	32.367 mg/kg	0.00324 %	✓		
39	2-methoxy-2-methylbutane; tert-amyl methyl ether 603-213-00-2	213-611-4	994-05-8		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
40	vanadium { divanadium pentaoxide; vanadium pentoxide } 023-001-00-8	215-239-8	1314-62-1		62 mg/kg	1.785	90.759 mg/kg	0.00908 %	✓		
Total:									0.0362 %		



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
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS02-180523-0.80-0.50

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

Sample details

Sample name:	LoW Code:
WS02-180523-0.80-0.50	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9.3% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 9.3% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				18.4 mg/kg	1.32	22.035 mg/kg	0.0022 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	beryllium { beryllium oxide }				0.766 mg/kg	2.775	1.928 mg/kg	0.000193 %	✓		
	004-003-00-8	215-133-1	1304-56-9								
3	boron { diboron trioxide; boric oxide }				<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %			<LOD
	005-008-00-8	215-125-8	1303-86-2								
4	cadmium { cadmium oxide }				0.101 mg/kg	1.142	0.105 mg/kg	0.0000105 %	✓		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				10.2 mg/kg	1.462	13.521 mg/kg	0.00135 %	✓		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.6 mg/kg	2.27	<1.362 mg/kg	<0.000136 %			<LOD
	024-017-00-8										
7	copper { dicopper oxide; copper (I) oxide }				19.1 mg/kg	1.126	19.505 mg/kg	0.00195 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	15.4 mg/kg		13.968 mg/kg	0.0014 %	✓		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel sulfate }				16.4 mg/kg	2.637	39.22 mg/kg	0.00392 %	✓		
	028-009-00-5	232-104-9	7786-81-4								
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %			<LOD
	028-031-00-5	239-125-2	15060-62-5								
12	zinc { zinc sulphate }				30.7 mg/kg	2.469	68.757 mg/kg	0.00688 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %			<LOD
			TPH								
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %			<LOD
	601-020-00-8	200-753-7	71-43-2								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	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]								
19	pH				8.74 pH		8.74 pH	8.74 pH			
			PH								
20	naphthalene				<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %			<LOD
		205-917-1	208-96-8								
22	acenaphthene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %			<LOD
		201-469-6	83-32-9								
23	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-695-5	86-73-7								
24	phenanthrene				0.0387 mg/kg		0.0351 mg/kg	0.00000351 %	✓		
		201-581-5	85-01-8								
25	anthracene				0.019 mg/kg		0.0172 mg/kg	0.00000172 %	✓		
		204-371-1	120-12-7								
26	fluoranthene				0.031 mg/kg		0.0281 mg/kg	0.00000281 %	✓		
		205-912-4	206-44-0								
27	pyrene				0.0308 mg/kg		0.0279 mg/kg	0.00000279 %	✓		
		204-927-3	129-00-0								
28	benzo[a]anthracene				0.0166 mg/kg		0.0151 mg/kg	0.00000151 %	✓		
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				0.0406 mg/kg		0.0368 mg/kg	0.00000368 %	✓		
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				0.0292 mg/kg		0.0265 mg/kg	0.00000265 %	✓		
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				0.0309 mg/kg		0.028 mg/kg	0.0000028 %	✓		
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				0.0369 mg/kg		0.0335 mg/kg	0.00000335 %	✓		
		205-883-8	191-24-2								
36	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
37	polychlorobiphenyls; PCB				<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
38	barium { barium sulphide }				38.2 mg/kg	1.233	42.737 mg/kg	0.00427 %	✓		
	016-002-00-X	244-214-4	21109-95-5								
39	2-methoxy-2-methylbutane; tert-amyl methyl ether				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	603-213-00-2	213-611-4	994-05-8								
40	vanadium { divanadium pentaoxide; vanadium pentoxide }				36.7 mg/kg	1.785	59.423 mg/kg	0.00594 %	✓		
	023-001-00-8	215-239-8	1314-62-1								
41	coronene				<0.2 mg/kg		<0.2 mg/kg	<0.000002 %			<LOD
		205-881-7	191-07-1								
Total:									0.0299 %		



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
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS03-180523-1.80-1.50

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

Sample details

Sample name:	LoW Code:
WS03-180523-1.80-1.50	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
16%	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(wet weight correction)	Entry:

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

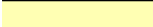
#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				18.8	mg/kg	1.32	20.851	mg/kg	0.00209 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.24	mg/kg	2.775	2.891	mg/kg	0.000289 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide; boric oxide }				<1	mg/kg	3.22	<3.22	mg/kg	<0.000322 %		<LOD
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				0.153	mg/kg	1.142	0.147	mg/kg	0.0000147 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				27	mg/kg	1.462	33.148	mg/kg	0.00331 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.6	mg/kg	2.27	<1.362	mg/kg	<0.000136 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				18.9	mg/kg	1.126	17.875	mg/kg	0.00179 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	24.9	mg/kg		20.916	mg/kg	0.00209 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				27.9	mg/kg	2.637	61.793	mg/kg	0.00618 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				64.9	mg/kg	2.469	134.616	mg/kg	0.0135 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.09	mg/kg		<0.09	mg/kg	<0.000009 %		<LOD
	601-020-00-8	200-753-7	71-43-2									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
	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]								
19	pH		PH		8.58 pH		8.58 pH	8.58 pH			
20	naphthalene				<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %			<LOD
		205-917-1	208-96-8								
22	acenaphthene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %			<LOD
		201-469-6	83-32-9								
23	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-695-5	86-73-7								
24	phenanthrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
		201-581-5	85-01-8								
25	anthracene				<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %			<LOD
		204-371-1	120-12-7								
26	fluoranthene				<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %			<LOD
		205-912-4	206-44-0								
27	pyrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
		204-927-3	129-00-0								
28	benzo[a]anthracene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %			<LOD
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %			<LOD
		205-883-8	191-24-2								
36	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
37	polychlorobiphenyls; PCB				<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
38	barium { barium sulphide }				97.5 mg/kg	1.233	101.023 mg/kg	0.0101 %		✓	
	016-002-00-X	244-214-4	21109-95-5								
39	2-methoxy-2-methylbutane; tert-amyl methyl ether				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	603-213-00-2	213-611-4	994-05-8								
40	vanadium { divanadium pentaoxide; vanadium pentoxide }				63.6 mg/kg	1.785	95.372 mg/kg	0.00954 %		✓	
	023-001-00-8	215-239-8	1314-62-1								
41	coronene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
		205-881-7	191-07-1								
Total:									0.0507 %		



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
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS03-180523-3.50-3.00

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

Sample details

Sample name:	LoW Code:
WS03-180523-3.50-3.00	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
13% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				10 mg/kg	1.32	11.487	mg/kg	0.00115 %	✓	
	033-003-00-0	215-481-4	1327-53-3								
2	beryllium { beryllium oxide }				0.936 mg/kg	2.775	2.26	mg/kg	0.000226 %	✓	
	004-003-00-8	215-133-1	1304-56-9								
3	boron { diboron trioxide; boric oxide }				<1 mg/kg	3.22	<3.22	mg/kg	<0.000322 %		<LOD
	005-008-00-8	215-125-8	1303-86-2								
4	cadmium { cadmium oxide }				0.0599 mg/kg	1.142	0.0595	mg/kg	0.00000595 %	✓	
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				31.1 mg/kg	1.462	39.545	mg/kg	0.00395 %	✓	
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.6 mg/kg	2.27	<1.362	mg/kg	<0.000136 %		<LOD
	024-017-00-8										
7	copper { dicopper oxide; copper (I) oxide }				14.1 mg/kg	1.126	13.811	mg/kg	0.00138 %	✓	
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	14.1 mg/kg		12.267	mg/kg	0.00123 %	✓	
	082-001-00-6										
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel sulfate }				27.1 mg/kg	2.637	62.165	mg/kg	0.00622 %	✓	
	028-009-00-5	232-104-9	7786-81-4								
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5								
12	zinc { zinc sulphate }				48.2 mg/kg	2.469	103.547	mg/kg	0.0104 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13	TPH (C6 to C40) petroleum group				<10 mg/kg		<10	mg/kg	<0.001 %		<LOD
			TPH								
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.1 mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.09 mg/kg		<0.09	mg/kg	<0.000009 %		<LOD
	601-020-00-8	200-753-7	71-43-2								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
	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]								
19	pH				7.31 pH		7.31 pH	7.31 pH			
			PH								
20	naphthalene				<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %			<LOD
		205-917-1	208-96-8								
22	acenaphthene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %			<LOD
		201-469-6	83-32-9								
23	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-695-5	86-73-7								
24	phenanthrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
		201-581-5	85-01-8								
25	anthracene				<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %			<LOD
		204-371-1	120-12-7								
26	fluoranthene				<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %			<LOD
		205-912-4	206-44-0								
27	pyrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
		204-927-3	129-00-0								
28	benzo[a]anthracene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %			<LOD
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %			<LOD
		205-883-8	191-24-2								
36	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
37	barium { barium sulphide }				46 mg/kg	1.233	49.364 mg/kg	0.00494 %	✓		
	016-002-00-X	244-214-4	21109-95-5								
38	2-methoxy-2-methylbutane; tert-amyl methyl ether				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	603-213-00-2	213-611-4	994-05-8								
39	vanadium { divanadium pentaoxide; vanadium pentoxide }				56.6 mg/kg	1.785	87.906 mg/kg	0.00879 %	✓		
	023-001-00-8	215-239-8	1314-62-1								
Total:									0.0401 %		



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
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS03-180523-0.50-0.00

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

Sample details

Sample name:	LoW Code:
WS03-180523-0.50-0.00	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
13% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				19.8	mg/kg	1.32	22.744	mg/kg	0.00227 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				1.77	mg/kg	2.775	4.274	mg/kg	0.000427 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide; boric oxide }				<1	mg/kg	3.22	<3.22	mg/kg	<0.000322 %		<LOD
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				0.269	mg/kg	1.142	0.267	mg/kg	0.0000267 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.26	mg/kg	1.462	11.775	mg/kg	0.00118 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.6	mg/kg	2.27	<1.362	mg/kg	<0.000136 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				291	mg/kg	1.126	285.041	mg/kg	0.0285 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	100	mg/kg		87	mg/kg	0.0087 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				32.1	mg/kg	2.637	73.635	mg/kg	0.00736 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				140	mg/kg	2.469	300.76	mg/kg	0.0301 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				21.1	mg/kg		18.357	mg/kg	0.00184 %	✓	
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.09	mg/kg		<0.09	mg/kg	<0.000009 %		<LOD
	601-020-00-8	200-753-7	71-43-2									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	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]							
19	pH		PH		7.89 pH		7.89 pH	7.89 pH		
20	naphthalene				0.0639 mg/kg		0.0556 mg/kg	0.00000556 %	✓	
	601-052-00-2	202-049-5	91-20-3							
21	acenaphthylene				0.0378 mg/kg		0.0329 mg/kg	0.00000329 %	✓	
		205-917-1	208-96-8							
22	acenaphthene				0.0115 mg/kg		0.01 mg/kg	0.000001 %	✓	
		201-469-6	83-32-9							
23	fluorene				0.0153 mg/kg		0.0133 mg/kg	0.00000133 %	✓	
		201-695-5	86-73-7							
24	phenanthrene				0.272 mg/kg		0.237 mg/kg	0.0000237 %	✓	
		201-581-5	85-01-8							
25	anthracene				0.0735 mg/kg		0.0639 mg/kg	0.00000639 %	✓	
		204-371-1	120-12-7							
26	fluoranthene				0.576 mg/kg		0.501 mg/kg	0.0000501 %	✓	
		205-912-4	206-44-0							
27	pyrene				0.492 mg/kg		0.428 mg/kg	0.0000428 %	✓	
		204-927-3	129-00-0							
28	benzo[a]anthracene				0.341 mg/kg		0.297 mg/kg	0.0000297 %	✓	
	601-033-00-9	200-280-6	56-55-3							
29	chrysene				0.354 mg/kg		0.308 mg/kg	0.0000308 %	✓	
	601-048-00-0	205-923-4	218-01-9							
30	benzo[b]fluoranthene				0.414 mg/kg		0.36 mg/kg	0.000036 %	✓	
	601-034-00-4	205-911-9	205-99-2							
31	benzo[k]fluoranthene				0.171 mg/kg		0.149 mg/kg	0.0000149 %	✓	
	601-036-00-5	205-916-6	207-08-9							
32	benzo[a]pyrene; benzo[def]chrysene				0.265 mg/kg		0.231 mg/kg	0.0000231 %	✓	
	601-032-00-3	200-028-5	50-32-8							
33	indeno[123-cd]pyrene				0.152 mg/kg		0.132 mg/kg	0.0000132 %	✓	
		205-893-2	193-39-5							
34	dibenz[a,h]anthracene				0.0377 mg/kg		0.0328 mg/kg	0.00000328 %	✓	
	601-041-00-2	200-181-8	53-70-3							
35	benzo[ghi]perylene				0.155 mg/kg		0.135 mg/kg	0.0000135 %	✓	
		205-883-8	191-24-2							
36	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
37	polychlorobiphenyls; PCB				<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
38	barium { barium sulphide }				172 mg/kg	1.233	184.58 mg/kg	0.0185 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
39	2-methoxy-2-methylbutane; tert-amyl methyl ether				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	603-213-00-2	213-611-4	994-05-8							
40	vanadium { divanadium pentaoxide; vanadium pentoxide }				41.5 mg/kg	1.785	64.454 mg/kg	0.00645 %	✓	
	023-001-00-8	215-239-8	1314-62-1							
Total:								0.106 %		



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
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 Given the nature of the samples (soils) the flammability hazardous property is not considered likely to apply.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00184%)

Classification of sample: WS04-180523-1.40-1.00

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

Sample details

Sample name:	LoW Code:
WS04-180523-1.40-1.00	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
15% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				11.2 mg/kg	1.32	12.569 mg/kg	0.00126 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	beryllium { beryllium oxide }				0.732 mg/kg	2.775	1.727 mg/kg	0.000173 %	✓		
	004-003-00-8	215-133-1	1304-56-9								
3	boron { diboron trioxide; boric oxide }				<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %			<LOD
	005-008-00-8	215-125-8	1303-86-2								
4	cadmium { cadmium oxide }				0.047 mg/kg	1.142	0.0456 mg/kg	0.00000456 %	✓		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				27.1 mg/kg	1.462	33.667 mg/kg	0.00337 %	✓		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.6 mg/kg	2.27	<1.362 mg/kg	<0.000136 %			<LOD
	024-017-00-8										
7	copper { dicopper oxide; copper (I) oxide }				11.5 mg/kg	1.126	11.006 mg/kg	0.0011 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	15.1 mg/kg		12.835 mg/kg	0.00128 %	✓		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel sulfate }				18.3 mg/kg	2.637	41.014 mg/kg	0.0041 %	✓		
	028-009-00-5	232-104-9	7786-81-4								
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %			<LOD
	028-031-00-5	239-125-2	15060-62-5								
12	zinc { zinc sulphate }				43.6 mg/kg	2.469	91.512 mg/kg	0.00915 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %			<LOD
			TPH								
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.09 mg/kg		<0.09 mg/kg	<0.000009 %			<LOD
	601-020-00-8	200-753-7	71-43-2								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
	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]								
19	pH				4.09 pH		4.09 pH	4.09 pH			
			PH								
20	naphthalene				<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %			<LOD
		205-917-1	208-96-8								
22	acenaphthene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %			<LOD
		201-469-6	83-32-9								
23	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-695-5	86-73-7								
24	phenanthrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
		201-581-5	85-01-8								
25	anthracene				<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %			<LOD
		204-371-1	120-12-7								
26	fluoranthene				<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %			<LOD
		205-912-4	206-44-0								
27	pyrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
		204-927-3	129-00-0								
28	benzo[a]anthracene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %			<LOD
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %			<LOD
		205-883-8	191-24-2								
36	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
37	barium { barium sulphide }				29.3 mg/kg	1.233	30.72 mg/kg	0.00307 %	✓		
	016-002-00-X	244-214-4	21109-95-5								
38	2-methoxy-2-methylbutane; tert-amyl methyl ether				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	603-213-00-2	213-611-4	994-05-8								
39	vanadium { divanadium pentaoxide; vanadium pentoxide }				50.3 mg/kg	1.785	76.326 mg/kg	0.00763 %	✓		
	023-001-00-8	215-239-8	1314-62-1								
Total:									0.033 %		



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
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS04-180523-4.50-4.00

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

Sample details

Sample name:	LoW Code:
WS04-180523-4.50-4.00	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 14% Wet Weight Moisture Correction applied (MC)

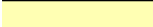
#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				13.6	mg/kg	1.32	15.443	mg/kg	0.00154 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	beryllium { beryllium oxide }				0.704	mg/kg	2.775	1.68	mg/kg	0.000168 %	✓	
	004-003-00-8	215-133-1	1304-56-9									
3	boron { diboron trioxide; boric oxide }				<1	mg/kg	3.22	<3.22	mg/kg	<0.000322 %		<LOD
	005-008-00-8	215-125-8	1303-86-2									
4	cadmium { cadmium oxide }				0.0347	mg/kg	1.142	0.0341	mg/kg	0.00000341 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				22.8	mg/kg	1.462	28.658	mg/kg	0.00287 %	✓	
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.6	mg/kg	2.27	<1.362	mg/kg	<0.000136 %		<LOD
	024-017-00-8											
7	copper { dicopper oxide; copper (I) oxide }				31.4	mg/kg	1.126	30.403	mg/kg	0.00304 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	65.6	mg/kg		56.416	mg/kg	0.00564 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				0.887	mg/kg	1.353	1.032	mg/kg	0.000103 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel sulfate }				13.8	mg/kg	2.637	31.292	mg/kg	0.00313 %	✓	
	028-009-00-5	232-104-9	7786-81-4									
11	selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
12	zinc { zinc sulphate }				38.9	mg/kg	2.469	82.608	mg/kg	0.00826 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
			TPH									
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.09	mg/kg		<0.09	mg/kg	<0.000009 %		<LOD
	601-020-00-8	200-753-7	71-43-2									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	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]							
19	pH		PH		4.7 pH		4.7 pH	4.7 pH		
20	naphthalene				<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
21	acenaphthylene				<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
		205-917-1	208-96-8							
22	acenaphthene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
		201-469-6	83-32-9							
23	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		201-695-5	86-73-7							
24	phenanthrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
		201-581-5	85-01-8							
25	anthracene				<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
		204-371-1	120-12-7							
26	fluoranthene				<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %		<LOD
		205-912-4	206-44-0							
27	pyrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
		204-927-3	129-00-0							
28	benzo[a]anthracene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
29	chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
30	benzo[b]fluoranthene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
31	benzo[k]fluoranthene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
32	benzo[a]pyrene; benzo[def]chrysene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
33	indeno[123-cd]pyrene				<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %		<LOD
		205-893-2	193-39-5							
34	dibenz[a,h]anthracene				<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
35	benzo[ghi]perylene				<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %		<LOD
		205-883-8	191-24-2							
36	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
37	barium { barium sulphide }				36.3 mg/kg	1.233	38.507 mg/kg	0.00385 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
38	2-methoxy-2-methylbutane; tert-amyl methyl ether				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	603-213-00-2	213-611-4	994-05-8							
39	vanadium { divanadium pentaoxide; vanadium pentoxide }				47.9 mg/kg	1.785	73.539 mg/kg	0.00735 %	✓	
	023-001-00-8	215-239-8	1314-62-1							
Total:								0.0378 %		



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
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS05-180523-2.50-2.00

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

Sample details

Sample name:	LoW Code:
WS05-180523-2.50-2.00	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
11% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				11.3 mg/kg	1.32	13.279 mg/kg	0.00133 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	beryllium { beryllium oxide }				1.01 mg/kg	2.775	2.495 mg/kg	0.000249 %	✓		
	004-003-00-8	215-133-1	1304-56-9								
3	boron { diboron trioxide; boric oxide }				<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %			<LOD
	005-008-00-8	215-125-8	1303-86-2								
4	cadmium { cadmium oxide }				0.0469 mg/kg	1.142	0.0477 mg/kg	0.00000477 %	✓		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				30.1 mg/kg	1.462	39.154 mg/kg	0.00392 %	✓		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.6 mg/kg	2.27	<1.362 mg/kg	<0.000136 %			<LOD
	024-017-00-8										
7	copper { dicopper oxide; copper (I) oxide }				11.9 mg/kg	1.126	11.924 mg/kg	0.00119 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	12.3 mg/kg		10.947 mg/kg	0.00109 %	✓		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel sulfate }				19.4 mg/kg	2.637	45.525 mg/kg	0.00455 %	✓		
	028-009-00-5	232-104-9	7786-81-4								
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %			<LOD
	028-031-00-5	239-125-2	15060-62-5								
12	zinc { zinc sulphate }				41.3 mg/kg	2.469	90.764 mg/kg	0.00908 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
13	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %			<LOD
			TPH								
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.09 mg/kg		<0.09 mg/kg	<0.000009 %			<LOD
	601-020-00-8	200-753-7	71-43-2								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
	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]								
19	pH				4.83 pH		4.83 pH	4.83 pH			
			PH								
20	naphthalene				<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %			<LOD
		205-917-1	208-96-8								
22	acenaphthene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %			<LOD
		201-469-6	83-32-9								
23	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-695-5	86-73-7								
24	phenanthrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
		201-581-5	85-01-8								
25	anthracene				<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %			<LOD
		204-371-1	120-12-7								
26	fluoranthene				<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %			<LOD
		205-912-4	206-44-0								
27	pyrene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
		204-927-3	129-00-0								
28	benzo[a]anthracene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %			<LOD
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %			<LOD
		205-883-8	191-24-2								
36	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
37	barium { barium sulphide }				24.9 mg/kg	1.233	27.335 mg/kg	0.00273 %	✓		
	016-002-00-X	244-214-4	21109-95-5								
38	2-methoxy-2-methylbutane; tert-amyl methyl ether				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	603-213-00-2	213-611-4	994-05-8								
39	vanadium { divanadium pentaoxide; vanadium pentoxide }				54.7 mg/kg	1.785	86.908 mg/kg	0.00869 %	✓		
	023-001-00-8	215-239-8	1314-62-1								
Total:									0.0346 %		



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
CLP: Note 1	Only the metal concentration has been used for classification



Appendix A: Classifier defined and non GB MCL 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

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

GB MCL 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 MCL protocols, considers many simple lead compounds to be Carcinogenic category 2

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - 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

■ **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

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

GB MCL index number: 601-023-00-4

Description/Comments:

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ **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

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

GB MCL 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.

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

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

■ **barium sulphide** (EC Number: 244-214-4, CAS Number: 21109-95-5)

GB MCL index number: 016-002-00-X

Description/Comments:

Additional Hazard Statement(s): EUH031 >= 0.8 %

Reason for additional Hazards Statement(s):

20 Nov 2021 - EUH031 >= 0.8 % hazard statement sourced from: WM3, Table C12.2

■ **divanadium pentaoxide; vanadium pentoxide** (EC Number: 215-239-8, CAS Number: 1314-62-1)

GB MCL index number: 023-001-00-8

Description/Comments: Hazard statements H301, H330, H350 added by HazWasteOnline due to ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be Carc. 1B; H350. The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.

Additional Hazard Statement(s): Carc. 1B; H350 , Acute Tox. 3; H301 , Acute Tox. 2; H330

Reason for additional Hazards Statement(s):

20 Sep 2022 - Carc. 1B; H350 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be Carc. 1B; H350. The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List].

Substance has therefore been self-classified.

28 Sep 2022 - Acute Tox. 3; H301 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 3; H301". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List].

Substance has therefore been self-classified.

28 Sep 2022 - Acute Tox. 2; H330 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 2; H330". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List].

Substance has therefore been self-classified.

▪ **coronene** (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.

Data source: <http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en>

Data source date: 16 Jun 2014

Hazard Statements: STOT SE 2; H371

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.

beryllium {beryllium oxide}

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

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.

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. 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.

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.

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight.

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. Worst case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

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

Chromate VI is below limit of detection. It is therefore considered unlikely that lead chromate is present within the soils.

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight.

nickel {nickel sulfate}

Chromate VI is below limit of detection. It is therefore considered unlikely that nickel chromate is present within the soils.

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight.

zinc {zinc sulphate}

Chromate VI is below limit of detection. It is therefore considered unlikely that zinc chromate is present within the soils.

barium {barium sulphide}

Chromate VI is below limit of detection. It is therefore considered unlikely that barium chromate is present within the soils.

vanadium {divanadium pentaoxide; vanadium pentoxide}

Worse case chosen

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021

HazWasteOnline Classification Engine Version: 2023.111.5569.10274 (22 Apr 2023)

HazWasteOnline Database: 2023.111.5569.10274 (22 Apr 2023)



This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

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 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

GB MCL List - version 1.1 of 09 June 2021



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