

REPORT

Castlefield Viaduct, Manchester

Land Quality Interpretative Ground Investigation and
Generic Quantitative Risk Assessment Report

Client: National Trust

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Executive Summary

Royal HaskoningDHV has been commissioned by the National Trust (the Trust) to undertake a ground investigation and assessment of Castlefield Viaduct, Manchester. The assessment will inform proposals to repurpose the historic viaduct structure into an elevated park with an integrated active travel hub.

The Trust's vision is for the urban park to be utilised in a variety of ways, ranging from exhibitions, fruit and vegetable growing, sculptures, workspace, onward travel information, community meeting and green space. A Phase 1 Pilot Scheme 'micro park' will be delivered on the eastern section of the viaduct, for a 12-week period in the summer of 2021. The temporary scheme will be undertaken to test the design possibilities and opportunities at the viaduct and generate momentum and support for the proposed scheme.

The railway is recorded as being dismantled in the late 1960s. The land underlying the viaduct was historically occupied by a roman fort, timber wharf, canal network and warehouses. The area surrounding the site has a long industrial history including use as railways, quaysides, wharfs, garages, gravel and sand pits, dye works, chemical works, paper mills, gas works and an abattoir.

The principal objective of the works was to evaluate the suitability of the site for the proposed elevated park. The works included an intrusive ground investigation, comprising a total of 10 hand dug pits, was undertaken by Royal HaskoningDHV on the 8th July 2021. The investigation included the collection of soil, paint scrapings and a surface water sample for laboratory analysis.

In order to evaluate potential risk to human health and controlled waters, soil, paint scrapings and soil-derived leachate analytical data were compared with pertinent Generic Assessment Criteria (GACs). To assess risks to controlled waters (surface waters) data was compared with Environmental Quality Standards (EQSs).

Based on the findings of the ground investigation and subsequent assessment detailed herein, the site soils potentially pose an unacceptable risk to site users, construction/maintenance workers and (if installed) potable water supply pipes. Paint scrapings indicate concentrations of metals that may pose an unacceptable risk to maintenance and construction workers.

Exceedances of the EQS for copper, zinc, lead, fluoranthene and benzo(a)pyrene were recorded. It was determined that lead, fluoranthene and benzo(a)pyrene have the potential to leach at concentrations which may pose an unacceptable risk to surface waters irrespective of development proposals.

Mitigation is required to reduce the risk and possible measures include covering of the ground with temporary boarding, or similar, removal of ballast and soil or processing of the ballast to remove the soil matrix, refurbishment of the drainage network, installation of new potable pipework and raised planting beds.

A remediation strategy and options appraisal should be completed to support the future redevelopment of the site.

1 Introduction

Royal HaskoningDHV was appointed by the National Trust (the Trust) to undertake a ground investigation and assessment for the proposed redevelopment of Castlefield Viaduct, Manchester, centred at Ordnance Survey (OS) Grid Reference 383005 Easting 397626 Northing (herein referred to as the 'site'). This assessment will inform proposals to develop the historic viaduct structure into an elevated urban park with integrated active travel hub. A site location plan is provided in Figure 1.1, at the end of this report.

This report should be read in conjunction with the Royal HaskoningDHV Castlefield Viaduct, Manchester Land Quality Desk Study and Preliminary Risk Assessment Report (Royal HaskoningDHV, 2021).

1.1 Description of the Proposed Scheme

Castlefield Viaduct is an unused, 330m long, historic structure in the heart of Manchester. The Trust wishes to bring the viaduct back into use by repurposing the structure into an elevated urban park and integrated active travel hub. The Trust's vision is for the urban park to be utilised in a variety of ways, ranging from exhibitions, fruit and vegetable growing, sculptures, workspace, onward travel information, community meeting and green space.

A Phase 1 Pilot Scheme 'micro park' will be delivered on the eastern section of the viaduct, for a 12-week period in the summer of 2021. The temporary scheme will be undertaken to test the design possibilities and opportunities at the viaduct, generate momentum and support for the permanent scheme. The temporary scheme will comprise the use of the viaduct as a 'micro park' for community events and organised walking tours. An architectural narrative booklet has been produced for the scheme, referred to as the Castlefield Story Book by Twelve Architects, in July 2020. Visualisations included within the booklet indicate the installation of a footpath across parts of the viaduct, the erection of weather shelters and the placement of planting containers.

The Phase 2 'permanent urban park and travel hub scheme' will comprise a permanent development on the viaduct inclusive of food / beverage stands, garden areas, exhibition stalls, seating areas, an events space and toilet facilities.

1.2 Aims and Objectives

The overall aims and objectives of the ground investigation and assessment were as follows:

- Provide information on the current ground conditions of the site with respect to land contamination.
- Refine the Conceptual Site Models (CSMs) and assess potential contaminant linkages associated with the proposed scheme.
- Identify potential unacceptable risks to human health or the environment via a Generic Quantitative Risk Assessment (GQRA).
- Identify potential risks, liabilities and constraints associated with the site and the proposed development.
- Determine if the site is suitable for the proposed scheme with regards to land contamination.
- Provide high level recommendations for further assessment, mitigation or remediation to render the site suitable for use and allow the proposed development to proceed.
- Facilitate and support the planning process.

1.3 Scope of Works

The scope of the investigation and assessment presented herein comprises:

- Intrusive ground investigation.
- A summary of the ground conditions encountered during the ground investigation works undertaken by Royal HaskoningDHV.
- Review the data presented in this report to identify any contaminant linkages that would need to be addressed to permit the safe redevelopment of the site for humans and to controlled waters.
- Complete a human health and controlled waters GQRA utilising soil, soil leachate, ballast leachate and paint laboratory analytical data collected during the ground investigation.
- Use the GQRA findings to refine the CSMs and update potential contaminant linkages, identify the environmental liabilities and how these may affect the proposed redevelopment of the site.
- If required, provide recommendations for further assessment of the environmental conditions of the site and evaluation of environmental risks and liabilities.
- If required, provide high level remedial recommendations to mitigate against the risks associated with the contaminant linkages to render the site suitable for use.

1.4 Legislative Context and Guidance

The key legislation applicable to this work is Part 2A of the Environmental Protection Act 1990.

Part 2A provides a statutory definition of 'Contaminated Land' and sets out the nature of liabilities that can be incurred as a result of contaminated land and groundwater. Contaminated land is defined as *"Any land which appears to the local authority in whose area it is situated to be in such condition, by reason of substances in, on or under the land that:*

- a) significant harm is being caused, or there is significant possibility of such harm being caused; or*
- b) significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused."*

Central to the regulatory system is a phased risk-based approach, which is used to establish the existence of 'contaminated land'.

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

- Environment Agency (EA) 'Land Contamination Risk Management Framework' (2021)
- Ministry of Housing, Communities and Local Government 'National Planning Policy Framework' (2019)
- British Standard 'Investigation of Potentially Contaminated Sites – Code of Practice', BS EN 10175:2011+A1:2013
- Defra 'Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance' PB13735 (2012)
- British Standard 'Code of Practice for Ground Investigations' BS 5930:2015
- EA 'Groundwater Protection Position Statements' (2018)
- CIRIA 'Contaminated Land Risk Assessment – A Guide to Good Practice', C552 (2001)

1.5 Sources of Information

The following information sources have been reviewed to inform the assessment:

- Royal HaskoningDHV, Castlefield Viaduct, Manchester Land Quality Desk Study and Preliminary Risk Assessment 2021. Ref PC2387-RHD-ZZ-XX-RP-Z-0002, dated 10th May 2021

2 Site Setting

2.1 Site Location and Description

Castlefield Viaduct is a Victorian railway viaduct built in 1893, located in Castlefield within Manchester City Centre. It is located approximately 200 metres (m) west of Deansgate-Castlefield Tram Station, which services the Metrolink light rail system and approximately 400 m west of Deansgate Train Station which services the trains. The viaduct is owned by the Department for Transport and is currently disused.

The viaduct is linear in shape, approximately 330 m in length and approximately 14m wide, comprising eight spans. The viaduct is raised off the ground by approximately 16m. It is constructed predominantly of wrought iron / steel and has decorative castellations along its length. Behind the castellations are bearing plates that support the end posts of 16 trusses, the longest of which reaches 53m. The viaduct is a Grade II listed structure.

The top of the viaduct is accessed by foot from Deansgate-Castlefield car park via a locked gate on the eastern site boundary. Vehicular access to the Deansgate-Castlefield car park is made via a ramp off Albion Street. The ground surface of the car park is approximately 0.5 m higher in elevation than the viaduct surface and there is a step down to the viaduct at the gate. There is no vehicular access onto the viaduct. Access is prevented by a vehicle restraint system (VRS) barrier present along the eastern site boundary shared with Deansgate-Castlefield car park.

Historically, three railway tracks ran across the viaduct carrying trains in and out of Manchester Central Station (now known as Manchester Central convention complex). Today, the railway tracks are no longer evident, as the surface of the viaduct is covered by a layer of railway ballast and vegetation.

The land below the viaduct is occupied by land parcels, roads, canals (Rochdale Canal and Bridgewater Canal) and a railway line.

A site layout plan is provided in Figure 2.1, at the end of this report.

2.2 Description of the Site Surroundings

The viaduct is located within a mixed-use setting, land uses adjacent to the site are summarised in Table 2-1 below.

Table 2-1: Current Surrounding Site Uses

Direction	Description
North	Immediately to the north of the western half of the viaduct is Potato Wharf and the Bridgewater Canal and basins. Beyond Potato Wharf are blocks of residential flats (10 m from the northern site boundary) and a construction site.
	Giant's Basin is located immediately north of the centre of the site with a YHA youth hostel present on its bank, approximately 60 m from the northern site boundary. Beyond the youth hostel is a railway line, orientated in a south-east to north-west direction. The railway line is located approximately 280 m north of the western half of the site and travels directly under the viaduct in the eastern part of the site.
	To the north of the eastern half of the site is the Bridgewater Canal Tow Path, Castle Street, the railway line and an events area, referred to as the Castlefield Bowl (50 m from the northern site boundary). To the north of the easterly end of the viaduct are Duke Street, grassed areas, the

Direction	Description
	Castlefield Urban Heritage Park and Beaufort Street (40 m from the north site boundary at its closest point). The River Medlock is located approximately 40 m to the north west of the site, the river flows in a western direction and then to the south where it flows below the Dawson Street road bridge.
East	Immediately to the east of the site is Deansgate-Castlefield car park. The car park is flat and roughly level with the viaduct (approximately 0.5 m higher in elevation). The car park area is raised above the surrounding ground level by red brick arches, which are accessed along Bridgewater Street to the north east of the site. The arches are used as commercial units and car parking facilities. Warehouses, commercial units, residential flats and offices are located in the wider area east of the site. A staircase which leads from ground level to the Deansgate-Castlefield car park is located to the north east of the site. The staircase is located approximately 20m south of Beaufort Street and 10 m from the eastern site boundary.
South	Immediately to the south is a tramline, which runs parallel to the viaduct. Beyond the tramline is a railway line, which also runs parallel to the viaduct and tramline. The Bridgewater Canal and canal basin are located to the south of the tram and railway lines. Beyond the canal is Slate Wharf, Merchant Bridge and Castle Street, the buildings on Castle Street comprise art galleries, offices, residential flats, restaurants and bars. The railway archway immediately below the railway line to the west of Castle Street has been developed into a restaurant with associated outdoor dining area. The Rochdale Canal is located approximately 50 m south the site. It runs in an east to west orientation and terminates at Rochdale Canal Lock 92, approximately 30 m east of a footbridge where Castle Street crosses the canal. A building, which was part of a former sawmill with a chimney, is located on the northern bank of the Rochdale Canal, approximately 50 m east of the site. This building appears to have been repurposed for use as a gallery and residential apartments. Merchants Bridge footbridge crosses the Bridgewater Canal and connects Catalan Square on the northern bank to Slate Wharf on the southern bank. Slate Wharf is characterised by residential apartment blocks, Castlefield Green area of grass, canal quay, car parks and road networks. The Slate Wharf Bridge is closed to public access via a locked gate and is located approximately 20 m south of the viaduct beyond the tram and active railway lines.
West	Immediately west of the site is a parcel of vacant land covered in railway ballast, which would have historically formed part of the railway which crossed the viaduct. This area tapers in width becoming narrower due to the change in trajectory of the tramline located immediately south. Egerton Street and Dawson Street (A56) are located approximately 50 m west of the site and runs in a north to south direction. The River Medlock flows below Dawson Street Bridge at this point. Land to the west is occupied by roads, residential and commercial buildings.

3 Environmental Setting

A summary of relevant background information and site history for the site prior to the ground investigation is presented below in Table 3-1. The information is presented in full within the Land Quality Desk Study and Preliminary Risk Assessment (Royal HaskoningDHV, 2021).

Table 3-1: Summary of Environmental Setting and Site History

Categories	Details
Geology	No superficial deposits recorded.
	Bedrock – Chester Pebble Bed Formation (Principal Aquifer).
Mining & Ground Working	Site is not located within an area affected by historical coal mining. There are 19 records of surface ground workings on the land below the viaduct; these include 12 records of canals, four records of unspecified wharves, one quay, one unspecified and one timber wharf. An additional 24 records of surface ground working are located within 250m of the site.
Groundwater Vulnerability	High in the eastern half of the site and low in the western half of the site.
Source Protection Zone (SPZ)	Not located within an SPZ. SPZ 3 (Total Catchment) located approximately 474 m east.
Groundwater Abstraction	No active groundwater abstractions are recorded on the land directly below or within 1km of the viaduct.
Nearest Surface Water	Bridgewater Canal basin complex is located below the viaduct extending to the north and south.
River / Sea Flooding	Land directly below the viaduct has a high risk of river flooding (Flood Zone 2).
Groundwater Flooding	Land directly below the viaduct has a moderate to high risk of groundwater flooding.
Surface Water Abstractions	No active surface water abstractions are recorded on the land directly below, or within 250m, of the viaduct.
Discharge Consents	No active discharge consents are attributed to the site. The nearest active consent is located 79m south west relating to the discharge of sewer storm overflow into the River Medlock.
Sensitive Land Use	The viaduct is not located in, or within 250 m of a Site of Special Scientific Interest (SSSI), Ramsar Site, Special Area of Conservation (SAC), Special Protection Area (SPA), National or Local Nature Reserve (NNR/LNR) or Ancient Woodland. There are no Nitrate Vulnerable Zones (NVZs) located at or within 250 m of the site. The viaduct is a Grade II listed structure.
Pollution Incidents to Controlled Waters	None attributed to the viaduct. The nearest recorded incident is 172 m north west: June 2001; the pollutant is recorded as diesel which had a minor impact to water (category 3 incident).
Registered landfill, historical landfill or other waste disposal sites	The EA records show that there are no active landfills or recorded historical landfills located at or within 250 m of the viaduct. Local Authority mapping identifies that there were two scrap yards adjacent to the northern boundary and to the south west of the site. Further details are not provided.

Categories	Details
	There are three records of mobile plant licences being issued 164m north west to R E M Mobile Plant and Rec Remediation Ltd.
Waste exemptions	There are six recorded waste exemptions with multiple activities recorded at the same address within 250 m of the site. The nearest is 69 m south of the site and is recorded as sorting of controlled drugs for disposal.
Historical garages	There are three records of historical garages located below the site; additional details on the garages are not included within the information reviewed.
Historical tanks	There is one record of an unspecified tank located below the site recorded on the map of 1922.
Fuel Sites	There is one record of a petrol station located within 250 m of the site. Now obsolete it was located 96 m south.
Historical industrial land uses	The following historical industrial land uses are recorded on or underlying the site: wharves, railways buildings and sidings, unspecified depots and unspecified ground workings. Within 250 m of the site, the following historical industrial land uses are recorded: ■ railway buildings, sidings and stations ■ unspecified depot / commercial / industrial / goods sheds ■ gravel / sand pits / unspecified ground workings ■ wharves, quays and docks ■ paper mill / unspecified mills / silk and cotton mills / sawmill ■ corporation yard ■ cleansing depot ■ refuse heap / unspecified heap ■ chemical works / automobile works
Unexploded Ordnance	Moderate Risk within the general vicinity of the site.
Site & Immediate Surrounding History	The Castlefield Viaduct was constructed in 1893 to carry heavy rail traffic in and out of Manchester Central Station (now Manchester Central convention complex). The viaduct had three rail tracks to carry rail traffic. Manchester Central Station closed in 1969 and the viaduct fell into disuse with the tracks later dismantled. The viaduct has been derelict since then. Prior to the creation of the viaduct, a timber wharf was present on the land underlying the viaduct from the earliest available mapping (1848). In addition to the timber wharf, part of the land underlying the viaduct was occupied by rectangular warehouses from the earliest available OS mapping (1848) until the 1990s, these buildings also extended to the north of the viaduct. The area below and surrounding the viaduct has a history of both industrial and commercial activities since the earliest available mapping to the present day. A number of residential properties have also surrounded the site, also since the earliest available mapping to the present day.
Summary of Preliminary Risk Assessment	Three end use scenarios were considered: leaving the site in its current condition; the pilot scheme in Phase 1; and, permanently repurposed in Phase 2.

Categories	Details
	The PRA is summarised as follows: ■ To remain in its current condition, it was considered that the site poses a moderate to low risk to site visitors / trespassers and controlled waters. ■ In undertaking Phase 1, the site poses a moderate to low risk to future site users, development workers and controlled waters. ■ In undertaking Phase 2, the site poses a moderate to low risk to future site users and a moderate to low risk to construction workers, controlled waters & future buildings / utilities.

4 Ground Investigation Methodology

4.1 Introduction

An intrusive ground investigation comprising the excavation of 10 hand dug pits and 10 paint scrapes was undertaken on the 8th July 2021. The hand dug pits and paint scrapes were undertaken by Royal HaskoningDHV environmental engineers.

4.2 Summary of Field and Laboratory Work

4.2.1 Service Clearance

Intrusive investigation locations were positioned to avoid features identified on the service drawings.

4.2.2 Hand Dug Pits

Hand dug pits were excavated at 10 locations across the viaduct to a maximum depth of 0.3m below ground level (bgl). The exploratory hole locations are illustrated on Figure 3.1, at the end of this report. Each hand dug pit was backfilled with arisings to pre-excavation levels. Exploratory hole logs are presented as Appendix A.

4.2.3 Paint Scrape Samples

Paint scrape samples were collected from ten locations across the viaduct. The locations of the paint samples are illustrated on Figure 3.1, at the end of this report.

4.2.4 Soil Logging

At each hand dug pit location a description of the soils, total depth of the location and differences in soil type or strata was recorded. Soil logging was undertaken in general accordance with BS 5930:2015 + A1:2020 and Eurocode 7. Recorded sample depths and water strikes were recorded on the exploratory hole logs. The exploratory hole logs are presented as Appendix A and exploratory hole photographs as Appendix B.

4.3 Soil and Soil Leachate Sampling

Soil samples were collected from each exploratory hole location in accordance with BS 10175:2011 + A2:2017 'Investigation of Potentially Contaminated Sites'. Sampling was informed by visual and olfactory indicators of contamination.

Soil samples for laboratory analysis were obtained from the arisings of each exploratory location by hand. Disposable nitrile gloves were worn during sampling, with a clean pair of gloves used for each sample to avoid cross contamination.

The soils were separated from the track ballast and placed into appropriate sample tubs and jars as provided by the laboratory. Sample jars intended for volatile organic compounds (VOC) testing were filled with as much material as possible to reduce void space / trapped air.

The sample jars were labelled and dated upon completion of each sample collection, and the containers were placed in a cool box to maintain their temperature for transportation to the laboratory.

4.4 Paint Sampling

Paint samples were collected from each paint scrape location. Paint samples for laboratory analysis were obtained by scraping the paint flakes off the viaduct using a stainless-steel paint scraper. The stainless-steel paint scraper was cleaned after each sample was collected to avoid cross contamination.

Paint samples were placed into appropriate sample jars as provided by the laboratory. Sample jars were filled with a minimum of 5 g of paint as specified by the laboratory.

The sample jars were labelled and dated upon completion of each sample collection, and the containers were placed in a cool box to maintain their temperature for transportation to the laboratory.

4.5 Surface Water Sampling

Surface water sampling was undertaken at one point within the Bridgewater Canal (SW1). The sample was collected using a bucket. The surface water sample was placed into appropriate sample bottles as provided by the laboratory. The surface water monitoring location is presented on Figure 3.1, at the end of this report.

The sample bottles were labelled and dated upon completion of each sample collection, and the containers were placed in a cool box to maintain their temperature for transportation to the laboratory.

4.6 Laboratory Chemical Analysis

A total of 11 soil samples collected from the Made Ground were scheduled for the following analysis:

- Asbestos.
- pH, Total Organic Carbon (TOC) and ammoniacal nitrogen as N.
- Metals: arsenic, barium, beryllium, boron, cadmium, chromium III, chromium VI, copper, lead, mercury, nickel, selenium, vanadium and zinc.
- Polycyclic aromatic Hydrocarbons (PAH) speciated (EPA 16).
- Petroleum hydrocarbons (Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG) with aromatic/aliphatic split).
- Phenols.
- VOCs and Semi Volatile Organic Compounds (SVOCs).

In addition, a total of three soil samples collected for the Made Ground were scheduled for the analysis of herbicides.

A total of 11 soil (Made Ground) and 11 ballast samples were collected and tested for the following soil-leachate chemical analysis:

- pH, sulphate, ammoniacal nitrogen as N and total alkalinity.
- Metals: arsenic, barium, beryllium, boron, cadmium, chromium III, chromium VI, copper, lead, mercury, nickel, selenium, vanadium and zinc.
- PAHs speciated (EPA 16).
- TPH CWG with aromatic/aliphatic split.

- Phenols.
- VOCs and SVOCs.

In addition, a total of three soil leachate samples collected for the Made Ground were scheduled for the analysis of herbicides.

One surface water sample was collected for the following chemical analysis:

- pH, sulphate, ammoniacal nitrogen as N and total alkalinity.
- Metals: arsenic, barium, beryllium, boron, cadmium, chromium III, chromium VI, copper, lead, mercury, nickel, selenium, vanadium and zinc.
- PAHs speciated (EPA 16).
- TPH CWG with aromatic/aliphatic split.
- Phenols.
- VOCs and SVOCs.
- M-BAT (calcium and dissolved organic carbon).

A total of 10 paint samples were collected for the following chemical analysis:

- Metals: cadmium, chromium, lead, nickel and zinc.

The laboratory analysis was undertaken by i2 Analytical UK Ltd. The original laboratory certificates are presented in Appendix C.

4.7 Laboratory Quality Control

One in every 10 samples was collected as a duplicate. The duplicate sample was collected in an identical manner and scheduled for laboratory analysis as part of the quality assurance process to identify potential laboratory variability. The duplicate samples were labelled and numbered anomalously, so that the laboratory was not aware that the sample was a duplicate.

Duplicate samples were collected from one location as summarised below.

Table 4-1: Duplicate Samples

Duplicate ID	Exploratory Hole Location	Depth (m bgl)
HP Dup 1 (soil)	HP110	Ground Level – 0.10
HP Dup 1 (soil-leachate)		
HP Dup Ballast	HP110B	

5 Ground Investigation Findings

5.1 Site Specific Ground Conditions

A summary of the encountered geology on the viaduct is provided in Table 5-1 below.

Table 5-1: Site Specific Geology

Stratum	Geological Unit	Depth to top of stratum	Depth to base of stratum	Thickness (m)	Description
Made Ground	Made Ground	Ground Level	0.30	0.30	Dark brown sandy clayey Gravel with occasional rootlets. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular ballast.

5.2 Visual and Olfactory Evidence of Contamination

Visual and olfactory observations of potential contamination was identified during the ground investigation and is summarised in Table 5-2 below.

Table 5-2: Summary of Visual and Olfactory Evidence of Contamination

Exploratory Hole Location	Visual/olfactory evidence of contamination	Strata
HP101	Oily/greasy feel on soil. Some hydrocarbon staining on track ballast.	Made Ground
HP102		
HP103		
HP104		
HP105		
HP106		
HP107		
HP108		
HP109		
HP110		

5.3 Features and Obstructions

Features and obstructions were identified within the hand dug pit locations across the site. The hand dug pits were terminated at the depth of the obstructions and features. A summary is presented below in Table 5-3.

Table 5-3: Summary of Features and Obstructions

Hand Dug Pit	Depth m bgl (m AOD)	Feature / Obstruction
HP101	0.25 (30.85)	Timber sleeper.
HP102	0.30 (30.70)	Metal Viaduct base.
HP103	0.15 (30.85)	
HP104	0.30 (30.70)	
HP105	0.20 (30.90)	

Hand Dug Pit	Depth m bgl (m AOD)	Feature / Obstruction
HP106	0.30 (30.70)	
HP107	0.30 (30.70)	
HP108	0.30 (30.70)	
HP109	0.15 (30.85)	
HP110	0.10 (30.80)	

5.4 Laboratory Quality Assurance / Quality Control

A comparison of the duplicate sample data sets has been undertaken and a summary of the differences between the samples are provided in the Table 5-4 below.

Table 5-4: Comparison of Duplicate Sample Data Sets

Sample	Duplicate	Differences detected	Greatest difference	Sample concentration (mg/kg)	Duplicate concentration (mg/kg)
HP110 (soil)	HP_Dup_1	Metals PAH TPH	Lead (28.6%) Benzo(k)fluoranthene (36%) Aromatic >EC10-EC12 (50%)	1400 150 43	1000 96 23
HP110 (soil leachate)	HP_Dup_1	Metals PAH	Copper (24.2%) Fluoranthene (71.4%)	9.10 0.21	12.00 0.06
HP110_B (ballast)	HP_Dup_Ballast	Metals PAH	Copper (78.7%) Pyrene (66.7%)	7.50 0.06	1.60 0.02

The differences in concentrations recorded in metals, PAHs and TPHs within soil and soil-leachate samples represents the variability of the samples and is not likely to be representative of invalid laboratory analysis. The differences in the dataset does not make a material difference to the assessment and report conclusions, therefore have been included.

6 Human Health Generic Quantitative Risk Assessment

6.1 Introduction

In order to provide an assessment of the risks to humans presented by contaminants within soils, a human health GQRA has been undertaken. The GQRA involves comparing contaminant concentrations observed at the site with appropriate generic assessment criteria (GACs). The GQRA forms Tier 2 of the tiered approach to assessing risks from land contamination as set out in the EA 2021 Land Contamination Risk Management Framework (LCRM).

The GACs used to screen the soil data include:

- Department for the Environment and Rural Affairs (CL:AIRE, 2014), Category 4 Screening Levels (C4SLs) and in their absence;
- Land Quality Management and the Chartered Institute for Environmental Health, Suitable for Use Levels (S4UL) (LQM,2014); and,
- In the absence of a C4SL or S4UL, data within the Environmental Industries Commission (EIC) / The Association of Geotechnical and Geoenvironmental Specialists (AGS) / Contaminated Land: Applications in Real Environment (CL:AIRE, 2010) have been utilised.

C4SLs are values that have been derived for use in England and Wales to define sites posing low or no risk to human health. The Environmental Protection Act 1990 Contaminated Land Statutory Guidance (DEFRA, 2012) includes a categorisation for land contamination assessment, ranging from Category 4 (low risk) to Category 1 (significant / high risk).

C4SLs are set contaminant levels which are not representative of significant possibility of significant harm (SPoSH) and, as such, where concentrations are below these levels as site would not be classed as a contaminated land as defined by Part 2A of the Environmental Protection Act.

The C4SLs have been adopted by the Department for Communities and Local Government (DCLG) for use under UK planning to define whether land is suitable for use. To date C4SL, have been published for nine contaminants (benzo(a)pyrene, benzene, lead, arsenic, cadmium, chromium VI, tetrachloroethene, trichloroethene and vinyl chloride).

In the absence of C4SLs, the S4ULs have been utilised which are based on minimal risk levels to human health. In the absence of C4SLs and S4ULs, EIC / AGS derived GACs have been used which are also based on minimal risk levels.

Generic parameters are currently published for the following land uses:

- Residential land use with gardens used for growing vegetables.
- Residential land use with gardens not used for growing vegetables.
- Public open space parkland.
- Public open space within residential developments.
- Allotments.
- Commercial land use.

To assess risk to site users, the scenario of public open space – park (POS_{park}) has been adopted as this land use is the most similar to the site's conceptual site model. In a POS_{park} land use scenario, the key receptor is considered to be a young child (age 0 – 6 years) who accompanies parents visiting the park for family visits, picnics and dog walking. It has been assumed that children visit the park 170 days a year and are on site for two hours per day. The exposure pathways considered relevant to young children are:

- Ingestion of soils and dust (outdoors).
- Dermal contact with soils and dusts (outdoors).
- Inhalation of dusts (outdoors).
- Inhalation of vapours (outdoors).

Soil samples have also been screened against allotment GACs to assess the potential risks should food stuffs be grown on the viaduct in the future. This scenario is considered to be a very conservative screen. The exposure pathways relevant to this end use scenario are:

- Direct ingestion of soil (outdoors) and dust derived from soils (indoors).
- Ingestion of soil attached to fruit/vegetables.
- Ingestion of fruit/vegetables.
- Dermal contact with soils (outdoors).
- Inhalation of dust derived from soils (outdoors).
- Inhalation of vapours (outdoors).

The GACs are derived for a variety of Soil Organic Matter (SOM) contents at 1%, 2.5% and 6%. As part of the ground investigation, SOM analysis was completed on representative samples. The SOM concentration of Made Ground soils on site ranged from 8.3% to 14%. It is thought that the SOM concentrations within Made Ground soils recorded are reflective of the PAH and TPH concentrations in all samples rather than true organic matter content. Therefore, a conservative SOM of 1% has been applied to the analysis.

6.2 Soil Screening Results

The soil data collected during the investigation have been screened against the POS_{park} and allotment GACs relevant to the site. The laboratory certificates of chemical analysis are provided within Appendix D.

6.2.1 Soil Sample Assessment

The soil sample data screened against the GAC for a public open space (park) end use identified exceedances for metals and PAHs. A summary of the screening for soil samples is provided below in Table 6-1.

Table 6-1: Summary of Screened Chemical Data – POS_{park} End Use

Determinands	Total number of samples	GAC (mg/kg)	Data range (min – max) mg/kg	No. of results above GAC	Location and exceedance of GAC
Lead	11	1300	59 – 4400	4	HP103 (0.00 – 0.15 m) – 4400 mg/kg HP105 (0.00 – 0.20 m) – 1400 mg/kg HP107 (0.00 – 0.30 m) – 2100 mg/kg HP110 (0.00 – 0.10 m) – 1400 mg/kg

Determinands	Total number of samples	GAC (mg/kg)	Data range (min – max) mg/kg	No. of results above GAC	Location and exceedance of GAC
Chrysene	11	93	6.3 – 270	3	HP103 (0.00 – 0.15 m) – 94 mg/kg HP110 (0.00 – 0.10 m) – 270 mg/kg HP Dup 1 (0.00 – 0.10 m) – 220 mg/kg
Benzo(a)pyrene	11	10	6.4 – 320	10	HP101 (0.00 – 0.25 m) – 37 mg/kg HP102 (0.00 – 0.30 m) – 12 mg/kg HP103 (0.00 – 0.15 m) – 62 mg/kg HP104 (0.00 – 0.30 m) – 13 mg/kg HP105 (0.00 – 0.20 m) – 39 mg/kg HP106 (0.00 – 0.30 m) – 22 mg/kg HP107 (0.00 – 0.30 m) – 72 mg/kg HP108 (0.00 – 0.30 m) – 16 mg/kg HP110 (0.00 – 0.10 m) – 320 mg/kg HP Dup 1 (0.00 – 0.10 m) – 280 mg/kg

The soil sample data screened against the GAC for an allotment end use identified exceedances for metals, TPHs and PAHs. A summary of the screening for soil samples is provided below in Table 6-2.

Table 6-2: Summary of Screened Chemical Data – Allotment End Use

Determinands	Total number of samples	GAC (mg/kg)	Data range (min – max) mg/kg	No. of results above GAC	Location and exceedance of GAC
Arsenic	11	49	16 – 83	9	HP101 (0.00 – 0.25 m) – 62 mg/kg HP102 (0.00 – 0.30 m) – 69 mg/kg HP103 (0.00 – 0.15 m) – 51 mg/kg HP104 (0.00 – 0.30 m) – 66 mg/kg HP106 (0.00 – 0.30 m) – 76 mg/kg HP107 (0.00 – 0.30 m) – 66 mg/kg HP108 (0.00 – 0.30 m) – 83 mg/kg HP110 (0.00 – 0.10 m) – 60 mg/kg HP Dup 1 (0.00 – 0.10 m) – 62 mg/kg
Lead	11	80	59 – 4400	10	HP101 (0.00 – 0.25 m) – 1200 mg/kg HP102 (0.00 – 0.30 m) – 550 mg/kg HP103 (0.00 – 0.15 m) – 4400 mg/kg HP104 (0.00 – 0.30 m) – 520 mg/kg HP105 (0.00 – 0.20 m) – 1400 mg/kg HP106 (0.00 – 0.30 m) – 1100 mg/kg HP107 (0.00 – 0.30 m) – 2100 mg/kg HP108 (0.00 – 0.30 m) – 1200 mg/kg HP110 (0.00 – 0.10 m) – 1400 mg/kg HP Dup 1 (0.00 – 0.10 m) – 1000 mg/kg
Nickel	11	53	39 – 150	10	HP101 (0.00 – 0.25 m) – 67 mg/kg HP102 (0.00 – 0.30 m) – 80 mg/kg HP103 (0.00 – 0.15 m) – 150 mg/kg HP104 (0.00 – 0.30 m) – 61 mg/kg HP105 (0.00 – 0.20 m) – 55 mg/kg HP106 (0.00 – 0.30 m) – 70 mg/kg HP107 (0.00 – 0.30 m) – 70 mg/kg HP108 (0.00 – 0.30 m) – 73 mg/kg HP110 (0.00 – 0.10 m) – 60 mg/kg

Determinands	Total number of samples	GAC (mg/kg)	Data range (min – max) mg/kg	No. of results above GAC	Location and exceedance of GAC
					HP Dup 1 (0.00 – 0.10 m) – 61 mg/kg
Zinc	11	620	110 – 990	3	HP101 (0.00 – 0.25 m) – 680 mg/kg HP110 (0.00 – 0.10 m) – 990 mg/kg HP Dup 1 (0.00 – 0.10 m) – 790 mg/kg
Naphthalene	11	4.1	0.58 – 18	2	HP110 (0.00 – 0.10 m) – 18 mg/kg HP Dup 1 (0.00 – 0.10 m) – 12 mg/kg
Acenaphthene	11	34	1.4 – 85	2	HP110 (0.00 – 0.10 m) – 85 mg/kg HP Dup 1 (0.00 – 0.10 m) – 73 mg/kg
Fluorene	11	27	0.97 – 50	2	HP110 (0.00 – 0.10 m) – 50 mg/kg HP Dup 1 (0.00 – 0.10 m) – 44 mg/kg
Phenanthrene	11	15	11 – 540	8	HP101 (0.00 – 0.25 m) – 49 mg/kg HP103 (0.00 – 0.15 m) – 54 mg/kg HP104 (0.00 – 0.30 m) – 20 mg/kg HP105 (0.00 – 0.20 m) – 24 mg/kg HP106 (0.00 – 0.30 m) – 22 mg/kg HP107 (0.00 – 0.30 m) – 68 mg/kg HP110 (0.00 – 0.10 m) – 540 mg/kg HP Dup 1 (0.00 – 0.10 m) – 450 mg/kg
Fluoranthene	11	52	17 – 760	6	HP101 (0.00 – 0.25 m) – 81 mg/kg HP103 (0.00 – 0.15 m) – 170 mg/kg HP105 (0.00 – 0.20 m) – 65 mg/kg HP107 (0.00 – 0.30 m) – 140 mg/kg HP110 (0.00 – 0.10 m) – 760 mg/kg HP Dup 1 (0.00 – 0.10 m) – 660 mg/kg
Pyrene	11	110	16 – 710	4	HP103 (0.00 – 0.15 m) – 170 mg/kg HP107 (0.00 – 0.30 m) – 130 mg/kg HP110 (0.00 – 0.10 m) – 710 mg/kg HP Dup 1 (0.00 – 0.10 m) – 600 mg/kg
Chrysene	11	4.1	6.3 – 270	11	HP101 (0.00 – 0.25 m) – 39 mg/kg HP102 (0.00 – 0.30 m) – 12 mg/kg HP103 (0.00 – 0.15 m) – 94 mg/kg HP104 (0.00 – 0.30 m) – 14 mg/kg HP105 (0.00 – 0.20 m) – 33 mg/kg HP106 (0.00 – 0.30 m) – 22 mg/kg HP107 (0.00 – 0.30 m) – 64 mg/kg HP108 (0.00 – 0.30 m) – 14 mg/kg HP109 (0.00 – 0.15 m) – 6.3 mg/kg HP110 (0.00 – 0.10 m) – 270 mg/kg HP Dup 1 (0.00 – 0.10 m) – 220 mg/kg
Benzo(a)pyrene	11	5.7	6.4 – 320	11	HP101 (0.00 – 0.25 m) – 37 mg/kg HP102 (0.00 – 0.30 m) – 12 mg/kg HP103 (0.00 – 0.15 m) – 62 mg/kg HP104 (0.00 – 0.30 m) – 13 mg/kg HP105 (0.00 – 0.20 m) – 39 mg/kg HP106 (0.00 – 0.30 m) – 22 mg/kg HP107 (0.00 – 0.30 m) – 72 mg/kg HP108 (0.00 – 0.30 m) – 16 mg/kg

Determinands	Total number of samples	GAC (mg/kg)	Data range (min – max) mg/kg	No. of results above GAC	Location and exceedance of GAC
					HP109 (0.00 – 0.15 m) – 6.4 mg/kg HP110 (0.00 – 0.10 m) – 320 mg/kg HP Dup 1 (0.00 – 0.10 m) – 280 mg/kg
Aromatic C10-C12	11	13	<1 – 46	2	HP110 (0.00 – 0.10 m) – 46 mg/kg HP Dup 1 (0.00 – 0.10 m) – 23 mg/kg
Aromatic C12-C16	11	23	8.3 – 230	8	HP101 (0.00 – 0.25 m) – 30 mg/kg HP102 (0.00 – 0.30 m) – 27 mg/kg HP103 (0.00 – 0.15 m) – 42 mg/kg HP104 (0.00 – 0.30 m) – 24 mg/kg HP105 (0.00 – 0.20 m) – 26 mg/kg HP107 (0.00 – 0.30 m) – 31 mg/kg HP110 (0.00 – 0.10 m) – 230 mg/kg HP Dup 1 (0.00 – 0.10 m) – 170 mg/kg
Aromatic C16-C21	11	46	52 – 1300	11	HP101 (0.00 – 0.25 m) – 210 mg/kg HP102 (0.00 – 0.30 m) – 73 mg/kg HP103 (0.00 – 0.15 m) – 410 mg/kg HP104 (0.00 – 0.30 m) – 81 mg/kg HP105 (0.00 – 0.20 m) – 170 mg/kg HP106 (0.00 – 0.30 m) – 110 mg/kg HP107 (0.00 – 0.30 m) – 340 mg/kg HP108 (0.00 – 0.30 m) – 78 mg/kg HP109 (0.00 – 0.15 m) – 52 mg/kg HP110 (0.00 – 0.10 m) – 1200 mg/kg HP Dup 1 (0.00 – 0.10 m) – 1300 mg/kg
Aromatic C21-C35	11	370	86 – 1300	6	HP101 (0.00 – 0.25 m) – 380 mg/kg HP103 (0.00 – 0.15 m) – 790 mg/kg HP105 (0.00 – 0.20 m) – 430 mg/kg HP107 (0.00 – 0.30 m) – 680 mg/kg HP110 (0.00 – 0.10 m) – 1000 mg/kg HP Dup 1 (0.00 – 0.10 m) – 1300 mg/kg

Asbestos analysis was undertaken on each of the soil samples collected as part of the investigation. No asbestos was detected within the samples analysed.

6.2.2 Discussion of Potential Risks to Human Health from Site Soils

This section of the report focuses primarily on exceedances for the POS_{park} end use as this land scenario closely matches the proposed end use. It is also likely that foodstuffs would be grown in elevated planters due to the matrix of the track ballast and associated soils to support plant growth.

6.2.2.1 Metals

Lead

Lead has been recorded above the POS_{park} GAC of 1mg/kg within four of the 11 soil samples collected from the site. Exceedances were recorded within HP103, HP105, HP107 and HP110 at concentrations ranging from 1400mg/kg to 4400mg/kg. The highest concentration was recorded within the soil sample collected from HP103.

The exceedances recorded are three orders of magnitude greater than that of the associated GAC. Therefore, the concentrations present have the potential to cause an unacceptable risk to human health receptors if mitigation measures are not incorporated into the design of the scheme.

6.2.2.2 Polycyclic Aromatic Hydrocarbons

Chrysene

Chrysene was recorded above the POS_{park} GAC of 93mg/kg within three of the 11 soil samples collected from the site. Exceedances were recorded within HP103, HP110 and HP Dup 1, the concentrations recorded were 94mg/kg, 270mg/kg and 220mg/kg respectively.

The exceedances of the GAC associated with chrysene are considered to be localised hotspots within the site rather than widespread. The exceedance within HP103 is considered to be marginal, whereas the remaining two exceedances associated with HP110 and its duplicate are an order of magnitude greater. Therefore, concentrations present within HP110 and its duplicate may potentially represent an unacceptable risk to human health receptors if mitigation measures are not incorporated into the design of the scheme within these areas.

Benzo(a)pyrene

Benzo(a)pyrene was recorded above the POS_{park} GAC of 11mg/kg within ten of the 11 soil samples collected from the site. An exceedance of benzo(a)pyrene was not recorded within HP109. Concentrations in excess of the GAC ranged from 12mg/kg to 320mg/kg, with the highest concentration recorded within HP110.

The exceedances were recorded across the site and benzo(a)pyrene contamination is considered to be widespread rather than an isolated occurrence. Therefore, the concentrations present have the potential to represent an unacceptable risk to human health receptors if mitigation measures are not incorporated into the design of the scheme.

6.2.2.3 Allotment End Use

The screening of the soil chemical data against GACs protective of an allotment end use is considered to be overly conservative given the proposed end use of the viaduct. However, it is understood that foodstuffs / 'greenstuff' will be planted directly into planters.

6.3 Drinking Water Pipes Assessment

The screening of the analytical results against United Kingdom Water Industry Research (UKWIR) Water Supply Threshold Values criteria indicates that at least one or more determinands that have the potential to permeate drinking water pipes and contaminate the supply (hydrocarbons and PAHs) are recorded above the UKWIR in No. 11 soil samples. The screened data are presented in Appendix D.

If new drinking water pipes are to be laid in Made Ground soils, a bespoke assessment needs to be undertaken along the route of future pipelines in accordance with the local water authority requirements. A risk assessment in line with United Utilities guidance needs to be completed and submitted for their consideration. Mitigation measures could include service runs of 'clean' inert materials that could be utilised and/or barrier piping to be protective of the potable water supply.

6.4 Paint Sample Screening Results

Paint samples collected as part of the ground investigation were assessed against the SoBRA aGAC protective of construction and maintenance workers who, for example, may be involved in repainting the viaduct structure.

6.4.1 Paint Sample Assessment

The paint samples screened against SoBRA aGAC identified no exceedances for cadmium. No additional aGAC values are currently available for the remaining metals assessed as part of the laboratory analysis.

Table 6-3: Summary of Paint Samples

Determinands	Total Number of samples	aGAC (mg/kg)	Data range (min-max) mg/kg
Cadmium	10	12,000	<0.20 – 10
Chromium	10	N/A	110 – 310
Lead	10	N/A	55,000 – 66,000
Nickel	10	N/A	12 – 30
Zinc	10	N/A	1,200 – 6,500

Due to the concentrations of lead and zinc recorded in the paint samples, there is the potential for unacceptable risks to construction and maintenance workers should appropriate mitigation measures, such as use of PPE, not be incorporated into the scheme design. In addition, the release of the paint flakes needs to be controlled when being worked on and not released into the wider environment. The works to refurbish the viaduct should be undertaken by a suitably qualified contractor who will provide the appropriate working methodologies and risk assessments to undertake work of this nature.

6.5 Human Health GQRA Summary

The assessment of the soil and paint chemical data identified the following key points:

- Concentrations of benzo(a)pyrene in excess of their respective POS_{Park} GAC are widespread across the site and may potentially present an unacceptable risk to human health receptors if appropriate measures are not incorporated into the design.
- Exceedances of GAC for lead and chrysene are considered to be localised. The concentrations recorded may pose a potentially unacceptable risk to human health if appropriate mitigation measures are not incorporated into the design.
- Should the end use for the site change to an allotment, mitigation measures would be required above those required for a POS_{Park} end use due to the degree of exceedances recorded.
- If potable water pipes are to be laid as part of the proposed scheme, risk assessment in line with United Utilities guidance needs to be completed.
- Paint samples containing high levels of lead and zinc were identified, mitigation measure protective of the health of construction and maintenance works should be incorporated into the project design and maintenance scheme to reduce the potential risks to these receptors.

7 Controlled Waters Generic Quantitative Risk Assessment

The controlled waters GQRA assessment evaluates potentially unacceptable risks posed to identified controlled water receptors from the migration of potential on-site sources of contamination as identified in the CSM. The GQRA has assessed the following data from the site investigation:

- Soil leachate data.
- Ballast leachate data.
- Surface water data.

7.1 Methodology

To support the evaluation of potential risks to controlled water receptors from contaminants within soils and ballast, a controlled waters GQRA has been undertaken. This has been carried out by comparing the results of the soil leachate and ballast leachate analysis with the relevant screening criteria for the key controlled waters receptors.

To assess the risks to surface water receptors, soil-leachate derived data has also been compared with Water Framework Directive (WFD) EQS for inland surface water.

The Water Framework Directive United Kingdom Technical Advisory Group (WFD-UKTAG) (WFD-UKTAG, 2013) river and lake assessment method for specific pollutants (metals) Metal Bioavailability Assessment Tool (M-BAT) was used to derive Tier 2 site specific EQS values for copper, lead, zinc, and nickel. These parameters were obtained from analysis of a surface water sample recovered from the surface water receptor (Bridgewater Canal).

The WFD-UKTAG ambient background concentration (ABC) for 'all other freshwaters not listed' of 1.4µg/l was added to the zinc EQS.

The risk to groundwater beneath the viaduct has not been considered from site soils / ballast, primarily due to the lack of plausible pollutant linkages between the source and receptor.

7.2 Assessment of Risks to Surface Water Receptors

7.2.1 Soil and Ballast Leachate Assessment

Table 7-1 summarises the soil leachate assessment with respect to data recorded above the EQS. Screened data are presented in Appendix D.

Table 7-1: Soil Leachate Data EQS Assessment

Determinands	Total number of samples	EQS (µg/l)	Data range (min – max) µg/l	No. of results above EQS	Location of exceedance of the EQS
Copper	11	17.1	5.2 – 24	2	HP101 (0.00 – 0.25 m) – 24 µg/l HP102 (0.00 – 0.30 m) – 20 µg/l
Lead	11	4.99	2.1 – 9.6	7	HP101 (0.00 – 0.25 m) – 5.6 µg/l HP103 (0.00 – 0.15 m) – 5.2 µg/l HP105 (0.00 – 0.20 m) – 9.6 µg/l HP107 (0.00 – 0.30 m) – 7.7 µg/l HP108 (0.00 – 0.30 m) – 7.0 µg/l HP110 (0.00 – 0.10 m) – 5.9 µg/l

Determinands	Total number of samples	EQS (µg/l)	Data range (min – max) µg/l	No. of results above EQS	Location of exceedance of the EQS
					HP Dup 1 (0.00 – 0.10 m) – 5.5 µg/l
Zinc	11	24.66	3.4 – 28	1	HP101 (0.00 – 0.25 m) – 28 µg/l
Anthracene	11	0.1	<0.01 – 0.14	1	HP109 (0.00 – 0.15 m) – 0.14 µg/l
Fluoranthene	11	0.0063	0.03 – 1.6	11	HP101 (0.00 – 0.25 m) – 0.16 µg/l HP102 (0.00 – 0.30 m) – 0.08 µg/l HP103 (0.00 – 0.15 m) – 0.39 µg/l HP104 (0.00 – 0.30 m) – 0.03 µg/l HP105 (0.00 – 0.20 m) – 0.14 µg/l HP106 (0.00 – 0.30 m) – 0.11 µg/l HP107 (0.00 – 0.30 m) – 0.62 µg/l HP108 (0.00 – 0.30 m) – 0.08 µg/l HP109 (0.00 – 0.15 m) – 1.6 µg/l HP110 (0.00 – 0.10 m) – 0.21 µg/l HP Dup 1 (0.00 – 0.10 m) – 0.06 µg/l
Benzo(a)pyrene	11	0.00017	<0.01 – 0.81	8	HP101 (0.00 – 0.25 m) – 0.05 µg/l HP103 (0.00 – 0.15 m) – 0.1 µg/l HP105 (0.00 – 0.20 m) – 0.14 µg/l HP106 (0.00 – 0.30 m) – 0.05 µg/l HP107 (0.00 – 0.30 m) – 0.32 µg/l HP109 (0.00 – 0.15 m) – 0.81 µg/l HP110 (0.00 – 0.10 m) – 0.11 µg/l HP Dup 1 (0.00 – 0.10 m) – 0.09 µg/l

Note: the assessment criteria are lower than the laboratory limit of detection (LoD) for determinands such as fluoranthene and benzo(a)pyrene. Only samples that exceeded the laboratory LoD have been included in this assessment.

Table 7-2 summarises the ballast leachate assessment with respect to data recorded above the EQS. Screened data is presented in Appendix D.

Table 7-2: Ballast Leachate Data EQS Assessment

Determinands	Total number of samples	EQS (µg/l)	Data range (min – max) µg/l	No. of results above EQS	Location of exceedance of the EQS
Lead	11	4.99	1.4 – 30	7	HP101B (0.00 – 0.25 m) – 9.8 µg/l HP103B (0.00 – 0.15 m) – 23 µg/l HP105B (0.00 – 0.20 m) – 30 µg/l HP107B (0.00 – 0.30 m) – 13 µg/l HP108B (0.00 – 0.30 m) – 15 µg/l HP109B (0.00 – 0.15 m) – 19 µg/l HP110B (0.00 – 0.10 m) – 7.9 µg/l
Fluoranthene	11	0.0063	0.01 – 0.1	11	HP101B (0.00 – 0.25 m) – 0.04 µg/l HP102B (0.00 – 0.30 m) – 0.01 µg/l HP103B (0.00 – 0.15 m) – 0.06 µg/l HP104B (0.00 – 0.30 m) – 0.02 µg/l HP105B (0.00 – 0.20 m) – 0.06 µg/l HP106B (0.00 – 0.30 m) – 0.02 µg/l HP107B (0.00 – 0.30 m) – 0.05 µg/l HP108B (0.00 – 0.30 m) – 0.02 µg/l HP109B (0.00 – 0.15 m) – 0.1 µg/l HP110B (0.00 – 0.10 m) – 0.06 µg/l

Determinands	Total number of samples	EQS (µg/l)	Data range (min – max) µg/l	No. of results above EQS	Location of exceedance of the EQS
					HP Dup B (0.00 – 0.10 m) – 0.02 µg/l
Benzo(a)pyrene	11	0.00017	<0.01 – 0.09	2	HP109B (0.00 – 0.15 m) – 0.09 µg/l HP110B (0.00 – 0.10 m) – 0.07 µg/l

Note: the assessment criteria are lower than the laboratory limit of detection (LoD) for determinands such as fluoranthene and benzo(a)pyrene. Only samples that exceeded the laboratory LoD have been included in this assessment.

7.2.2 Surface Water Assessment

Table 7-3 summarises the surface water assessment with respect to the data recorded above the EQS. Screened data are presented as Appendix D. The surface water sample was collected from the Bridgewater Canal.

Table 7-3: Surface Water Data EQS Assessment

Determinands	EQS (µg/l)	Exceedance concentration (µg/l)
Lead	4.99	8.4
Zinc	24.66	25
Fluoranthene	0.0063	0.02

Note: the assessment criteria are lower than the laboratory limit of detection (LoD) for determinands such as fluoranthene and benzo(a)pyrene. Only samples that exceeded the laboratory LoD have been included in this assessment.

7.2.3 Discussion of Potentially Unacceptable Risks Relating to Surface Water Receptors

Concentrations of contaminants in soil-derived leachate, ballast-derived leachate and surface water were assessed against EQS protective of the Bridgewater Canal and River Medlock, a discussion of the results is provided below.

7.2.3.1 Metals and Metalloids

A comparison of exceedances of the EQS for metals in soil-derived leachate and ballast-derived leachate is presented below in Table 7-4.

Table 7-4: Comparison of Metals in Soil-Derived Leachate and Ballast-Derived Leachate EQS Assessment

Determinands	No. of samples (soil-Leachate)	No. of exceedances (soil-leachate)	No. of samples (ballast-leachate)	No. of exceedances (ballast leachate)
Copper	11	2	11	0
Lead	11	7	11	7
Zinc	11	1	11	0

Copper

Copper was recorded above its EQS of 17.1 µg/l within two of the 11 soil leachate samples analysed. The exceedances were recorded within HP101 and HP102 at concentrations of 24 µg/l and 20 µg/l respectively. No additional exceedances of the copper EQS were recorded within the remaining soil leachate or ballast leachate samples.

The concentrations of copper recorded within the soil leachate samples are marginally above the site specific EQS. It is therefore considered unlikely that the recorded concentrations of copper at the site represent an unacceptable risk to surface water receptors.

Lead

Lead was recorded above its EQS of 4.99 µg/l within seven of the 11 soil leachate samples and seven of the 11 ballast leachate samples. Six of the exceedances of the lead EQS were recorded in both the soil leachate and ballast leachate samples from the same exploratory holes. An exceedance of lead was also recorded within the surface water sample.

The concentrations of lead recorded within the ballast leachate samples were generally higher than those recorded in the soil leachate samples. Within the soil leachate samples the exceedances were within the same order of magnitude as the EQS. However, within the ballast leachate samples, apart from two samples, all exceedances were one order of magnitude greater than the EQS.

Exceedances of the lead EQS are widespread across the site and could potentially represent an unacceptable risk to surface water receptors.

Zinc

Zinc was recorded above its EQS of 24.66 µg/l within one of the 11 soil leachate samples analysed. The exceedance was recorded within HP101 at a concentration of 28 µg/l. No additional exceedances of the zinc EQS were recorded within the remaining soil leachate or ballast leachate samples. However, an exceedance of zinc was also recorded within the surface water sample at a similar concentration to that of the soil leachate sample (25 µg/l).

The concentration of zinc recorded within the soil leachate sample was marginally above the site specific EQS and is not considered widespread across the site. It is therefore considered unlikely that the recorded concentration of zinc at the site represents an unacceptable risk to surface water receptors.

7.2.3.2 Polycyclic Aromatic Hydrocarbons

A comparison of the exceedances of the EQS for PAHs in soil leachate and ballast leachate is presented in Table 7-5.

Table 7-5: Comparison of PAHs in Soil Leachate and Ballast Leachate – EQS Assessment

Determinands	No. of soil leachate samples	No. of exceedances (soil leachate)	No. of ballast leachate samples	No. of exceedances (ballast leachate)
Anthracene	11	1	11	0
Fluoranthene	11	11	11	11
Benzo(a)pyrene	11	8	11	2

Anthracene

Anthracene was recorded above its EQS of 0.1 µg/l in one of the 11 soil leachate samples analysed at the site. The exceedance was recorded within the sample obtained from HP109 at a concentration of 0.14 µg/l. Apart from one soil leachate sample, the remaining soil leachate samples and all ballast leachate samples recorded concentrations of anthracene below the laboratory limit of detection.

Analysis of the soil leachate and ballast leachate samples indicates that the exceedance of anthracene is isolated and not widespread across the site. Therefore, it is considered unlikely that anthracene represents an unacceptable risk to surface water receptors.

Fluoranthene

Fluoranthene was recorded above its EQS of 0.0063 µg/l in all soil leachate samples at concentrations ranging from 0.03 µg/l to 1.6 µg/l. Fluoranthene was also recorded above its EQS in all ballast leachate samples. Exceedances were recorded at concentrations between 0.01 µg/l and 0.1 µg/l within the ballast leachate samples. The greatest exceedance for both the soil leachate and ballast leachate was recorded in samples collected from HP109 and HP019B. An exceedance of fluoranthene was also recorded within the surface water sample collected as part of the ground investigation.

Analysis of the chemical data indicates that fluoranthene has the potential to leach from the soils and the ballast site wide at a concentration which may pose an unacceptable risk to surface waters. The impact would come via the present drainage arrangement.

Benzo(a)pyrene

Benzo(a)pyrene was recorded above its EQS of 0.00017 µg/l within eight of the 11 soil leachate samples analysed at the site. Exceedances of benzo(a)pyrene ranged from 0.05 µg/l to 0.81 µg/l with the most elevated concentration recorded in HP109.

Benzo(a)pyrene was also recorded above its EQS in two of the 11 ballast leachate samples analysed at the site. The exceedances of the EQS were recorded in HP109B and HP110B at concentrations of 0.09 µg/l and 0.07 µg/l respectively.

Concentrations of benzo(a)pyrene within the surface water sample was recorded as being below the laboratory limit of detection.

Analysis of the chemical data indicates that benzo(a)pyrene contamination within soil leachate samples is widespread across the site. Within the ballast leachate samples, the exceedances are localised. In terms of risk to surface water receptors, it is considered that it has the potential to leach from the soils at a concentration which may pose an unacceptable risk to surface waters. The impact would come via the present drainage arrangement.

7.3 Controlled Waters GQRA Summary

Based on the findings of the ground investigation and subsequent assessment, the following conclusions can be made for controlled waters:

- It is considered unlikely that the recorded concentrations of copper and zinc at the site represent an unacceptable risk to surface water receptors.
- Lead, benzo(a)pyrene and fluoranthene have the potential to leach at concentrations which may pose an unacceptable risk to surface waters.

Whilst exceedances of the EQS have been identified within soil-leachate sample results, the following needs to be considered:

- The method of laboratory analysis overestimates what could be leached from the soil in a real-life scenario from rainfall due to the aggressive nature of the sample preparation.
- The most elevated exceedances of the EQS were recorded for metals (copper, zinc and lead) and PAHs (benzo(a)pyrene and fluoranthene) and these generally have a low groundwater mobility.
- It is known that surface water runoff is collected via a drainage system located on the viaduct and discharged into the Bridgewater Canal. It is considered likely that the canal is lined with puddle clay

forming an impermeable barrier between the surface water and groundwater bodies therefore a risk to groundwater has not been considered further.

8 Refined Conceptual Site Model

The CSM presented in the PRA identifying potential contamination source, pathway and receptors (Royal HaskoningDHV, 2021) has been updated following the GQRA. The refined CSM incorporates the site geology, hydrogeology, hydrology and the site-specific data gathered during this phase of investigation to determine the potential contaminant linkages (PCLs).

The refined CSM is described below prior to inclusion in the refined risk assessment table. The pathways are considered to be the same.

8.1 Refined Sources

Based on the available information for the site the following potential sources of contamination have been identified in Table 8-1 below.

Table 8-1: Refined Sources on the Viaduct Structure

Potential Source	Refined Contaminants
Railway land and ballast/soil matrix (on viaduct structure)	Soils (human health) - lead, chrysene and benzo(a)pyrene.
	Soils (water pipelines) - hydrocarbons and PAH.
	Soil-Leachate (surface water receptors) – primarily lead, fluoranthene and benzo(a)pyrene.
Metals and paint flaked off from viaduct structure (on viaduct structure)	Lead and Zinc.

The potential for further contamination may be present within areas between exploratory hole locations.

Potential offsite sources below and within the immediate vicinity of the scheme have been summarised below. In the absence of ground investigation, the sources and potential contaminants have been reduced.

Table 8-2: Refined Off-Site Sources on the Viaduct Structure

Potential Source	Refined Contaminants
Land uses above and below ground (historical and current) which have the potential to impact the ground.	Contaminants of potential concern include metals and metal compounds, cyanides, sulphates, phenols, PAHs, creosote, paints and solvents (aromatic hydrocarbons and chlorinated aliphatic hydrocarbons), organotin, cyanides, biocides, fuels and oil hydrocarbons and asbestos.

8.2 Potential Pathways and Receptors

Three potential scenarios have been identified in relation to the use of the site, these include:

- The site in its current condition (current CSM).
- The site during the Phase 1 'Pilot Scheme' being utilised as a 'micro park' this includes the introduction of a temporary footpath surface, the erection of temporary pop-up shelters (assumed to be well ventilated) and placement of planters (Phase 1 Pilot Scheme CSM).
- The site when it is permanently repurposed in Phase 2 as an urban park and travel hub. This will include the construction of food / beverage stands, gardens, stalls, seating areas, an events space and toilet facilities. It has been assumed that raised planting beds will be created and a pathway between railway ballast and consumption of site grown vegetables is not considered (Phase 2, Permanent Urban Park and Travel Hub CSM).

Table 8-3 below outlines which receptors and pathways would be associated with each of the three scenarios in relation to the refined model.

Table 8-3: Refined Pathways and Receptors

Receptors	Pathways	Current CSM	Phase 1 - Pilot Scheme CSM	Phase 2- Permanent Urban Park and Travel Hub CSM	Comments regarding sources
Human Health					
Site users (visitors, trespassers, maintenance, future workers and visitors)	Direct exposure through dermal contact, ingestion or inhalation of contaminants within the ballast cover across the viaduct.	✓	✓	✓	
	Direct exposure through dermal contact, ingestion or inhalation of contaminants within the paintwork.	✓	✓	✓	
	Inhalation of volatile contaminants.	X	X	X	Not identified in investigation
Development workers during construction	Direct exposure through dermal contact, ingestion or inhalation of contaminants within the ballast cover across the viaduct.	X	✓	✓	
	Direct exposure through dermal contact, ingestion or inhalation of contaminants within the paintwork.	✓	✓	✓	
	Inhalation of volatile contaminants.	X	X	X	Not identified in investigation
Controlled Waters					
Chester Pebble Bed Formation – Principal Aquifer	Migration via preferential pathways caused by piling (if required).	X	X	✓	Specifically, at ground level
Bridgewater Canal (below the viaduct and in immediate surrounding area)	Leaching, dissolution and migration of contaminants from the ballast covering the site via surface drainage and discharge into surface water receptors.	✓	✓	✓	
River Medlock (40m west of the site)		✓	✓	✓	
Buildings and Utilities					
Future utilities (on the structure and below)	Direct contact and permeation of water supply pipes.	X	X	✓	High level assessment identifies a risk

Table 8-4: Revised Conceptual Site Model for Current Use

Source	Pathway	Receptor	Associated hazard	Potential consequence of contaminant linkage	Likelihood of contaminant linkage	Risk classification	Justification
Historical site use as railway land, ballast/soil layer covering viaduct and paint on the viaduct.	Direct exposure through dermal contact, ingestion or inhalation of soil/ballast and associated dusts.	Site visitors and trespassers	Health risk	Severe	Low likelihood	Moderate to low risk	Exceedances of the POS _{park} GACs for lead and PAHs were identified within the soil samples analysed. Exposure is possible but it would be unlikely that visitors and trespassers would be interfering with the soil matrix surrounding the ballast.
		Maintenance Workers		Severe	Likely	High	Maintenance workers who visit the site in order to undertake vegetation clearance may come into direct contact with the contaminants identified on site specifically lead and PAH. The likelihood of a linkage being present can be lowered through appropriate hygiene and working procedures coupled with PPE.
	Direct exposure through dermal contact, ingestion or inhalation of paint flakes and associated dusts.	Site visitors and trespassers		Severe	Low likelihood	Moderate to low risk	High concentrations of metals, in particular lead and zinc, were recorded within paint samples collected from the site. Exposure is possible but it would be unlikely that visitors and trespassers would be interfering with the paint work.
		Maintenance Workers		Severe	Likely	High	Maintenance workers who visit the site in order to undertake painting of the viaduct may come into direct contact with the contaminants identified on site specifically lead and zinc. The likelihood of a linkage being present can be lowered through appropriate hygiene and working procedures coupled with PPE.
	Leaching of contaminants and migration via surface water network.	Bridgewater Canal and River Medlock	Pollution of controlled waters	Mild	Likely	Moderate to Low	Exceedances of EQS for lead and PAHs were recorded in both soil leachate and ballast leachate samples analysed at the site. A widespread impact was noted for lead and fluoranthene. This is an aggressive test. There was no evidence of water within the exploratory holes and the timeframes between raining and drainage of the viaduct maybe insufficient for leachate to be generated.

Source	Pathway	Receptor	Associated hazard	Potential consequence of contaminant linkage	Likelihood of contaminant linkage	Risk classification	Justification
							There may be an unacceptable risk to surface water receptors. The risk could be lowered through appropriate drainage arrangements.

Table 8-5: Revised Conceptual Site Model for Phase 1 – Pilot Scheme

Source	Pathway	Receptor	Associated hazard	Potential consequence of contaminant linkage	Likelihood of contaminant linkage	Risk classification	Justification
Historical site use as railway land, ballast/soil layer covering viaduct and paint on the viaduct.	Direct exposure through dermal contact, ingestion or inhalation of soil/ballast and associated dusts.	Future site users	Health risk	Severe	Low likelihood	Moderate to low risk	Exceedances of the POS _{park} GACs for lead and PAHs were identified within the soil samples analysed. Exposure is possible but it would be unlikely that future site users would be interfering with the soil matrix surrounding the ballast. Further mitigation will occur if the ballast was covered to create a level walkway.
		Development workers during construction		Severe	Likely	High	Construction workers will come into direct contact with the ballast / soil matrix and the contaminants identified on site specifically lead and PAH. The likelihood of a linkage being present can be lowered through appropriate hygiene and working procedures incorporated into a CEMP coupled with PPE.
		Maintenance Workers		Severe	Likely	High	Maintenance workers who visit the site may come into direct contact with the contaminants identified on site specifically lead, zinc and PAH. The likelihood of a linkage being present can be lowered through appropriate hygiene and working procedures coupled with PPE.
	Direct exposure through dermal contact, ingestion or inhalation of paint flakes and associated dusts.	Future site users		Severe	Low likelihood	Moderate to low risk	High concentrations of metals, in particular lead and zinc, were recorded within paint samples collected from the site. Exposure is possible but it would be unlikely that future users would be interfering with the paint work.
		Development workers during construction		Severe	Likely	High	Construction workers will come into direct contact with the paint work and the elevated metal concentrations specifically lead and zinc. The likelihood of a linkage being present can be lowered through appropriate hygiene and working procedures incorporated into a CEMP coupled with PPE.

Source	Pathway	Receptor	Associated hazard	Potential consequence of contaminant linkage	Likelihood of contaminant linkage	Risk classification	Justification
		Maintenance Workers		Severe	Likely	High	Maintenance workers who visit the site in order to undertake painting of the viaduct may come into direct contact with the contaminants identified on site specifically lead and zinc. The likelihood of a linkage being present can be lowered through appropriate hygiene and working procedures coupled with PPE.
	Inhalation of volatile contaminants.	Future site users	Health risk	Medium	Unlikely	Low risk	Analysis of soil samples indicated that there were no exceedances of POS _{park} GACs for either VOC or SVOC.
	Leaching of contaminants and migration via surface water network.	Bridgewater Canal and River Medlock	Pollution of controlled waters	Mild	Likely	Moderate to Low	Exceedances of EQS for lead and PAHs were recorded in both soil leachate and ballast leachate samples analysed at the site. A widespread impact was noted for lead and fluoranthene. This is an aggressive test. There was no evidence of water within the exploratory holes and the timeframes between raining and drainage of the viaduct maybe insufficient for leachate to be generated. There may be an unacceptable risk to surface water receptors. The risk could be lowered through appropriate drainage arrangements.

Table 8-6: Revised Conceptual Site Model for Phase 2 – Permanent Urban Park and Travel Hub

Source	Pathway	Receptor	Associated hazard	Potential consequence of contaminant linkage	Likelihood of contaminant linkage	Risk classification	Justification
Historical site use as railway land, ballast layer covering viaduct and paint on the viaduct.	Direct exposure through dermal contact, ingestion or inhalation of soil/ballast and associated dusts.	Future site users	Health risk	Severe	Low likelihood	Moderate to low risk	Exceedances of the POS _{park} GACs for lead and PAH were identified within the soil samples analysed. Exposure is possible but it would be unlikely that future site users would be interfering with the soil matrix surrounding the ballast. If left exposed at the surface, site visitors may come into direct contact with the contaminants identified. However, it is likely that the underlying soil and ballast will be covered by a temporary or permanent walkway and therefore breaking the source-pathway-receptor linkage. Should any area of the viaduct be developed in such a way that food stuffs be planted directly into the ground additional mitigation measures would need to be incorporated into the design scheme.
		Development workers during construction		Severe	Likely	High	Construction workers will come into direct contact with the ballast / soil matrix and the contaminants identified on site specifically lead and PAH. The likelihood of a linkage being present can be lowered through appropriate hygiene and working procedures incorporated into a construction environmental management plan (CEMP) coupled with PPE.
		Maintenance Workers		Severe	Likely	High	Maintenance workers who visit the site may come into direct contact with the contaminants identified on site specifically lead and PAH. The likelihood of a linkage being present can be lowered through appropriate hygiene and working procedures coupled with PPE.
	Direct exposure through dermal contact, ingestion or	Future site users		Severe	Low likelihood	Moderate to low risk	High concentrations of metals, in particular lead and zinc, were recorded within paint samples collected from the site. Exposure is possible but it would be unlikely that future users would be interfering with the paint work.

Source	Pathway	Receptor	Associated hazard	Potential consequence of contaminant linkage	Likelihood of contaminant linkage	Risk classification	Justification
	inhalation of paint flakes and associated dusts.	Development workers during construction		Severe	Likely	High	Construction workers will come into direct contact with the paint work and the elevated metal concentrations specifically lead and zinc. The likelihood of a linkage being present can be lowered through appropriate hygiene and working procedures incorporated into a CEMP coupled with PPE.
		Maintenance Workers		Severe	Likely	High	Maintenance workers who visit the site in order to undertake painting of the viaduct may come into direct contact with the contaminants identified on site specifically lead and zinc. The likelihood of a linkage being present can be lowered through appropriate hygiene and working procedures coupled with PPE.
	Inhalation of volatile contaminants.	Future site users		Medium	Unlikely	Low risk	Analysis of soil samples indicated that there were no exceedances of POS _{park} GACs for either VOC or SVOC. In addition, odours were not noted during the investigation works.
		Development workers during construction		Medium	Unlikely	Low risk	
		Maintenance Workers		Medium	Unlikely	Low risk	
	Leaching of contaminants and migration via surface water network.	Bridgewater Canal and River Medlock	Pollution of controlled waters	Mild	Likely	Moderate to Low risk	Exceedances of EQS for lead and PAHs were recorded in both soil leachate and ballast leachate samples analysed at the site. A widespread impact was noted for lead and fluoranthene. This is an aggressive test. There was no evidence of water within the exploratory holes and the timeframes between raining and drainage of the viaduct maybe insufficient for leachate to be generated. There may be an unacceptable risk to surface water receptors. The risk could be lowered through appropriate drainage arrangements.
	Direct contact and permeation of water supply pipes.	Future buildings and utilities	Building and foundation corrosion and impact to	Medium	Likely	Moderate risk	Exceedances of UKWIR screening criteria for PAH and TPH were recorded within the soil samples analysed. If drinking water pipes are to be laid, then the appropriate risk assessments should be complete and submitted to United Utilities in order to mitigate and lower the risk.

Source	Pathway	Receptor	Associated hazard	Potential consequence of contaminant linkage	Likelihood of contaminant linkage	Risk classification	Justification
			potable water supplies				
Sources below the viaduct and within the immediate vicinity as identified in Table 4-2	Direct exposure through dermal contact, ingestion or inhalation of soils, dusts or vapours.	Development workers during construction if works are required to the viaduct structure at ground level, such as the installation of new access ways or via piling	Health risk	Medium	Low likelihood	Moderate to low risk	Exposure to potential contaminants can be mitigated during construction with the use of appropriate working methods incorporated into a CEMP and use of PPE.
	Creation of preferential migration pathways via piling or construction works at ground level.	Surface water receptors (Bridgewater Canal and River Medlock)	Pollution of controlled waters	Mild	Low likelihood	Low Risk	If construction works are required at ground level, such as excavation works or piling, this has the potential to mobilise contaminants within soils or groundwater underlying the site associated with historical activities.

Source	Pathway	Receptor	Associated hazard	Potential consequence of contaminant linkage	Likelihood of contaminant linkage	Risk classification	Justification
		Groundwater: Principal Aquifer (Chester Pebble Bed Formation)		Medium	Low Likelihood	Moderate to Low risk	Piled foundations, if required, could potentially create a preferential pathway between sources underlying the viaduct and receptors.
	Direct contact and permeation of water supply pipes.	Future buildings and utilities	Building and foundation corrosion and impact to potable water supplies	Medium	Likely	Moderate	If new water pipes are required at ground level to service the viaduct, potential organic contaminants in soils could permeate potable water supplies and have detrimental impacts on human health.

9 Conclusions and recommendations

9.1 Conclusions

9.1.1 Summary of Human Health Risk Assessment

Based on the findings of the ground investigation and subsequent assessment, the following conclusions can be made for human health:

- The refined risk assessment has identified the following:
 - If the site remains the same the risk from the soil / ballast / paint in the absence of mitigation is considered to pose a moderate to low risk to site visitors/trespassers and a high risk to maintenance workers.
 - If the Phase 1 – Pilot Scheme is implemented the risk from the soil / ballast / paint in the absence of mitigation is considered to pose a moderate to low risk to site visitors/trespassers and a high risk to construction / maintenance workers. The risk from volatile contaminants to all receptors is considered low.
 - If the Phase 2 – Permanent Urban Park/Travel Hub is implemented the risk from the soil / ballast / paint in the absence of mitigation is considered to pose a moderate to low risk to site visitors/trespassers and a high risk to construction / maintenance workers. The risk from volatile contaminants to all receptors is considered low. The risk from off site sources, i.e. below the structure, is considered to be moderate to low to construction workers and moderate to potable water supply pipes.

9.1.2 Summary of Controlled Waters Risk Assessment

Based on the findings of the ground investigation and subsequent assessment, the following conclusions can be made for controlled waters:

- The refined risk assessment has identified the following:
 - In the sites current condition the soil / ballast has the potential to leach at concentrations which may pose a moderate to low risk to surface waters.
 - If the Phase 1 – Pilot Scheme or Phase 2 – Permanent Urban Park/Travel Hub is implemented the soil / ballast has the potential to leach at concentrations which may pose a moderate to low risk to surface waters.
 - If the Phase 2 – Permanent Urban Park/Travel Hub is implemented with the inclusion of piled foundations the risk from off-site sources (i.e. below the viaduct and within the immediate vicinity), is considered to be moderate to low risk in relation groundwater receptors and a low risk to surface water receptors.

9.2 Recommendations

The following recommendations are made:

- If new drinking water pipes are to be laid in Made Ground soils as part of the permanent scheme, a bespoke assessment needs to be undertaken along the route of future pipelines in accordance with the local water authority requirements.
- A CEMP should be prepared which should include measures to reduce the impact of ground conditions including:

- Provision of PPE to minimise direct contact of workers with site soils.
 - Provision of adequate hygiene and welfare facilities for construction workers.
 - Preparation and adoption of a site and task specific health and safety plan.
 - Provision of adequate storage of stockpiled soils.
 - Adequate storage of fuels/ chemicals and associated emergency response spillage control procedures.
 - Method statements for use if unexpected contamination in soil or groundwater is encountered during construction and to ensure safe management and disposal of materials.
- Currently an assumption that a bridge proposed for the permanent Phase 2 permanent urban park and travel hub scheme can be supported from the viaduct and piling to provide support is not required. This is subject to change should Historic England find this design unacceptable on a Grade II listed structure. As such, intrusive investigation to obtain soil samples for both geo-environmental and geotechnical purposes will be required at ground level, and assessment of potential risks to controlled waters through piling as a contamination pathway
 - Should piling be proposed to be undertaken within the aquifer located below the site. Consultations in respect to potential disturbance to water abstractions should be undertaken with the EA, and it may be necessary to undertake a piling risk assessment. If required, the risk assessment should be undertaken in accordance with industry guidance NC/99-17: Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention (2001).

9.2.1 Recommendations for Re-use of Ballast with Soil Matrix

The following bespoke recommendations are made with regards to development of the site with the reuse of ballast material with soils:

- The risk to site users needs to be lowered by some form of treatment, e.g. covering of the ground with boarding, thereby interrupting the pathway and breaking the pollutant linkage.
- The risk to surface waters from onsite sources can be lowered through the refurbishment of the drainage network, i.e. interruption of the pathway resulting in the pollutant linkage being broken.
- If the installation of 'green stuff' such as vegetable plots or fruit growing areas – a recommendation is made that any planting is within raised beds disconnected from ballast, due to the degree of exceedances of the allotment GAC recorded.

9.2.2 Recommendations for Re-use of Ballast without Site Soil Matrix

The following bespoke recommendations are made with regards to the development of the site with the reuse of ballast material without site soils:

- The risk to site users needs to be lowered by some form of treatment for example potentially removing the soil matrix resulting in source removal and the pollutant linkage being broken.
- The risk to surface waters from onsite sources can be lowered through the refurbishment of the drainage network, i.e. interruption of the pathway resulting in the pollutant linkage being broken alternatively removal of the soil matrix will result in betterment.

9.2.3 Drainage of the Structure Presently and in the Future

The following recommendations are made with regards to the present and future drainage on the site:

- The drainage on site needs to be suitably refurbished so that rainwater is not retained around the ballast or ballast plus matrix giving it time to generate leachate impacted water.
- To address the risk from metals within the site soils and ballast will be required, which could include the following:
 - Sampling of surface water from the downpipe.
 - Installation of drainage that does not outfall directly into the canal system.
 - The installation of a multi-layer substrate technologies could be potentially be utilised for the direct treatment of surface water leached through the surface of the viaduct.
 - Removal of the soil matrix (as discussed above) to result in betterment.

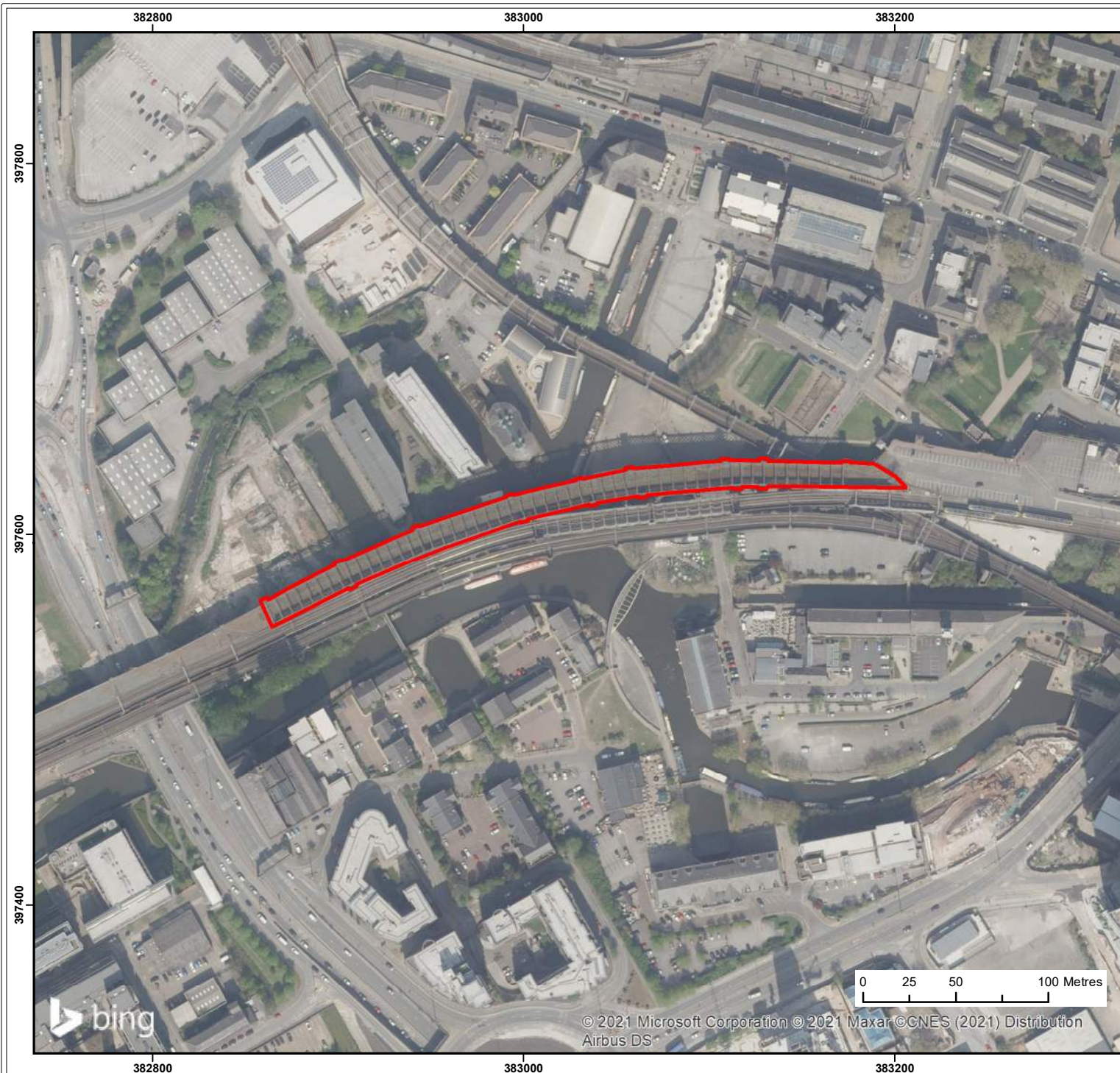
9.2.4 Next Steps

A remediation strategy and options appraisal should be produced. The appraisal will include a discussion on remedial measures to mitigate / lower the risk to the identified receptors in line with current guidance and is likely to be required to support the discharge of planning conditions.

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Figures



Legend:
 Red Line Boundary

Data Sources: © HaskoningDHV UK Ltd, 2021
Base map: © OpenStreetMap (and) contributors, CC-BY-SA.

Client:	Project:
National Trust	Castlefield Viaduct

Title:
Site Location Plan

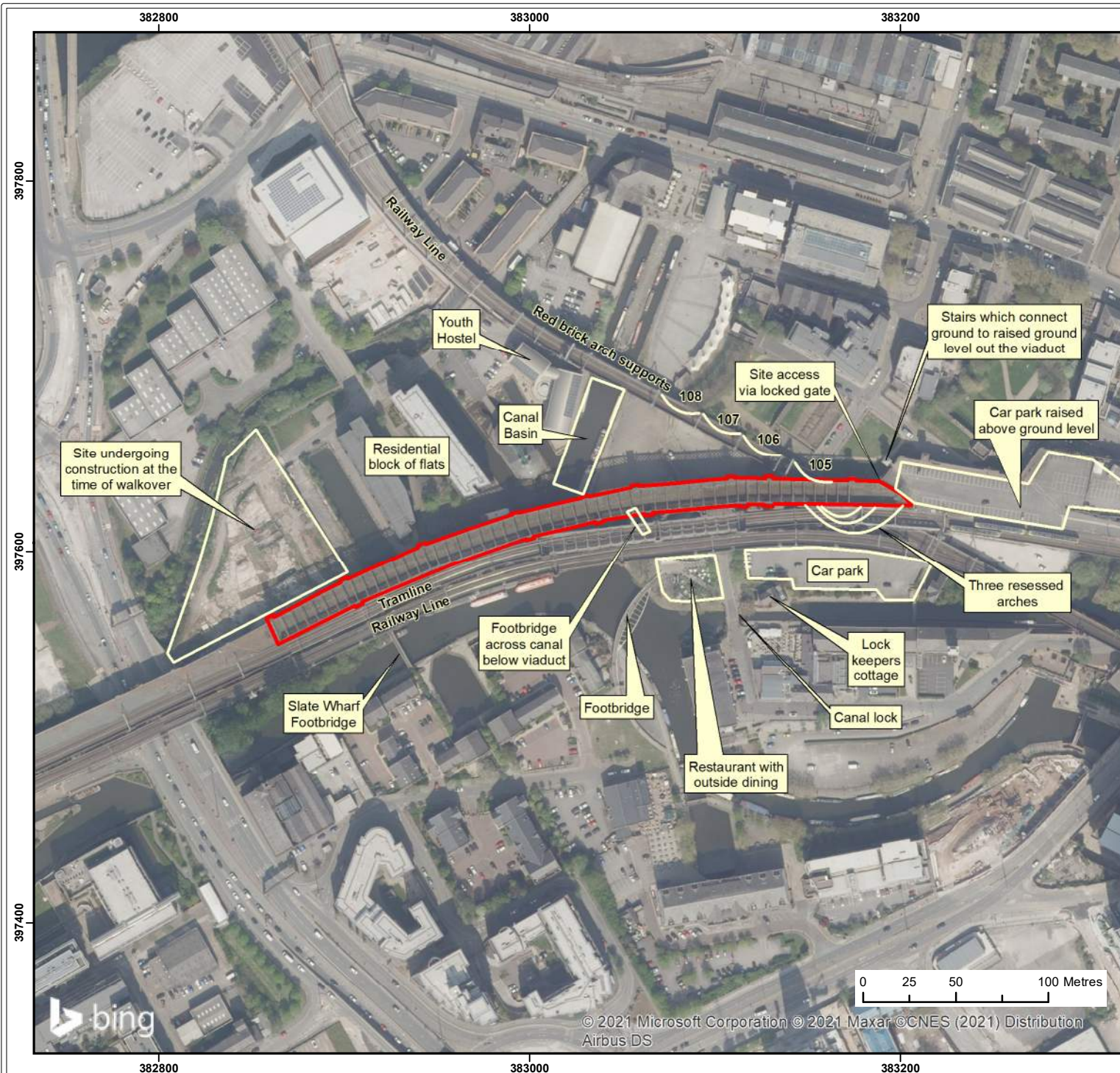
Figure: 1.1 Drawing No: PC2387-RHD-ZZ-XX-DR-Z-0001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	28/04/2021	GC	KD	A4	1:3,000

Co-ordinate system: British National Grid



ROYAL HASKONINGDHV
INDUSTRY & BUILDINGS
2 ABBEY GARDENS
GREAT COLLEGE STREET
WESTMINSTER
LONDON
SW1P 3NL
+44 (0)20 7222 2115
www.royalhaskoning.co.uk



Legend:

Red Line Boundary

Data Sources: © HaskoningDHV UK Ltd, 2021

Base map: © OpenStreetMap (and) contributors, CC-BY-SA.

Client:	Project:
National Trust	Castlefield Viaduct

Title:
Site Layout

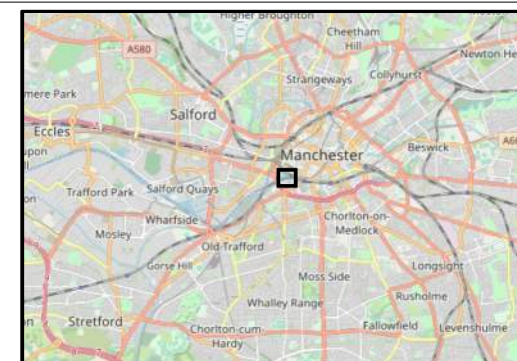
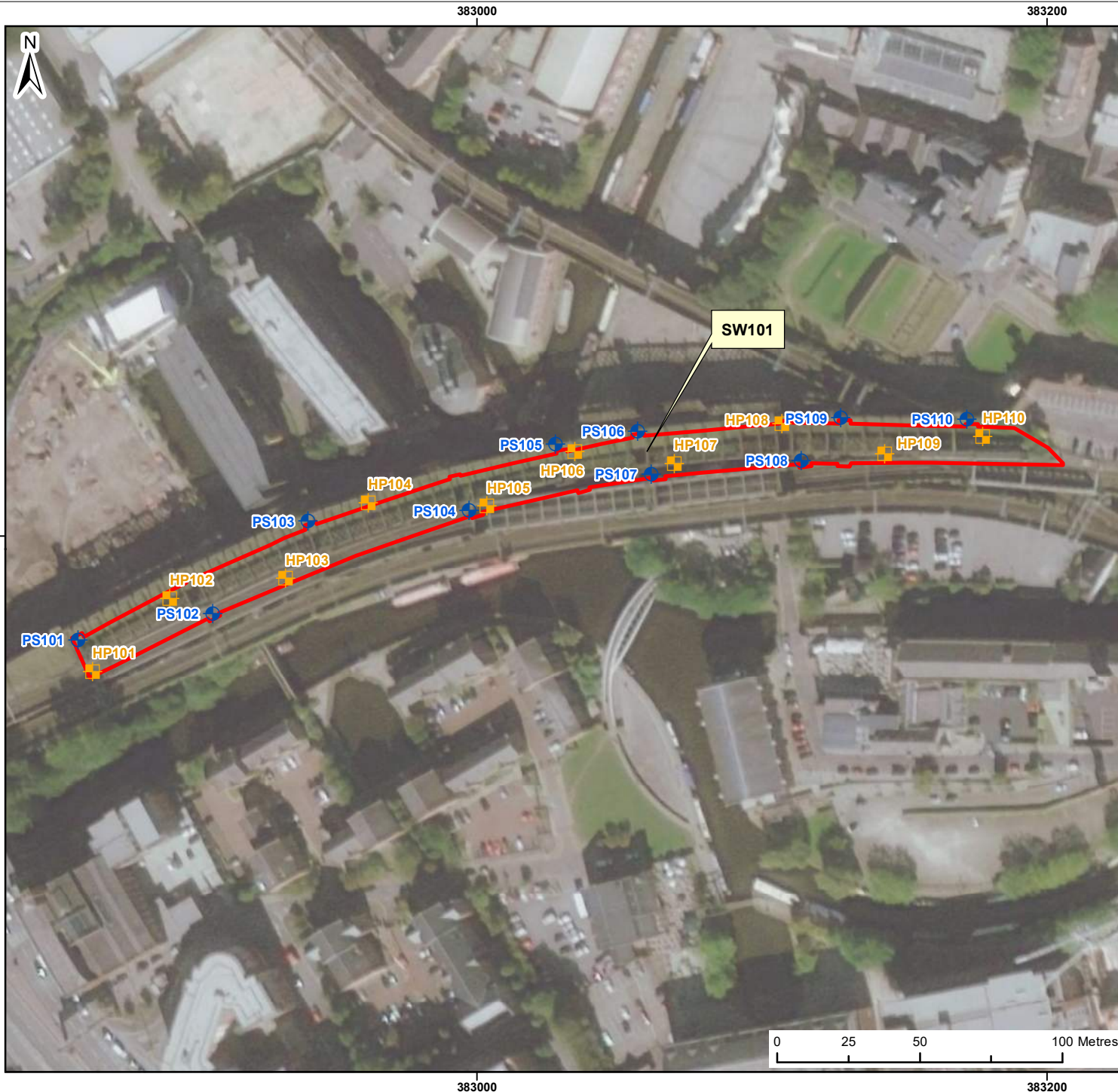
Figure: 2.1 Drawing No: PC2387-RHD-ZZ-XX-DR-Z-0002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	28/04/2021	GC	KD	A4	1:3,000

Co-ordinate system: British National Grid



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Legend:

 Red Line Boundary

Exploratory Hole

✦ Hand Pit

✦ Paint sample

Data Sources: © HaskoningDHV UK Ltd, 2021

Base map: © OpenStreetMap (and) contributors, CC-BY-SA

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Client:

National Trust

Project:

Castlefield Viaduct

Title:

Exploratory Hole Plan

Figure: 3.1

Drawing No: PC2387-RHD-ZZ-XX-DR-Z-0005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	10/08/2021	GC	PP	A4	1:2,000

Co-ordinate system: British National Grid


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Appendix

Appendix A – Hand Dug Pit Logs

Hand Dug Pit Log

Hand Pit No
HP101
Sheet 1 of 1

Project Name: **Castlefield Viaduct**

Project No.
PC2387

Co-ords: E: 382865.31m, N: 397552.40m
Level: **31.10mAD**

Date
08/07/2021

Location: **Manchester**

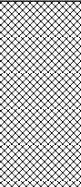
Dimensions
(m):

Scale
1:10

Client: **National Trust**

Depth
0.25

Logged
PP

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.00 - 0.25	ES		0.25	30.85		MADE GROUND: Grass over dark brown sandy GRAVEL with occasional rootlets. Gravel is fine to coarse, angular to subangular granite ballast with hydrocarbon staining.
							End of Pit at 0.25m

Remarks: Refusal on timber sleeper.

Groundwater not observed.

Stability:

Hand Dug Pit Log

Hand Pit No
HP104
Sheet 1 of 1

Project Name: **Castlefield Viaduct**

Project No.
PC2387

Co-ords: E: 382961.89m, N: 397611.67m
Level: **31.00mAD**

Date
08/07/2021

Location: **Manchester**

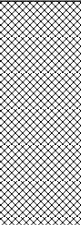
Dimensions
(m):

Scale
1:10

Client: **National Trust**

Depth
0.30

Logged
PP

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.00 - 0.30	ES		0.30	30.70		MADE GROUND: Grass over dark brown slightly clayey sandy GRAVEL. Sand is fine to medium. Gravel is fine to coarse, angular to subangular granite ballast with hydrocarbon staining
							End of Pit at 0.30m

Remarks: Refusal on metal viaduct base.
Groundwater not observed.

Stability:

Hand Dug Pit Log

Hand Pit No
HP105
Sheet 1 of 1

Project Name: **Castlefield Viaduct**

Project No.
PC2387

Co-ords: E: 383003.56m, N: 397610.40m
Level: **31.10mAD**

Date
08/07/2021

Location: **Manchester**

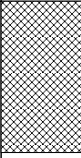
Dimensions
(m):

Scale
1:10

Client: **National Trust**

Depth
0.20

Logged
PP

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.00 - 0.20	ES		0.20	30.90		MADE GROUND: Grass over dark brown slightly clayey sandy GRAVEL. Sand is fine to medium. Gravel is fine to coarse, angular to subangular granite ballast with hydrocarbon staining
							End of Pit at 0.20m

Remarks: Refusal on metal viaduct base.

Groundwater not observed.

Stability:

Hand Dug Pit Log

Hand Pit No
HP106
Sheet 1 of 1

Project Name: **Castlefield Viaduct**

Project No.
PC2387

Co-ords: E: 383034.38m, N: 397629.58m
Level: **31.00mAD**

Date
08/07/2021

Location: **Manchester**

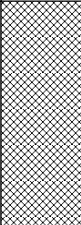
Dimensions
(m):

Scale
1:10

Client: **National Trust**

Depth
0.30

Logged
PP

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.00 - 0.30	ES		0.30	30.70		MADE GROUND: Grass over dark brown slightly clayey sandy GRAVEL with occasional rootlets. Sand is fine to medium. Gravel is fine to coarse, angular to subangular granite ballast with hydrocarbon staining.
							End of Pit at 0.30m

Remarks: Refusal on metal viaduct base.
Groundwater not observed.

Stability:

Hand Dug Pit Log

Hand Pit No
HP107
Sheet 1 of 1

Project Name: **Castlefield Viaduct**

Project No.
PC2387

Co-ords: E: 383069.31m, N: 397625.34m
Level: **31.00mAD**

Date
08/07/2021

Location: **Manchester**

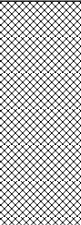
Dimensions
(m):

Scale
1:10

Client: **National Trust**

Depth
0.30

Logged
PP

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.00 - 0.30	ES		0.30	30.70		MADE GROUND: Grass over dark brown slightly clayey sandy GRAVEL with rare rootlets. Sand is fine to medium. Gravel is fine to coarse, angular to subangular granite ballast with hydrocarbon staining.
							End of Pit at 0.30m

Remarks: Refusal on metal viaduct base.
Groundwater not observed.

Stability:

Hand Dug Pit Log

Hand Pit No
HP108
Sheet 1 of 1

Project Name: **Castlefield Viaduct**

Project No.
PC2387

Co-ords: E: 383107.09m, N: 397639.37m
Level: **31.00mAD**

Date
08/07/2021

Location: **Manchester**

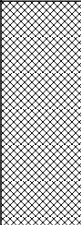
Dimensions
(m):

Scale
1:10

Client: **National Trust**

Depth
0.30

Logged
PP

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.00 - 0.30	ES		0.30	30.70		MADE GROUND: Grass over dark brown slightly clayey sandy GRAVEL with rare rootlets. Sand is fine to medium. Gravel is fine to coarse, angular to subangular granite ballast with hydrocarbon staining.
							End of Pit at 0.30m

Remarks: Refusal on metal viaduct base.
Groundwater not observed.

Stability:

Hand Dug Pit Log

Hand Pit No
HP109
Sheet 1 of 1

Project Name: **Castlefield Viaduct**

Project No.
PC2387

Co-ords: E: 383143.07m, N: 397628.92m
Level: **31.00mAD**

Date
08/07/2021

Location: **Manchester**

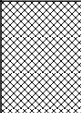
Dimensions
(m):

Scale
1:10

Client: **National Trust**

Depth
0.15

Logged
PP

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.00 - 0.15	ES		0.15	30.85		MADE GROUND: Grass over dark brown slightly clayey sandy GRAVEL with rare rootlets. Sand is fine to medium. Gravel is fine to coarse, angular to subangular granite ballast with hydrocarbon staining
							End of Pit at 0.15m

Remarks: Refusal on metal viaduct base.

Groundwater not observed.

Stability:





Appendix

Appendix B – Exploratory Hole Photographs



Photo Plate No. 01: HP101 (08/07/21, down hole picture (timber sleeper at base))



Photo Plate No. 02: HP101 (08/07/2021, excavated material)

**Manchester One,
53 Portland Street,
Manchester,
M1 3LD**

**Tel: 0161 236 1018
E-mail: info@RHDHV.com**



Project : Castlefield Viaduct, Manchester

Client: National Trust

Hand Dug Pit Photo Plates

Project No.: PC2387

Date: 29/07/2021



Photo Plate No. 03: HP102 (08/07/21, down hole picture)



Photo Plate No. 04: HP102 (08/07/2021, excavated material)

**Manchester One,
53 Portland Street,
Manchester,
M1 3LD**

**Tel: 0161 236 1018
E-mail: info@RHDHV.com**



Project : Castlefield Viaduct, Manchester

Client: National Trust

Hand Dug Pit Photo Plates

Project No.: PC2387

Date: 29/07/2021



Photo Plate No. 05: HP103 (08/07/21, down hole picture)



Photo Plate No. 06: HP103 (08/07/2021, excavated material)

**Manchester One,
53 Portland Street,
Manchester,
M1 3LD**

**Tel: 0161 236 1018
E-mail: info@RHDHV.com**



Project : Castlefield Viaduct, Manchester

Client: National Trust

Hand Dug Pit Photo Plates

Project No.: PC2387

Date: 29/07/2021



Photo Plate No. 07: HP104 (08/07/21, down hole picture)



Photo Plate No. 08: HP104 (08/07/2021, excavated material)

**Manchester One,
53 Portland Street,
Manchester,
M1 3LD**

**Tel: 0161 236 1018
E-mail: info@RHDHV.com**



Project : Castlefield Viaduct, Manchester

Client: National Trust

Hand Dug Pit Photo Plates

Project No.: PC2387

Date: 29/07/2021



Photo Plate No. 08: HP105 (08/07/21, down hole picture)



Photo Plate No. 09: HP105 (08/07/2021, excavated material)

**Manchester One,
53 Portland Street,
Manchester,
M1 3LD**

**Tel: 0161 236 1018
E-mail: info@RHDHV.com**



Project : Castlefield Viaduct, Manchester

Client: National Trust

Hand Dug Pit Photo Plates

Project No.: PC2387

Date: 29/07/2021



Photo Plate No. 11: HP106 (08/07/21, down hole picture)



Photo Plate No. 12: HP106 (08/07/2021, excavated material)

**Manchester One,
53 Portland Street,
Manchester,
M1 3LD**

**Tel: 0161 236 1018
E-mail: info@RHDHV.com**



Project : Castlefield Viaduct, Manchester

Client: National Trust

Hand Dug Pit Photo Plates

Project No.: PC2387

Date: 29/07/2021



Photo Plate No. 13: HP107 (08/07/21, down hole picture)



Photo Plate No. 14: HP107 (08/07/2021, excavated material)

**Manchester One,
53 Portland Street,
Manchester,
M1 3LD**

**Tel: 0161 236 1018
E-mail: info@RHDHV.com**



Project : Castlefield Viaduct, Manchester

Client: National Trust

Hand Dug Pit Photo Plates

Project No.: PC2387

Date: 29/07/2021



Photo Plate No. 15: HP108 (08/07/21, down hole picture)



Photo Plate No. 16: HP108 (08/07/2021, excavated material)

**Manchester One,
53 Portland Street,
Manchester,
M1 3LD**

**Tel: 0161 236 1018
E-mail: info@RHDHV.com**



Project : Castlefield Viaduct, Manchester

Client: National Trust

Hand Dug Pit Photo Plates

Project No.: PC2387

Date: 29/07/2021



Photo Plate No. 17: HP109 (08/07/21, down hole picture)



Photo Plate No. 18: HP109 (08/07/2021, excavated material)

**Manchester One,
53 Portland Street,
Manchester,
M1 3LD**

**Tel: 0161 236 1018
E-mail: info@RHDHV.com**



Project : Castlefield Viaduct, Manchester

Client: National Trust

Hand Dug Pit Photo Plates

Project No.: PC2387

Date: 29/07/2021



Photo Plate No. 19: HP110 (08/07/21, down hole picture)



Photo Plate No. 20: HP110 (08/07/2021, excavated material)

**Manchester One,
53 Portland Street,
Manchester,
M1 3LD**

**Tel: 0161 236 1018
E-mail: info@RHDHV.com**



Project : Castlefield Viaduct, Manchester

Client: National Trust

Hand Dug Pit Photo Plates

Project No.: PC2387

Date: 29/07/2021

Appendix

Appendix C – Chemical Analysis Laboratory Certificates

Punit Patel

Royal HaskoningDHV
9th Floor Manchester One
53 Portland Street
Manchester
M1 3LD

e: punit.patel@RHDHV.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 21-86295

Replaces Analytical Report Number: 21-86295, issue no. 1
Additional analysis undertaken.

Project / Site name:	Castlefield Viaduct NT	Samples received on:	09/07/2021
Your job number:	PC2387	Samples instructed on/ Analysis started on:	12/07/2021
Your order number:	PC2387 103 100	Analysis completed by:	28/07/2021
Report Issue Number:	2	Report issued on:	28/07/2021
Samples Analysed:	22 leachate samples - 10 other samples - 11 soil samples - 1 water sample		

Signed:

Joanna Wawrzeczko
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT
Your Order No: PC2387 103 100

Lab Sample Number				1934531	1934532	1934533	1934534	1934535
Sample Reference				HP101	HP102	HP103	HP104	HP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	< 0.1
Moisture Content				%	0.01	NONE	13	10
Total mass of sample received				kg	0.001	NONE	2.0	2.0

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
------------------	------	-----	-----------	--------------	--------------	--------------	--------------	--------------

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.7	8.0	7.8	8.0	7.9
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	< 0.5	< 0.5	0.8	< 0.5	1.0
Total Organic Carbon (TOC)	%	0.1	MCERTS	6.3	6.0	8.1	4.8	4.8

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
----------------------------	-------	---	--------	-------	-------	-------	-------	-------

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	2.7	1.8	2.4	2.3	1.4
Acenaphthylene	mg/kg	0.05	MCERTS	0.61	< 0.05	1.3	0.27	0.59
Acenaphthene	mg/kg	0.05	MCERTS	7.4	1.6	6.2	3.6	2.9
Fluorene	mg/kg	0.05	MCERTS	5.2	1.0	3.7	2.0	1.7
Phenanthrene	mg/kg	0.05	MCERTS	49	13	54	20	24
Anthracene	mg/kg	0.05	MCERTS	13	3.3	16	4.2	6.5
Fluoranthene	mg/kg	0.05	MCERTS	81	24	170	29	65
Pyrene	mg/kg	0.05	MCERTS	78	23	170	26	67
Benzo(a)anthracene	mg/kg	0.05	MCERTS	41	14	97	14	39
Chrysene	mg/kg	0.05	MCERTS	39	12	94	14	33
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	44	14	130	16	46
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	16	5.3	97	5.9	16
Benzo(a)pyrene	mg/kg	0.05	MCERTS	37	12	62	13	39
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	14	5.8	42	5.9	17
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	4.4	1.4	12	1.8	4.3
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	17	6.5	46	6.4	19

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	448	140	996	164	382
-----------------------------	-------	-----	--------	-----	-----	-----	-----	-----

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	62	69	51	66	44
Barium (aqua regia extractable)	mg/kg	1	MCERTS	310	230	610	220	330
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.7	1.9	1.5	1.3	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	0.7	0.7	0.5	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2.4	3.1	2.6	2.7	1.6
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	58	69	63	60	57
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	58	69	63	61	57
Copper (aqua regia extractable)	mg/kg	1	MCERTS	330	310	230	250	210
Lead (aqua regia extractable)	mg/kg	1	MCERTS	1200	550	4400	520	1400
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	67	80	150	61	55
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	67	70	65	68	67
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	680	290	500	320	320

Monoaromatics & Oxygenates

Analytical Report Number: 21-86295
 Project / Site name: Castlefield Viaduct NT
 Your Order No: PC2387 103 100

Lab Sample Number				1934531	1934532	1934533	1934534	1934535
Sample Reference				HP101	HP102	HP103	HP104	HP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	18	< 2.0	12	< 2.0	7.2
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	35	< 8.0	21	< 8.0	28
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	180	320	92	210	340
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	230	320	130	210	370

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	4.4	5.6	11	6.9	4.6
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	30	27	42	24	26
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	210	73	410	81	170
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	380	200	790	200	430
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	630	310	1300	310	630

Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT
Your Order No: PC2387 103 100

Lab Sample Number				1934531	1934532	1934533	1934534	1934535
Sample Reference				HP101	HP102	HP103	HP104	HP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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 Project / Site name: Castlefield Viaduct NT
 Your Order No: PC2387 103 100

Lab Sample Number				1934531	1934532	1934533	1934534	1934535
Sample Reference				HP101	HP102	HP103	HP104	HP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Project / Site name: Castlefield Viaduct NT
Your Order No: PC2387 103 100

Lab Sample Number				1934531	1934532	1934533	1934534	1934535
Sample Reference				HP101	HP102	HP103	HP104	HP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	2.7	1.8	2.4	2.3	1.4
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	0.61	< 0.05	1.3	0.27	0.59
Acenaphthene	mg/kg	0.05	MCERTS	7.4	1.6	6.2	3.6	2.9
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	5.2	1.0	3.7	2.0	1.7
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	49	13	54	20	24
Anthracene	mg/kg	0.05	MCERTS	13	3.3	16	4.2	6.5
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	81	24	170	29	65
Pyrene	mg/kg	0.05	MCERTS	78	23	170	26	67
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	41	14	97	14	39
Chrysene	mg/kg	0.05	MCERTS	39	12	94	14	33
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	44	14	130	16	46
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	16	5.3	97	5.9	16
Benzo(a)pyrene	mg/kg	0.05	MCERTS	37	12	62	13	39

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 Project / Site name: Castlefield Viaduct NT
 Your Order No: PC2387 103 100

Lab Sample Number				1934531	1934532	1934533	1934534	1934535
Sample Reference				HP101	HP102	HP103	HP104	HP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	14	5.8	42	5.9	17
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	4.4	1.4	12	1.8	4.3
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	17	6.5	46	6.4	19

Acid Herbicides

2,3,6-TBA	µg/kg	50	NONE	< 50	< 50	< 50	-	-
2,4,5-T	µg/kg	10	NONE	< 10	< 10	< 10	-	-
2,4,5-TP (Fenoprop)	µg/kg	10	NONE	< 10	< 10	< 10	-	-
2,4-D	µg/kg	10	NONE	< 10	< 10	< 10	-	-
2,4-DB	µg/kg	10	NONE	< 10	< 10	< 10	-	-
4-CPA	µg/kg	20	NONE	< 20	< 20	< 20	-	-
Bromacil	µg/kg	10	NONE	< 10	< 10	< 10	-	-
Bromoxynil	µg/kg	10	NONE	< 10	< 10	< 10	-	-
Clopyralid	µg/kg	100	NONE	< 100	< 100	< 100	-	-
Dicamba	µg/kg	20	NONE	< 20	< 20	< 20	-	-
Diclofop	µg/kg	10	NONE	< 10	< 10	< 10	-	-
Dichlorprop	µg/kg	10	NONE	< 10	< 10	< 10	-	-
Dinoseb	µg/kg	10	NONE	< 10	< 10	< 10	-	-
Flamprop	µg/kg	50	NONE	< 50	< 50	< 50	-	-
Flamprop-Isopropyl	µg/kg	10	NONE	< 10	< 10	< 10	-	-
Ioxynil	µg/kg	10	NONE	< 10	< 10	< 10	-	-
MCPA	µg/kg	10	NONE	< 10	< 10	< 10	-	-
MCPB	µg/kg	20	NONE	< 20	< 20	< 20	-	-
MCPB (Mecoprop)	µg/kg	10	NONE	< 10	< 10	< 10	-	-
Picloram	µg/kg	50	NONE	< 50	< 50	< 50	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT
Your Order No: PC2387 103 100

Lab Sample Number				1934536	1934537	1934538	1934539	1934540
Sample Reference				HP106	HP107	HP108	HP109	HP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	< 0.1
Moisture Content				%	0.01	NONE	11	9.6
Total mass of sample received				kg	0.001	NONE	2.0	2.0

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.9	7.8	7.7	8.0	7.8
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	2.3	< 0.5	< 0.5	1.4	< 0.5
Total Organic Carbon (TOC)	%	0.1	MCERTS	6.3	5.8	8.1	6.4	7.4

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	1.1	3.3	0.91	0.58	18
Acenaphthylene	mg/kg	0.05	MCERTS	0.69	0.95	0.35	< 0.05	28
Acenaphthene	mg/kg	0.05	MCERTS	3.1	11	1.4	2.0	85
Fluorene	mg/kg	0.05	MCERTS	1.9	6.3	0.97	1.2	50
Phenanthrene	mg/kg	0.05	MCERTS	22	68	12	11	540
Anthracene	mg/kg	0.05	MCERTS	5.1	17	3.3	2.4	130
Fluoranthene	mg/kg	0.05	MCERTS	43	140	28	17	760
Pyrene	mg/kg	0.05	MCERTS	42	130	29	16	710
Benzo(a)anthracene	mg/kg	0.05	MCERTS	22	83	15	6.7	320
Chrysene	mg/kg	0.05	MCERTS	22	64	14	6.3	270
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	24	94	19	7.3	310
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	11	23	7.6	2.9	150
Benzo(a)pyrene	mg/kg	0.05	MCERTS	22	72	16	6.4	320
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	9.8	31	8.2	2.8	150
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.7	9.5	2.2	0.74	32
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	11	35	9.3	3.3	180

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	243	781	166	86.1	4040
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	76	66	83	16	60
Barium (aqua regia extractable)	mg/kg	1	MCERTS	330	410	310	56	360
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.8	1.9	1.4	1.2	1.7
Boron (water soluble)	mg/kg	0.2	MCERTS	1.0	0.3	0.9	1.3	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	3.4	2.8	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	63	64	81	44	56
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	64	64	82	45	56
Copper (aqua regia extractable)	mg/kg	1	MCERTS	320	290	340	38	330
Lead (aqua regia extractable)	mg/kg	1	MCERTS	1100	2100	1200	59	1400
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	70	70	73	39	60
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	85	82	76	69	71
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	390	480	460	110	990

Monoaromatics & Oxygenates

Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT
Your Order No: PC2387 103 100

Lab Sample Number				1934536	1934537	1934538	1934539	1934540
Sample Reference				HP106	HP107	HP108	HP109	HP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	9.9
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	14	< 2.0	< 2.0	27
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	16	59	21	< 8.0	81
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	270	290	330	< 8.0	480
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	290	360	350	< 10	600

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	3.8	5.1	< 1.0	< 1.0	46
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	19	31	8.3	23	230
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	110	340	78	52	1200
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	270	680	270	86	1000
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	400	1100	360	160	2500

Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT
Your Order No: PC2387 103 100

Lab Sample Number				1934536	1934537	1934538	1934539	1934540
Sample Reference				HP106	HP107	HP108	HP109	HP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 21-86295
 Project / Site name: Castlefield Viaduct NT
 Your Order No: PC2387 103 100

Lab Sample Number				1934536	1934537	1934538	1934539	1934540
Sample Reference				HP106	HP107	HP108	HP109	HP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 21-86295
 Project / Site name: Castlefield Viaduct NT
 Your Order No: PC2387 103 100

Lab Sample Number				1934536	1934537	1934538	1934539	1934540
Sample Reference				HP106	HP107	HP108	HP109	HP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	1.1	3.3	0.91	0.58	18
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	29
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	0.69	0.95	0.35	< 0.05	28
Acenaphthene	mg/kg	0.05	MCERTS	3.1	11	1.4	2.0	85
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	25
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	1.9	6.3	0.97	1.2	50
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	22	68	12	11	540
Anthracene	mg/kg	0.05	MCERTS	5.1	17	3.3	2.4	130
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	43	140	28	17	760
Pyrene	mg/kg	0.05	MCERTS	42	130	29	16	710
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	22	83	15	6.7	320
Chrysene	mg/kg	0.05	MCERTS	22	64	14	6.3	270
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	24	94	19	7.3	310
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	11	23	7.6	2.9	150
Benzo(a)pyrene	mg/kg	0.05	MCERTS	22	72	16	6.4	320

Analytical Report Number: 21-86295
 Project / Site name: Castlefield Viaduct NT
 Your Order No: PC2387 103 100

Lab Sample Number				1934536	1934537	1934538	1934539	1934540
Sample Reference				HP106	HP107	HP108	HP109	HP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	9.8	31	8.2	2.8	150
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.7	9.5	2.2	0.74	32
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	11	35	9.3	3.3	180

Acid Herbicides

2,3,6-TBA	µg/kg	50	NONE	-	-	-	-	-
2,4,5-T	µg/kg	10	NONE	-	-	-	-	-
2,4,5-TP (Fenoprop)	µg/kg	10	NONE	-	-	-	-	-
2,4-D	µg/kg	10	NONE	-	-	-	-	-
2,4-DB	µg/kg	10	NONE	-	-	-	-	-
4-CPA	µg/kg	20	NONE	-	-	-	-	-
Bromacil	µg/kg	10	NONE	-	-	-	-	-
Bromoxynil	µg/kg	10	NONE	-	-	-	-	-
Clopyralid	µg/kg	100	NONE	-	-	-	-	-
Dicamba	µg/kg	20	NONE	-	-	-	-	-
Diclofop	µg/kg	10	NONE	-	-	-	-	-
Dichlorprop	µg/kg	10	NONE	-	-	-	-	-
Dinoseb	µg/kg	10	NONE	-	-	-	-	-
Flamprop	µg/kg	50	NONE	-	-	-	-	-
Flamprop-Isopropyl	µg/kg	10	NONE	-	-	-	-	-
Ioxynil	µg/kg	10	NONE	-	-	-	-	-
MCPA	µg/kg	10	NONE	-	-	-	-	-
MCPB	µg/kg	20	NONE	-	-	-	-	-
MCPP (Mecoprop)	µg/kg	10	NONE	-	-	-	-	-
Picloram	µg/kg	50	NONE	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT
Your Order No: PC2387 103 100

Lab Sample Number				1934541
Sample Reference				HP Dup 1
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				08/07/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	15
Total mass of sample received	kg	0.001	NONE	1.3

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.9
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	< 0.5
Total Organic Carbon (TOC)	%	0.1	MCERTS	7.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	12
Acenaphthylene	mg/kg	0.05	MCERTS	23
Acenaphthene	mg/kg	0.05	MCERTS	73
Fluorene	mg/kg	0.05	MCERTS	44
Phenanthrene	mg/kg	0.05	MCERTS	450
Anthracene	mg/kg	0.05	MCERTS	100
Fluoranthene	mg/kg	0.05	MCERTS	660
Pyrene	mg/kg	0.05	MCERTS	600
Benzo(a)anthracene	mg/kg	0.05	MCERTS	310
Chrysene	mg/kg	0.05	MCERTS	220
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	310
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	96
Benzo(a)pyrene	mg/kg	0.05	MCERTS	280
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	130
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	28
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	160

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	3490
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	62
Barium (aqua regia extractable)	mg/kg	1	MCERTS	280
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.5
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2
Chromium (III)	mg/kg	1	NONE	51
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	51
Copper (aqua regia extractable)	mg/kg	1	MCERTS	310
Lead (aqua regia extractable)	mg/kg	1	MCERTS	1000
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	61
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	70
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	790

Monoaromatics & Oxygenates

Analytical Report Number: 21-86295
 Project / Site name: Castlefield Viaduct NT
 Your Order No: PC2387 103 100

Lab Sample Number				1934541
Sample Reference				HP Dup 1
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				08/07/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Benzene	µg/kg	1	MCERTS	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	10
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	23
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	110
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	730
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	870

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	23
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	170
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	1300
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	1300
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	2700

Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT
Your Order No: PC2387 103 100

Lab Sample Number				1934541
Sample Reference				HP Dup 1
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				08/07/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
VOCs				
Chloromethane	µg/kg	1	ISO 17025	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0

Analytical Report Number: 21-86295
 Project / Site name: Castlefield Viaduct NT
 Your Order No: PC2387 103 100

Lab Sample Number					1934541
Sample Reference					HP Dup 1
Sample Number					None Supplied
Depth (m)					None Supplied
Date Sampled					08/07/2021
Time Taken					None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	

Analytical Report Number: 21-86295
 Project / Site name: Castlefield Viaduct NT
 Your Order No: PC2387 103 100

Lab Sample Number				1934541
Sample Reference				HP Dup 1
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				08/07/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
SVOCs				
Aniline	mg/kg	0.1	NONE	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	12
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	24
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	23
Acenaphthene	mg/kg	0.05	MCERTS	73
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	22
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2
Fluorene	mg/kg	0.05	MCERTS	44
Azobenzene	mg/kg	0.3	MCERTS	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	450
Anthracene	mg/kg	0.05	MCERTS	100
Carbazole	mg/kg	0.3	MCERTS	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	660
Pyrene	mg/kg	0.05	MCERTS	600
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	310
Chrysene	mg/kg	0.05	MCERTS	220
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	310
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	96
Benzo(a)pyrene	mg/kg	0.05	MCERTS	280

Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT
Your Order No: PC2387 103 100

Lab Sample Number					1934541
Sample Reference					HP Dup 1
Sample Number					None Supplied
Depth (m)					None Supplied
Date Sampled					08/07/2021
Time Taken					None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS		130
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS		28
Benzo(ghi)perylene	mg/kg	0.05	MCERTS		160

Acid Herbicides

2,3,6-TBA	µg/kg	50	NONE	-
2,4,5-T	µg/kg	10	NONE	-
2,4,5-TP (Fenoprop)	µg/kg	10	NONE	-
2,4-D	µg/kg	10	NONE	-
2,4-DB	µg/kg	10	NONE	-
4-CPA	µg/kg	20	NONE	-
Bromacil	µg/kg	10	NONE	-
Bromoxynil	µg/kg	10	NONE	-
Clopyralid	µg/kg	100	NONE	-
Dicamba	µg/kg	20	NONE	-
Diclofop	µg/kg	10	NONE	-
Dichlorprop	µg/kg	10	NONE	-
Dinoseb	µg/kg	10	NONE	-
Flamprop	µg/kg	50	NONE	-
Flamprop-Isopropyl	µg/kg	10	NONE	-
Ioxynil	µg/kg	10	NONE	-
MCPA	µg/kg	10	NONE	-
MCPB	µg/kg	20	NONE	-
MCPP (Mecoprop)	µg/kg	10	NONE	-
Picloram	µg/kg	50	NONE	-

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934564
Sample Reference				SW101
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				08/07/2021
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

General Inorganics

pH	pH Units	N/A	ISO 17025	7.6
Sulphate as SO ₄	mg/l	0.045	ISO 17025	16.3
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	120
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	4.16
Alkalinity as CaCO ₃	mg/l	3	ISO 17025	54

Phenols by GC-MS

Phenol	µg/l	0.05	NONE	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05

Total Phenols

Total Phenols (GC-MS)	µg/l	0.5	NONE	< 0.5
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Heavy Metals / Metalloids

Boron (dissolved)	µg/l	10	ISO 17025	120
Calcium (dissolved)	mg/l	0.012	ISO 17025	21
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Chromium (III)	µg/l	1	NONE	1.4

Arsenic (dissolved)	µg/l	0.15	ISO 17025	2.71
Barium (dissolved)	µg/l	0.06	ISO 17025	60
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	1.4
Copper (dissolved)	µg/l	0.5	ISO 17025	8.8
Lead (dissolved)	µg/l	0.2	ISO 17025	8.4
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.5
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Vanadium (dissolved)	µg/l	0.2	ISO 17025	1.4
Zinc (dissolved)	µg/l	0.5	ISO 17025	25

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934564
Sample Reference				SW101
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				08/07/2021
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934564
Sample Reference				SW101
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				08/07/2021
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0
Trichlorofluoromethane	µg/l	1	NONE	< 1.0
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0
p & m-Xylene	µg/l	1	ISO 17025	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0
Tribromomethane	µg/l	1	ISO 17025	< 1.0
o-Xylene	µg/l	1	ISO 17025	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number					1934564
Sample Reference					SW101
Sample Number					None Supplied
Depth (m)					None Supplied
Date Sampled					08/07/2021
Time Taken					None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934564
Sample Reference				SW101
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				08/07/2021
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	0.02
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05
Fluorene	µg/l	0.01	ISO 17025	0.03
Azobenzene	µg/l	0.05	NONE	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	0.02
Pyrene	µg/l	0.01	ISO 17025	0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number					1934564
Sample Reference					SW101
Sample Number					None Supplied
Depth (m)					None Supplied
Date Sampled					08/07/2021
Time Taken					None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	

3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	
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Environmental Forensics

Fluoranthene (low level)	µg/l	0.002	NONE	0.020	
Benzo(b)fluoranthene (low level)	µg/l	0.002	NONE	< 0.002	
Benzo(k)fluoranthene (low level)	µg/l	0.002	NONE	< 0.002	
Benzo(a)pyrene (low level)	µg/l	0.002	NONE	< 0.002	
Indeno(1,2,3-cd)pyrene (low level)	µg/l	0.002	NONE	< 0.002	
Benzo(ghi)perylene (low level)	µg/l	0.002	NONE	< 0.002	
Naphthalene (low level)	µg/l	0.002	NONE	< 0.0020	
Acenaphthylene (low level)	µg/l	0.002	NONE	< 0.0020	
Acenaphthene (low level)	µg/l	0.002	NONE	0.020	
Fluorene (low level)	µg/l	0.002	NONE	0.030	
Phenanthrene (low level)	µg/l	0.002	NONE	< 0.0020	
Antracene (low level)	µg/l	0.002	NONE	< 0.0020	
Pyrene (low level)	µg/l	0.002	NONE	0.010	
Benzo(a)anthracene (low level)	µg/l	0.002	NONE	< 0.0020	
Chrysene (low level)	µg/l	0.002	NONE	< 0.0020	
Di-benzo(a,h)anthracene (low level)	µg/l	0.002	NONE	< 0.0020	

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number	1934552	1934553	1934554	1934555	1934556
Sample Reference	HP101	HP102	HP103	HP104	HP105
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20
Date Sampled	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	7.7	7.9	8.0	8.0	7.9
Sulphate as SO4	mg/l	0.1	ISO 17025	4.2	3.0	3.5	3.0	4.5
Ammoniacal Nitrogen as N	µg/l	15	NONE	34	35	< 15	< 15	< 15
Alkalinity as CaCO3	mg/l	3	ISO 17025	86	56	69	110	77

Phenols by GC-MS

Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total Phenols

Total Phenols (GC-MS)	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	2.8	< 1.0	4.2	< 1.0	< 1.0
Barium (dissolved)	µg/l	0.05	ISO 17025	92	45	130	95	140
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	0.4	< 0.2	0.4
Boron (dissolved)	µg/l	10	ISO 17025	28	16	18	23	17
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.4	< 0.4	< 0.4	0.6	0.4
Copper (dissolved)	µg/l	0.7	ISO 17025	24	20	6.8	8.2	6.7
Lead (dissolved)	µg/l	1	ISO 17025	5.6	2.3	5.2	2.1	9.6
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	3.7	1.6	2.7	2.6	2.6
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7
Zinc (dissolved)	µg/l	0.4	ISO 17025	28	6.0	3.8	4.3	3.4

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934552	1934553	1934554	1934555	1934556
Sample Reference				HP101	HP102	HP103	HP104	HP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C16	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C16	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C10 - C16	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C10 - C35	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934552	1934553	1934554	1934555	1934556
Sample Reference				HP101	HP102	HP103	HP104	HP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ter-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
P-Isopropyltoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934552	1934553	1934554	1934555	1934556
Sample Reference				HP101	HP102	HP103	HP104	HP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
1,2,4-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,3-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934552	1934553	1934554	1934555	1934556
Sample Reference				HP101	HP102	HP103	HP104	HP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)				Units	Limit of detection	Accreditation Status		

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01	0.02	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	NONE	0.07	0.07	0.10	0.05	0.12
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	NONE	0.08	0.07	0.07	0.05	0.06
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	0.09
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	0.06
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	NONE	0.16	0.08	0.39	0.03	0.14
Pyrene	µg/l	0.01	NONE	0.16	0.07	0.40	0.03	0.16
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	NONE	0.07	0.04	0.13	< 0.01	0.11
Chrysene	µg/l	0.01	NONE	0.05	0.02	0.12	< 0.01	0.07
Benzo(b)fluoranthene	µg/l	0.01	NONE	0.05	< 0.01	0.12	< 0.01	0.11
Benzo(k)fluoranthene	µg/l	0.01	NONE	0.03	< 0.01	0.05	< 0.01	0.10
Benzo(a)pyrene	µg/l	0.01	NONE	0.05	< 0.01	0.10	< 0.01	0.14



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934552	1934553	1934554	1934555	1934556
Sample Reference				HP101	HP102	HP103	HP104	HP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	0.04	< 0.01	0.07
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	0.02
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	0.07	< 0.01	0.10

Phenyl Urea Pesticides

Benazolin	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	-	-
Bromoxynil	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	-	-
Clopyralid	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	-	-

Environmental Forensics

Fluoranthene (low level)	µg/l	0.002	NONE	0.16	0.080	0.39	0.030	0.14
Benzo(b)fluoranthene (low level)	µg/l	0.002	NONE	0.050	< 0.002	0.12	< 0.002	0.11
Benzo(k)fluoranthene (low level)	µg/l	0.002	NONE	0.030	< 0.002	0.050	< 0.002	0.10
Benzo(a)pyrene (low level)	µg/l	0.002	NONE	0.050	< 0.002	0.10	< 0.002	0.14
Indeno(1,2,3-cd)pyrene (low level)	µg/l	0.002	NONE	< 0.002	< 0.002	0.040	< 0.002	0.070
Benzo(ghi)perylene (low level)	µg/l	0.002	NONE	< 0.002	< 0.002	0.070	< 0.002	0.10
Naphthalene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Acenaphthylene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	0.020	< 0.0020	< 0.0020
Acenaphthene (low level)	µg/l	0.002	NONE	0.070	0.070	0.10	0.050	0.12
Fluorene (low level)	µg/l	0.002	NONE	0.080	0.070	0.070	0.050	0.060
Phenanthrene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	0.090
Antracene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	0.060
Pyrene (low level)	µg/l	0.002	NONE	0.16	0.070	0.40	0.030	0.16
Benzo(a)anthracene (low level)	µg/l	0.002	NONE	0.070	0.040	0.13	< 0.0020	0.11
Chrysene (low level)	µg/l	0.002	NONE	0.050	0.020	0.12	< 0.0020	0.070
Di-benzo(a,h)anthracene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	0.020

Acid Herbicides

2,4,5-T	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	-	-
2,4,5-TP	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	-	-
2,4-D	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	-	-
2,4-DB	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	-	-
Dicamba	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	-	-
Dichlorprop	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	-	-
Dinoseb	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	-	-
MCPA	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	-	-
MCPB	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	-	-
MCPP (Mecoprop)	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	-	-
Picloram	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	-	-
Bentazone	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number	1934557				1934558	1934559	1934560	1934561
Sample Reference	HP106				HP107	HP108	HP109	HP110
Sample Number	None Supplied				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.00-0.30				0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
Date Sampled	08/07/2021				08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken	None Supplied				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	8.1	8.1	7.9	7.9	8.0
Sulphate as SO4	mg/l	0.1	ISO 17025	2.5	2.4	2.5	3.5	7.6
Ammoniacal Nitrogen as N	µg/l	15	NONE	< 15	< 15	42	< 15	16
Alkalinity as CaCO3	mg/l	3	ISO 17025	81	66	77	110	72

Phenols by GC-MS

Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total Phenols

Total Phenols (GC-MS)	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	5.4	5.5	< 1.0
Barium (dissolved)	µg/l	0.05	ISO 17025	93	110	73	180	95
Beryllium (dissolved)	µg/l	0.2	ISO 17025	0.4	0.3	< 0.2	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	18	16	21	20	18
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.5	0.5	0.6	< 0.4	0.5
Copper (dissolved)	µg/l	0.7	ISO 17025	5.2	11	17	7.2	9.1
Lead (dissolved)	µg/l	1	ISO 17025	2.6	7.7	7.0	4.1	5.9
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.8	2.7	2.4	2.6	2.2
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7
Zinc (dissolved)	µg/l	0.4	ISO 17025	3.4	3.8	8.5	3.7	6.8

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934557	1934558	1934559	1934560	1934561
Sample Reference				HP106	HP107	HP108	HP109	HP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C16	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C16	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C10 - C16	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C10 - C35	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934557	1934558	1934559	1934560	1934561
Sample Reference				HP106	HP107	HP108	HP109	HP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ter-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
P-Isopropyltoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934557	1934558	1934559	1934560	1934561
Sample Reference				HP106	HP107	HP108	HP109	HP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
1,2,4-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,3-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934557	1934558	1934559	1934560	1934561
Sample Reference				HP106	HP107	HP108	HP109	HP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	NONE	0.07	0.08	0.05	0.24	0.04
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	NONE	0.05	0.06	0.05	0.10	0.03
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	0.46	< 0.01
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	0.14	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	NONE	0.11	0.62	0.08	1.6	0.21
Pyrene	µg/l	0.01	NONE	0.12	0.72	0.08	1.8	0.20
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	NONE	0.05	0.27	< 0.01	0.58	0.09
Chrysene	µg/l	0.01	NONE	0.05	0.30	< 0.01	0.60	0.07
Benzo(b)fluoranthene	µg/l	0.01	NONE	0.05	0.34	< 0.01	0.89	0.11
Benzo(k)fluoranthene	µg/l	0.01	NONE	0.03	0.18	< 0.01	0.36	0.05
Benzo(a)pyrene	µg/l	0.01	NONE	0.05	0.32	< 0.01	0.81	0.11



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934557	1934558	1934559	1934560	1934561
Sample Reference				HP106	HP107	HP108	HP109	HP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	0.14	< 0.01	0.42	0.09
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	0.05	< 0.01	0.14	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	0.22	< 0.01	0.64	0.13

Phenyl Urea Pesticides

Benazolin	µg/l	0.01	NONE	-	-	-	-	-
Bromoxynil	µg/l	0.01	NONE	-	-	-	-	-
Clopyralid	µg/l	0.01	NONE	-	-	-	-	-

Environmental Forensics

Fluoranthene (low level)	µg/l	0.002	NONE	0.11	0.62	0.080	1.6	0.21
Benzo(b)fluoranthene (low level)	µg/l	0.002	NONE	0.050	0.34	< 0.002	0.89	0.11
Benzo(k)fluoranthene (low level)	µg/l	0.002	NONE	0.030	0.18	< 0.002	0.36	0.050
Benzo(a)pyrene (low level)	µg/l	0.002	NONE	0.050	0.32	< 0.002	0.81	0.11
Indeno(1,2,3-cd)pyrene (low level)	µg/l	0.002	NONE	< 0.002	0.14	< 0.002	0.42	0.090
Benzo(ghi)perylene (low level)	µg/l	0.002	NONE	< 0.002	0.22	< 0.002	0.64	0.13
Naphthalene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Acenaphthylene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Acenaphthene (low level)	µg/l	0.002	NONE	0.070	0.080	0.050	0.24	0.040
Fluorene (low level)	µg/l	0.002	NONE	0.050	0.060	0.050	0.10	0.030
Phenanthrene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	0.46	< 0.0020
Antracene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	0.14	< 0.0020
Pyrene (low level)	µg/l	0.002	NONE	0.12	0.72	0.080	1.8	0.20
Benzo(a)anthracene (low level)	µg/l	0.002	NONE	0.050	0.27	< 0.0020	0.58	0.090
Chrysene (low level)	µg/l	0.002	NONE	0.050	0.30	< 0.0020	0.60	0.070
Di-benzo(a,h)anthracene (low level)	µg/l	0.002	NONE	< 0.0020	0.050	< 0.0020	0.14	< 0.0020

Acid Herbicides

2,4,5-T	µg/l	0.02	NONE	-	-	-	-	-
2,4,5-TP	µg/l	0.02	NONE	-	-	-	-	-
2,4-D	µg/l	0.02	NONE	-	-	-	-	-
2,4-DB	µg/l	0.02	NONE	-	-	-	-	-
Dicamba	µg/l	0.02	NONE	-	-	-	-	-
Dichlorprop	µg/l	0.02	NONE	-	-	-	-	-
Dinoseb	µg/l	0.02	NONE	-	-	-	-	-
MCPA	µg/l	0.02	NONE	-	-	-	-	-
MCPB	µg/l	0.02	NONE	-	-	-	-	-
MCPP (Mecoprop)	µg/l	0.02	NONE	-	-	-	-	-
Picloram	µg/l	0.02	NONE	-	-	-	-	-
Bentazone	µg/l	0.02	NONE	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number	1934562	1934563	1935614	1935615	1935616
Sample Reference	HP Dup 1	HP Dup Ballast	HP101 B	HP102 B	HP103 B
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	0.00-0.25	0.00-0.30	0.00-0.15
Date Sampled	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	8.0	7.5	7.3	7.7	7.4
Sulphate as SO4	mg/l	0.1	ISO 17025	7.7	0.9	1.1	1.1	1.6
Ammoniacal Nitrogen as N	µg/l	15	NONE	< 15	26	35	33	42
Alkalinity as CaCO3	mg/l	3	ISO 17025	71	6.5	< 3.0	6.5	< 3.0

Phenols by GC-MS

Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total Phenols

Total Phenols (GC-MS)	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Barium (dissolved)	µg/l	0.05	ISO 17025	94	11	16	11	32
Beryllium (dissolved)	µg/l	0.2	ISO 17025	0.3	0.5	0.4	0.4	0.5
Boron (dissolved)	µg/l	10	ISO 17025	16	< 10	< 10	< 10	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	1.1
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.6	0.4	0.5	0.6	1.1
Copper (dissolved)	µg/l	0.7	ISO 17025	12	1.6	7.2	3.7	5.9
Lead (dissolved)	µg/l	1	ISO 17025	5.5	4.7	9.8	1.4	23
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	2.8	2.4	3.5	2.5	3.4
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7
Zinc (dissolved)	µg/l	0.4	ISO 17025	6.9	5.7	13	4.5	13

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934562	1934563	1935614	1935615	1935616
Sample Reference				HP Dup 1	HP Dup Ballast	HP101 B	HP102 B	HP103 B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	0.00-0.25	0.00-0.30	0.00-0.15
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C16	µg/l	10	NONE	< 10	-	-	-	-
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C16	µg/l	10	NONE	< 10	-	-	-	-
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C10 - C16	µg/l	10	NONE	< 10	-	-	-	-
TPH-CWG - Aromatic >C10 - C35	µg/l	10	NONE	< 10	-	-	-	-
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934562	1934563	1935614	1935615	1935616
Sample Reference				HP Dup 1	HP Dup Ballast	HP101 B	HP102 B	HP103 B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	0.00-0.25	0.00-0.30	0.00-0.15
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)				Units	Limit of detection	Accreditation Status		

VOCs

Chloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tri bromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ter-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
P-Isopropyltoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934562	1934563	1935614	1935615	1935616
Sample Reference				HP Dup 1	HP Dup Ballast	HP101 B	HP102 B	HP103 B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	0.00-0.25	0.00-0.30	0.00-0.15
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
1,2,4-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,3-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934562	1934563	1935614	1935615	1935616
Sample Reference				HP Dup 1	HP Dup Ballast	HP101 B	HP102 B	HP103 B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	0.00-0.25	0.00-0.30	0.00-0.15
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	NONE	0.03	0.04	0.04	0.02	0.06
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	NONE	0.02	0.03	0.03	0.02	0.03
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	NONE	0.06	0.02	0.04	0.01	0.06
Pyrene	µg/l	0.01	NONE	0.08	0.02	0.04	0.02	0.07
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	NONE	0.07	< 0.01	< 0.01	< 0.01	0.04
Chrysene	µg/l	0.01	NONE	0.07	< 0.01	< 0.01	< 0.01	0.02
Benzo(b)fluoranthene	µg/l	0.01	NONE	0.09	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	0.07	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	0.09	< 0.01	< 0.01	< 0.01	< 0.01



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1934562	1934563	1935614	1935615	1935616
Sample Reference				HP Dup 1	HP Dup Ballast	HP101 B	HP102 B	HP103 B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	0.00-0.25	0.00-0.30	0.00-0.15
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	0.05	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	0.07	< 0.01	< 0.01	< 0.01	< 0.01

Phenyl Urea Pesticides

Benazolin	µg/l	0.01	NONE	-	-	-	-	-
Bromoxynil	µg/l	0.01	NONE	-	-	-	-	-
Clopyralid	µg/l	0.01	NONE	-	-	-	-	-

Environmental Forensics

Fluoranthene (low level)	µg/l	0.002	NONE	0.060	0.020	0.040	0.010	0.060
Benzo(b)fluoranthene (low level)	µg/l	0.002	NONE	0.090	< 0.002	< 0.002	< 0.002	< 0.002
Benzo(k)fluoranthene (low level)	µg/l	0.002	NONE	0.070	< 0.002	< 0.002	< 0.002	< 0.002
Benzo(a)pyrene (low level)	µg/l	0.002	NONE	0.090	< 0.002	< 0.002	< 0.002	< 0.002
Indeno(1,2,3-cd)pyrene (low level)	µg/l	0.002	NONE	0.050	< 0.002	< 0.002	< 0.002	< 0.002
Benzo(ghi)perylene (low level)	µg/l	0.002	NONE	0.070	< 0.002	< 0.002	< 0.002	< 0.002
Naphthalene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Acenaphthylene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Acenaphthene (low level)	µg/l	0.002	NONE	0.030	0.040	0.040	0.020	0.060
Fluorene (low level)	µg/l	0.002	NONE	0.020	0.030	0.030	0.020	0.030
Phenanthrene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Antracene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Pyrene (low level)	µg/l	0.002	NONE	0.080	0.020	0.040	0.020	0.070
Benzo(a)anthracene (low level)	µg/l	0.002	NONE	0.070	< 0.0020	< 0.0020	< 0.0020	0.040
Chrysene (low level)	µg/l	0.002	NONE	0.070	< 0.0020	< 0.0020	< 0.0020	0.020
Di-bezno(a,h)anthracene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020

Acid Herbicides

2,4,5-T	µg/l	0.02	NONE	-	-	-	-	-
2,4,5-TP	µg/l	0.02	NONE	-	-	-	-	-
2,4-D	µg/l	0.02	NONE	-	-	-	-	-
2,4-DB	µg/l	0.02	NONE	-	-	-	-	-
Dicamba	µg/l	0.02	NONE	-	-	-	-	-
Dichlorprop	µg/l	0.02	NONE	-	-	-	-	-
Dinoseb	µg/l	0.02	NONE	-	-	-	-	-
MCPA	µg/l	0.02	NONE	-	-	-	-	-
MCPB	µg/l	0.02	NONE	-	-	-	-	-
MCPP (Mecoprop)	µg/l	0.02	NONE	-	-	-	-	-
Picloram	µg/l	0.02	NONE	-	-	-	-	-
Bentazone	µg/l	0.02	NONE	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number	1935617				1935618	1935619	1935620	1935621
Sample Reference	HP104 B				HP105 B	HP106 B	HP107 B	HP108 B
Sample Number	None Supplied				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.00-0.30				0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30
Date Sampled	08/07/2021				08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken	None Supplied				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	7.4	7.2	7.6	7.8	7.8
Sulphate as SO4	mg/l	0.1	ISO 17025	0.9	1.8	0.8	1.0	1.2
Ammoniacal Nitrogen as N	µg/l	15	NONE	29	48	19	38	50
Alkalinity as CaCO3	mg/l	3	ISO 17025	8.0	7.4	3.9	6.5	< 3.0

Phenols by GC-MS

Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total Phenols

Total Phenols (GC-MS)	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Barium (dissolved)	µg/l	0.05	ISO 17025	9.8	17	8.8	17	14
Beryllium (dissolved)	µg/l	0.2	ISO 17025	0.3	0.2	< 0.2	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.4	0.9	< 0.4	0.5	0.9
Copper (dissolved)	µg/l	0.7	ISO 17025	3.2	4.2	2.6	3.2	3.9
Lead (dissolved)	µg/l	1	ISO 17025	3.1	30	1.9	13	15
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	2.5	2.4	2.4	1.8	2.5
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7
Zinc (dissolved)	µg/l	0.4	ISO 17025	7.2	7.3	12	11	14

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

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Lab Sample Number				1935617	1935618	1935619	1935620	1935621
Sample Reference				HP104 B	HP105 B	HP106 B	HP107 B	HP108 B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C16	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C16	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C10 - C16	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C10 - C35	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



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Lab Sample Number				1935617	1935618	1935619	1935620	1935621
Sample Reference				HP104 B	HP105 B	HP106 B	HP107 B	HP108 B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ter-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
P-Isopropyltoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



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Lab Sample Number				1935617	1935618	1935619	1935620	1935621
Sample Reference				HP104 B	HP105 B	HP106 B	HP107 B	HP108 B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
1,2,4-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,3-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



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Project / Site name: Castlefield Viaduct NT

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Lab Sample Number				1935617	1935618	1935619	1935620	1935621
Sample Reference				HP104 B	HP105 B	HP106 B	HP107 B	HP108 B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	NONE	0.02	0.06	0.03	0.02	0.02
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	NONE	0.02	0.04	0.03	0.02	0.03
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	NONE	0.02	0.06	0.02	0.05	0.02
Pyrene	µg/l	0.01	NONE	0.02	0.07	0.02	0.05	0.03
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	0.04	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01	0.02	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01



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Project / Site name: Castlefield Viaduct NT

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Lab Sample Number				1935617	1935618	1935619	1935620	1935621
Sample Reference				HP104 B	HP105 B	HP106 B	HP107 B	HP108 B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Phenyl Urea Pesticides

Benazolin	µg/l	0.01	NONE	-	-	-	-	-
Bromoxynil	µg/l	0.01	NONE	-	-	-	-	-
Clopyralid	µg/l	0.01	NONE	-	-	-	-	-

Environmental Forensics

Fluoranthene (low level)	µg/l	0.002	NONE	0.020	0.060	0.020	0.050	0.020
Benzo(b)fluoranthene (low level)	µg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Benzo(k)fluoranthene (low level)	µg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Benzo(a)pyrene (low level)	µg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Indeno(1,2,3-cd)pyrene (low level)	µg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Benzo(ghi)perylene (low level)	µg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Naphthalene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Acenaphthylene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Acenaphthene (low level)	µg/l	0.002	NONE	0.020	0.060	0.030	0.020	0.020
Fluorene (low level)	µg/l	0.002	NONE	0.020	0.040	0.030	0.020	0.030
Phenanthrene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Antracene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Pyrene (low level)	µg/l	0.002	NONE	0.20	0.070	0.020	0.050	0.030
Benzo(a)anthracene (low level)	µg/l	0.002	NONE	< 0.0020	0.040	< 0.0020	< 0.0020	< 0.0020
Chrysene (low level)	µg/l	0.002	NONE	< 0.0020	0.020	< 0.0020	< 0.0020	< 0.0020
Di-bezno(a,h)anthracene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020

Acid Herbicides

2,4,5-T	µg/l	0.02	NONE	-	-	-	-	-
2,4,5-TP	µg/l	0.02	NONE	-	-	-	-	-
2,4-D	µg/l	0.02	NONE	-	-	-	-	-
2,4-DB	µg/l	0.02	NONE	-	-	-	-	-
Dicamba	µg/l	0.02	NONE	-	-	-	-	-
Dichlorprop	µg/l	0.02	NONE	-	-	-	-	-
Dinoseb	µg/l	0.02	NONE	-	-	-	-	-
MCPA	µg/l	0.02	NONE	-	-	-	-	-
MCPB	µg/l	0.02	NONE	-	-	-	-	-
MCPP (Mecoprop)	µg/l	0.02	NONE	-	-	-	-	-
Picloram	µg/l	0.02	NONE	-	-	-	-	-
Bentazone	µg/l	0.02	NONE	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1935622	1935623
Sample Reference				HP109 B	HP110 B
Sample Number				None Supplied	None Supplied
Depth (m)				0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	7.8	8.1
Sulphate as SO ₄	mg/l	0.1	ISO 17025	1.4	1.1
Ammoniacal Nitrogen as N	µg/l	15	NONE	43	45
Alkalinity as CaCO ₃	mg/l	3	ISO 17025	< 3.0	4.8

Phenols by GC-MS

Phenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05

Total Phenols

Total Phenols (GC-MS)	µg/l	0.5	NONE	< 0.5	< 0.5
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0
Barium (dissolved)	µg/l	0.05	ISO 17025	32	22
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	< 10	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.9	0.9
Copper (dissolved)	µg/l	0.7	ISO 17025	4.7	7.5
Lead (dissolved)	µg/l	1	ISO 17025	19	7.9
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	3.3	2.8
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7
Zinc (dissolved)	µg/l	0.4	ISO 17025	11	9.6

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1935622	1935623
Sample Reference				HP109 B	HP110 B
Sample Number				None Supplied	None Supplied
Depth (m)				0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status		

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C16	µg/l	10	NONE	-	-
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C16	µg/l	10	NONE	-	-
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C10 - C16	µg/l	10	NONE	-	-
TPH-CWG - Aromatic >C10 - C35	µg/l	10	NONE	-	-
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1935622	1935623
Sample Reference				HP109 B	HP110 B
Sample Number				None Supplied	None Supplied
Depth (m)				0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status		

VOCs

Chloromethane	µg/l	1	NONE	< 1.0	< 1.0
Chloroethane	µg/l	1	NONE	< 1.0	< 1.0
Bromomethane	µg/l	1	NONE	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0
1,1-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	NONE	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	NONE	< 1.0	< 1.0
1,1-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0
Trichloromethane	µg/l	1	NONE	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0
1,2-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	NONE	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	NONE	< 1.0	< 1.0
1,2-dichloropropane	µg/l	1	NONE	< 1.0	< 1.0
Trichloroethene	µg/l	1	NONE	< 1.0	< 1.0
Dibromomethane	µg/l	1	NONE	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	NONE	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	NONE	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	NONE	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	NONE	< 1.0	< 1.0
Chlorobenzene	µg/l	1	NONE	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
Styrene	µg/l	1	NONE	< 1.0	< 1.0
Tri bromomethane	µg/l	1	NONE	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	NONE	< 1.0	< 1.0
Bromobenzene	µg/l	1	NONE	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	NONE	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0
ter-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0
1,3-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0
P-Isopropyltoluene	µg/l	1	NONE	< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0
Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	NONE	< 1.0	< 1.0



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1935622	1935623
Sample Reference				HP109 B	HP110 B
Sample Number				None Supplied	None Supplied
Depth (m)				0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status		
1,2,4-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.1	NONE	< 0.1	< 0.1
1,2,3-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1935622	1935623
Sample Reference				HP109 B	HP110 B
Sample Number				None Supplied	None Supplied
Depth (m)				0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status		

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	NONE	0.50	0.06
Acenaphthene	µg/l	0.01	NONE	0.30	0.06
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05
Fluorene	µg/l	0.01	NONE	0.10	0.03
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	NONE	0.10	0.06
Pyrene	µg/l	0.01	NONE	0.10	0.06
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	NONE	0.10	0.10
Chrysene	µg/l	0.01	NONE	0.07	0.05
Benzo(b)fluoranthene	µg/l	0.01	NONE	0.10	0.07
Benzo(k)fluoranthene	µg/l	0.01	NONE	0.06	0.04
Benzo(a)pyrene	µg/l	0.01	NONE	0.09	0.07



Analytical Report Number: 21-86295
Project / Site name: Castlefield Viaduct NT

Your Order No: PC2387 103 100

Lab Sample Number				1935622	1935623
Sample Reference				HP109 B	HP110 B
Sample Number				None Supplied	None Supplied
Depth (m)				0.00-0.15	0.00-0.10
Date Sampled				08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status		
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	0.04	0.04
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	0.08	0.05

Phenyl Urea Pesticides

Benazolin	µg/l	0.01	NONE	-	-
Bromoxynil	µg/l	0.01	NONE	-	-
Clopyralid	µg/l	0.01	NONE	-	-

Environmental Forensics

Fluoranthene (low level)	µg/l	0.002	NONE	0.10	0.060
Benzo(b)fluoranthene (low level)	µg/l	0.002	NONE	0.10	0.070
Benzo(k)fluoranthene (low level)	µg/l	0.002	NONE	0.060	0.040
Benzo(a)pyrene (low level)	µg/l	0.002	NONE	0.090	0.070
Indeno(1,2,3-cd)pyrene (low level)	µg/l	0.002	NONE	0.040	0.040
Benzo(ghi)perylene (low level)	µg/l	0.002	NONE	0.080	0.050
Naphthalene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020
Acenaphthylene (low level)	µg/l	0.002	NONE	0.050	0.060
Acenaphthene (low level)	µg/l	0.002	NONE	0.30	0.060
Fluorene (low level)	µg/l	0.002	NONE	0.10	0.030
Phenanthrene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020
Anthracene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020
Pyrene (low level)	µg/l	0.002	NONE	0.10	0.060
Benzo(a)anthracene (low level)	µg/l	0.002	NONE	0.10	0.10
Chrysene (low level)	µg/l	0.002	NONE	0.070	0.050
Di-benzo(a,h)anthracene (low level)	µg/l	0.002	NONE	< 0.0020	< 0.0020

Acid Herbicides

2,4,5-T	µg/l	0.02	NONE	-	-
2,4,5-TP	µg/l	0.02	NONE	-	-
2,4-D	µg/l	0.02	NONE	-	-
2,4-DB	µg/l	0.02	NONE	-	-
Dicamba	µg/l	0.02	NONE	-	-
Dichlorprop	µg/l	0.02	NONE	-	-
Dinoseb	µg/l	0.02	NONE	-	-
MCPA	µg/l	0.02	NONE	-	-
MCPB	µg/l	0.02	NONE	-	-
MCPB (Mecoprop)	µg/l	0.02	NONE	-	-
Picloram	µg/l	0.02	NONE	-	-
Bentazone	µg/l	0.02	NONE	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-86295
 Project / Site name: Castlefield Viaduct NT
 Your Order No: PC2387 103 100

Lab Sample Number				1934542	1934543	1934544	1934545	1934546
Sample Reference				PS101	PS102	PS103	PS104	PS105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter	Units	Limit of detection	Accreditation Status					

Heavy Metals / Metalloids

Cadmium (aqua regia extractable in "other")	mg/kg	0.2	NONE	6.6	4.1	< 0.2	4.5	10
Chromium (aqua regia extractable in "other")	mg/kg	1	NONE	190	130	120	290	310
Lead (aqua regia extractable in "other")	mg/kg	1	NONE	62000	55000	57000	57000	61000
Nickel (aqua regia extractable in "other")	mg/kg	1	NONE	30	22	13	25	15
Zinc (aqua regia extractable in "other")	mg/kg	1	NONE	4800	5400	1200	5800	4600

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-86295
 Project / Site name: Castlefield Viaduct NT
 Your Order No: PC2387 103 100

Lab Sample Number				1934547	1934548	1934549	1934550	1934551
Sample Reference				PS106	PS107	PS108	PS109	PS110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter	Units	Limit of detection	Accreditation Status					

Heavy Metals / Metalloids

Cadmium (aqua regia extractable in "other")	mg/kg	0.2	NONE	2.1	3.0	2.6	5.7	3.0
Chromium (aqua regia extractable in "other")	mg/kg	1	NONE	110	220	200	250	240
Lead (aqua regia extractable in "other")	mg/kg	1	NONE	59000	61000	62000	58000	66000
Nickel (aqua regia extractable in "other")	mg/kg	1	NONE	12	18	22	15	20
Zinc (aqua regia extractable in "other")	mg/kg	1	NONE	1200	2200	2400	6500	1500

U/S = Unsuitable Sample I/S = Insufficient Sample

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Project / Site name: Castlefield Viaduct NT

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1934531	HP101	None Supplied	0.00-0.25	Brown loam with gravel and vegetation.
1934532	HP102	None Supplied	0.00-0.30	Brown loam with gravel and vegetation.
1934533	HP103	None Supplied	0.00-0.15	Brown loam with gravel and vegetation.
1934534	HP104	None Supplied	0.00-0.30	Brown loam with gravel and vegetation.
1934535	HP105	None Supplied	0.00-0.20	Brown loam with gravel and vegetation.
1934536	HP106	None Supplied	0.00-0.30	Brown loam with gravel and vegetation.
1934537	HP107	None Supplied	0.00-0.30	Brown loam with gravel and vegetation.
1934538	HP108	None Supplied	0.00-0.30	Brown loam with gravel and vegetation.
1934539	HP109	None Supplied	0.00-0.15	Brown clay and loam with gravel and vegetation.
1934540	HP110	None Supplied	0.00-0.10	Brown clay and loam with gravel and vegetation.
1934541	HP Dup 1	None Supplied	None Supplied	Brown clay and loam with gravel and vegetation.

Analytical Report Number : 21-86295

Project / Site name: Castlefield Viaduct NT

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices: SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 *for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
Phenols, speciated, in leachate, by GCMS	Determination of speciated phenols in leachate by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-PL	W	NONE
Phenols, speciated, in water, by GCMS	Determination of speciated phenols in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-PL	W	NONE
Alkalinity in Leachate	Determination of Alkalinity by discreet analyser (colorimetry).	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE

Analytical Report Number : 21-86295

Project / Site name: Castlefield Viaduct NT

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In house method.	L005-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in leachate	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L070-PL	W	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Volatile organic compounds in leachate	Determination of volatile organic compounds in leachate by headspace GC-MS	In-house method based on USEPA8260	L073B-PL	W	NONE
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025

Analytical Report Number : 21-86295

Project / Site name: Castlefield Viaduct NT

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Ammoniacal Nitrogen as N in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Ammoniacal Nitrogen as N in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method,10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Metals in "other" type samples by ICP-OES	Determination of metals in "other" type sample by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil"	L038-PL	D	NONE
Cr (III) in water	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Cr (III) in leachate	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TO - Acid herbs in leachate by LC-MS/MS	Determination of Acid herbicides in leachates by LC-MS/MS	In-house method		W	NONE
Phenyl Urea Pesticides in leachates	Not to be used until confirmed with TP/CS	Subcontracted analysis		W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
low level PAHs in water	Determination of low level PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use os surrogate and internal standards.	In-house method	L102B-PL	W	NONE
low level PAHs in leachate	Determination of low level PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method	L102B-PL	W	NONE
Acid Herbicides by LC-MS	Determination of Acid Herbicides by LC MS	In-house method	L057B-PL	W	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

Analytical Report Number : 21-86295

Project / Site name: Castlefield Viaduct NT

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Alkalinity in Water (by discrete analyser)	Determination of Alkalinity by discrete analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report



Analytical Report Number : 21-86295
Project / Site name: Castlefield Viaduct NT

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
HP Dup 1	None Supplied	L	1934562	b	low level PAHs in leachate	L102B-PL	b
HP Dup Ballast	None Supplied	L	1934563	b	low level PAHs in leachate	L102B-PL	b
HP101	None Supplied	L	1934552	b	low level PAHs in leachate	L102B-PL	b
HP101 B	None Supplied	L	1935614	b	low level PAHs in leachate	L102B-PL	b
HP102	None Supplied	L	1934553	b	low level PAHs in leachate	L102B-PL	b
HP102 B	None Supplied	L	1935615	b	low level PAHs in leachate	L102B-PL	b
HP103	None Supplied	L	1934554	b	low level PAHs in leachate	L102B-PL	b
HP103 B	None Supplied	L	1935616	b	low level PAHs in leachate	L102B-PL	b
HP104	None Supplied	L	1934555	b	low level PAHs in leachate	L102B-PL	b
HP104 B	None Supplied	L	1935617	b	low level PAHs in leachate	L102B-PL	b
HP105	None Supplied	L	1934556	b	low level PAHs in leachate	L102B-PL	b
HP105 B	None Supplied	L	1935618	b	low level PAHs in leachate	L102B-PL	b
HP106	None Supplied	L	1934557	b	low level PAHs in leachate	L102B-PL	b
HP106 B	None Supplied	L	1935619	b	low level PAHs in leachate	L102B-PL	b
HP107	None Supplied	L	1934558	b	low level PAHs in leachate	L102B-PL	b
HP107 B	None Supplied	L	1935620	b	low level PAHs in leachate	L102B-PL	b
HP108	None Supplied	L	1934559	b	low level PAHs in leachate	L102B-PL	b
HP108 B	None Supplied	L	1935621	b	low level PAHs in leachate	L102B-PL	b
HP109	None Supplied	L	1934560	b	low level PAHs in leachate	L102B-PL	b
HP109 B	None Supplied	L	1935622	b	low level PAHs in leachate	L102B-PL	b
HP110	None Supplied	L	1934561	b	low level PAHs in leachate	L102B-PL	b
HP110 B	None Supplied	L	1935623	b	low level PAHs in leachate	L102B-PL	b
SW101	None Supplied	W	1934564	c	Ammoniacal Nitrogen as N in water	L082-PL	c
SW101	None Supplied	W	1934564	c	pH at 20oC in water (automated)	L099-PL	c

Appendix

Appendix D – Screened Chemical Data

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Ballast leachate		
Land Use:	EQS	Completed By:	PP
Receptor:	Controlled waters	Checked By:	CM

Assessment Criteria Key

- a) WFD inland surface waters 2015
b) EQS Freshwater (older EQS values)
c) M-BAT Tool

Contaminant	Units	Method Detection Limit	Assessment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data										
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	HP Dup Ballast	HP101 B	HP102 B	HP103 B	HP104 B	HP105 B	HP106 B	HP107 B	HP108 B	HP109 B	HP110 B
												None Supplied	0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
												08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	
pH	pH Units	N/A	6 to 9	a	11	11	7.2	8.1	7.6	0.26832816	0	7.5	7.3	7.7	7.4	7.4	7.2	7.6	7.8	7.8	7.8	8.1
Sulphate as SO4	mg/l	0.1	-		11	11	0.8	1.8	1.17272727	0.31013194	-	0.9	1.1	1.1	1.6	0.9	1.8	0.8	1	1.2	1.4	1.1
Ammoniacal Nitrogen as N	µg/l	15	200	a	11	11	19	50	37.0909091	9.72064345	0	26	35	33	42	29	48	19	38	50	43	45
Alkalinity as CaCO3	mg/l	3	-		11	7	3	8	5.05454545	1.96792461	-	6.5	< 3.0	6.5	< 3.0	8	7.4	3.9	6.5	< 3.0	< 3.0	4.8
			-																			
Phenol	µg/l	0.05	7.7	a	11	0	0.05	0.05	-	-	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	µg/l	0.05	0.3	a	11	0	0.05	0.05	-	-	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	50	a	11	0	0.05	0.05	-	-	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	40	a	11	0	0.05	0.05	-	-	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
			-																			
Total Phenols (GC-MS)	µg/l	0.5	-		11	0	0.5	0.5	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
			-																			
Arsenic (dissolved)	µg/l	1	50	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Barium (dissolved)	µg/l	0.05	-		11	11	8.8	32	17.3272727	8.21524083	-	11	16	11	32	9.8	17	8.8	17	14	32	22
Beryllium (dissolved)	µg/l	0.2	-		11	6	0.2	0.5	0.3	0.12649111	-	0.5	0.4	0.4	0.5	0.3	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	2000	a	11	0	10	10	-	-	0	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cadmium (dissolved)	µg/l	0.08	0.08	a	11	0	0.08	0.08	-	-	0	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	3.4	a	11	0	5	5	-	-	11	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	4.7	a	11	1	1	1.1	1.00909091	-	0	< 1.0	< 1.0	< 1.0	1.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (dissolved)	µg/l	0.4	-		11	10	0.4	1.1	0.68181818	0.26006992	-	0.4	0.5	0.6	1.1	0.4	0.9	< 0.4	0.5	0.9	0.9	0.9
Copper (dissolved)	µg/l	0.7	17.1	c	11	11	1.6	7.5	4.33636364	1.85702597	0	1.6	7.2	3.7	5.9	3.2	4.2	2.6	3.2	3.9	4.7	7.5
Lead (dissolved)	µg/l	1	4.99	c	11	11	1.4	30	11.7090909	9.33589359	7	4.7	9.8	1.4	23	3.1	30	1.9	13	15	19	7.9
Mercury (dissolved)	µg/l	0.5	0.07	b	11	0	0.5	0.5	-	-	11	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	9.58	c	11	11	1.8	3.5	2.68181818	0.51926522	0	2.4	3.5	2.5	3.4	2.5	2.4	2.4	1.8	2.5	3.3	2.8
Selenium (dissolved)	µg/l	4	-		11	0	4	4	-	-	-	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	20	a	11	0	1.7	1.7	-	-	0	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7
Zinc (dissolved)	µg/l	0.4	24.66	c	11	11	4.5	14	9.84545455	3.2212928	0	5.7	13	4.5	13	7.2	7.3	12	11	14	11	9.6
			-																			
Benzene	µg/l	1	10	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	74	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	20	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	30	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	30	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	-		11	0	10	10	-	-	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Ballast leachate		
Land Use:	EQS	Completed By:	PP
Receptor:	Controlled waters	Checked By:	CM

Assessment Criteria Key

- a) WFD inland surface waters 2015
- b) EQS Freshwater (older EQS values)
- c) M-BAT Tool

[illegible]

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Ballast leachate		
Land Use:	EQS	Completed By:	PP
Receptor:	Controlled waters	Checked By:	CM

Assessment Criteria Key

- a) WFD inland surface waters 2015
b) EQS Freshwater (older EQS values)
c) M-BAT Tool

Contaminant	Units	Method Detection Limit	Assess- ment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data										
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	HP Dup Ballast	HP101 B	HP102 B	HP103 B	HP104 B	HP105 B	HP106 B	HP107 B	HP108 B	HP109 B	HP110 B
												None Supplied	0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10
												08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
2-Chloronaphthalene	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	800	a	11	0	0.05	0.05	-	-	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	-		11	2	0.01	0.5	0.05909091	0.14700031	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.5	0.06
Acenaphthene	µg/l	0.01	-		11	11	0.02	0.3	0.06090909	0.08104993	-	0.04	0.04	0.02	0.06	0.02	0.06	0.03	0.02	0.02	0.3	0.06
2,4-Dinitrotoluene	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	200	a	11	0	0.05	0.05	-	-	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	-		11	11	0.02	0.1	0.03454545	0.02252272	-	0.03	0.03	0.02	0.03	0.02	0.04	0.03	0.02	0.03	0.1	0.03
Azobenzene	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.02	0.05	a	11	0	0.02	0.02	-	-	0	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	µg/l	0.01	-		11	0	0.01	0.01	-	-	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	0.1	a	11	0	0.01	0.01	-	-	0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	0.0063	a	11	11	0.01	0.1	0.04181818	0.02713602	11	0.02	0.04	0.01	0.06	0.02	0.06	0.02	0.05	0.02	0.1	0.06
Pyrene	µg/l	0.01	-		11	11	0.02	0.1	0.04545455	0.02696799	-	0.02	0.04	0.02	0.07	0.02	0.07	0.02	0.05	0.03	0.1	0.06
Butyl benzyl phthalate	µg/l	0.05	7.5	a	11	0	0.05	0.05	-	-	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	-		11	4	0.01	0.1	0.03181818	0.03572623	-	< 0.01	< 0.01	< 0.01	0.04	< 0.01	0.04	< 0.01	< 0.01	< 0.01	0.1	0.1
Chrysene	µg/l	0.01	-		11	4	0.01	0.07	0.02090909	0.020226	-	< 0.01	< 0.01	< 0.01	0.02	< 0.01	0.02	< 0.01	< 0.01	< 0.01	0.07	0.05
Benzo(b)fluoranthene	µg/l	0.01	-		11	2	0.01	0.1	0.02363636	0.03107176	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.1	0.07
Benzo(k)fluoranthene	µg/l	0.01	-		11	2	0.01	0.06	0.01727273	0.01678744	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.06	0.04
Benzo(a)pyrene	µg/l	0.01	0.00017	a	11	2	0.01	0.09	0.02272727	0.02866737	11	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.09	0.07
Indeno(1,2,3-cd)pyrene	µg/l	0.01	-		11	2	0.01	0.04	0.01545455	0.0121356	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04	0.04
Dibenz(a,h)anthracene	µg/l	0.01	-		11	0	0.01	0.01	-	-	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	-		11	2	0.01	0.08	0.02	0.0232379	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.08	0.05
			-																			
Fluoranthene (low level)	µg/l	0.002	0.0063	a	11	11	0.01	0.1	0.04181818	0.02713602	11	0.02	0.04	0.01	0.06	0.02	0.06	0.02	0.05	0.02	0.1	0.06
Benzo(b)fluoranthene (low level)	µg/l	0.002	-		11	2	0.002	0.1	0.01709091	0.03423873	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.1	0.07
Benzo(k)fluoranthene (low level)	µg/l	0.002	-		11	2	0.002	0.06	0.01072727	0.01992532	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.06	0.04
Benzo(a)pyrene (low level)	µg/l	0.002	0.00017	a	11	2	0.002	0.09	0.01618182	0.03186791	11	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.09	0.07
Indeno(1,2,3-cd)pyrene (low level)	µg/l	0.002	-		11	2	0.002	0.04	0.00890909	0.01537176	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.04	0.04
Benzo(ghi)perylene (low level)	µg/l	0.002	-		11	2	0.002	0.08	0.01345455	0.02635285	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.08	0.05
Naphthalene (low level)	µg/l	0.002	2	a	11	0	0.002	0.002	-	-	0	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Acenaphthylene (low level)	µg/l	0.002	-		11	2	0.002	0.06	0.01163636	0.02155585	-	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	0.05	0.06
Acenaphthene (low level)	µg/l	0.002	-		11	11	0.02	0.3	0.06090909	0.08104993	-	0.04	0.04	0.02	0.06	0.02	0.06	0.03	0.02	0.02	0.3	0.06
Fluorene (low level)	µg/l	0.002	-		11	11	0.02	0.1	0.03454545	0.02252272	-	0.03	0.03	0.02	0.03	0.02	0.04	0.03	0.02	0.03	0.1	0.03
Phenanthrene (low level)	µg/l	0.002	-		11	0	0.002	0.002	-	-	-	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Antracene (low level)	µg/l	0.002	0.1	a	11	0	0.002	0.002	-	-	0	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Pyrene (low level)	µg/l	0.002	-		11	11	0.02	0.2	0.06181818	0.05250108	-	0.02	0.04	0.02	0.07	0.2	0.07	0.02	0.05	0.03	0.1	0.06
Benzo(a)anthracene (low level)	µg/l	0.002	-		11	4	0.002	0.1	0.02672727	0.03920482	-	< 0.0020	< 0.0020	< 0.0020	0.04	< 0.0020	0.04	< 0.0020	< 0.0020	< 0.0020	0.1	0.1
Chrysene (low level)	µg/l	0.002	-		11	4	0.002	0.07	0.01581818	0.02340008	-	< 0.0020	< 0.0020	< 0.0020	0.02	< 0.0020	0.02	< 0.0020	< 0.0020	< 0.0020	0.07	0.05
Di-bezno(a,h)anthracene (low level)	µg/l	0.002	-		11	0	0.002	0.002	-	-	-	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
			-																			
Sum of benzo(b)fluoranthene, benzo(k)fluoranthene, bezon(g,h,i)perylene and indeno(1,2,3-cd)pyrene	ug/l		-		2	2	0.2	0.28	0.24	0.05656854	-	-	-	-	-	-	-	-	-	-	0.28	0.2

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Soil Data		
Land Use:	Drinking water pipe assessment	Completed By:	KD
Receptor:	Human health	Checked By:	PP

Assessment Criteria Key

- a) UK WIR PVC Pipe Material
b) UK WIR PE Pipe Material

Contaminant	Units	Method Detection Limit	Assessment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data										
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	HP101	HP102	HP103	HP104	HP105	HP106	HP107	HP108	HP109	HP110	HP Dup 1
												0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10	one Sample
												08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Asbestos in Soil	Type	N/A	-		0	0	#VALUE!	#VALUE!	-	-	-	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
pH - Automated	pH Units	N/A	-		11	11	7.7	8	7.86363636	0.11200649	-	7.7	8	7.8	8	7.9	7.9	7.8	7.7	8	7.8	7.9
Ammoniacal Nitrogen as N	mg/kg	0.5	-		11	4	0.5	2.3	0.81818182	0.57239529	-	< 0.5	< 0.5	0.8	< 0.5	1	2.3	< 0.5	< 0.5	1.4	< 0.5	< 0.5
Total Organic Carbon (TOC)	%	0.1	-		11	11	4.8	8.1	6.46363636	1.13514116	-	6.3	6	8.1	4.8	4.8	6.3	5.8	8.1	6.4	7.4	7.1
Total Phenols (monohydric)	mg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
			-																			
Naphthalene	mg/kg	0.05	-		11	11	0.58	18	4.22636364	5.55266472	-	2.7	1.8	2.4	2.3	1.4	1.1	3.3	0.91	0.58	18	12
Acenaphthylene	mg/kg	0.05	1.4	a	11	9	0.05	28	5.07818182	10.1652445	2	0.61	< 0.05	1.3	0.27	0.59	0.69	0.95	0.35	< 0.05	28	23
Acenaphthene	mg/kg	0.05	1.4	a	11	11	1.4	85	17.9272727	30.4506844	10	7.4	1.6	6.2	3.6	2.9	3.1	11	1.4	2	85	73
Fluorene	mg/kg	0.05	1.4	a	11	11	0.97	50	10.7245455	18.0696604	8	5.2	1	3.7	2	1.7	1.9	6.3	0.97	1.2	50	44
Phenanthrene	mg/kg	0.05	1.4	a	11	11	11	540	114.818182	189.97885	11	49	13	54	20	24	22	68	12	11	540	450
Anthracene	mg/kg	0.05	1.4	a	11	11	2.4	130	27.3454545	44.1609865	11	13	3.3	16	4.2	6.5	5.1	17	3.3	2.4	130	100
Fluoranthene	mg/kg	0.05	1.4	a	11	11	17	760	183.363636	265.891058	11	81	24	170	29	65	43	140	28	17	760	660
Pyrene	mg/kg	0.05	1.4	a	11	11	16	710	171.909091	244.8385	11	78	23	170	26	67	42	130	29	16	710	600
Benzo(a)anthracene	mg/kg	0.05	1.4	a	11	11	6.7	320	87.4272727	116.218364	11	41	14	97	14	39	22	83	15	6.7	320	310
Chrysene	mg/kg	0.05	1.4	a	11	11	6.3	270	71.6636364	90.2270721	11	39	12	94	14	33	22	64	14	6.3	270	220
Benzo(b)fluoranthene	mg/kg	0.05	1.4	a	11	11	7.3	310	92.2090909	113.974826	11	44	14	130	16	46	24	94	19	7.3	310	310
Benzo(k)fluoranthene	mg/kg	0.05	1.4	a	11	11	2.9	150	39.1545455	50.5491912	11	16	5.3	97	5.9	16	11	23	7.6	2.9	150	96
Benzo(a)pyrene	mg/kg	0.05	1.4	a	11	11	6.4	320	79.9454545	111.13412	11	37	12	62	13	39	22	72	16	6.4	320	280
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	1.4	a	11	11	2.8	150	37.8636364	52.0378376	11	14	5.8	42	5.9	17	9.8	31	8.2	2.8	150	130
Dibenz(a,h)anthracene	mg/kg	0.05	1.4	a	11	11	0.74	32	9.00363636	10.9829753	9	4.4	1.4	12	1.8	4.3	2.7	9.5	2.2	0.74	32	28
Benzo(ghi)perylene	mg/kg	0.05	1.4	a	11	11	3.3	180	44.8636364	63.36591	11	17	6.5	46	6.4	19	11	35	9.3	3.3	180	160
			-																			
Speciated Total EPA-16 PAHs	mg/kg	0.8	-		11	11	86.1	4040	994.190909	1404.21679	-	448	140	996	164	382	243	781	166	86.1	4040	3490
			-																			
Arsenic (aqua regia extractable)	mg/kg	1	-		11	11	16	83	59.5454545	17.935237	-	62	69	51	66	44	76	66	83	16	60	62
Barium (aqua regia extractable)	mg/kg	1	-		11	11	56	610	313.272727	135.313777	-	310	230	610	220	330	330	410	310	56	360	280
Beryllium (aqua regia extractable)	mg/kg	0.06	-		11	11	1.2	1.9	1.55454545	0.26215887	-	1.7	1.9	1.5	1.3	1.2	1.8	1.9	1.4	1.2	1.7	1.5
Boron (water soluble)	mg/kg	0.2	-		11	11	0.3	1.3	0.79090909	0.28090762	-	1.1	0.7	0.7	0.5	0.6	1	0.3	0.9	1.3	0.8	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	-		11	7	0.2	3.4	1.76363636	1.31626192	-	2.4	3.1	2.6	2.7	1.6	3.4	2.8	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	-		11	0	1.2	1.2	-	-	-	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	-		11	11	44	81	60.5454545	9.5850262	-	58	69	63	60	57	63	64	81	44	56	51
Chromium (aqua regia extractable)	mg/kg	1	-		11	11	45	82	60.9090909	9.65872192	-	58	69	63	61	57	64	64	82	45	56	51
Copper (aqua regia extractable)	mg/kg	1	-		11	11	38	340	268.909091	88.0970539	-	330	310	230	250	210	320	290	340	38	330	310
Lead (aqua regia extractable)	mg/kg	1	-		11	11	59	4400	1357.18182	1144.33446	-	1200	550	4400	520	1400	1100	2100	1200	59	1400	1000
Mercury (aqua regia extractable)	mg/kg	0.3	-		11	0	0.3	0.3	-	-	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	-		11	11	39	150	71.4545455	28.1828446	-	67	80	150	61	55	70	70	73	39	60	61
Selenium (aqua regia extractable)	mg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	-		11	11	65	85	71.8181818	6.46247912	-	67	70	65	68	67	85	82	76	69	71	70
Zinc (aqua regia extractable)	mg/kg	1	-		11	11	110	990	484.545455	250.813223	-	680	290	500	320	320	390	480	460	110	990	790
			-																			
Benzene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	&				

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Soil Data		
Land Use:	Drinking water pipe assessment	Completed By:	KD
Receptor:	Human health	Checked By:	PP

Assessment Criteria Key

- a) UK WIR PVC Pipe Material
b) UK WIR PE Pipe Material

Contaminant	Units	Method Detection Limit	Assess- ment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data										
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	HP101	HP102	HP103	HP104	HP105	HP106	HP107	HP108	HP109	HP110	HP Dup 1
												0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10	one Sample
												08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	
Vinyl Chloride	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	30	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	125	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1																				

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Soil Data		
Land Use:	Drinking water pipe assessment	Completed By:	KD
Receptor:	Human health	Checked By:	PP

Assessment Criteria Key
a) UK WIR PVC Pipe Material
b) UK WIR PE Pipe Material

Contaminant	Units	Method Detection Limit	Assess-ment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data										
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	HP101	HP102	HP103	HP104	HP105	HP106	HP107	HP108	HP109	HP110	HP Dup 1
												0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10	one Supplie
												08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Naphthalene	mg/kg	0.05	-		11	11	0.58	18	4.22636364	5.55266472	-	2.7	1.8	2.4	2.3	1.4	1.1	3.3	0.91	0.58	18	12
2,4-Dichlorophenol	mg/kg	0.3	1.4	a	11	0	0.3	0.3	-	-	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	1.4	a	11	0	0.1	0.1	-	-	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	1.4	a	11	0	0.1	0.1	-	-	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	1.4	a	11	0	0.1	0.1	-	-	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	1.4	a	11	0	0.1	0.1	-	-	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	1.4	a	11	0	0.2	0.2	-	-	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	1.4	a	11	2	0.1	29	4.9	10.7376906	2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	29	24
2-Chloronaphthalene	mg/kg	0.1	1.4	a	11	0	0.1	0.1	-	-	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	1.4	a	11	0	0.1	0.1	-	-	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	1.4	a	11	0	0.1	0.1	-	-	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	1.4	a	11	8	0.05	23	2.53727273	6.79835582	1	0.61	< 0.05	1.3	0.27	0.59	0.69	0.95	0.35	< 0.05	< 0.05	23
Acenaphthene	mg/kg	0.05	-		11	11	1.4	85	17.9272727	30.4506844	-	7.4	1.6	6.2	3.6	2.9	3.1	11	1.4	2	85	73
2,4-Dinitrotoluene	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	1.4	a	11	2	0.2	25	4.43636364	9.44915581	2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	25	22
4-Chlorophenyl phenyl ether	mg/kg	0.3	1.4	a	11	0	0.3	0.3	-	-	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	1.4	a	11	0	0.2	0.2	-	-	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	1.4	a	11	0	0.2	0.2	-	-	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	-		11	11	0.97	50	10.7245455	18.0696604	-	5.2	1	3.7	2	1.7	1.9	6.3	0.97	1.2	50	44
Azobenzene	mg/kg	0.3	1.4	a	11	0	0.3	0.3	-	-	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	1.4	a	11	0	0.3	0.3	-	-	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	1.4	a	11	11	11	540	114.818182	189.97885	11	49	13	54	20	24	22	68	12	11	540	450
Anthracene	mg/kg	0.05	1.4	a	11	11	2.4	130	27.3454545	44.1609865	11	13	3.3	16	4.2	6.5	5.1	17	3.3	2.4	130	100
Carbazole	mg/kg	0.3	1.4	a	11	0	0.3	0.3	-	-	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	1.4	a	11	0	0.2	0.2	-	-	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	-		11	0	0.3	0.3	-	-	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	1.4	a	11	11	17	760	183.363636	265.891058	11	81	24	170	29	65	43	140	28	17	760	660
Pyrene	mg/kg	0.05	1.4	a	11	11	16	710	171.909091	244.8385	11	78	23	170	26	67	42	130	29	16	710	600
Butyl benzyl phthalate	mg/kg	0.3	1.4	a	11	0	0.3	0.3	-	-	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	1.4	a	11	11	6.7	320	87.4272727	116.218364	11	41	14	97	14	39	22	83	15	6.7	320	310
Chrysene	mg/kg	0.05	1.4	a	11	11	6.3	270	71.6636364	90.2270721	11	39	12	94	14	33	22	64	14	6.3	270	220
Benzo(b)fluoranthene	mg/kg	0.05	1.4	a	11	11	7.3	310	92.2090909	113.974826	11	44	14	130	16	46	24	94	19	7.3	310	310
Benzo(k)fluoranthene	mg/kg	0.05	1.4	a	11	11	2.9	150	39.1545455	50.5491912	11	16	5.3	97	5.9	16	11	23	7.6	2.9	150	96
Benzo(a)pyrene	mg/kg	0.05	1.4	a	11	11	6.4	320	79.9454545	111.13412	11	37	12	62	13	39	22	72	16	6.4	320	280
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	1.4	a	11	11	2.8	150	37.8636364	52.0378376	11	14	5.8	42	5.9	17	9.8	31	8.2	2.8	150	130
Dibenz(a,h)anthracene	mg/kg	0.05	1.4	a	11	11	0.74	32	9.00363636	10.9829753	9	4.4	1.4	12	1.8	4.3	2.7	9.5	2.2	0.74	32	28
Benzo(ghi)perylene	mg/kg	0.05	1.4	a	11	11	3.3	180	44.8636364	63.36591	11	17	6.5	46	6.4	19	11	35	9.3	3.3	180	160
			-																			

Data Summary Statistics

Site:	Castlefield Viaduct NT	Project No:	PC2387
Data Description:	Paint	SOM (%):	
Land Use:		Completed By:	KD
Receptor:	Human Health	Checked By:	PP

Assessment Criteria Key
a) SoBRA aGAC

Contaminant	Units	Method Detection Limit	Assess- ment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data									
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	PS101	PS102	PS103	PS104	PS105	PS106	PS107	PS108	PS109	PS110
												08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Cadmium (aqua regia extractable in "other")	mg/kg	0.2	12000	a	10	9	0.2	10	4.18	2.74055955	0	6.6	4.1	< 0.2	4.5	10	2.1	3	2.6	5.7	3
Chromium (aqua regia extractable in "other")	mg/kg	1	-		10	10	110	310	206	69.7933458	-	190	130	120	290	310	110	220	200	250	240
Lead (aqua regia extractable in "other")	mg/kg	1	-		10	10	55000	66000	59800	3224.9031	-	62000	55000	57000	57000	61000	59000	61000	62000	58000	66000
Nickel (aqua regia extractable in "other")	mg/kg	1	-		10	10	12	30	19.2	5.71158666	-	30	22	13	25	15	12	18	22	15	20
Zinc (aqua regia extractable in "other")	mg/kg	1	-		10	10	1200	6500	3560	2061.39112	-	4800	5400	1200	5800	4600	1200	2200	2400	6500	1500

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Soil leachate EQS		
Land Use:	EQS	Completed By:	KD
Receptor:	Controlled Waters	Checked By:	PP

Assessment Criteria Key

- a) WFD inland surface waters 2015
- b) EQS Freshwater (older EQS values)
- c) M-BAT Tool

[illegible]

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Soil leachate EQS		
Land Use:	EQS	Completed By:	KD
Receptor:	Controlled Waters	Checked By:	PP

Assessment Criteria Key

- a) WFD inland surface waters 2015
b) EQS Freshwater (older EQS values)
c) M-BAT Tool

Contaminant	Units	Method Detection Limit	Assess- ment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data										
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	HP101	HP102	HP103	HP104	HP105	HP106	HP107	HP108	HP109	HP110	HP Dup 1
												0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10	lone Supplier
												08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	
1,2-dichloroethane	µg/l	1	10	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	10	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	12	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloropropane	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	10	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	74	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	400	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	10	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	20	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	30	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	50	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ter-Butylbenzene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-dichlorobenzene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
P-Isopropyltoluene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	1	20	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	1	20	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Soil leachate EQS		
Land Use:	EQS	Completed By:	KD
Receptor:	Controlled Waters	Checked By:	PP

Assessment Criteria Key

- a) WFD inland surface waters 2015
b) EQS Freshwater (older EQS values)
c) M-BAT Tool

Contaminant	Units	Method Detection Limit	Assess- ment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data										
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	HP101	HP102	HP103	HP104	HP105	HP106	HP107	HP108	HP109	HP110	HP Dup 1
												0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10	one Supplier
												08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	
2,6-Dinitrotoluene	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	-		11	0	0.01	0.02	-	-	-	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	-		11	0	0.03	0.24	-	-	-	0.07	0.07	0.10	0.05	0.12	0.07	0.08	0.05	0.24	0.04	0.03
2,4-Dinitrotoluene	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	200	a	11	0	0.05	0.05	-	-	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	-		11	0	0.02	0.1	-	-	-	0.08	0.07	0.07	0.05	0.06	0.05	0.06	0.05	0.10	0.03	0.02
Azobenzene	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.02	0.05	a	11	0	0.02	0.02	-	-	0	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	µg/l	0.01	-		11	0	0.01	0.46	-	-	-	< 0.01	< 0.01	< 0.01	< 0.01	0.09	< 0.01	< 0.01	< 0.01	0.46	< 0.01	< 0.01
Anthracene	µg/l	0.01	0.1	a	11	0	0.01	0.14	-	-	1	< 0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.01	< 0.01	< 0.01	0.14	< 0.01	< 0.01
Carbazole	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	-		11	0	0.05	0.05	-	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	0.0063	a	11	0	0.03	1.6	-	-	11	0.16	0.08	0.39	0.03	0.14	0.11	0.62	0.08	1.6	0.21	0.06
Pyrene	µg/l	0.01	-		11	0	0.03	1.8	-	-	-	0.16	0.07	0.40	0.03	0.16	0.12	0.72	0.08	1.8	0.20	0.08
Butyl benzyl phthalate	µg/l	0.05	7.5	a	11	0	0.05	0.05	-	-	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	-		11	0	0.01	0.58	-	-	-	0.07	0.04	0.13	< 0.01	0.11	0.05	0.27	< 0.01	0.58	0.09	0.07
Chrysene	µg/l	0.01	-		11	0	0.01	0.6	-	-	-	0.05	0.02	0.12	< 0.01	0.07	0.05	0.30	< 0.01	0.60	0.07	0.07
Benzo(b)fluoranthene	µg/l	0.01	-		11	0	0.01	0.89	-	-	-	0.05	< 0.01	0.12	< 0.01	0.11	0.05	0.34	< 0.01	0.89	0.11	0.09
Benzo(k)fluoranthene	µg/l	0.01	-		11	0	0.01	0.36	-	-	-	0.03	< 0.01	0.05	< 0.01	0.10	0.03	0.18	< 0.01	0.36	0.05	0.07
Benzo(a)pyrene	µg/l	0.01	0.00017	a	11	0	0.01	0.81	-	-	11	0.05	< 0.01	0.10	< 0.01	0.14	0.05	0.32	< 0.01	0.81	0.11	0.09
Indeno(1,2,3-cd)pyrene	µg/l	0.01	-		11	0	0.01	0.42	-	-	-	< 0.01	< 0.01	0.04	< 0.01	0.07	< 0.01	0.14	< 0.01	0.42	0.09	0.05
Dibenz(a,h)anthracene	µg/l	0.01	-		11	0	0.01	0.14	-	-	-	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	0.05	< 0.01	0.14	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	-		11	0	0.01	0.64	-	-	-	< 0.01	< 0.01	0.07	< 0.01	0.10	< 0.01	0.22	< 0.01	0.64	0.13	0.07
			-																			
Fluoranthene (low level)	µg/l	0.002	0.0063	a	11	0	0.03	1.6	-	-	11	0.16	0.080	0.39	0.030	0.14	0.11	0.62	0.080	1.6	0.21	0.060
Benzo(b)fluoranthene (low level)	µg/l	0.002	-		11	0	0.002	0.89	-	-	-	0.050	< 0.002	0.12	< 0.002	0.11	0.050	0.34	< 0.002	0.89	0.11	0.090
Benzo(k)fluoranthene (low level)	µg/l	0.002	-		11	0	0.002	0.36	-	-	-	0.030	< 0.002	0.050	< 0.002	0.10	0.030	0.18	< 0.002	0.36	0.050	0.070
Benzo(a)pyrene (low level)	µg/l	0.002	0.00017	a	11	0	0.002	0.81	-	-	11	0.050	< 0.002	0.10	< 0.002	0.14	0.050	0.32	< 0.002	0.81	0.11	0.090
Indeno(1,2,3-cd)pyrene (low level)	µg/l	0.002	-		11	0	0.002	0.42	-	-	-	< 0.002	< 0.002	0.040	< 0.002	0.070	< 0.002	0.14	< 0.002	0.42	0.090	0.050
Benzo(ghi)perylene (low level)	µg/l	0.002	-		11	0	0.002	0.64	-	-	-	< 0.002	< 0.002	0.070	< 0.002	0.10	< 0.002	0.22	< 0.002	0.64	0.13	0.070
Naphthalene (low level)	µg/l	0.002	2	a	11	0	0.002	0.002	-	-	0	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Acenaphthylene (low level)	µg/l	0.002	-		11	0	0.002	0.02	-	-	-	< 0.0020	< 0.0020	0.020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Acenaphthene (low level)	µg/l	0.002	-		11	0	0.03	0.24	-	-	-	0.070	0.070	0.10	0.050	0.12	0.070	0.080	0.050	0.24	0.040	0.030
Fluorene (low level)	µg/l	0.002	-		11	0	0.02	0.1	-	-	-	0.080	0.070	0.070	0.050	0.060	0.050	0.060	0.050	0.10	0.030	0.020
Phenanthrene (low level)	µg/l	0.002	-		11	0	0.002	0.46	-	-	-	< 0.0020	< 0.0020	< 0.0020	< 0.0020	0.090	< 0.0020	< 0.0020	< 0.0020	0.46	< 0.0020	< 0.0020
Antracene (low level)	µg/l	0.002	0.1	a	11	0	0.002	0.14	-	-	1	< 0.0020	< 0.0020	< 0.0020	< 0.0020	0.060	< 0.0020	< 0.0020	< 0.0020	0.14	< 0.0020	< 0.0020
Pyrene (low level)	µg/l	0.002	-		11	0	0.03	1.8	-	-	-	0.16	0.070	0.40	0.030	0.16	0.12	0.7				

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Soil	SOM (%):	1.0%
Land Use:	Allotment	Completed By:	KD
Receptor:	Human Health	Checked By:	PP

Assessment Criteria Key

- a) LQM/CIEH S4UL

b) RHDHV GAC

c) CL:AIRE / EIC GAC

d) CL:AIRE / EIC & RHDHV GAC
- e) DEFRA C4SL

f)

g)

h)

Contaminant	Units	Method Detection Limit	Assessment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data										
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	HP101	HP102	HP103	HP104	HP105	HP106	HP107	HP108	HP109	HP110	HP Dup 1
												0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10	one Supplier
												08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Asbestos in Soil	Type	N/A	-		0	0	#VALUE!	#VALUE!	-	-	-	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
pH - Automated	pH Units	N/A	-		11	11	7.7	8	7.86363636	0.11200649	-	7.7	8	7.8	8	7.9	7.9	7.8	7.7	8	7.8	7.9
Ammoniacal Nitrogen as N	mg/kg	0.5	-		11	4	0.5	2.3	0.81818182	0.57239529	-	< 0.5	< 0.5	0.8	< 0.5	1	2.3	< 0.5	< 0.5	1.4	< 0.5	< 0.5
Total Organic Carbon (TOC)	%	0.1	-		11	11	4.8	8.1	6.46363636	1.13514116	-	6.3	6	8.1	4.8	4.8	6.3	5.8	8.1	6.4	7.4	7.1
Total Phenols (monohydric)	mg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
			-																			
Naphthalene	mg/kg	0.05	4.1	a	11	11	0.58	18	4.22636364	5.55266472	2	2.7	1.8	2.4	2.3	1.4	1.1	3.3	0.91	0.58	18	12
Acenaphthylene	mg/kg	0.05	28	a	11	9	0.05	28	5.07818182	10.1652445	0	0.61	< 0.05	1.3	0.27	0.59	0.69	0.95	0.35	< 0.05	28	23
Acenaphthene	mg/kg	0.05	34	a	11	11	1.4	85	17.9272727	30.4506844	2	7.4	1.6	6.2	3.6	2.9	3.1	11	1.4	2	85	73
Fluorene	mg/kg	0.05	27	a	11	11	0.97	50	10.7245455	18.0696604	2	5.2	1	3.7	2	1.7	1.9	6.3	0.97	1.2	50	44
Phenanthrene	mg/kg	0.05	15	a	11	11	11	540	114.818182	189.97885	8	49	13	54	20	24	22	68	12	11	540	450
Anthracene	mg/kg	0.05	380	a	11	11	2.4	130	27.3454545	44.1609865	0	13	3.3	16	4.2	6.5	5.1	17	3.3	2.4	130	100
Fluoranthene	mg/kg	0.05	52	a	11	11	17	760	183.363636	265.891058	6	81	24	170	29	65	43	140	28	17	760	660
Pyrene	mg/kg	0.05	110	a	11	11	16	710	171.909091	244.8385	4	78	23	170	26	67	42	130	29	16	710	600
Benzo(a)anthracene	mg/kg	0.05	-		11	11	6.7	320	87.4272727	116.218364	-	41	14	97	14	39	22	83	15	6.7	320	310
Chrysene	mg/kg	0.05	4.1	a	11	11	6.3	270	71.6636364	90.2270721	11	39	12	94	14	33	22	64	14	6.3	270	220
Benzo(b)fluoranthene	mg/kg	0.05	-		11	11	7.3	310	92.2090909	113.974826	-	44	14	130	16	46	24	94	19	7.3	310	310
Benzo(k)fluoranthene	mg/kg	0.05	-		11	11	2.9	150	39.1545455	50.5491912	-	16	5.3	97	5.9	16	11	23	7.6	2.9	150	96
Benzo(a)pyrene	mg/kg	0.05	5.7	e	11	11	6.4	320	79.9454545	111.13412	11	37	12	62	13	39	22	72	16	6.4	320	280
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	-		11	11	2.8	150	37.8636364	52.0378376	-	14	5.8	42	5.9	17	9.8	31	8.2	2.8	150	130
Dibenz(a,h)anthracene	mg/kg	0.05	-		11	11	0.74	32	9.00363636	10.9829753	-	4.4	1.4	12	1.8	4.3	2.7	9.5	2.2	0.74	32	28
Benzo(ghi)perylene	mg/kg	0.05	-		11	11	3.3	180	44.8636364	63.36591	-	17	6.5	46	6.4	19	11	35	9.3	3.3	180	160
			-																			
Speciated Total EPA-16 PAHs	mg/kg	0.8	-		11	11	86.1	4040	994.190909	1404.21679	-	448	140	996	164	382	243	781	166	86.1	4040	3490
			-																			
Arsenic (aqua regia extractable)	mg/kg	1	49	e	11	11	16	83	59.5454545	17.935237	9	62	69	51	66	44	76	66	83	16	60	62
Barium (aqua regia extractable)	mg/kg	1	1300	c	11	11	56	610	313.272727	135.313777	0	310	230	610	220	330	330	410	310	56	360	280
Beryllium (aqua regia extractable)	mg/kg	0.06	35	a	11	11	1.2	1.9	1.55454545	0.26215887	0	1.7	1.9	1.5	1.3	1.2	1.8	1.9	1.4	1.2	1.7	1.5
Boron (water soluble)	mg/kg	0.2	45	a	11	11	0.3	1.3	0.79090909	0.28090762	0	1.1	0.7	0.7	0.5	0.6	1	0.3	0.9	1.3	0.8	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	3.9	e	11	7	0.2	3.4	1.76363636	1.31626192	0	2.4	3.1	2.6	2.7	1.6	3.4	2.8	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	170	e	11	0	1.2	1.2	-	-	0	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	18000	a	11	11	44	81	60.5454545	9.5850262	0	58	69	63	60	57	63	64	81	44	56	51
Chromium (aqua regia extractable)	mg/kg	1	-		11	11	45	82	60.9090909	9.65872192	-	58	69	63	61	57	64	64	82	45	56	51
Copper (aqua regia extractable)	mg/kg	1	520	a	11	11	38	340	268.909091	88.0970539	0	330	310	230	250	210	320	290	340	38	330	310
Lead (aqua regia extractable)	mg/kg	1	80	e	11	11	59	4400	1357.18182	1144.33446	10	1200	550	4400	520	1400	1100	2100	1200	59	1400	1000
Mercury (aqua regia extractable)	mg/kg	0.3	19	a	11	0	0.3	0.3	-	-	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	53	a	11	11	39	150	71.4545455	28.1828446	10	67	80	150	61	55	70	70	73	39	60	61
Selenium (aqua regia extractable)	mg/kg	1	88	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	91	a	11	11	65	85	71.8181818	6.46247912	0	67	70	65	68	67	85	82	76	69	71	70
Zinc (aqua regia extractable)	mg/kg	1	620	a	11	11	110	990	484.545455	250.813223	3	680	290	500	320	320	390	480	460	110	990	790
			-																			
Benzene	µg/kg	1	18	e	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	22000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Soil	SOM (%):	1.0%
Land Use:	Allotment	Completed By:	KD
Receptor:	Human Health	Checked By:	PP

Assessment Criteria Key

- | | |
|------------------------------|---------------|
| a) LQM/CIEH S4UL | e) DEFRA C4SL |
| b) RHDHV GAC | f) |
| c) CL:AIRE / EIC GAC | g) |
| d) CL:AIRE / EIC & RHDHV GAC | h) |

Contaminant	Units	Method Detection Limit	Assessment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data										
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	HP101	HP102	HP103	HP104	HP105	HP106	HP107	HP108	HP109	HP110	HP Dup 1
												0.00-0.25 08/07/2021	0.00-0.30 08/07/2021	0.00-0.15 08/07/2021	0.00-0.30 08/07/2021	0.00-0.20 08/07/2021	0.00-0.30 08/07/2021	0.00-0.30 08/07/2021	0.00-0.30 08/07/2021	0.00-0.15 08/07/2021	0.00-0.10 08/07/2021	one Sample 08/07/2021
Vinyl Chloride	µg/kg	1	1.7	e	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	2900	c	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	260	c	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	23000	c	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	9200	c	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	420	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	48000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	4.6	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	930	c	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	18	e	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	450	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	620	c	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	32	e	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	22000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	280	c	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	2000	e	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	5900	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	790	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	16000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	29000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	1600	c	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	28000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	410	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	32000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	3200	c	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	34000	c	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	380	c	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	250	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	94000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	15000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	55000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	4700	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
			-																			
Aniline	mg/kg	0.1	-		11	0	0.1	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	23	a	11	0	0.2	0.2	-	-	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	0.13	a	11	0	0.1	0.1	-	-	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	0.25	a	11	0	0.2	0.2	-													

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Soil	SOM (%):	1.0%
Land Use:	Allotment	Completed By:	KD
Receptor:	Human Health	Checked By:	PP

Assessment Criteria Key

- a) LQM/CIEH S4UL
- b) RHDHV GAC
- c) CL:AIRE / EIC GAC
- d) CL:AIRE / EIC & RHDHV GAC
- e) DEFRA C4SL
- f)
- g)
- h)

Contaminant	Units	Method Detection Limit	Assess-ment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data										
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	HP101	HP102	HP103	HP104	HP105	HP106	HP107	HP108	HP109	HP110	HP Dup 1
												0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10	one Supplie
												08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Naphthalene	mg/kg	0.05	4.1	a	11	11	0.58	18	4.22636364	5.55266472	2	2.7	1.8	2.4	2.3	1.4	1.1	3.3	0.91	0.58	18	12
2,4-Dichlorophenol	mg/kg	0.3	0.13	a	11	0	0.3	0.3	-	-	11	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	-		11	0	0.1	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	-		11	0	0.1	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	-		11	0	0.1	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	0.13	a	11	0	0.1	0.1	-	-	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	-		11	2	0.1	29	4.9	10.7376906	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	29	24
2-Chloronaphthalene	mg/kg	0.1	-		11	0	0.1	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	-		11	0	0.1	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	0.12	c	11	0	0.1	0.1	-	-	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	28	a	11	8	0.05	23	2.53727273	6.79835582	0	0.61	< 0.05	1.3	0.27	0.59	0.69	0.95	0.35	< 0.05	< 0.05	23
Acenaphthene	mg/kg	0.05	34	a	11	11	1.4	85	17.9272727	30.4506844	2	7.4	1.6	6.2	3.6	2.9	3.1	11	1.4	2	85	73
2,4-Dinitrotoluene	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	-		11	2	0.2	25	4.43636364	9.44915581	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	25	22
4-Chlorophenyl phenyl ether	mg/kg	0.3	-		11	0	0.3	0.3	-	-	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	19	c	11	0	0.2	0.2	-	-	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	27	a	11	11	0.97	50	10.7245455	18.0696604	2	5.2	1	3.7	2	1.7	1.9	6.3	0.97	1.2	50	44
Azobenzene	mg/kg	0.3	-		11	0	0.3	0.3	-	-	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	0.47	a	11	0	0.3	0.3	-	-	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	15	a	11	11	11	540	114.818182	189.97885	8	49	13	54	20	24	22	68	12	11	540	450
Anthracene	mg/kg	0.05	380	a	11	11	2.4	130	27.3454545	44.1609865	0	13	3.3	16	4.2	6.5	5.1	17	3.3	2.4	130	100
Carbazole	mg/kg	0.3	-		11	0	0.3	0.3	-	-	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	-		11	0	0.3	0.3	-	-	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	52	a	11	11	17	760	183.363636	265.891058	6	81	24	170	29	65	43	140	28	17	760	660
Pyrene	mg/kg	0.05	110	a	11	11	16	710	171.909091	244.8385	4	78	23	170	26	67	42	130	29	16	710	600
Butyl benzyl phthalate	mg/kg	0.3	220	c	11	0	0.3	0.3	-	-	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	-		11	11	6.7	320	87.4272727	116.218364	-	41	14	97	14	39	22	83	15	6.7	320	310
Chrysene	mg/kg	0.05	4.1	a	11	11	6.3	270	71.6636364	90.2270721	11	39	12	94	14	33	22	64	14	6.3	270	220
Benzo(b)fluoranthene	mg/kg	0.05	-		11	11	7.3	310	92.2090909	113.974826	-	44	14	130	16	46	24	94	19	7.3	310	310
Benzo(k)fluoranthene	mg/kg	0.05	-		11	11	2.9	150	39.1545455	50.5491912	-	16	5.3	97	5.9	16	11	23	7.6	2.9	150	96
Benzo(a)pyrene	mg/kg	0.05	5.7	e	11	11	6.4	320	79.9454545	111.13412	11	37	12	62	13	39	22	72	16	6.4	320	280
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	-		11	11	2.8	150	37.8636364	52.0378376	-	14	5.8	42	5.9	17	9.8	31	8.2	2.8	150	130
Dibenz(a,h)anthracene	mg/kg	0.05	-		11	11	0.74	32	9.00363636	10.9829753	-	4.4	1.4	12	1.8	4.3	2.7	9.5	2.2	0.74	32	28
Benzo(ghi)perylene	mg/kg	0.05	-		11	11	3.3	180	44.8636364	63.36591	-	17	6.5	46	6.4	19	11	35	9.3	3.3	180	160
			-																			
2,3,6-TBA	µg/kg	50	-		3	0	50	50	-	-	-	< 50	< 50	< 50	-	-	-	-	-	-	-	-
2,4,5-T	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
2,4,5-TP (Fenoprop)	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
2,4-D	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
2,4-DB	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
4-CPA	µg/kg	20	-		3	0	20	20	-	-	-	< 20	< 20	< 20	-	-	-	-	-	-	-	-
Bromacil	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Bromoxynil	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Clopyralid	µg/kg	100	-		3	0	100	100	-	-	-	< 100	< 100	< 100	-	-	-	-	-	-	-	-
Dicamba	µg/kg	20	-		3	0	20	20	-	-	-	< 20	< 20	< 20	-	-	-	-	-	-	-	-
Diclofop	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Dichlorprop	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Dinoseb	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Flamprop	µg/kg	50	-		3	0	50	50	-	-	-	< 50	< 50	< 50	-	-	-	-	-	-	-	-
Flamprop-Isopropyl	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Ioxynil	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
MCPA	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
MCPB	µg/kg	20	-		3	0	20	20	-	-	-	< 20	< 20	< 20	-	-	-	-	-	-	-	-
MCPP (Mecoprop)	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Picloram	µg/kg	50	-		3	0	50	50	-	-	-	< 50	< 50	< 50	-	-	-	-	-	-	-	-

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Soil	SOM (%):	1.0%
Land Use:	Public open space park	Completed By:	KD
Receptor:	Human Health	Checked By:	PP

Assessment Criteria Key

- a) LQM/CIEH S4UL

b) RHDHV GAC

c) CL:AIRE / EIC GAC

d) CL:AIRE / EIC & RHDHV GAC
- e) DEFRA C4SL

f)

g)

h)

Contaminant	Units	Method Detection Limit	Assessment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data										
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	HP101	HP102	HP103	HP104	HP105	HP106	HP107	HP108	HP109	HP110	HP Dup 1
												0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10	one Supplier
												08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Asbestos in Soil	Type	N/A	-		0	0	#VALUE!	#VALUE!	-	-	-	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
pH - Automated	pH Units	N/A	-		11	11	7.7	8	7.86363636	0.11200649	-	7.7	8	7.8	8	7.9	7.9	7.8	7.7	8	7.8	7.9
Ammoniacal Nitrogen as N	mg/kg	0.5	-		11	4	0.5	2.3	0.81818182	0.57239529	-	< 0.5	< 0.5	0.8	< 0.5	1	2.3	< 0.5	< 0.5	1.4	< 0.5	< 0.5
Total Organic Carbon (TOC)	%	0.1	-		11	11	4.8	8.1	6.46363636	1.13514116	-	6.3	6	8.1	4.8	4.8	6.3	5.8	8.1	6.4	7.4	7.1
Total Phenols (monohydric)	mg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
			-																			
Naphthalene	mg/kg	0.05	1200	a	11	11	0.58	18	4.22636364	5.55266472	0	2.7	1.8	2.4	2.3	1.4	1.1	3.3	0.91	0.58	18	12
Acenaphthylene	mg/kg	0.05	29000	a	11	9	0.05	28	5.07818182	10.1652445	0	0.61	< 0.05	1.3	0.27	0.59	0.69	0.95	0.35	< 0.05	28	23
Acenaphthene	mg/kg	0.05	29000	a	11	11	1.4	85	17.9272727	30.4506844	0	7.4	1.6	6.2	3.6	2.9	3.1	11	1.4	2	85	73
Fluorene	mg/kg	0.05	20000	a	11	11	0.97	50	10.7245455	18.0696604	0	5.2	1	3.7	2	1.7	1.9	6.3	0.97	1.2	50	44
Phenanthrene	mg/kg	0.05	6200	a	11	11	11	540	114.818182	189.97885	0	49	13	54	20	24	22	68	12	11	540	450
Anthracene	mg/kg	0.05	150000	a	11	11	2.4	130	27.3454545	44.1609865	0	13	3.3	16	4.2	6.5	5.1	17	3.3	2.4	130	100
Fluoranthene	mg/kg	0.05	6300	a	11	11	17	760	183.363636	265.891058	0	81	24	170	29	65	43	140	28	17	760	660
Pyrene	mg/kg	0.05	15000	a	11	11	16	710	171.909091	244.8385	0	78	23	170	26	67	42	130	29	16	710	600
Benzo(a)anthracene	mg/kg	0.05	-		11	11	6.7	320	87.4272727	116.218364	-	41	14	97	14	39	22	83	15	6.7	320	310
Chrysene	mg/kg	0.05	93	a	11	11	6.3	270	71.6636364	90.2270721	3	39	12	94	14	33	22	64	14	6.3	270	220
Benzo(b)fluoranthene	mg/kg	0.05	-		11	11	7.3	310	92.2090909	113.974826	-	44	14	130	16	46	24	94	19	7.3	310	310
Benzo(k)fluoranthene	mg/kg	0.05	-		11	11	2.9	150	39.1545455	50.5491912	-	16	5.3	97	5.9	16	11	23	7.6	2.9	150	96
Benzo(a)pyrene	mg/kg	0.05	10	e	11	11	6.4	320	79.9454545	111.13412	10	37	12	62	13	39	22	72	16	6.4	320	280
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	-		11	11	2.8	150	37.8636364	52.0378376	-	14	5.8	42	5.9	17	9.8	31	8.2	2.8	150	130
Dibenz(a,h)anthracene	mg/kg	0.05	-		11	11	0.74	32	9.00363636	10.9829753	-	4.4	1.4	12	1.8	4.3	2.7	9.5	2.2	0.74	32	28
Benzo(ghi)perylene	mg/kg	0.05	-		11	11	3.3	180	44.8636364	63.36591	-	17	6.5	46	6.4	19	11	35	9.3	3.3	180	160
			-																			
Speciated Total EPA-16 PAHs	mg/kg	0.8	-		11	11	86.1	4040	994.190909	1404.21679	-	448	140	996	164	382	243	781	166	86.1	4040	3490
			-																			
Arsenic (aqua regia extractable)	mg/kg	1	170	e	11	11	16	83	59.5454545	17.935237	0	62	69	51	66	44	76	66	83	16	60	62
Barium (aqua regia extractable)	mg/kg	1	-		11	11	56	610	313.272727	135.313777	-	310	230	610	220	330	330	410	310	56	360	280
Beryllium (aqua regia extractable)	mg/kg	0.06	63	a	11	11	1.2	1.9	1.55454545	0.26215887	0	1.7	1.9	1.5	1.3	1.2	1.8	1.9	1.4	1.2	1.7	1.5
Boron (water soluble)	mg/kg	0.2	46000	a	11	11	0.3	1.3	0.79090909	0.28090762	0	1.1	0.7	0.7	0.5	0.6	1	0.3	0.9	1.3	0.8	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	880	e	11	7	0.2	3.4	1.76363636	1.31626192	0	2.4	3.1	2.6	2.7	1.6	3.4	2.8	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	250	e	11	0	1.2	1.2	-	-	0	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	33000	a	11	11	44	81	60.5454545	9.5850262	0	58	69	63	60	57	63	64	81	44	56	51
Chromium (aqua regia extractable)	mg/kg	1	-		11	11	45	82	60.9090909	9.65872192	-	58	69	63	61	57	64	64	82	45	56	51
Copper (aqua regia extractable)	mg/kg	1	44000	a	11	11	38	340	268.909091	88.0970539	0	330	310	230	250	210	320	290	340	38	330	310
Lead (aqua regia extractable)	mg/kg	1	1300	e	11	11	59	4400	1357.18182	1144.33446	4	1200	550	4400	520	1400	1100	2100	1200	59	1400	1000
Mercury (aqua regia extractable)	mg/kg	0.3	240	a	11	0	0.3	0.3	-	-	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	800	a	11	11	39	150	71.4545455	28.1828446	0	67	80	150	61	55	70	70	73	39	60	61
Selenium (aqua regia extractable)	mg/kg	1	1800	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	5000	a	11	11	65	85	71.8181818	6.46247912	0	67	70	65	68	67	85	82	76	69	71	70
Zinc (aqua regia extractable)	mg/kg	1	170000	a	11	11	110	990	484.545455	250.813223	0	680	290	500	320	320	390	480	460	110	990	790
			-																			
Benzene	µg/kg	1	230000	e	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	87000000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Soil	SOM (%):	1.0%
Land Use:	Public open space park	Completed By:	KD
Receptor:	Human Health	Checked By:	PP

Assessment Criteria Key

- | | |
|------------------------------|---------------|
| a) LQM/ClEH S4UL | e) DEFRA C4SL |
| b) RHDHV GAC | f) |
| c) CL:AIRE / EIC GAC | g) |
| d) CL:AIRE / EIC & RHDHV GAC | h) |

Contaminant	Units	Method Detection Limit	Assess- ment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data										
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	HP101	HP102	HP103	HP104	HP105	HP106	HP107	HP108	HP109	HP110	HP Dup 1
												0.00-0.25 08/07/2021	0.00-0.30 08/07/2021	0.00-0.15 08/07/2021	0.00-0.30 08/07/2021	0.00-0.20 08/07/2021	0.00-0.30 08/07/2021	0.00-0.30 08/07/2021	0.00-0.30 08/07/2021	0.00-0.15 08/07/2021	0.00-0.10 08/07/2021	one Sample 08/07/2021
Vinyl Chloride	µg/kg	1	18000	e	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	2600000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	57000000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	21000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	230000	e	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	190000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	41000	e	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	87000000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	1400000	e	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	1300000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	1500000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	17000000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	17000000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	17000000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	1800000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	390000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	24000000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	36000000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	1700000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	-		11	0	1	1	-	-	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	770000	a	11	0	1	1	-	-	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
			-																			
Aniline	mg/kg	0.1	-		11	0	0.1	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	440	a	11	0	0.2	0.2	-	-	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	1100	a	11	0	0.1	0.1	-	-	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	390	a	11	0																

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Soil	SOM (%):	1.0%
Land Use:	Public open space park	Completed By:	KD
Receptor:	Human Health	Checked By:	PP

Assessment Criteria Key

- a) LQM/CIEH S4UL
- b) RHDHV GAC
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- e) DEFRA C4SL
- f)
- g)
- h)

Contaminant	Units	Method Detection Limit	Assess-ment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data										
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	HP101	HP102	HP103	HP104	HP105	HP106	HP107	HP108	HP109	HP110	HP Dup 1
												0.00-0.25	0.00-0.30	0.00-0.15	0.00-0.30	0.00-0.20	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.15	0.00-0.10	one Supplie
												08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Naphthalene	mg/kg	0.05	1200	a	11	11	0.58	18	4.22636364	5.55266472	0	2.7	1.8	2.4	2.3	1.4	1.1	3.3	0.91	0.58	18	12
2,4-Dichlorophenol	mg/kg	0.3	1100	a	11	0	0.3	0.3	-	-	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	-		11	0	0.1	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	-		11	0	0.1	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	-		11	0	0.1	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	1100	a	11	0	0.1	0.1	-	-	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	-		11	2	0.1	29	4.9	10.7376906	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	29	24
2-Chloronaphthalene	mg/kg	0.1	-		11	0	0.1	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	-		11	0	0.1	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	-		11	0	0.1	0.1	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	29000	a	11	8	0.05	23	2.53727273	6.79835582	0	0.61	< 0.05	1.3	0.27	0.59	0.69	0.95	0.35	< 0.05	< 0.05	23
Acenaphthene	mg/kg	0.05	29000	a	11	11	1.4	85	17.9272727	30.4506844	0	7.4	1.6	6.2	3.6	2.9	3.1	11	1.4	2	85	73
2,4-Dinitrotoluene	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	-		11	2	0.2	25	4.43636364	9.44915581	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	25	22
4-Chlorophenyl phenyl ether	mg/kg	0.3	-		11	0	0.3	0.3	-	-	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	20000	a	11	11	0.97	50	10.7245455	18.0696604	0	5.2	1	3.7	2	1.7	1.9	6.3	0.97	1.2	50	44
Azobenzene	mg/kg	0.3	-		11	0	0.3	0.3	-	-	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	30	a	11	0	0.3	0.3	-	-	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	6200	a	11	11	11	540	114.818182	189.97885	0	49	13	54	20	24	22	68	12	11	540	450
Anthracene	mg/kg	0.05	150000	a	11	11	2.4	130	27.3454545	44.1609865	0	13	3.3	16	4.2	6.5	5.1	17	3.3	2.4	130	100
Carbazole	mg/kg	0.3	-		11	0	0.3	0.3	-	-	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	-		11	0	0.2	0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	-		11	0	0.3	0.3	-	-	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	6300	a	11	11	17	760	183.363636	265.891058	0	81	24	170	29	65	43	140	28	17	760	660
Pyrene	mg/kg	0.05	15000	a	11	11	16	710	171.909091	244.8385	0	78	23	170	26	67	42	130	29	16	710	600
Butyl benzyl phthalate	mg/kg	0.3	-		11	0	0.3	0.3	-	-	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	-		11	11	6.7	320	87.4272727	116.218364	-	41	14	97	14	39	22	83	15	6.7	320	310
Chrysene	mg/kg	0.05	93	a	11	11	6.3	270	71.6636364	90.2270721	3	39	12	94	14	33	22	64	14	6.3	270	220
Benzo(b)fluoranthene	mg/kg	0.05	-		11	11	7.3	310	92.2090909	113.974826	-	44	14	130	16	46	24	94	19	7.3	310	310
Benzo(k)fluoranthene	mg/kg	0.05	-		11	11	2.9	150	39.1545455	50.5491912	-	16	5.3	97	5.9	16	11	23	7.6	2.9	150	96
Benzo(a)pyrene	mg/kg	0.05	11	e	11	11	6.4	320	79.9454545	111.13412	10	37	12	62	13	39	22	72	16	6.4	320	280
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	-		11	11	2.8	150	37.8636364	52.0378376	-	14	5.8	42	5.9	17	9.8	31	8.2	2.8	150	130
Dibenz(a,h)anthracene	mg/kg	0.05	-		11	11	0.74	32	9.00363636	10.9829753	-	4.4	1.4	12	1.8	4.3	2.7	9.5	2.2	0.74	32	28
Benzo(ghi)perylene	mg/kg	0.05	-		11	11	3.3	180	44.8636364	63.36591	-	17	6.5	46	6.4	19	11	35	9.3	3.3	180	160
			-																			
2,3,6-TBA	µg/kg	50	-		3	0	50	50	-	-	-	< 50	< 50	< 50	-	-	-	-	-	-	-	-
2,4,5-T	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
2,4,5-TP (Fenoprop)	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
2,4-D	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
2,4-DB	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
4-CPA	µg/kg	20	-		3	0	20	20	-	-	-	< 20	< 20	< 20	-	-	-	-	-	-	-	-
Bromacil	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Bromoxynil	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Clopyralid	µg/kg	100	-		3	0	100	100	-	-	-	< 100	< 100	< 100	-	-	-	-	-	-	-	-
Dicamba	µg/kg	20	-		3	0	20	20	-	-	-	< 20	< 20	< 20	-	-	-	-	-	-	-	-
Diclofop	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Dichloroprop	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Dinoseb	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Flamprop	µg/kg	50	-		3	0	50	50	-	-	-	< 50	< 50	< 50	-	-	-	-	-	-	-	-
Flamprop-Isopropyl	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Ioxynil	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
MCPA	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
MCPB	µg/kg	20	-		3	0	20	20	-	-	-	< 20	< 20	< 20	-	-	-	-	-	-	-	-
MCPP (Mecoprop)	µg/kg	10	-		3	0	10	10	-	-	-	< 10	< 10	< 10	-	-	-	-	-	-	-	-
Picloram	µg/kg	50	-		3	0	50	50	-	-	-	< 50	< 50	< 50	-	-	-	-	-	-	-	-

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Surface Water		
Land Use:	EQS	Completed By:	KD
Receptor:	Controlled Waters	Checked By:	PP

Assessment Criteria Key

- a) WFD inland surface waters 2015
b) EQS Freshwater (older EQS values)
c) M-BAT Tool

Contaminant	Units	Method Detection Limit	Assess-ment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data			
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	SW101			
												08/07/2021			
pH	pH Units	N/A	6 to 9	a	1	1	7.6	7.6	7.6	-	0	7.6			
Sulphate as SO4	mg/l	0.045	-		1	1	16.3	16.3	16.3	-	-	16.3			
Ammoniacal Nitrogen as N	µg/l	15	200	a	1	1	120	120	120	-	0	120			
Dissolved Organic Carbon (DOC)	mg/l	0.1	-		1	1	4.16	4.16	4.16	-	-	4.16			
Alkalinity as CaCO3	mg/l	3	-		1	1	54	54	54	-	-	54			
			-												
Phenol	µg/l	0.05	7.7	a	1	0	0.05	0.05	-	-	0	< 0.05			
2,4,5-Trichlorophenol	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
2,4,6-Trichlorophenol	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
2,4-Dichlorophenol	µg/l	0.05	0.3	a	1	0	0.05	0.05	-	-	0	< 0.05			
2,4-Dimethylphenol	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
2-Chlorophenol	µg/l	0.05	50	a	1	0	0.05	0.05	-	-	0	< 0.05			
2-Methylphenol	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
2-Nitrophenol	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
4-Chloro-3-methylphenol	µg/l	0.05	40	a	1	0	0.05	0.05	-	-	0	< 0.05			
4-Methylphenol	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
			-												
Total Phenols (GC-MS)	µg/l	0.5	-		1	0	0.5	0.5	-	-	-	< 0.5			
			-												
Boron (dissolved)	µg/l	10	2000	a	1	1	120	120	120	-	0	120			
Calcium (dissolved)	mg/l	0.012	-		1	1	21	21	21	-	-	21			
Chromium (hexavalent)	µg/l	5	3.4	a	1	0	5	5	-	-	1	< 5.0			
Chromium (III)	µg/l	1	4.7	a	1	1	1.4	1.4	1.4	-	0	1.4			
			-												
Arsenic (dissolved)	µg/l	0.15	50	a	1	1	2.71	2.71	2.71	-	0	2.71			
Barium (dissolved)	µg/l	0.06	-		1	1	60	60	60	-	-	60			
Beryllium (dissolved)	µg/l	0.1	-		1	0	0.1	0.1	-	-	-	< 0.1			
Cadmium (dissolved)	µg/l	0.02	0.08	a	1	0	0.02	0.02	-	-	0	< 0.02			
Chromium (dissolved)	µg/l	0.2	-		1	1	1.4	1.4	1.4	-	-	1.4			
Copper (dissolved)	µg/l	0.5	17.1	c	1	1	8.8	8.8	8.8	-	0	8.8			
Lead (dissolved)	µg/l	0.2	4.99	c	1	1	8.4	8.4	8.4	-	1	8.4			
Mercury (dissolved)	µg/l	0.05	0.07	b	1	0	0.05	0.05	-	-	0	< 0.05			
Nickel (dissolved)	µg/l	0.5	9.58	c	1	1	2.5	2.5	2.5	-	0	2.5			
Selenium (dissolved)	µg/l	0.6	-		1	0	0.6	0.6	-	-	-	< 0.6			
Vanadium (dissolved)	µg/l	0.2	20	a	1	1	1.4	1.4	1.4	-	0	1.4			
Zinc (dissolved)	µg/l	0.5	24.66	c	1	1	25	25	25	-	1	25			
			-												
Benzene	µg/l	1	10	a	1	0	1	1	-	-	0	< 1.0			
Toluene	µg/l	1	74	a	1	0	1	1	-	-	0	< 1.0			
Ethylbenzene	µg/l	1	20	a	1	0	1	1	-	-	0	< 1.0			
p & m-xylene	µg/l	1	30	a	1	0	1	1	-	-	0	< 1.0			
o-xylene	µg/l	1	30	a	1	0	1	1	-	-	0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
			-												
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	10	a	1	0	1	1	-	-	0	< 1.0			
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	10	a	1	0	1	1	-	-	0	< 1.0			
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	10	a	1	0	1	1	-	-	0	< 1.0			
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	10	a	1	0	10	10	-	-	0	< 10			
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	10	a	1	0	10	10	-	-	0	< 10			
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	10	a	1	0	10	10	-	-	0	< 10			
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	10	a	1	0	10	10	-	-	0	< 10			
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	-		1	0	10	10	-	-	-	< 10			
			-												
TPH-CWG - Aromatic >C5 - C7	µg/l	1	10	a	1	0	1	1	-	-	0	< 1.0			
TPH-CWG - Aromatic >C7 - C8	µg/l	1	10	a	1	0	1	1	-	-	0	< 1.0			
TPH-CWG - Aromatic >C8 - C10	µg/l	1	10	a	1	0	1	1	-	-	0	< 1.0			
TPH-CWG - Aromatic >C10 - C12	µg/l	10	10	a	1	0	10	10	-	-	0	< 10			
TPH-CWG - Aromatic >C12 - C16	µg/l	10	10	a	1	0	10	10	-	-	0	< 10			
TPH-CWG - Aromatic >C16 - C21	µg/l	10	10	a	1	0	10	10	-	-	0	< 10			
TPH-CWG - Aromatic >C21 - C35	µg/l	10	10	a	1	0	10	10	-	-	0	< 10			
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	-		1	0	10	10	-	-	-	< 10			
			-												
Chloromethane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Chloroethane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Bromomethane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Vinyl Chloride	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Trichlorofluoromethane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
1,1-Dichloroethene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Cis-1,2-dichloroethene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Surface Water		
Land Use:	EQS	Completed By:	KD
Receptor:	Controlled Waters	Checked By:	PP

Assessment Criteria Key

- a) WFD inland surface waters 2015
b) EQS Freshwater (older EQS values)
c) M-BAT Tool

Contaminant	Units	Method Detection Limit	Assess- ment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data			
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	SW101			
												08/07/2021			
1,1-Dichloroethane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
2,2-Dichloropropane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Trichloromethane	µg/l	1	2.5	a	1	0	1	1	-	-	0	< 1.0			
1,1,1-Trichloroethane	µg/l	1	100	a	1	0	1	1	-	-	0	< 1.0			
1,2-Dichloroethane	µg/l	1	10	a	1	0	1	1	-	-	0	< 1.0			
1,1-Dichloropropene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Trans-1,2-dichloroethene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Benzene	µg/l	1	10	a	1	0	1	1	-	-	0	< 1.0			
Tetrachloromethane	µg/l	1	12	a	1	0	1	1	-	-	0	< 1.0			
1,2-Dichloropropane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Trichloroethene	µg/l	1	10	a	1	0	1	1	-	-	0	< 1.0			
Dibromomethane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Bromodichloromethane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Cis-1,3-dichloropropene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Trans-1,3-dichloropropene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Toluene	µg/l	1	74	a	1	0	1	1	-	-	0	< 1.0			
1,1,2-Trichloroethane	µg/l	1	400	a	1	0	1	1	-	-	0	< 1.0			
1,3-Dichloropropane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Dibromochloromethane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Tetrachloroethene	µg/l	1	10	a	1	0	1	1	-	-	0	< 1.0			
1,2-Dibromoethane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Chlorobenzene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
1,1,1,2-Tetrachloroethane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Ethylbenzene	µg/l	1	20	a	1	0	1	1	-	-	0	< 1.0			
p & m-Xylene	µg/l	1	30	a	1	0	1	1	-	-	0	< 1.0			
Styrene	µg/l	1	50	a	1	0	1	1	-	-	0	< 1.0			
Tribromomethane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
o-Xylene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
1,1,2,2-Tetrachloroethane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Isopropylbenzene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Bromobenzene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
n-Propylbenzene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
2-Chlorotoluene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
4-Chlorotoluene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
1,3,5-Trimethylbenzene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
tert-Butylbenzene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
1,2,4-Trimethylbenzene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
sec-Butylbenzene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
1,3-Dichlorobenzene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
p-Isopropyltoluene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
1,2-Dichlorobenzene	µg/l	1	20	a	1	0	1	1	-	-	0	< 1.0			
1,4-Dichlorobenzene	µg/l	1	20	a	1	0	1	1	-	-	0	< 1.0			
Butylbenzene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
1,2-Dibromo-3-chloropropane	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
1,2,4-Trichlorobenzene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
Hexachlorobutadiene	µg/l	1	0.6	a	1	0	1	1	-	-	1	< 1.0			
1,2,3-Trichlorobenzene	µg/l	1	-		1	0	1	1	-	-	-	< 1.0			
			-												
Aniline	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Phenol	µg/l	0.05	7.7	a	1	0	0.05	0.05	-	-	0	< 0.05			
2-Chlorophenol	µg/l	0.05	50	a	1	0	0.05	0.05	-	-	0	< 0.05			
Bis(2-chloroethyl)ether	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
1,3-Dichlorobenzene	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
1,2-Dichlorobenzene	µg/l	0.05	20	a	1	0	0.05	0.05	-	-	0	< 0.05			
1,4-Dichlorobenzene	µg/l	0.05	20	a	1	0	0.05	0.05	-	-	0	< 0.05			
Bis(2-chloroisopropyl)ether	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
2-Methylphenol	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Hexachloroethane	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Nitrobenzene	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
4-Methylphenol	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Isophorone	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
2-Nitrophenol	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
2,4-Dimethylphenol	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Bis(2-chloroethoxy)methane	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
1,2,4-Trichlorobenzene	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Naphthalene	µg/l	0.01	2	a	1	0	0.01	0.01	-	-	0	< 0.01			
2,4-Dichlorophenol	µg/l	0.05	0.3	a	1	0	0.05	0.05	-	-	0	< 0.05			
4-Chloroaniline	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Hexachlorobutadiene	µg/l	0.05	0.6	a	1	0	0.05	0.05	-	-	0	< 0.05			
4-Chloro-3-methylphenol	µg/l	0.05	40	a	1	0	0.05	0.05	-	-	0	< 0.05			
2,4,6-Trichlorophenol	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			

Data Summary Statistics

Site:	Castlefield Viaduct	Project No:	PC2387
Data Description:	Surface Water		
Land Use:	EQS	Completed By:	KD
Receptor:	Controlled Waters	Checked By:	PP

Assessment Criteria Key

- a) WFD inland surface waters 2015
b) EQS Freshwater (older EQS values)
c) M-BAT Tool

Contaminant	Units	Method Detection Limit	Assess- ment Criteria (AC)	Source (see key)	Summary Statistics							Sample Identifiers and Analytical Data			
					Total Number of Samples	Results Above Detection Limit	Minimum	Maximum	Arithmetic Mean	Standard Deviation	Number of results >AC	SW101			
												08/07/2021			
2,4,5-Trichlorophenol	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
2-Methylnaphthalene	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
2-Chloronaphthalene	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Dimethylphthalate	µg/l	0.05	800	a	1	0	0.05	0.05	-	-	0	< 0.05			
2,6-Dinitrotoluene	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Acenaphthylene	µg/l	0.01	-		1	0	0.01	0.01	-	-	-	< 0.01			
Acenaphthene	µg/l	0.01	-		1	1	0.02	0.02	0.02	-	-	0.02			
2,4-Dinitrotoluene	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Dibenzofuran	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
4-Chlorophenyl phenyl ether	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Diethyl phthalate	µg/l	0.05	200	a	1	0	0.05	0.05	-	-	0	< 0.05			
4-Nitroaniline	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Fluorene	µg/l	0.01	-		1	1	0.03	0.03	0.03	-	-	0.03			
Azobenzene	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Bromophenyl phenyl ether	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Hexachlorobenzene	µg/l	0.05	0.05	a	1	0	0.05	0.05	-	-	0	< 0.05			
Phenanthrene	µg/l	0.01	-		1	0	0.01	0.01	-	-	-	< 0.01			
Anthracene	µg/l	0.01	0.1	a	1	0	0.01	0.01	-	-	0	< 0.01			
Carbazole	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Dibutyl phthalate	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Anthraquinone	µg/l	0.05	-		1	0	0.05	0.05	-	-	-	< 0.05			
Fluoranthene	µg/l	0.01	0.0063	a	1	1	0.02	0.02	0.02	-	1	0.02			
Pyrene	µg/l	0.01	-		1	1	0.01	0.01	0.01	-	-	0.01			
Butyl benzyl phthalate	µg/l	0.05	7.5	a	1	0	0.05	0.05	-	-	0	< 0.05			
Benzo(a)anthracene	µg/l	0.01	-		1	0	0.01	0.01	-	-	-	< 0.01			
Chrysene	µg/l	0.01	-		1	0	0.01	0.01	-	-	-	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	-		1	0	0.01	0.01	-	-	-	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	-		1	0	0.01	0.01	-	-	-	< 0.01			
Benzo(a)pyrene	µg/l	0.01	0.00017	a	1	0	0.01	0.01	-	-	1	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	-		1	0	0.01	0.01	-	-	-	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	-		1	0	0.01	0.01	-	-	-	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	-		1	0	0.01	0.01	-	-	-	< 0.01			
			-												
3&4-Methylphenol	µg/l	0.1	-		1	0	0.1	0.1	-	-	-	< 0.10			
			-												
Fluoranthene (low level)	µg/l	0.002	0.0063	a	1	1	0.02	0.02	0.02	-	1	0.02			
Benzo(b)fluoranthene (low level)	µg/l	0.002	-		1	0	0.002	0.002	-	-	-	< 0.002			
Benzo(k)fluoranthene (low level)	µg/l	0.002	-		1	0	0.002	0.002	-	-	-	< 0.002			
Benzo(a)pyrene (low level)	µg/l	0.002	0.00017	a	1	0	0.002	0.002	-	-	1	< 0.002			
Indeno(1,2,3-cd)pyrene (low level)	µg/l	0.002	-		1	0	0.002	0.002	-	-	-	< 0.002			
Benzo(ghi)perylene (low level)	µg/l	0.002	-		1	0	0.002	0.002	-	-	-	< 0.002			
Naphthalene (low level)	µg/l	0.002	2	a	1	0	0.002	0.002	-	-	0	< 0.0020			
Acenaphthylene (low level)	µg/l	0.002	-		1	0	0.002	0.002	-	-	-	< 0.0020			
Acenaphthene (low level)	µg/l	0.002	-		1	1	0.02	0.02	0.02	-	-	0.02			
Fluorene (low level)	µg/l	0.002	-		1	1	0.03	0.03	0.03	-	-	0.03			
Phenanthrene (low level)	µg/l	0.002	-		1	0	0.002	0.002	-	-	-	< 0.0020			
Antracene (low level)	µg/l	0.002	0.1	a	1	0	0.002	0.002	-	-	0	< 0.0020			
Pyrene (low level)	µg/l	0.002	-		1	1	0.01	0.01	0.01	-	-	0.01			
Benzo(a)anthracene (low level)	µg/l	0.002	-		1	0	0.002	0.002	-	-	-	< 0.0020			
Chrysene (low level)	µg/l	0.002	-		1	0	0.002	0.002	-	-	-	< 0.0020			
Di-bezno(a,h)anthracene (low level)	µg/l	0.002	-		1	0	0.002	0.002	-	-	-	< 0.0020			

Appendix

Appendix E – Limitations

Limitations

The direct assessments and judgements given in this report are limited by both the finite data on which they are based and the proposed works to which they are addressed. The acquisition of data is constrained by both physical and economic factors and, by definition, is subject to limitations. Conditions at the site will change over time due to natural variations and may be affected by human activities.

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The findings and opinions are relevant to the dates of the information reviewed and should not be relied upon to represent conditions at later dates. The opinions included herein are based on the information obtained from the assessments undertaken in the study area and from the experience of the reviewers.

This Phase II Land Quality Assessment has utilised a variety of publicly available data sources such as the Environment Agency, Groundsure, historical maps and the British Geological Survey. Therefore, the study is limited by the age and limitations inherent in the data described.



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