

Alexandra Docks, Newport

784-B075403



Ground Investigation Report



National Grid Electricity Distribution

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
AOD	above Ordnance Datum
bgl	below ground level
BGS	British Geological Survey
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
C4SL	Category 4 Screening Levels
CIEH	Chartered Institute of Environmental Health
CLEA	Contaminated Land Exposure Assessment
CoC	Constituent of Concern
CSM	Conceptual Site Model
DEFRA	Department of Environment, food and Rural Affairs
DQRA	Detailed Quantitative Risk Assessment
DTS	Desktop Study
DRO	Diesel Range Organics
DWS	Drinking Water Standard
EA	Environment Agency (England)
EPH	Extractable Petroleum Hydrocarbons
EQS	Environmental Quality Standards
FOC	Fraction Organic Carbon
GPR	Ground Penetrating Radar
LOD	Limit of detection
LQM	Land Quality Management
NRW	Natural Resources Wales
OS	Ordnance Survey
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PPE	Personal Protection Equipment
ppm	parts per million
PRO	Petroleum Range Organics
SGV	Soil Guideline Values
SOM	Soil Organic Matter
SVOC	Semi-volatile organic compounds
TPH	Total Petroleum Hydrocarbon
TSV	Tier 1 Screening Values
VOC	Volatile Organic Carbon
VPH	Volatile Petroleum Hydrocarbons

1.0 INTRODUCTION

1.1 INSTRUCTION

Tetra Tech Ltd (Tetra Tech) was commissioned by National Grid Electricity Distribution (the client) to undertake a Ground Investigation for a site known as Alexandra Docks, Newport (known hereafter as “the site”).

The location of the site is shown on Figure 1.

1.2 BRIEF

The brief was to provide an intrusive ground investigation to support the drainage design process and support the planning application process.

The scope of the investigation has been informed by the Tetra Tech Desktop Study (*‘784-B069008_NGED_Rpt_DTS_Issue’*) and was agreed with the client designers, Burroughs.

The works were designed to comprise of the following elements and is outlined within the Fee Proposal issued to the client on 25th April 2025 (784-B069008 NGED Substation Alexandra Docks Drainage GI 210325PLNEB_v2):

Scope of the works:

- 1 No. Day trial pitting including up to 2 No. Soil Infiltration tests to BRE365 in the area where SuDS drainage features are proposed.
- Up to 3 No. Cable percussive boreholes to a maximum depth of 10m bgl to facilitate the installation of groundwater and ground gas monitoring points.
- Collection of soil samples within all exploratory locations for environmental laboratory testing.
- Three return monitoring visits to monitor groundwater & ground gas, with groundwater samples to be obtained on one occasion.
- Preparation of a combined Factual and Ground Investigation report.

The specification of works was completed in accordance with ICE specification for ground investigation and the works themselves be completed in general accordance with the principles set out in BS EN 1997-2:2007 and with the general practice described in BS5930:2015. The geo-environmental aspects of the ground investigation complied with the general requirements of BS 10175+A1:2017.

The works were also undertaken in accordance with the requirements outlined within Land Contamination Risk Management procedures (Gov.uk, 2026), specifically the Stage 1 Risk assessment process. The assessment presented within this document is based on information obtained from the intrusive ground investigation and the desk top study (Tetra Tech, 2025).

1.3 PROPOSED DEVELOPMENT

It is understood that the proposed development will involve the construction of a new National Grid Electricity Distribution (NGED) Substation with the proposed development plan being issued to Tetra Tech as part of the pre-construction information (ref. NGED_typical 33-11kV Layout).

1.4 REPORT SCOPE

This report includes the following key elements:

- Full factual records of the site works carried out.
- Summary of the ground conditions encountered.
- In-Situ testing results.
- Environmental laboratory testing results.
- Interpretation Environmental laboratory data, including a qualitative ground contamination risk assessment (compliant with CIRIA 552 (CIRIA, 2001) methodology);
- An executive summary of the report to allow a rapid, layman's overview.
-

1.5 LIMITATIONS

The recommendations and opinions expressed in this report are based on information obtained as part of the desk study or provided by others. Information provided from other sources is taken in good faith and Tetra Tech cannot guarantee its accuracy.

This report is subject to the report conditions presented in Appendix A.

The information contained in this report is intended for the use of the National Grid Electricity Distribution and Tetra Tech can take no responsibility for the use of this information by any third party or for uses other than that described in this report or detailed within the terms of our engagement.

2.0 SITE INFORMATION

2.1 LOCATION

The site is part of the wider Alexandra Docks located in Newport, South Wales. The site is rectangular in shape and is orientated lengthways northeast to southwest. The site is approximately 0.3ha in area and is centred on National Grid Reference ST 31626 85810.

The site address is: Alexandra Docks, Newport, NP20 2NP.

A site location plan is presented in Figure 1 and the proposed development plans are appended to this report.

2.2 SITE DESCRIPTION

The site in its entirety lies within the area of ABP Newport Docks and is bounded by the following, outlined in Table 2-1.

Table 2-1 - Surrounding land uses

Direction	Description
North west	To the immediate north west of site is an unnamed warehouse with associated car parking areas. The East Way Road trends broadly northwest to southeast. Howard Tenant Logistics is present to the north followed by the A48 which broadly trends east-west.
North East	The northeastern boundary of the site lies adjacent to the East Way Road followed by an area of hardstanding and the River Usk. A railway line is present trending broadly northwest to southeast and cuts across the East Way Road immediately east of site.
South east	To the south of site lies Alexandra Docks Road followed by industrial warehouses and the Graving dock water body associated with Alexandra Docks.
South West	To the west of the site is the 'North Dock' water body associated with Alexandra Docks and various commercial businesses including Farrall's Group, Burt Boulton & Haywood and 29 th Newport Sea Scouts HQ.

The site in its entirety is situated within Alexandra Dock area which is owned and managed by Associated British Ports (ABP). The site was formerly used for bespoke steel manufacturing but is no longer occupied and is derelict except for the current substation building. There are two buildings and two shipping containers that were used for the storage of materials and as office use. These buildings were not inspected as part of the ground investigation.

The site is located on relatively flat, low-lying land between approximately 8.80m AOD and 9.10m AOD and a very slight incline to the north. The East Way Road and Alexandra Docks Road are approximately level at around 9m AOD. As Alexandra Docks Road veers northwards, the level increases slightly to around 9.2m AOD in line with the north of site.

The site is surrounded by a mesh fence approximately 1.80m in height.

A 2D Topographical Survey was completed by Luciun Survey Ltd in April 2025 (Drawing nr. 670414 0) and is provided in Appendix D of the Tetra Tech Desktop Report.

2.3 GEOLOGY, HYDROGEOLOGY, HYDROLOGY AND RADON

2.3.1 Geology

Details of the geology underlying the site have been obtained from the following sources:

- British Geological Survey (BGS) Sheet No. 249 (Newport) Solid and Drift, 1:50 000
- BGS website (British Geological Survey, 2025), accessed 17/11/2025.
- UK Radon Mapping (UK Radon, 2025)
- Mine Remediation Interactive Mapper (Mining Remediation Authority, 2025)

2.3.2 Made Ground / Artificial Ground

Artificial Ground, such as Made Ground, is not shown to be present on published BGS mapping. The BGS mapping defines Made Ground as *'an area where the pre-existing (natural or artificial) land surface is raised by artificial deposits. The purpose of the made ground is unspecified.'*

However, given the previous history at the site, its current use and the previous site investigations undertaken within the surrounding area, Made Ground is anticipated to be encountered on site and is likely to comprise of highly variable materials, including remnants of former sub-structures.

The Made Ground might be associated with potentially contaminated material, unpredictable engineering conditions and instability.

2.3.3 Superficial Deposits

The BGS mapping records the entirety of the site to underlain by strata associated with Tidal Flat Deposits of Clay and Silt, which are anticipated to consist of unconsolidated sediments, mainly mud and/or sand.

BGS lexicon lithological description states that the strata are described as: *'mud flat and sand flat deposits, form extensive horizontal marshy land in the intertidal zone that is alternately covered and uncovered by the rise and fall of the tide. They consist of unconsolidated sediment, mud, and/or sand. They may form the top surface of a deltaic deposit.'*

2.3.4 Solid Geology

BGS mapping indicates that the solid geology underlying the site is comprised of the Mercia Mudstone Group. The BGS lexicon defines its lithological description as *'dominantly red, less commonly green-grey, mudstones and subordinate siltstones with thick halite-bearing units in some basinal areas. Thin beds of gypsum/anhydrite are widespread; thin sandstones are also present.'*

2.3.5 Hydrogeology

The bedrock deposits are designated as a Secondary B Aquifer. The BGS defines these as *'predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers'*.

The superficial deposits are designated as Unproductive Strata. The BGS defines these as *'predominantly rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.'*

The site is not located within a Source Protection Zone (SPZ).

A review of the available mapping indicates that is within an area classified as low groundwater vulnerability. The BGS defines low groundwater vulnerability areas as *'areas that provide the greatest protection to groundwater from pollution. They are likely to be characterised by low-leaching soils and/or the presence of low-permeability superficial deposits.'*

Due to the proximity of the site to the tidal section of the River Usk, a degree of tidal influence is anticipated within groundwater levels below the site.

2.3.6 Hydrology

Details of the hydrology of the area have been obtained from the following sources:

- Environmental database (Groundsure™).
- Natural Resources Wales Interactive Map.

There are no watercourses on site that are classified as either a tidal river or stream, with the nearest watercourse being the River Usk which is situated immediately adjacent along the north-western part of the site.

The site is also located adjacent to the North Dock within the Alexandra Dock complex.

2.3.7 Radon

UK mapping (UK Radon, 2025) coverage for the site area was consulted and indicates that the site is located within an area where no radon protection measures are required for new developments as the site is classified where less than 1% of properties are above the action level.

It should be noted that this mapping is based on the highest classification within a 1km grid square, however the surrounding site is also classified as an area requiring no protection measures.

2.4 SUMMARY OF SITE HISTORY

The earliest available mapping shows the site is located within the wider Alexandra docks complex. Railway lines and sidings are noted to run through the site, orientated broadly northwest to southeast. These rail lines are no longer shown in mapping dated 2010. Buildings are first recorded on the site in mapping dated 1920, with various developments of these buildings shown in subsequent mapping until the current layout which is first recorded in the most recent mapping.

The main infrastructure associated with Alexandra Docks is present from the earliest mapping, with a number of large buildings reflecting the largely industrial nature of the surrounding area. Railway sidings are present in the general area providing access to the buildings.

3.0 SITE INVESTIGATION

3.1 INTRODUCTION

The site investigation was undertaken between 3rd and 7th November 2025. Three groundwater and ground gas monitoring visits have been completed between 17th November and 1st December 2025 following the completion of the ground investigation.

Details of the fieldwork methods are given in the notes section at the end of this report.

3.2 SCOPE

The scope of the site investigation included the following:

- 3 No. Cable Percussion boreholes to a maximum depth of 10.45m bgl with dual installations to facilitate ground gas and water monitoring.
- 4 No. Machine excavated trial pits to investigate potential presence of shallow contamination, and general investigation of ground conditions within the red line boundary.
- 2 No. Soil Infiltration tests to BRE365 in the area where SuDS drainage features are proposed.
- Collection of samples for geo-environmental testing purposes to incorporate include sampling of shallow soils.
- Three return monitoring visits to monitor groundwater & ground gas, with groundwater samples obtained on two occasions (10th and 17th October 2024).
- Preparation of a Ground Investigation Report.

Figure 2b shows the layout of the exploratory holes advanced during the site investigation, Exploratory hole logs are presented in Appendix B with photographic plates presented in the figure section of the report.

Upon completion of all cable percussive boreholes the installations were agreed with Tetra Tech Project Team prior to the completion of the installation. The installations were installed to reflect the ground conditions encountered.

3.2.1 Deviations to Scope

There were some minor deviations to the initial scope of works due to constraints on site that meant the works could not be undertaken. Deviations included the following:

- TP04 was originally positioned on the ground investigation exploratory hole plan to be in the highway, and an updated position was received from Burroughs in an email dated 03/11/2025;
- After 24 hours of infiltration testing in SA01 and SA02, Burroughs instructed Tetra Tech to undertake a further 2nd and 3rd test within both locations.

Figure 2 shows the layout of exploratory hole locations. Exploratory hole logs including photographic plates are presented in Appendix B.

4.0 GROUND CONDITIONS ENCOUNTERED

4.1 STRATA ENCOUNTERED

The sequence of strata encountered beneath the site was;

- Topsoil
- Made Ground
- Tidal Flat Deposits

A summary of each stratum depth is provided in the Table 4-1 below, with descriptions of each stratum detailed in the subsequent sections, A summary of installation details outlined in Table 4-2. Exploratory hole logs including photographic plates can also be seen in Appendix B.

Table 4-1 – Summary of Ground Conditions Encountered

Location	Depth of strata (m bgl)				
	Topsoil	Made Ground (Hardstanding)	Made Ground	Peat	Tidal Flat Deposits
BH01	Ne	Ne	GL – 1.50	6.00 – 6.60	1.50 – 6.00 6.60 -10.00*
BH02	Ne	Ne	GL – 1.50	6.00 – 6.50	1.50 – 6.00 6.50 – 10.00*
BH03	Ne	Ne	GL – 3.50	Ne	3.50-10.00*
TP01	GL – 0.05	Ne	0.05 – 0.90	Ne	0.90 – 1.60*
TP02	GL – 0.05	Ne	0.05 – 0.90	Ne	0.90 – 1.50*
TP03	Ne	GL – 0.25	0.25 – 0.60	Ne	0.60 – 1.40*
TP04	GL – 0.10	Ne	0.10 – 1.70*	Ne	Ne
SA01	Ne	Ne	GL-1.50*	Ne	Ne
SA02	Ne	Ne	GL-1.50*	Ne	Ne

Ne – Not Encountered

*Base of strata not proven.

4.1.1 Topsoil (Made Ground)

A thin veneer of topsoil was encountered in three of the exploratory locations to a maximum depth of 0.10m bgl which was encountered within TP04.

These strata were described as a slightly sandy slightly gravelly CLAY. Sands were typically fine to coarse, and gravels were fine to coarse subangular to angular of mudstone, quartzite and rare siltstone and generally consisted of a shade of dark greyish brown. The stratum had local variance in gravel content.

4.1.2 Hardstanding

Hardstanding was encountered in a single location at the site and was encountered to a maximum depth of 0.25m bgl in TP03. This stratum was described as grey concrete.

4.1.3 Made Ground

Made Ground was encountered across the site and was identified in locations, outlined in Table 4-1 above, varying in thickness and being encountered to a maximum depth of 3.50m bgl which was encountered in BH03. This stratum was generally encountered a fine and coarse element and typically consisted of a slightly sandy slightly gravelly CLAY or a clayey fine to coarse SAND and angular to subangular fine to coarse GRAVEL. Sands were typically fine to coarse, and gravels were fine to coarse subangular to angular of siltstone, mudstone and quartzite with rare cobbles of the same.

This stratum had frequent remnants of anthropogenic detritus which included concrete, brick, porcelain tiles and wood. This colour of the strata was typically shades of brown, grey or black.

Deeper Made Ground was encountered to a maximum depth of 2.80m bgl in BH03. This stratum was typically described as grey slightly sandy slightly gravelly CLAY with fragments of wood and timbers.

4.1.4 Tidal Flat Deposits

Tidal Flat deposits were encountered underlying the Made Ground and was found in eight locations to a maximum depth of 10.00m bgl, which was encountered in the cable percussive boreholes BH01-BH03. The strata were entirely encountered as a fine-grained deposit and was described as either a mottled silty CLAY or a clayey SILT on site, with various shades of grey and orangish brown.

Due to drilling methods implemented on site and the required hole depth, the base of this stratum was not encountered.

Table 4-2 – Summary of Installations

Location	Installation Summary				
	Borehole Type (m bgl)	Standpipe Type	Installation Depth (m bgl)	Diameter (mm)	Installation
BH01	Cable Percussive (CP)	Ground Gas	1.00	19	GL – 0.50m (Plain) 1.00m (Slotted)
		Groundwater	10.00	54	GL – 7.00m (Plain) 7.00 – 10.00m (Slotted)
BH02	Cable Percussive (CP)	Ground Gas	1.50	19	GL – 0.50m (Plain) 0.50 – 1.50m (Slotted)
		Groundwater	10.00	54	GL – 2.00m (Plain) 2.00 – 6.00m (Slotted)
BH03	Cable Percussive (CP)	Ground Gas	1.50	19	GL – 0.50m (Plain) 0.50 – 1.50m (Slotted)
		Groundwater	10.00	54	GL – 1.50m (Plain) 1.50 – 3.50m (Slotted) 3.50 – 10.00m (Plain)

4.2 GROUNDWATER

Groundwater strikes were noted in three of the exploratory locations across the site during drilling.

Details of the water strikes can be found in table 4-3 below:

Table 4-3 – Summary of Groundwater Strikes Encountered

Exploratory Location	Groundwater Strike (m bgl)	Comments
	8.00	Groundwater was static after 20minutes
BH02	4.50	Groundwater was static after 20minutes
	3.00	Groundwater rose to 1.50m bgl after 20minutes.

It may be possible further water strikes were encountered, however due to the nature of the cable percussive drilling techniques, and the shallow nature of the other exploratory locations, it was not possible to positively identify these to an accurate depth.

For full details of the water strikes at each location, please see the exploratory logs in Appendix B.

4.3 IN-SITU TESTING

4.3.1 Infiltration Testing

A total of two soil infiltration tests were carried out to BRE 365 Digest, designated as SA01-SA02. The tests were undertaken within the Tidal Flat Deposits at a depth of a 1.00-1.50m bgl as specified by Burroughs in a communication dated 03/11/2025. The results are presented in Table 4-4 below.

Test locations were securely fenced and covered until the testing period was completed and excavations backfilled on completion.

The results of the soil infiltration tests are presented in the following table. Full test results are included in Appendix E of this report.

Table 4-4 - Summary of Infiltration Testing

Location	Depth (m bgl)	Target Strata	Hydraulic Conductivity (m/sec)		
			Test 1	Test 2	Test 3
SA01	1.50	Tidal Flat Deposits	Test failed - did not reach 75% infiltration invert level	Test failed - did not reach 75% infiltration invert level	Test failed - did not reach 75% infiltration invert level
SA02	1.50	Tidal Flat Deposits	Test failed - did not reach 75% infiltration invert level	Test failed - did not reach 75% infiltration invert level	Test failed - did not reach 75% infiltration invert level

4.4 VISUAL OR OLFACTORY EVIDENCE OF CONTAMINATION

No visual or olfactory evidence was encountered within topsoil or natural deposits on site. Exploratory hole locations throughout the site encountered Made Ground with some of the locations having remnants of anthropogenic debris.

Environmental samples were taken from a range of depths across the site and scheduled for testing.

Exploratory locations which encountered minor water seepage were observed to have no shine or odours.

The test results from samples analysed for contamination are included in Appendix C, with further details being provided on the ground investigation logs in Appendix B.

4.5 OBSTRUCTIONS

All exploratory positions were cleared of services and obstructions prior to the start of the works by ADP Group Ltd using a Ground Penetrating Radar (GPR) and a CAT and Genny.

The positions were further re-scanned by a Tetra Tech Engineer every 300mm during excavation. Please note that the GPR clearance was limited to the proposed exploratory positions only.

Obstructions that were encountered during the works, which caused deviations to the original scope, are outlined within section 3.2.1.

5.0 LABORATORY TESTING

5.1 ENVIRONMENTAL TESTING

Environmental chemistry was investigated by specialist chemical analysis of selected soil samples carried out by I2 Environmental Laboratories, an approved supplier in accordance with the requirements of Tetra Tech quality system and UKAS and MCERTS accredited for a range of chemical analyses. The testing was scheduled by Tetra Tech and is summarised in Table 5-1 for soil samples. The test results are included in Appendix C.

Table 5-1 - Summary of Environmental Testing

Test suite	No.
Soil Samples: • Tetra Tech Suite C ○ Heavy metals including Chromium (Hexavalent), Boron (water soluble), Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc, manganese and molybdenum; ○ Inorganics – including pH, Water soluble Sulphate as SO₄ (2:1 Extract), Cyanide (Easily liberatable- low level); ○ Speciated Petroleum Hydrocarbons (TPH CWG); ○ Speciated Polyaromatic Hydrocarbons (USEPA 16); ○ BTEX and MTBE; ○ Asbestos Screen; and, ○ Phenol.	8
Asbestos Quantification	1
Soil Derived Leachate Samples and Groundwater Suites • Tetra Tech Leachate Suite C ○ Heavy metals including Antimony, Boron, Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc, manganese and molybdenum; ○ Inorganics – including pH, Sulphate, Chloride, Nitrite, Nitrate, Total Cyanide, Ammoniacal Nitrogen and NH₃ and NH₄ and Total Alkalinity ○ Speciated Petroleum Hydrocarbons (TPH CWG); ○ Speciated Polyaromatic Hydrocarbons (USEPA 16); ○ BTEX and MTBE; ○ Phenol.	4 (soil leachate) 2 (groundwater)

6.0 GROUNDWATER AND GAS MONITORING

6.1 GROUNDWATER MONITORING

Groundwater levels were monitored on three occasions following the completion of the ground investigation, between 17/11/25 and 01/12/2025. The monitoring data is presented in Appendix D and summarised in Table 6-1 below:

Table 6-1- Summary of Groundwater Levels

Location	Base of borehole (m bgl)	Depth to water (m bgl)		
		17/11/2025	24/11/2025	01/12/2025
BH01 (19mm)	1.10	Water at surface	0.72	1.07
BH01 (50mm)	10.00	2.61	2.31	1.83
BH02 (19mm)	1.60	0.71	0.73	0.60
BH02 (50mm)	6.00	0.67	0.74	0.62
BH03 (19mm)	1.82	Dry	Dry	1.64
BH03 (50mm)	10.00	1.84	1.81	1.65

6.2 GROUND GAS MONITORING

Ground gas levels were monitored on 3 No. occasions following the completion of the ground investigation, between 17th November 2025 and 1st December 2025. The monitoring data is presented in Appendix D and summarised in table 6-2 below:

Table 6-2– Summary of Ground Gas Monitoring

Location	Max. Methane (peak) (% vol)	Max. Carbon Dioxide (peak) (% vol)	Min. Oxygen (steady) (% vol)	Max. Carbon Monoxide (steady) (ppm)	Max. Hydrogen Sulphide (steady) (ppm)	Max. Borehole flow (peak) (l/h)
BH01 (19mm)	15.30	2.0	10.30	2	< 1	1.00
BH01 (50mm)	Location flooded due to high ground water levels.					
BH02 (19mm)	0.50	0.40	21.0	1	< 1	nt
BH02 (50mm)	Location flooded due to high ground water levels.					
BH03 (19mm)	0.30	4.20	13.40	1	< 1	0.70
BH03 (50mm)	0.30	4.50	11.50	1	< 1	0.50

*nt denotes Not Tested.

The results indicate measurable concentrations of carbon dioxide (maximum of 4.50%/vol) and methane (maximum 15.30%/vol).

The maximum gas flow recorded across the monitoring round was a flow of 1 l/hr, recorded at BH01.

The monitoring rounds were undertaken during atmospheric pressure conditions ranging from 990mb to 1026mb. A review of atmospheric pressure graphs on weatheronline.co.uk indicates that monitoring was undertaken during periods of raising and falling pressure.

Maximum concentrations of carbon monoxide and hydrogen sulphide of 2ppm and 1 ppm were recorded respectively.

7.0 GROUND CONTAMINATION ASSESSMENT – HUMAN HEALTH

7.1 INTRODUCTION

The UK Contaminated Land Regime (CLR) is outlined in the Land Contamination Risk Management procedures (Gov.uk, 2026) and allows for a tiered approach to the assessment of ground contamination which is designed to allow increasingly site-specific assessment. In order to assess the potential risk posed by contaminants contained within the soils at the study area a generic quantitative risk assessment (gQRA) has been undertaken by comparing recorded concentrations of chemical constituents in soil with Generic Assessment Criteria (GAC) to identify whether, at the concentrations recorded, the presence of the constituent has the potential to adversely affect the health of site users (a Tier 1 assessment). GAC are set at levels where potential exposure is deemed to be within acceptable limits.

If the recorded concentrations of a particular constituent are below the GAC then the risk is generally considered to be acceptable and further assessment / or mitigation measures are not required. Where a substance is recorded at concentrations higher than GAC this does not necessarily indicate that a particular risk is present, however, it does typically signify the requirement to undertake further assessment in line with the UK tiered risk assessment framework.

7.2 ASSESSMENT CRITERIA

7.2.1 Generic Assessment Criteria

The following GAC for soils have been utilised for the screening process, in order of preference:

- CL:AIRE published C4SL (DEFRA, 2014);
- CIEH/LQM published S4UL (LQM/CIEH, 2015);
- Tetra Tech internal Tier 1 Screening Criteria (issue 15) derived using the derivation tool CLEA version 1.06, in line with the current UK Contaminated Land Regime.

C4SL are currently available for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead¹. The C4SL were originally developed to support the categorisation of sites in accordance with Part 2A are also, based on DEFRA guidance, considered suitable for use during the assessment of sites as part of the planning process.

Where C4SLs are not available, 'Suitable for Use Levels' (S4UL) developed by CIEH/LQM have been used. The S4UL provide GAC based on minimal or tolerable risk intended to be protective of human health for individual or mixtures of substances. It is considered conservative and appropriate to use these values for contaminants for which C4SL are unavailable. GAC for volatile and semi-volatile organic compounds (VOC and SVOC) not presented in the S4UL document are sourced from CL:AIRE (CL:AIRE, January 2010).

Where no published screening values are available Tetra Tech have derived their own values (easily liberatable cyanide).

The CLEA model states that "For most exposure pathways, the contamination is assumed to be at or within one metre of the surface" (Environment Agency, 2009). It is considered that at depths greater than 1.0m,

¹ Arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI, lead assuming 6% SOM (1% SOM C4SL also published for benzene).

the probability of human exposure via the direct contact pathways are significantly reduced, leaving inhalation of volatile compounds as the dominant pathway with regard to human health risks. Typically, volatile compounds only significantly affect the indoor inhalation pathway. The same screening concentrations have been used for all depths at this stage, though it is noted that these are highly conservative for depths below 1.00m bgl.

7.2.2 Proposed End Use

Screening criteria have been developed for the following land use scenarios:

- Residential with plant uptake;
- Residential without plant uptake;
- Allotments;
- Public open space (park and residential);
- Commercial / Industrial.

The proposed development will involve the construction of a new National Grid Electricity Distribution (NGED) Substation. This will include the demolishing of current structures.

The assessment has been undertaken against a Commercial / Industrial end use scenario.

7.2.3 Soil Organic Matter

For organic contaminants, the generic soil screening values have been derived for a range of concentrations of soil organic matter (1%, 2.5%, 6%). In order to provide a conservative assessment the GAC derived for a 1% SOM have been adopted.

7.3 TIER 1 – SOIL SCREENING

A total of eight soil samples collected from across the site were submitted for chemical laboratory analysis. Full copies of laboratory certificates for all soil analysis are included in Appendix C.

The data has been screened against a Commercial / Industrial end use scenario as this enables a conservative comparison that can be justified given the development plan. If the development plan were to change then this assessment should be reviewed.

The site has undergone comparison between the chemical analysis results and the generic assessment criteria for a Commercial / Industrial end use has identified no exceedances, with the exception of three alkaline (>9) pH levels in samples TP02, TP03 and TP04 at 10.5, 9.7 and 10.7 respectively. These samples originate from the Made Ground strata

Elevated pH values are generally associated with anthropogenic components, it is noted that the Made Ground is described as ashy in these locations and it is considered likely that the elevated pH values are attributed to this content.

No other exceedances were identified within the context of the adopted end use.

7.4 ASBESTOS

All samples submitted for environmental testing were subject to asbestos screening, of which one sample returned a positive result for the presence of asbestos in BH02 at 0.2 – 0.3m bgl. Asbestos quantification testing was instructed on 17th December 2025, and the results of which are summarised below.

Table 7-1 – Summary of Asbestos Quantification

Exploratory Hole	Depth (m)	Asbestos Identified (Laboratory Description)	Asbestos Containing Material (Laboratory Description)	Asbestos by hand picking/weighing (mass %)
BH02	0.2-0.3	Loose Fibres	Chrysotile	0.002

Table Notes: ACM = asbestos containing material.

8.0 GROUND CONTAMINATION ASSESSMENT – WIDER ENVIRONMENT

8.1 INTRODUCTION

The potential for contaminated groundwater on site to adversely affect controlled water receptors (groundwater and surface water bodies) has been assessed at this stage by direct comparison of analytical data from the Tetra Tech ground investigation with relevant Water Quality Standards (WQS).

Similarly, the potential for soil contamination to impact controlled waters has been assessed by comparing analytical data from soil derived leachate tests directly against WQS.

8.2 ASSESSMENT CRITERIA

In light of the environmental setting of the site under consideration. The following water quality standards have been adopted, in order of preference.

- Water Framework Directive (WFD),
- Environmental Quality Standards (EQS);²
- WHO 2008 - Petroleum Products in Drinking Water (WHO 2008)
- UK Drinking Water Standards³.

8.2.1 Bioavailability

For certain heavy metals (copper, zinc, manganese, nickel and lead) the bioavailability of the metal within the water can be calculated to generate a bespoke screening criteria based on other groundwater parameters. This assessment is undertaken utilising the Metal Bioavailability Assessment Tool (M-BAT) which was developed using the EQS_(bioavailable) developed in line with the Water Framework Directive.

In the case of copper, zinc, manganese and nickel the assessment takes into account the concentration of calcium, Dissolved Organic Carbon (DOC) and pH of the water sample. The assessment for lead only takes the DOC of the sample into account. A spreadsheet has been developed for the assessment by the UK Technical Advisory Group on the Water Framework Directive.

8.3 SOIL DERIVED LEACHATE METHODOLOGY

Soil derived leachate samples can be used to identify potentially mobile contamination within soil samples collected from the site. It should be noted that the laboratory test methodology indicates a potential mobility of contaminants and is usually considered to reflect a worst-case situation and unlikely to represent on-site conditions.

The laboratory preparation of leachate samples is likely to produce higher concentrations of leachable components than conditions encountered on site and as such the following assessment is considered to be inherently conservative in nature. Furthermore, the resulting data are screened against criteria intended to

² Where WFD 2015 are not presented revoked WFD 2010 standards are used

³ WHO 2005; WHO 2008; UK Water Supply Regulations 2010 and 1989 Regulations. Priority given to UK drinking water standards

be protective of water bodies and drinking water supplies and are not intended to assess the potential significance of contaminant mobility.

8.4 TIER 1 SCREENING ASSESSMENT – SOIL DERIVED LEACHATE

Three soil derived leachate samples were screened against a suite of determinants outlined in Section 8.2.

The following table summarises the determinants which have been identified at concentrations in excess of the adopted screening value.

Table 8-1 – Summary of Exceedances within Soil Derived Leachate Samples

Determinant	Units	Maximum	Minimum	Screening Value	Exceedances	
					No.	Location
Copper (dissolved)	µg/l	5.2	1.8	1*	3	BH03 @ 3 – 3.1m bgl TP02 @ 0.6 – 0.7m bgl TP04 @ 1.4 – 1.5m bgl
Antimony (dissolved)	µg/l	7	2	5 [#]	2	BH03 @ 3 – 3.1m bgl TP02 @ 0.6 – 0.7m bgl
Zinc (dissolved)	µg/l	20	5.9	13.1*	2	TP02 @ 0.6 – 0.7m bgl TP04 @ 1.4 – 1.5m bgl

* Freshwater waters EQS 2015

DWS 2016

N.B the screening value for zinc takes into account the ambient background concentrations (ABC) for the river catchment. The site is located within the River Usk catchment and as such an ABC value of 2.2 is added to the freshwater EQS.

Three determinants were identified within soil derived leachate samples at concentrations in excess of the adopted screening criteria. Antimony exceedances are considered to be minor and have been assessed only against the 2016 Drinking Water Standard. Based on the location of the site it is considered unlikely that groundwater below the site will be used to support drinking water resources.

Given the proximity of the site to Alexandra Docks (70m) and River Usk (100m) concentrations of heavy metals Copper and Zinc can be considered within the context of the bioavailability of the heavy metal based on other soil parameters. The M-BAT tool has been used to calculate site specific screening criteria for these determinants, with the results presented in the Table 8-2.

Table 8-2 – M-BAT adjusted Screening Values for Heavy Metals – Soil Derived Leachate

Determinant	Sample	Concentration (µg/l)	Screening Value (µg/l)	M-BAT Screening Value (µg/l)	Exceedances
Copper	BH03 @ 3 – 3.1m bgl	1.8	1*	29.20	No

Determinant	Sample	Concentration (µg/l)	Screening Value (µg/l)	M-BAT Screening Value (µg/l)	Exceedances
Zinc	TP02 @ 0.6 – 0.7m bgl	5.2	13.1*	35.74	No
	TP04 @ 1.4 – 1.5m bgl	1.9		22.48	No
	TP02 @ 0.6 – 0.7m bgl	20		35.74	No
	TP04 @ 1.4 – 1.5m bgl	18		22.48	No

* Freshwater waters EQS 2016

N.B the screening value for zinc takes into account the ambient background concentrations (ABC) for the river catchment. The site is located within the River Usk catchment and as such an ABC value of 2.2 is added to the freshwater EQS.

As presented in the table above, when bioavailability is taken into consideration no samples have been identified above the adjusted screening criteria.

8.5 TIER 1 SCREENING ASSESSMENT – GROUNDWATER

Two groundwater samples were screened against a suite of determinants outlined in Section 8.2.

The following table summarises the determinants which have been identified at concentrations in excess of the adopted screening value.

Table 8-3 – Summary of Exceedances within Groundwater Samples

Determinant	Units	Maximum	Minimum	Screening Value	Exceedances	
					No.	Location
Fluoranthene	µg/l	0.26	<0.01	0.01#	1	BH03
Benzo(b)fluoranthene	µg/l	0.13	<0.01	0.01#	1	BH03
Benzo(k)fluoranthene	µg/l	0.05	<0.01	0.01#	1	BH03
Benzo(a)pyrene	µg/l	0.07	<0.01	0.01#	1	BH03
Nickel	µg/l	6	2.9	4*	1	BH03

* Freshwater waters EQS 2016

Laboratory Lower Limit of Detection has been utilised as a screening value due to being greater than the available freshwater EQS.

Five determinants were identified within groundwater samples at concentrations in excess of the adopted screening criteria. Fluoranthene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene

exceedances are considered to be minor and have been assessed only against the laboratory's lower Limit of Detection.

Given the proximity of the site to Alexandra Docks (70m) and River Usk (100m) concentrations of heavy metal nickel can be considered within the context of the bioavailability of the heavy metal based on other sample parameters. The M-BAT tool has been used to calculate site specific screening criteria for these determinants, with the results presented in the Table 8-2.

Table 8-4 – M-BAT adjusted Screening Values for Heavy Metals – Groundwater

Determinant	Sample	Concentration (µg/l)	Screening Value (µg/l)	M-BAT Screening Value (µg/l)	Exceedances
Nickel	BH03	6	4*	17.09	No
* Freshwater waters EQS 2016					

As presented in the table above, when bioavailability is taken into consideration no samples have been identified above the adjusted screening criteria.

9.0 PRELIMINARY GROUND GAS ASSESSMENT

9.1 INTRODUCTION

Three return ground gas monitoring visits were undertaken between the 17/11/2025 and 01/12/2025. Full factual site records of the gas monitoring results are presented in Appendix D and summarised in Section 6.2.

9.1.1 Ground Gas Monitoring

Ground gases are monitored within boreholes on the site recording the following parameters.

- Concentrations of ground gases;
 - Methane (%v/v);
 - Carbon dioxide (%v/v);
 - Oxygen (%v/v);
 - Carbon monoxide (ppm);
 - Hydrogen sulphide (ppm);
- Borehole flow rate (l/hr);
- Depth to groundwater;
- Atmospheric pressure trends;

Where groundwater levels are noted to be above the screened sections of the boreholes the data is not considered to be representative of the ground gas regime and are therefore not used within the risk assessment process.

Atmospheric pressure trends are recorded on site during the monitoring process, but are also noted in the preceding three days, and one day after each monitoring visit. Falls in atmospheric pressure are generally considered to indicate a higher potential for ground gas migration from the sub surface and as such monitoring during periods of falling pressure are considered to represent worst case scenarios as outlined in the CL:AIRE Technical Bulletin TB17 (CL:AIRE, August 2018).

9.1.2 Ground Gas Risk Assessment Methodology

The key reference document which has been used to undertake the semi-quantitative ground gas assessment presented in this report is CIRIA C665 (CIRIA, 2007). This provides a framework for assessment of land gas risk to buildings/structures with foundations (i.e. houses and/or commercial properties).

The risk assessment process is based on a Source-Pathway-Receptor Conceptual Site Model Methodology, with consideration given to the potential sources likely to be present on the site and the ground gas monitoring regime designed to reflect the scale of the source potential.

The collected data has been used for the purposes of undertaking a semi-quantitative assessment in accordance with the CIRIA 665 methodology. The calculation used to calculate the gas screening value (GSV) for the site, together with the relevant definition of units, is as follows:

$$\text{GSV (litres of gas/hr)} = \text{borehole flow rate (l/hr)} \times \text{gas concentration (volume/100)}$$

The calculated GSV values are used to determine the Characteristic Situation (CS) for the site in terms of methane and carbon dioxide, based on the conditions outlined in Table 9-1 below.

Table 9-1 –GSV Classification (Modified Wilson and Card Methodology)

Characteristic Situation	Risk Classification	Gas Screening Value Threshold (l/hr)	Additional Considerations
1	Very Low Risk	<0.07	Methane concentration <1% Carbon dioxide <5%
2	Low Risk	<0.7	Borehole flow rate <70 l/hr
3	Moderate Risk	<3.5	-
4	Moderate to High Risk	<15	Quantitative risk assessment required to evaluate scope of protective measures
5	High Risk	<70	-
6	Very High Risk	>70	-

9.2 PRELIMINARY GROUND GAS RISK ASSESSMENT

9.2.1 Conceptual Site Model

The following sections outline the anticipated Source-Pathway- Receptor model associated with the proposed development on site.

Sources

The following potential sources have been identified on and off site.

- Made Ground deposits
- Tidal Flat deposits

Pathways

The following potential pathways have been identified which may act as preferential pathways for ground gas migration:

- The underlying strata have been classified as consisting of:
 - Made Ground of varying consistency including granular materials.
 - Generally fine grained tidal flat deposits. Soil infiltration testing has demonstrated generally low permeability in the natural strata below the site.
- Buried service runs and existing foundations, including sub-floor voids.

Receptors

Within the context of ground gases, the following enclosed structures are considered to represent potential receptors.

- The existing structure on the site;
- Structures within proposed development – it is assumed that the proposed development will include permanent structures with enclosed spaces including office spaces / workshops / welfare facilities.

9.2.2 Risk Assessment – Methane and Carbon Dioxide

In order to assess the significance of ground gases at the site, measured concentrations and flow rates have been used to derive Gas Screening Values (GSVs). GSVs are the product of gas concentration and gas flow measured in a borehole and provide an indication of the flow of the particular gas in question out of the ground.

Due to the limited data obtained from the site the worst-case values have been used within the risk assessment.

Based on a maximum flow recorded of 1l/hr and the maximum recorded concentration of carbon dioxide (CO₂) and methane (CH₄) during the three monitoring visits, the GSVs have been calculated as presented in Table 9-2.

Table 9-2 – Initial GSV Calculations

	Maximum Concentration (%)	Maximum Flow Rate (l/hr)	GSV (l/hr)	Characteristic Situation (Wilson and Card)
Carbon Dioxide	4.50	1.00	0.045	CSV1
Methane	15.30	1.00	0.153	CSV2

These values have been compared with the Revised Wilson and Card Classification presented in Table 9-1.

The risk assessment process indicates the site is representative of Characteristic Situation 1 (Very Low Risk) for Carbon Dioxide and Characteristic Situation 2 (Low Risk) for Methane, based on the recorded concentrations of carbon dioxide and methane and maximum flow rates within the sub surface.

9.2.3 Carbon Monoxide and Hydrogen Sulphide

Maximum concentrations of carbon monoxide and hydrogen sulphide were recorded at 2ppm and 1ppm throughout the monitoring period. The recorded concentrations are considered to be suitably low to negate the requirement for additional risk assessment.

9.2.4 Atmospheric Pressure Trends

Atmospheric Pressure on site was found to fall during the first and second monitoring visit and slightly rise on the third visit. In the three days prior and day after monitoring visits atmospheric pressure was found to generally be rising for the first monitoring visit and was found to be falling for the second and third visits.

9.3 SUMMARY AND DISCUSSION

The site has been classified as Characteristic Situation 1 (Very Low Risk) for Carbon Dioxide and Characteristic Situation 2 (Low Risk) for Methane, based on the worst-case recorded concentrations of carbon dioxide and methane and maximum flow rates.

Whilst the underlying strata are anticipated to be low permeability, the recorded presence of Made Ground and potential for tidally influenced groundwater levels below the site it is recommended that based on the recorded concentrations, gas protection measures appropriate for a Characteristic Situation 2 are utilised or extended continuous gas monitoring is conducted to more acutely determine the risk levels. Any ground gas protection measures should be designed in line with the requirements of BS8485:2015+A1:2019.

10.0 CONCEPTUAL SITE MODEL & PRELIMINARY GROUND CONTAMINATION RISK ASSESSMENT

10.1 OVERVIEW

The information presented in the previous sections of this report have been collated and evaluated to establish an initial qualitative risk assessment for the site. A conceptual model of the site has been generated based on information derived from this Phase 1 Geo-environmental Assessment, supplemented by information attained during the Tetra Tech site walkover.

The site has been considered with regard to current UK legislation and guidance, namely Part 2A of the Environmental Protection Act 1990 and the Contaminated Land (England) Regulations 2006, as amended, and in accordance with current UK good practice guidelines (for example BS10175:2011).

In general, ground contamination can occur through several causes, particularly from historical operations and activities. Contamination can result from either on-site sources or from on-site migration from off-site sources, leading to long term liabilities under recent legislation for any site owner.

For a risk of pollution or environmental harm to occur as a result of ground contamination, all of the following elements must be present:

- Source, i.e. a substance that is capable of causing pollution or harm;
- Pathway, i.e. a route by which the contaminant can reach a target; and
- Receptor (target), i.e. something which could be adversely affected by the contaminant.

If one of these elements is absent there can be no significant risk. If all are present then the magnitude of the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

10.2 CURRENT SITE USAGE AND PROPOSED DEVELOPMENT

The site is currently unoccupied, featuring two disused single storey buildings, shipping containers (including office) and an active substation building with associated parking and an area of disused land.

It is understood that the proposed development will involve the construction of a new National Grid Electricity Distribution (NGED) Substation.

10.3 CONCEPTUAL SITE MODEL

The key source, pathways and receptor model is outlined below within the context of potential development of the site.

As the proposed development is for a new substation installation, the following risk assessment is undertaken in the context of an industrial/commercial end use scenario to provide a conservative approach.

10.3.1 Potential Sources of Contamination

The main potential sources of contamination on the site are associated with existing features as well as historical land uses on the site as summarised below.

On site Sources

- Made Ground associated with former development on the site;
- Asbestos containing materials
- Ground Gas
- Historical/existing substations

Off Site Sources

- Infilled/Made Ground

10.3.2 Potential Contaminant Pathways

The following contaminant pathways are considered to potentially be active based on the current site use and proposed development:

Human Exposure Pathways

- Direct dermal contact or ingestion of soils, or inhalation of dust and/or vapours (i.e. human interaction with surface and sub-surface materials) during the demolition/construction phase of works.

Environmental Pathways

- Leaching and horizontal or vertical migration through the unsaturated ground, either through permeable sub-surface materials and/or preferential pathways;
- Lateral and vertical migration of groundwater through permeable sub-surface materials and/ or preferential pathways;
- Leaching to surface water run-off/drainage;
- The migration and accumulation of gases or vapours through permeable sub-surface materials and/ or preferential pathways.

10.3.3 Potential Receptors at Risk

The following potential receptors have been identified:

Human Health

- Future site users (non-permanent substation operatives);
- Site workers during the redevelopment of the site;
- Adjacent site users (commercial);

Wider Environment

- Secondary B Aquifer within bedrock deposits;
- Surface waters (River Usk and Alexandra Dock);
- Building Infrastructure and supply pipes.
- Adjacent Properties

10.4 GROUND CONDITIONS RISK ASSESSMENT

The source, pathway, receptor linkages identified in the previous section are outlined and a qualitative risk assessment shown in the following tables.

The risk assessment considers the site within an area context and assesses potential risks to identified receptors in relation to the existing site setting and the proposed development. CIRIA C552 has been used to define the risk rating presented in the Qualitative Risk Assessment matrix, the methodology for which is presented in Appendix F.

Table 9-3 – CIRIA C552 Qualitative Risk Assessment

This matrix is based on CIRIA C552 risk evaluation methodology, definitions for risk ratings is presented in Appendix F.						
Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Potential risk management requirements
Made Ground associated with the former/current development on the site	Direct dermal contact or ingestion of soils	Current site users	Medium	Unlikely	Low risk	Laboratory testing of samples obtained during the ground investigation did not indicate the presence of any contaminants at concentrations in excess of the relevant screening criteria. Elevated pH values are considered to be associated with the presence of ash and other anthropogenic materials within the Made Ground, however given the limited interaction with near surface soils, the recorded values are not considered to pose a significant risk to site users. There is a potential for PCBs from the substation dated from the 1970s; these chemicals are of low mobility and may be present within Made Ground. Proposal drawing nr SKT180325 Rev 0, the historical substation dated 1976 will be removed and replaced with new
		Future site users		Unlikely	Low risk	
		Construction workers		Low likelihood	Moderate / Low risk	

This matrix is based on CIRIA C552 risk evaluation methodology, definitions for risk ratings is presented in Appendix F.						
Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Potential risk management requirements
	Leaching and lateral migration through groundwater and perched water		Mild			hardstanding placed, removing the pollutant linkage pathway. Risks to construction workers should be managed through the CDP regulations, the adoption of good on-site hygiene and PPE.
		Groundwater		Low likelihood	Low Risk	Potential PCBs from the electrical substation are low mobility chemicals and coupled with the low permeability Tidal Flat Deposits underlying site, are unlikely to leach into groundwater or Alexandra Docks. Elevated heavy metals (Copper, Zinc, and Antimony) were recorded in soil derived leachate samples from shallow soils. While concentrations are elevated relative to the respective the EQS values once the aggressive nature of the
		Surface waters		Low likelihood	Low Risk	

This matrix is based on CIRIA C552 risk evaluation methodology, definitions for risk ratings is presented in Appendix F.						
Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Potential risk management requirements
		Building supply pipes		Unlikely	Very Low risk	leachate testing and site-specific bioavailability are taken into account, no further risk management procedures are considered necessary. Groundwater monitoring indicated elevated concentrations of PAH within BH03 which are likely to be associated with the area of deeper Made Ground. The introduction of further areas of hardstanding as part of the proposed development plan will reduce the rate of infiltration across the site, thereby reducing the overall mobility of the potential contaminants. With regards to building supply pipes, volatile contaminants have not been identified on the site, however the requirement for barrier pipe should be considered within the context of WRAS requirements and the proposed development.

This matrix is based on CIRIA C552 risk evaluation methodology, definitions for risk ratings is presented in Appendix F.						
Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Potential risk management requirements
Asbestos containing materials	Inhalation	Current site users	Medium	Unlikely	Low Risk	Asbestos containing materials (ACM) were identified as present within one sample submitted for testing, collected at a depth of 0.20-0.30m bgl quantified at 0.002%. Given the historical development and location of the site the potential for further ACM presence cannot be discounted. Within the context of the proposed development specific risk management procedures are not considered necessary however a Reactive Approach should be put in place during any development works to identify and manage any suspected ACM which may be identified.
		Future site users		Unlikely	Low Risk	
		Construction workers		Low likelihood	Moderate / Low Risk	
Ground gas generation (on and off site)	The migration and accumulation of gases or vapours	Current site users	Medium	Likely	Moderate Risk	Ground gas monitoring has detected elevated concentrations of Methane and Carbon Dioxide within monitoring installations. As a result, an overall

This matrix is based on CIRIA C552 risk evaluation methodology, definitions for risk ratings is presented in Appendix F.						
Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Potential risk management requirements
	through permeable sub-surface materials and/ or preferential pathways.	Future site users		Likely	Moderate Risk	classification of Characteristic Situation 2 has been assigned to the site. As a result, it is recommended that gas protection measures appropriate for a Characteristic Situation 2 are incorporated into the design and construction of any direct-to-ground buildings or occupied structures within the proposed development. As an initial alternative extended continuous gas monitoring can be conducted to further determine the risk levels posed, allowing for the categorisation of any potential link with tidal influence given the proximity of the River Usk.
		Construction workers		Likely	Moderate Risk	
		Building infrastructure		Likely	Moderate Risk	

11.0 CONCLUSIONS AND RECOMMENDATIONS

11.1 CONCLUSIONS

11.1.1 Ground Contamination

When screened against a Commercial / Industrial end use scenario no potential contaminants of concern were identified to be in exceedance of the nominated values, with the exception of elevated alkaline (>9) pH levels within three samples to a maximum of 10.7. The presence of elevated pH values is likely to be attributed to the presence of ash and other anthropogenic materials within the Made Ground. However, based on the proposed development and nature of the site, only limited interaction is anticipated within the shallow soils. As such no risk management procedures are considered necessary.

There is a current substation structure on the site potentially dating back to the 1970s. Whilst the potential for PCBs to be present on the site remains, the of potential risk to human health is considered to be low. Drawing nr SKT180325 Rev 0 indicates the presence of hardstanding across the site, furthermore direct interaction with shallow soils is anticipated to limited. If the proposed development is subject to significant change, it is recommended to test specifically for the presence of PCB contamination within shallow soils on site during future ground investigation.

11.1.2 Asbestos

A single sample submitted for testing returned a positive asbestos containing material identification, consisting of loose Chrysotile fibres, quantified by hand picking method as 0.002 mass%. Based on the nature of the site, the presence of further asbestos containing materials cannot be discounted. However, the recorded concentrations and limited interaction with near surface soils / proposed presence of hardstanding will reduce the risk potential to a level whereby no further risk management procedures are considered necessary.

A reactive approach is recommended during the development phase to identify and assess any potential asbestos containing materials encountered during the development phase.

11.1.3 Controlled Waters

Soil derived leachate testing was conducted on three soil samples, returning exceedances against nominated screening values for concentrations of Copper, Zinc and Antimony. When the Site-Specific-Bioavailability of Copper and Zinc are calculated utilising the M-Bat Screening tool, neither are found to be in exceedance. Furthermore, when the aggressive nature of leachate testing is taken into account, the recorded concentrations are not considered to pose a significant risk to controlled waters.

Elevated concentrations of Polycyclic Aromatic Hydrocarbons (Fluoranthene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene) have been recorded within one groundwater sample which are considered to be associated with the area of deeper Made Ground, however the recorded concentrations are considered to be limited and given the location of the site the recorded concentrations are not considered to pose a significant risk to controlled waters.

Whilst PCBs may be present within shallow made ground, the potential risk to controlled waters is considered to be low, as PCBs are of low mobility and is furthermore coupled with the low permeability Tidal Flat Deposits confirmed to underlie site.

11.1.4 Ground Gas

Ground gas monitoring has detected elevated concentrations of Methane (15.3%) and Carbon Dioxide (4.5%) within monitoring installations, with maximum borehole flow of 1.l/hr. Maximum concentrations of carbon monoxide and hydrogen sulphide were recorded at 2ppm and 1ppm throughout the monitoring period.

As a result, the site has been classified overall as Characteristic Situation 2 (Low Risk). Based on this classification, ground gas protection measures will be required for new developments in line with the requirements of BS8485:2015+A1:2019.

11.2 RECOMMENDATIONS

Gas protection measures appropriate for a Characteristic Situation 2 are recommended to be incorporated into the design and construction of any direct-to-ground buildings or occupied structures within the proposed development. As an initial alternative extended continuous gas monitoring can be conducted to further determine the risk levels posed, allowing for the categorisation of any potential link with tidal influence given the proximity of the River Usk.

A reactive approach is recommended during the development phase to identify any further asbestos containing materials within the Made Ground strata on the site.

12.0 NOTES

1. Standards

All boring operations, sampling of soils, *in situ* testing and geotechnical laboratory testing have been carried out in accordance with the recommendations of the British Standards BS 5930(2015)⁽¹⁾, BS 1377 (1990)⁽²⁾ and BS10175 (2001)⁽³⁾.

Soil and rock descriptions follow the recommendations of BS 593. Where descriptions or classifications are based on other documents (e.g. BS 8004 (1986) or CIRIA Project Report 11 (1993)), this is stated in the report text.

2. Site methods

Unless specifically stated otherwise, the following methods are used for exploratory holes.

- Holes described as cable percussive are bored using a light cable percussive rig. Standard penetration tests are carried out where appropriate, as shown in the logs. Disturbed and undisturbed samples are taken from the exploratory holes at the depths on the records.
- Window sampling generally uses the windowless sampling method, using a tracked Geotool.
- Dynamic probes are usually heavy dynamic probes, using the same tracked Geotool used for window sampling.

3. Definitions and abbreviations

The following terms are used in the exploratory hole logs

Samples

U	Undisturbed 102mm dia. sample
TW	Thin Walled undisturbed 102mm dia. sample
B	Bulk sample
D	Small disturbed sample
W	Water sample
CBR	California Bearing Ratio test or CBR value obtained from Mexiprobe test

In situ tests

S	Standard penetration test (SPT)
N	SPT N value (blows/300mm)
HP	Hand penetrometer – shear strength
SV	Hand shear vane – shear strength
VOC	Volatile organic compounds (ppm)
PID	Photo-ionisation detector – used to detect the presence of VOCs.

Core recovery and rock quality

TCR	Total core recovery (%)
SCR	Solid core recovery (%)
RQD	Rock quality designation (%)
FI	Fracture index
NR	No recovery
NI	Not intact

Rotary drilling sizes

Index letter	Nominal diameter (mm)	
	Borehole	Core
N	75	54
H	99	76
P	120	92
S	146	113

Water strikes

▽	Level of water strike
▼	Water level rose to this level (see Remarks at foot of log for details)

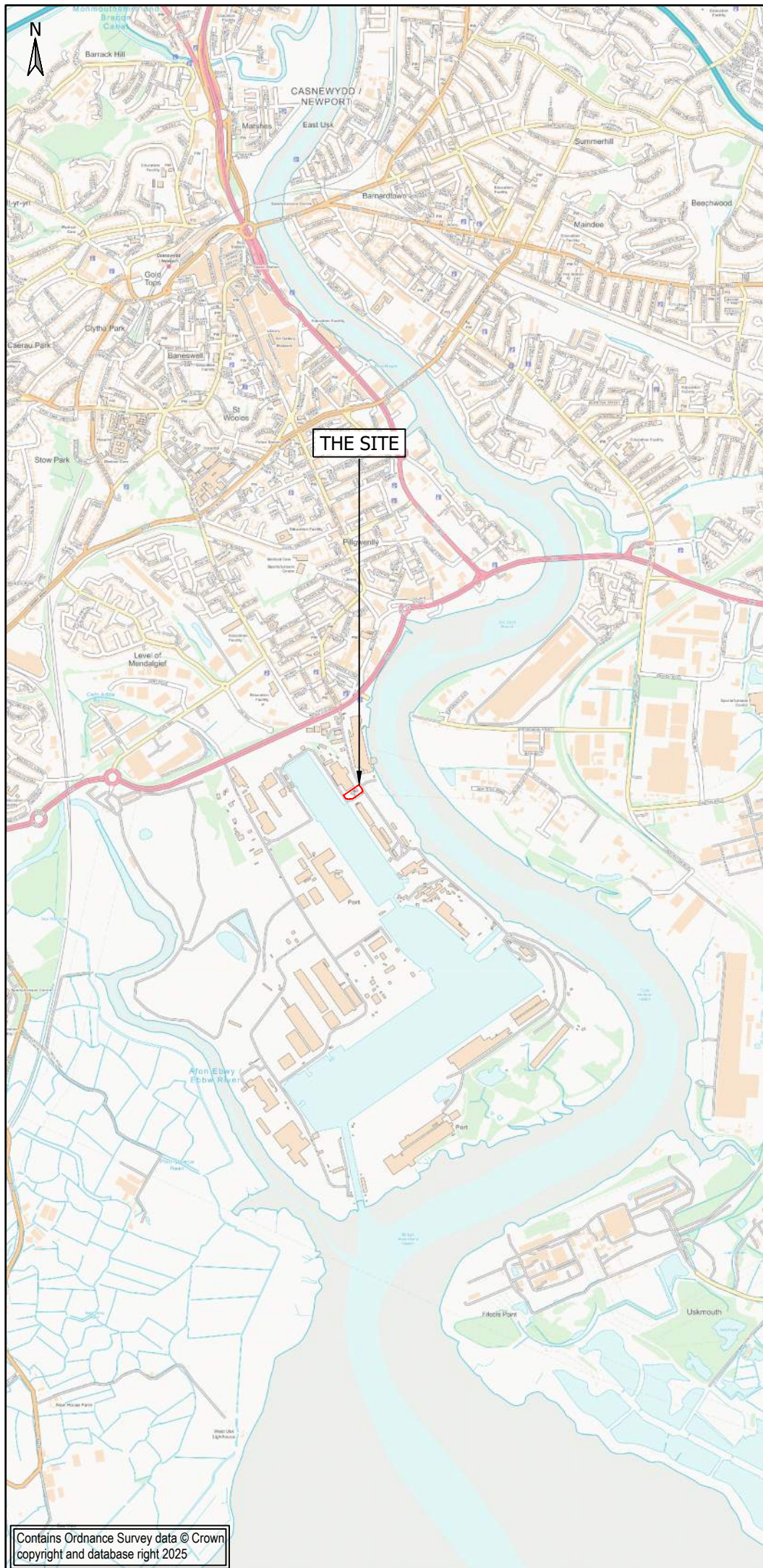
Depth means depth below existing ground level unless otherwise specified. Values specified in soil descriptions given in the exploratory hole logs are depths unless otherwise specified.

13.0 REFERENCES

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FIGURES

Figure 1 – Site Location Plan



PRELIMINARY ISSUE

P01	PRELIMINARY FIRST ISSUE					24.11.2025	PP	JC	NEB
Rev	Description				Date	Dm / Chk	App		

Document Control

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NATIONAL GRID ELECTRICITY DISTRIBUTION

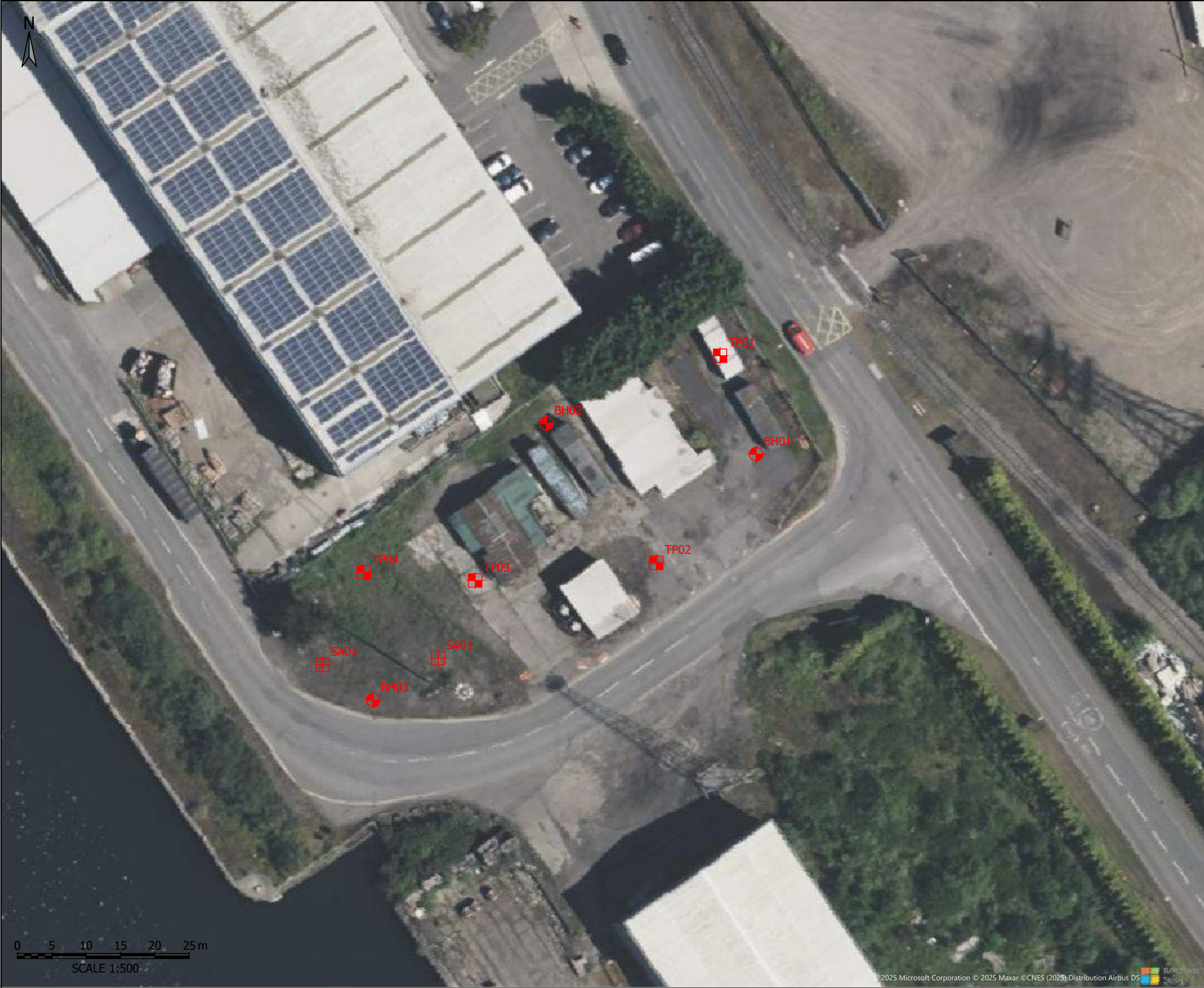
Project Name
NEWPORT DOCKS

Sheet Title

SITE LOCATION PLAN

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A4	Suitability
784-B075043	PP	24.11.25	JC	24.11.25	NEB	24.11.25	1:25,000	S0
Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision	
B075043	- TTE	- 00	- XX	- DR	- U	- 0001	P01	

Figure 2 – Site Investigation Layout Plan



- LEGEND:
- TRIAL PIT
 - SOAKAWAY
 - BOREHOLE

PRELIMINARY ISSUE

P01	PRELIMINARY FIRST ISSUE	24.11.2025	PP	JC	NEB
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Client

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Project Name

NEWPORT DOCKS

Sheet Title

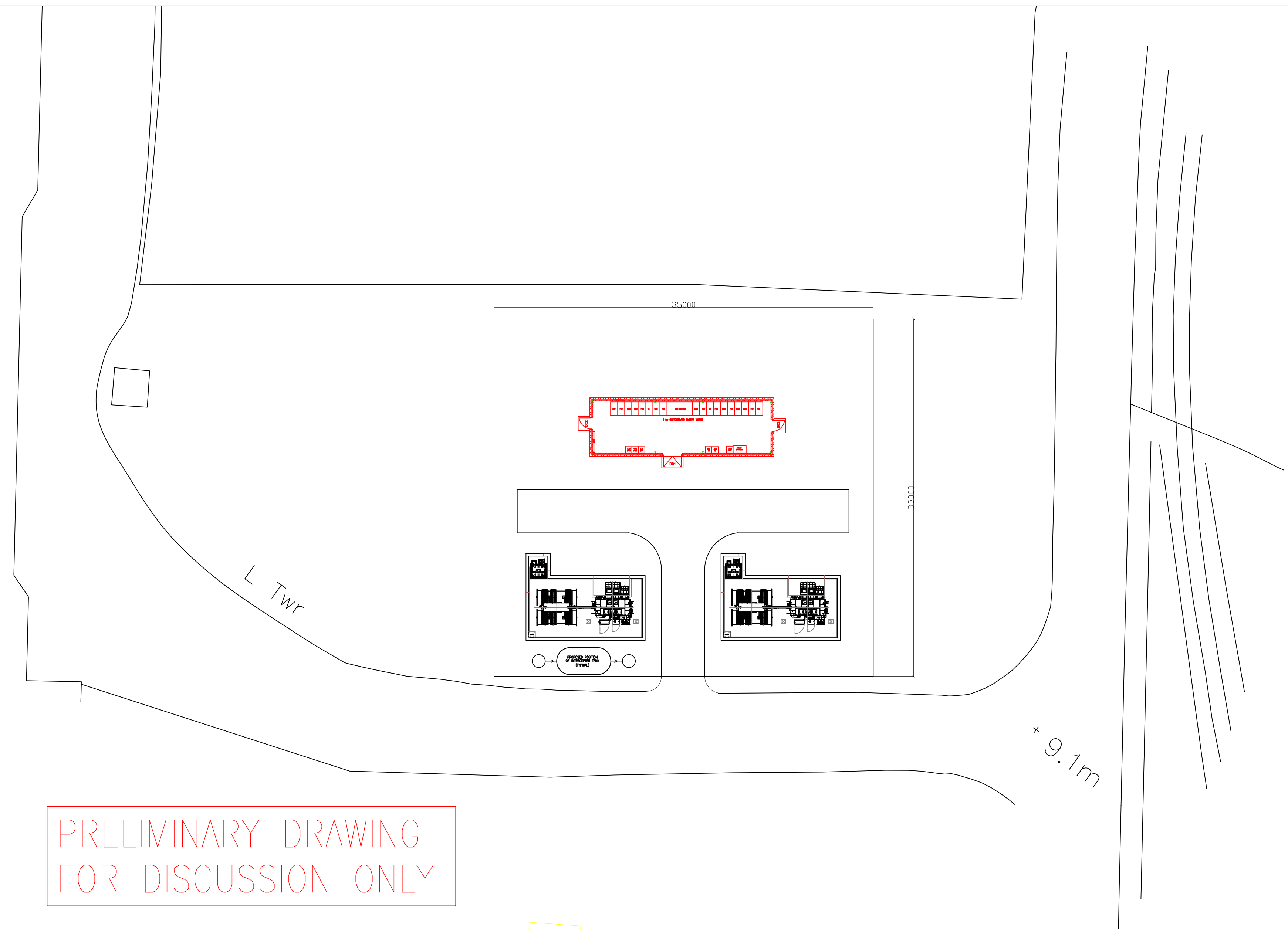
SITE INVESTIGATION LAYOUT PLAN

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A3	Suitability
784-B075043	PP	24.11.25	JC	24.11.25	NEB	24.11.25	1:500	50
Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision	
B075043	- TTE	- 00	- XX	- DR	- U	- 0002	P01	

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TTE_MT_v1

OUTLINE DEVELOPMENT PLAN



PRELIMINARY DRAWING
FOR DISCUSSION ONLY

						ORIGINAL ISSUE	Date
						Drawn	GR 18.03.25
						Checked	
						Approved	
0	GR			18.03.25	ISSUED FOR DISCUSSION	SCALE:	AS SHOWN
Rev No	Drawn	Chk'd	App'd	Date	Revision	ORIGINAL SHEET SIZE: A2	

nationalgrid Electricity Distribution		Engineering Design (South Wales) Lamby Way, Cardiff CF3 2EQ	
Title		Drg. No.	Rev No.
USK WAY 33/11kV SUBSTATION		SKT180325	0
PROPOSED LOCATION EXISTING SUB REMOVED			

APPENDIX A: REPORT CONDITIONS

APPENDIX A – REPORT CONDITIONS

GROUND INVESTIGATION

This report is produced solely for the benefit of National Grid Electricity Distribution and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site.

This report is based on a visual site inspection, reference to accessible referenced historical records, information supplied by those parties referenced in the text and preliminary discussions with local and Statutory Authorities. Some of the opinions are based on unconfirmed data and information and are presented as the best that can be obtained without further extensive research. Where ground contamination is suspected but no physical site test results are available to confirm this, the report must be regarded as initial advice only, and further assessment should be undertaken prior to activities related to the site. Where test results undertaken by others have been made available these can only be regarded as a limited sample. The possibility of the presence of contaminants, perhaps in higher concentrations, elsewhere on the site cannot be discounted.

Whilst confident in the findings detailed within this report because there are no exact UK definitions of these matters, being subject to risk analysis, we are unable to give categoric assurances that they will be accepted by Authorities or Funds etc. without question as such bodies often have unpublished, more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to Tetra Tech. In time improved practices or amended legislation may necessitate a re-assessment.

The assessment of ground conditions within this report is based upon the findings of the study undertaken. We have interpreted the ground conditions in between locations on the assumption that conditions do not vary significantly. However, no investigation can inspect every part of the site and therefore changes or variances in the physical and chemical site conditions as described in this report cannot be discounted.

The report is limited to those aspects of land contamination specifically reported on and is necessarily restricted and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents. The opinions expressed cannot be absolute due to the limitations of time and resources imposed by the agreed brief and the possibility of unrecorded previous use and abuse of the site and adjacent sites. The report concentrates on the site as defined in the report and provides an opinion on surrounding sites. If migrating pollution or contamination (past or present) exists further extensive research will be required before the effects can be better determined.

APPENDIX B: EXPLORATORY HOLE LOGS

Tt TETRA TECH Project: NGED Newport Docks Location: Newport Docks Client: National Grid						Location Details						Status		Borehole Number	
						Easting: 331649.50 Northing: 185830.28						FINAL		BH01	
						Level: 9.07mAOD Depth: 10.00m									
						Logger: Type: CP									
						Inclination: °									
Method, Plant and Crew						Diameter		Casing		Drilling Progress by Time				Scale: 1:50	
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By:	JC
0.00	1.20	Inspection Pit	Insulated Hand Diggig Tools	Apex	1.20	300	1.20	300	03/11	00:00	9.00	9.00	8	Approved By:	NEB
1.20	10.00	Cable Percussion	Cable Percussion Rig	Apex	10.00	200	10.00	200	04/11	08:30	10.00	10.00	8	Start Date:	03/11/2025
														Finish Date:	04/11/2025
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing			
												Depth (m)	Ref	Tests / Results	
MADE GROUND: Dark grey sandy gravelly CLAY with rare thin rootlets (<2mm). Sand is fine to coarse. Gravel is angular to subangular fine to coarse of sandstone, brick, quartzite and mudstone.								0.50	8.57			0.00 - 0.50	B1		
MGR(TS) MADE GROUND: Dark grey slightly sandy gravelly ashy CLAY with a medium cobble content. Sand is fine to coarse. Gravel is sub angular to subrounded fine to coarse of quartzite, brick, porcelain, mudstone and rare sandstone. Cobbles are subrounded of mudstone.												0.00 - 0.50	ES1		
												0.20 - 0.30	ES2		
												0.50 - 0.60	ES4		
												0.50 - 1.00	B2		
												0.50 - 1.00	ES3		
												1.00 - 1.50	B3		
												1.00 - 1.50	ES5		
												1.50 - 6.00	B4		
												1.50 - 6.10	ES6		
												1.80 - 1.90	ES7		

Tt TETRA TECH Project: NGED Newport Docks Location: Newport Docks Client: National Grid						Location Details				Status FINAL		Borehole Number				
						Easting: 331619.03 Northing: 185834.76 Level: 8.97mAOD Depth: 10.00m Logger: Type: CP Inclination: °						BH02				
																Sheet 1 of 1
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time				Scale: 1:50			
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By:	JC	
0.00	1.20	Inspection Pit	Insulated Hand Digging Tools	Apex	1.20	300	1.20	300	04/11	10:00	7.00	7.00	4.5	Approved By:	NEB	
1.20	10.00	Cable Percussion	Cable Percussion Rig	Apex	1.20	200	10.00	200	05/11	09:30	10.00	10.00	4.5	Start Date:	04/11/2025	
														Finish Date:	05/11/2025	
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing				
												Depth (m)	Ref	Tests / Results		
MADE GROUND: Grey slightly clayey fine to coarse SAND and angular to subangular fine to coarse GRAVEL of mixed lithologies including brick, stone, porcelain, quartzite and mudstone with a low content. Cobbles are subrounded of mudstone.								1.50	7.47		0.00 - 1.20	B1				
MGR											0.20	ES1				
											0.50	ES2				
											1.20 - 6.00	B2				
											Firm grey slightly sandy slightly gravelly CLAY with rare black organic matter (<2mm). Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, quartzite and rare sandstone.					
TF																
Soft to Firm grey locally orangish brown slightly sandy CLAY. Sand is fine to coarse. (PEAT).							6.00	2.97		6.00 - 6.10	ES4					
PEAT							6.00 - 6.50	B3								
Firm grey locally mottled greyish brown slightly sandy slight gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and rare quartzite.							6.50	2.47		6.50 - 8.00	B4					
TF							6.70 - 6.80	ES5								
							8.00 - 10.00	B5								
							9.10 - 9.20	ES6								
EOH at 10.00m - Target Depth Achieved							10.00	-1.03								
Observations / Remarks										Chiselling			Water Added		Hammer Information	
1. Location cleared by ADP Group Ltd with GPR and with CAT and Genny by TT Engineer. 2. Groundwater encountered at 4.5m bgl. 3. Upon completion, location installed and backfilled. 4. Samples: ES = Environmental Sample, B = Bulk.										From (m)	To (m)	Time (mins)	From (m)	To (m)	Serial No.	Energy Ratio %
										7.50	8.50	120				
										Groundwater						
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks		784-B075043									
4.50	-	-	20	4.50												

Tt TETRA TECH Project: NGED Newport Docks Location: Newport Docks Client: National Grid <td colspan="4">Location Details Easting: 331593.81 Northing: 185794.54 Level: 9.12mAOD Depth: 10.00m Logger: Type: CP Inclination: °</td> <td colspan="2">Status FINAL</td> <td colspan="2">Borehole Number BH03</td>						Location Details Easting: 331593.81 Northing: 185794.54 Level: 9.12mAOD Depth: 10.00m Logger: Type: CP Inclination: °				Status FINAL		Borehole Number BH03					
																Sheet 1 of 1	
																Scale: 1:50	
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time					Checked By: JC			
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Approved By: NEB			
0.00	1.20	Inspection Pit	Insulated Hand Digging Tools	Apex	1.20	300	1.20	300	05/11	17:00	3.50	3.50	3	Start Date: 05/11/2025			
1.20	10.00	Cable Percussion	Cabl Percussion Rig	Apex	10.00	200	10.00	200	06/11	13:00	10.00	10.00	3	Finish Date: 06/11/2025			
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing					
												Depth (m)	Ref	Tests / Results			
TOPSOIL: Dark brown slightly sandy slightly gravelly CLAY with rare thin rootlets (<1mm). Sand is fine to coarse. Gravel is subangular of mudstone and rare quartzite. MADE GROUND: Grey slightly sandy gravelly CLAY with a medium cobble content. Sand is fine to coarse. Gravel is angular to sub angular fine to course of brick, porcelain and mudstone. Cobbles are sub rounded of mudstone.								0.25	8.87			0.00 - 1.50	B1				
												0.20 - 0.30	ES1				
MADE GROUND: Grey slightly sandy slightly gravelly CLAY with mild hydrocarbon odour noted. Sand is fine to coarse. Gravel is angular to sub angular fine to coarse of brick, quartzite, mudstone and rare sandstone.								1.20	7.92			1.50 - 2.80	B2				
												1.70 - 1.80	ES2				
MADE GROUND - DRILLER'S DESCRIPTION								2.80	6.32			2.80 - 3.50	B3				
												3.00 - 3.10	ES3				
Firm brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and rare quartzite.								3.50	5.62			3.50 - 4.50	B4				
												3.60 - 3.70	ES4				
Firm brown locally mottled dark grey slightly sandy slightly gravelly CLAY with rare black organic matter (<2mm). Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone, quartzite and rare siltstone.								4.50	4.62			4.50 - 5.00	B5				
												4.60 - 4.70	ES5				
Firm brown locally mottled blueish grey slightly sandy slightly gravelly CLAY with rare black organic matter (<2mm). Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, siltstone and rare quartzite.								5.50	3.62			5.00 - 5.10	ES6				
												5.00 - 5.50	B6				
Firm brown locally mottled dark grey sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, siltstone and rare quartzite.								8.00	1.12			5.50 - 8.00	B7				
												6.00 - 6.10	ES7				
EOH at 10.00m - Target Depth Achieved								10.00	-0.88			8.00 - 10.00	B8				
												8.10 - 8.20	ES8				
Observations / Remarks										Chiselling		Water Added		Hammer Information			
1. Location cleared by ADP Group Ltd with GPR and with CAT and Genny by TT Engineer. 2. Groundwater encountered at 3.0m bgl. 3. Upon completion, location installed and backfilled. 4. Samples: ES = Environmental Sample, B = Bulk.										From (m)	To (m)	Time (mins)	From (m)	To (m)	Serial No.	Energy Ratio %	
										2.80	3.50	180					
										Groundwater				Project Number			
										Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	784-B075043	
										3.00	-	-	20	1.50			

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Tt TETRA TECH	Project: NGED Newport Docks		Location Details			Status		Pit Number		
	Location: Newport Docks		Easting: 331592.46 Northing: 185813.12			FINAL		TP04		
Client: National Grid		Level: 9.01mAOD Depth: 1.70m			Logger: SA Type: TP		Sheet 1 of 1			
Pit Dimensions 0.60m 1.20m		Hole Information		Groundwater				Scale: 1:25		
		Orientation: °		Strike (m)	Rose To (m)	After (mins)	Remarks	Checked By: JC		
		Shoring: None						Approved By: NEB		
		Stability: Moderate						Start Date: 03/11/2025		
		Plant: JCB 3CX						Finish Date: 04/11/2025		
Strata Description			Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Samples and Testing		
TOPSOIL: Dark greyish brown slightly sandy slightly gravelly CLAY, sand is fine to coarse. Gravel is angular to subangular fine to coarse of mudstone, quartzite and rare siltstone. TOP MADE GROUND: Greyish Brown locally yellowish brown clayey fine to coarse SAND and angular to subangular fine to coarse GRAVEL of mudstone, ballast, quartzite and sandstone. MGR				0.10	8.91			Depth (m)	Ref	Tests / Results
								0.50 - 0.60	ES1	
								0.70 - 0.80	ES2	
								0.90 - 1.00	ES3	
MADE GROUND: Brownish grey slightly sandy slightly gravelly CLAY with a low cobble content. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of rare ballast, mudstone, siltstone and quartzite. Cobbles are of subrounded mudstone.				0.90	8.11			1.40 - 1.50	ES4	
MGR										
EOH at 1.70m - Target Depth Achieved				1.70	7.31					
Observations / Remarks										
1. Location cleared by ADP Group Ltd with GPR and with CAT and Genny by TT Engineer.			Hodge House, 114-116 St Mary Street, Cardiff, CF10 1DY							
2. Groundwater not encountered.			029 2082 9200							
3. Upon completion, location backfilled.			Project Number							
4. Samples: ES = Environmental Sample, B = Bulk.			784-B075043							



Plate 1 TP01



Plate 2 TP02

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Environmental Consultancy
Ground Technologies & Investigation



Project :-
Alexandra Docks

NGED

Project No.:

B075043



Plate 3

TP03



Plate 4

TP04

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Ground Technologies & Investigation

Project :-
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Plate 5

BH01



Plate 6

BH02

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Ground Technologies & Investigation



Project :-
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NGED

Project No.:

B075043



Plate 7

BH03

BLANK

Plate 8

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Environmental Consultancy
Ground Technologies & Investigation



Project :-
Alexandra Docks

NGED

Project No.:

B075043

APPENDIX C: ENVIRONMENTAL LABORATORY RESULTS

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e: james.craddock@tetrattech.com

i2 Analytical Ltd.
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Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404

f: 01923 237404

e: info-i2analytical@normecgroup.com

Analytical Report Number : 25-061899

Replaces Analytical Report Number: 25-061899, issue no. 1
Additional analysis undertaken.
Asbestos Quantification added to 750469 as per client's request.

Project / Site name:	Newport Docks	Samples received on:	11/11/2025
Your job number:	B075043	Samples instructed on/ Analysis started on:	14/11/2025
Your order number:	7021273	Analysis completed by:	19/12/2025
Report Issue Number:	2	Report issued on:	22/12/2025
Samples Analysed:	7 soil samples - 3 leachate samples		



Signed:

Rachel Chappell
Key Account Manager
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
air	- once the analysis is complete

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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: 25-061899
Project / Site name: Newport Docks
Your Order No: 7021273

Lab Sample Number	750468	750469	750470	750471	750472
Sample Reference	BH03	BH01	TP03	TP02	TP01
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A	N/A	N/A
Depth (m)	3.00-3.10	0.20-0.30	0.40-0.50	0.60-0.70	0.60-0.70
Date Sampled	07/11/2025	03/11/2025	05/11/2025	05/11/2025	07/11/2025
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	56.1	89.4	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	25	6.7	4.6	4.6	21
Total mass of sample received	kg	0.1	NONE	2	0.5	2	2	0.2

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KWB	KWB	KWB	-	KWB
Analysis completed	N/A	N/A	N/A	24/11/2025	24/11/2025	24/11/2025	-	24/11/2025
Actinolite detected	Type	N/A	ISO 17025	-	Not-detected	-	-	-
Amosite detected	Type	N/A	ISO 17025	-	Not-detected	-	-	-
Anthophyllite detected	Type	N/A	ISO 17025	-	Not-detected	-	-	-
Chrysotile detected	Type	N/A	ISO 17025	-	Detected	-	-	-
Crocidolite detected	Type	N/A	ISO 17025	-	Not-detected	-	-	-
Tremolite detected	Type	N/A	ISO 17025	-	Not-detected	-	-	-

Asbestos % by hand picking/weighing	%	0.001	ISO 17025	-	0.002	-	-	-
-------------------------------------	---	-------	-----------	---	-------	---	---	---

Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	-	Loose Fibres	-	-	-
---	------	-----	-----------	---	--------------	---	---	---

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.1	8.9	9.7	10.5	8.7
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	310	190	94	980	100
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	155	94.8	46.8	491	51
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.01	0.033	0.0081	0.056	0.017

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Analytical Report Number: 25-061899
Project / Site name: Newport Docks
Your Order No: 7021273

Lab Sample Number	750468	750469	750470	750471	750472
Sample Reference	BH03	BH01	TP03	TP02	TP01
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A	N/A	N/A
Depth (m)	3.00-3.10	0.20-0.30	0.40-0.50	0.60-0.70	0.60-0.70
Date Sampled	07/11/2025	03/11/2025	05/11/2025	05/11/2025	07/11/2025
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.07	< 0.05	0.23
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.29
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.06	< 0.05	< 0.05	0.1
Phenanthrene	mg/kg	0.05	MCERTS	0.22	0.66	0.37	0.25	1.2
Anthracene	mg/kg	0.05	MCERTS	0.07	0.16	0.08	< 0.05	0.35
Fluoranthene	mg/kg	0.05	MCERTS	0.41	1.3	0.8	0.23	4.2
Pyrene	mg/kg	0.05	MCERTS	0.34	1.2	0.65	0.22	3.7
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.2	0.61	0.59	0.16	2.7
Chrysene	mg/kg	0.05	MCERTS	0.19	0.61	0.68	0.24	3.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.2	0.81	0.84	0.38	3.8
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.09	0.36	0.31	< 0.05	1.8
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.16	0.64	0.52	0.24	3.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.07	0.36	0.31	0.25	1.9
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.11	0.08	0.53
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.45	0.35	0.4	2.3

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.95	7.25	5.68	2.44	29.4
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	7.6	17	5.3	32
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4	1.4	3.3	5.6	1.7
Boron (water soluble)	mg/kg	0.2	MCERTS	3.5	0.9	0.4	2.6	1.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.2	1.7	0.3	2.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	39	25	20	29	40
Chromium (hexavalent) by IC	mg/kg	1.8	NONE	-	-	-	-	-
Chromium (III) by IC	mg/kg	1	NONE	-	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	39	25	20	29	40
Copper (aqua regia extractable)	mg/kg	1	MCERTS	35	38	300	54	400
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29	30	88	26	400
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	35	15	17	5.2	31
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	4	4.2	2.1
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	48	27	41	28	53
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	210	98	660	89	1200

Analytical Report Number: 25-061899
Project / Site name: Newport Docks
Your Order No: 7021273

Lab Sample Number	750468	750469	750470	750471	750472
Sample Reference	BH03	BH01	TP03	TP02	TP01
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A	N/A	N/A
Depth (m)	3.00-3.10	0.20-0.30	0.40-0.50	0.60-0.70	0.60-0.70
Date Sampled	07/11/2025	03/11/2025	05/11/2025	05/11/2025	07/11/2025
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_ID_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC6 - EC8 _{HS_ID_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC8 - EC10 _{HS_ID_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_ID_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_ID_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_ID_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_ID_AL}	mg/kg	8	MCERTS	< 8.0	92	< 8.0	56	< 8.0
TPHCWG - Aliphatic >EC35 - EC44 _{EH_CU_ID_AL}	mg/kg	8.4	NONE	< 8.4	160	< 8.4	150	< 8.4
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_ID_AL}	mg/kg	10	NONE	< 10	92	< 10	56	< 10
TPHCWG - Aliphatic >EC5 - EC44 _{EH_CU+HS_ID_AL}	mg/kg	10	NONE	< 10	250	< 10	200	< 10

TPHCWG - Aromatic >EC5 - EC7 _{HS_ID_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 _{HS_ID_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 _{HS_ID_AR}	mg/kg	0.02	MCERTS	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_ID_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_ID_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_ID_AR}	mg/kg	10	MCERTS	< 10	11	< 10	< 10	< 10
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_ID_AR}	mg/kg	10	MCERTS	< 10	200	< 10	110	21
TPHCWG - Aromatic >EC35 - EC44 _{EH_CU_ID_AR}	mg/kg	8.4	NONE	< 8.4	490	< 8.4	380	< 8.4
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_ID_AR}	mg/kg	10	NONE	< 10	210	< 10	110	21
TPHCWG - Aromatic >EC5 - EC44 _{EH_CU+HS_ID_AR}	mg/kg	10	NONE	< 10	710	< 10	490	21

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 25-061899

Project / Site name: Newport Docks

Your Order No: 7021273

Lab Sample Number	750473			750474	
Sample Reference	TP04			TP04	
Sample Number	None Supplied			None Supplied	
Water Matrix	N/A			N/A	
Depth (m)	0.50-0.60			1.40-1.50	
Date Sampled	05/11/2025			05/11/2025	
Time Taken	None Supplied			None Supplied	
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	100	< 0.1
Moisture Content	%	0.01	NONE	3.3	25
Total mass of sample received	kg	0.1	NONE	1.7	2

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	KWB	-
Analysis completed	N/A	N/A	N/A	24/11/2025	-
Actinolite detected	Type	N/A	ISO 17025	-	-
Amosite detected	Type	N/A	ISO 17025	-	-
Anthophyllite detected	Type	N/A	ISO 17025	-	-
Chrysotile detected	Type	N/A	ISO 17025	-	-
Crocidolite detected	Type	N/A	ISO 17025	-	-
Tremolite detected	Type	N/A	ISO 17025	-	-

Asbestos % by hand picking/weighing	%	0.001	ISO 17025	-	-
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Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	-	-
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General Inorganics

pH (L099)	pH Units	N/A	MCERTS	10.7	8.3
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	69	95
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	34.6	47.6
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0099	0.0075

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
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Analytical Report Number: 25-061899

Project / Site name: Newport Docks

Your Order No: 7021273

Lab Sample Number	750473	750474
Sample Reference	TP04	TP04
Sample Number	None Supplied	None Supplied
Water Matrix	N/A	N/A
Depth (m)	0.50-0.60	1.40-1.50
Date Sampled	05/11/2025	05/11/2025
Time Taken	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection
		Test Accreditation Status

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.1	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.07	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.06	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.65	0.14
Anthracene	mg/kg	0.05	MCERTS	0.15	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.84	0.27
Pyrene	mg/kg	0.05	MCERTS	0.73	0.25
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.48	0.13
Chrysene	mg/kg	0.05	MCERTS	0.49	0.15
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.6	0.16
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.24	0.09
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.42	0.16
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.24	0.08
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.08	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.27	0.1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	5.43	1.53
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	15
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	1.8
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	0.5
Chromium (hexavalent)	mg/kg	1.8	MCERTS	U/S ^{U/S g}	< 1.8
Chromium (III)	mg/kg	1	NONE	U/S ^{U/S g}	48
Chromium (hexavalent) by IC	mg/kg	1.8	NONE	< 1.80	-
Chromium (III) by IC	mg/kg	1	NONE	370	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	370	48
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	52
Lead (aqua regia extractable)	mg/kg	1	MCERTS	33	46
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	40
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	22	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	1600	61
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130	410

Analytical Report Number: 25-061899

Project / Site name: Newport Docks

Your Order No: 7021273

Lab Sample Number	750473	750474
Sample Reference	TP04	TP04
Sample Number	None Supplied	None Supplied
Water Matrix	N/A	N/A
Depth (m)	0.50-0.60	1.40-1.50
Date Sampled	05/11/2025	05/11/2025
Time Taken	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection
		Test Accreditation Status

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_ID_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010
TPHCWG - Aliphatic >EC6 - EC8 _{HS_ID_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010
TPHCWG - Aliphatic >EC8 - EC10 _{HS_ID_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_ID_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_ID_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_ID_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_ID_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0
TPHCWG - Aliphatic >EC35 - EC44 _{EH_CU_ID_AL}	mg/kg	8.4	NONE	< 8.4	< 8.4
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_ID_AL}	mg/kg	10	NONE	< 10	< 10
TPHCWG - Aliphatic >EC5 - EC44 _{EH_CU+HS_ID_AL}	mg/kg	10	NONE	< 10	< 10

TPHCWG - Aromatic >EC5 - EC7 _{HS_ID_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 _{HS_ID_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 _{HS_ID_AR}	mg/kg	0.02	MCERTS	< 0.020	< 0.020
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_ID_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_ID_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_ID_AR}	mg/kg	10	MCERTS	< 10	< 10
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_ID_AR}	mg/kg	10	MCERTS	< 10	< 10
TPHCWG - Aromatic >EC35 - EC44 _{EH_CU_ID_AR}	mg/kg	8.4	NONE	< 8.4	< 8.4
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_ID_AR}	mg/kg	10	NONE	< 10	< 10
TPHCWG - Aromatic >EC5 - EC44 _{EH_CU+HS_ID_AR}	mg/kg	10	NONE	< 10	< 10

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



Analytical Report Number: **25-061899**
Project / Site name: **Newport Docks**
Your Order No: **7021273**

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample	Analysis completed	Analyst ID
750469	BH01	0.20-0.30	204	Loose Fibres	Chrysotile	0.002	0.002	19/12/2025	KWB

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number: 25-061899
Project / Site name: Newport Docks

Your Order No: 7021273

Lab Sample Number	750468	750471	750474
Sample Reference	BH03	TP02	TP04
Sample Number	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A
Depth (m)	3.00-3.10	0.60-0.70	1.40-1.50
Date Sampled	07/11/2025	05/11/2025	05/11/2025
Time Taken	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Test Limit of detection	Test Accreditation Status

General Inorganics

pH (automated)	pH Units	N/A	ISO 17025	8	7.7	8.3
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10
Sulphate as SO ₄	mg/l	0.045	ISO 17025	13	4.32	3.99
Chloride	mg/l	0.15	ISO 17025	34	0.88	1.6
Ammoniacal Nitrogen as NH ₃	µg/l	15	NONE	1300	53	860
Ammoniacal Nitrogen as NH ₄ ⁺	µg/l	15	NONE	1400	56	910
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	9.5	15	10
Nitrate as NO ₃	mg/l	0.05	NONE	< 0.05	2.34	0.28
Nitrite as NO ₂	µg/l	5	ISO 17025	< 5.0	17	52
Alkalinity as CaCO ₃	mgCaCO ₃ /l	3	ISO 17025	65	25	31

Total Phenols

Total Phenols (monohydric) low level	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	µg/l	0.01	NONE	< 0.01	0.81	0.88
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01	0.02
Acenaphthene	µg/l	0.01	NONE	< 0.01	< 0.01	0.06
Fluorene	µg/l	0.01	NONE	< 0.01	< 0.01	0.03
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01	0.03
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16	0.81	1.03
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Analytical Report Number: 25-061899
Project / Site name: Newport Docks

Your Order No: 7021273

Lab Sample Number	750468	750471	750474
Sample Reference	BH03	TP02	TP04
Sample Number	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A
Depth (m)	3.00-3.10	0.60-0.70	1.40-1.50
Date Sampled	07/11/2025	05/11/2025	05/11/2025
Time Taken	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Test Limit of detection	Test Accreditation Status

Heavy Metals / Metalloids

Antimony (dissolved)	µg/l	1.7	ISO 17025	7	6.4	2
Arsenic (dissolved)	µg/l	1	ISO 17025	3.5	< 1.0	< 1.0
Barium (dissolved)	µg/l	0.05	ISO 17025	13	28	6.6
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	130	64	84
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08
Chromium (dissolved)	µg/l	0.4	ISO 17025	< 0.4	< 0.4	< 0.4
Copper (dissolved)	µg/l	0.7	ISO 17025	1.8	5.2	1.9
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	2.8
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5
Molybdenum (dissolved)	µg/l	0.4	ISO 17025	5.9	0.6	3.7
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.6	< 0.3	< 0.3
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.9	20	18

Petroleum Hydrocarbons

TPH - Aliphatic >EC5 - EC6 HS_1D_AL	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >EC6 - EC8 HS_1D_AL	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >EC8 - EC10 HS_1D_AL	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >EC10 - EC12 EH_2D_AL_#1_#2	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aliphatic >EC12 - EC16 EH_2D_AL_#1_#2	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aliphatic >EC16 - EC21 EH_2D_AL_#1_#2	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aliphatic >EC21 - EC35 EH_2D_AL_#1_#2	µg/l	10	NONE	< 10	< 10	< 10
Total TPH Aliphatic >EC10 - EC35 EH_2D_AL_#1_#2	µg/l	10	NONE	< 10	< 10	< 10

TPH - Aromatic >EC5 - EC7 HS_1D_AR	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC7 - EC8 HS_1D_AR	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC8 - EC10 EH_1D_AR_MS	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC10 - EC12 EH_2D_AR_#1_#2	µg/l	10	NONE	< 10	< 10	25
TPH - Aromatic >EC12 - EC16 EH_2D_AR_#1_#2	µg/l	10	NONE	< 10	150	120
TPH - Aromatic >EC16 - EC21 EH_2D_AR_#1_#2	µg/l	10	NONE	< 10	58 ***	< 10 **
TPH - Aromatic >EC21 - EC35 EH_2D_AR_#1_#2	µg/l	10	NONE	< 10	200	< 10
Total TPH Aromatic >EC10 - EC35 EH_2D_AR_#1_#2	µg/l	10	NONE	< 10	400	140

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Benzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 25-061899

Project / Site name: Newport Docks

* 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 *
750468	BH03	None Supplied	3.00-3.10	Brown clay
750469	BH01	None Supplied	0.20-0.30	Brown loam and sand with stones
750470	TP03	None Supplied	0.40-0.50	Brown loam and sand with stones
750471	TP02	None Supplied	0.60-0.70	Brown sand with gravel and stones
750472	TP01	None Supplied	0.60-0.70	Brown clay with vegetation
750473	TP04	None Supplied	0.50-0.60	Brown loam and sand with vegetation and stones
750474	TP04	None Supplied	1.40-1.50	Brown clay

Analytical Report Number : 25-061899

Project / Site name: Newport Docks

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
Dissolved Organic Carbon in leachate	Determination of dissolved organic carbon in leachate by the measurement on a non-dispersive infrared analyser of carbon dioxide released by acidification	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	NONE
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	L038B	D	MCERTS
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	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
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	L039B	W	ISO 17025
One stage WAC 10:1 leachate preparation	One stage batch test at a liquid to solid ratio of 10 L/kg	BS EN 12457-2-2002	L043B	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in leachate	Determination of volatile organic compounds in leachate by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	NONE
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID in soil	Determination of total petroleum hydrocarbons in soil by GC-FID with carbon banding aliphatic and aromatic	In-house method	L076B	D	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil (Summed Bands)	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic (Summed Bands).	Calculation	L076B/L088-PL	D/W	NONE
Nitrite, leachate soluble, in leachate	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L082B	W	ISO 17025

Analytical Report Number : 25-061899

Project / Site name: Newport Docks

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Nitrate, leachate soluble, in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08	L078-PL	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL/L130B	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Monohydric phenols (low level) in leachate	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
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	L080-PL	W	MCERTS
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Alkalinity in leachate	Determination of Alkalinity by discrete analyser (colorimetry)	In-house method based on MEWAM & USEPA Method 310.2	L082B	W	ISO 17025
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Ammonia as NH3 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Ammonium as NH4 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Total petroleum hydrocarbons with carbon banding by HS-GC/MS in leachate	Determination of total petroleum hydrocarbons in leachate by HS-GC/MS with carbon banding aliphatic and aromatic	In-house method	L088-PL	W	NONE
Total petroleum hydrocarbons with carbon banding by HS-GC/MS in soil	Determination of total petroleum hydrocarbons in soil by HS-GC/MS with carbon banding aliphatic and aromatic	In-house method	L088-PL	W	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 20°C in leachate (automated)	Determination of pH in leachate by electrometric measurement	In-house method	L099-PL	W	ISO 17025

Analytical Report Number : 25-061899

Project / Site name: Newport Docks

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total petroleum hydrocarbons with carbon banding by GCxGC-FID	Determination of total petroleum hydrocarbons in leachate by GC x GC FID with carbon banding aliphatic and aromatic C10-C35	In-house method	L101B	W	NONE
Total petroleum hydrocarbons with carbon banding by GCxGC-FID/GC-MS HS	Determination of total petroleum hydrocarbons in leachate by GCxGC-FID/GC-MS HS with carbon banding aliphatic and aromatic (Summed Bands)	Calculation	L101B/L088-PL	W	NONE
Speciated PAHs and/or Semi-volatile organic compounds in leachate	SVOCs and PAHs in leachate	In-house method	L102B		NONE
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate	In-house method	L009B	D	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references	HSE Report No: 83/1996, HSG 248 (2021), HSG 264 (2012) & SCA Blue Book (draft)	A006B	D	ISO 17025

Analytical Report Number : 25-061899

Project / Site name: Newport Docks

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Hexavalent chromium in soil by Ion Chromatography	Determination of hexavalent chromium in alkaline soil extract by use of ion chromatography with spectrophotometric detection	In-house method	L130B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' 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.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

*U/S g- Unsuitable for analysis due to high colour intensity.

##- Quality control parameter has a high recovery (outside of limit); however the associated result is below the reporting limit, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

+/- Method detection limit raised due to a positive contribution in the blank. The result should be considered as being deviating and may be compromised.

#- Quality control parameter failure associated with this result; other checks applied prior to reporting the data have been accepted. The result should be considered as deviating and should be interpreted with caution. The result is not accredited.

Analytical Report Number : 25-061899

Project / Site name: Newport Docks

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container/Insufficient material provided c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH01	N/A	S	750469	bc	Asbestos Quantification - Gravimetric	A006B	b
BH01	N/A	S	750469	bc	Asbestos identification in Soil	A001B	b
BH01	N/A	S	750469	bc	BTEX and/or Volatile organic compounds in soil	L073B	bc
BH01	N/A	S	750469	bc	Free cyanide in soil	L080-PL	c
BH01	N/A	S	750469	bc	Monohydric phenols in soil	L080-PL	c
BH01	N/A	S	750469	bc	Speciated PAHs and/or Semi-volatile organic compounds in soil	L064B	c
BH01	N/A	S	750469	bc	Total petroleum hydrocarbons with carbon banding by GC-FID in soil	L076B	c
BH03	N/A	L	750468	b	One stage WAC 10:1 leachate preparation	L043B	b
BH03	N/A	S	750468	b	BTEX and/or Volatile organic compounds in soil	L073B	b
TP01	N/A	S	750472	b	Asbestos identification in Soil	A001B	b
TP01	N/A	S	750472	b	BTEX and/or Volatile organic compounds in soil	L073B	b
TP02	N/A	L	750471	bc	One stage WAC 10:1 leachate preparation	L043B	b
TP02	N/A	S	750471	bc	BTEX and/or Volatile organic compounds in soil	L073B	bc
TP02	N/A	S	750471	bc	Free cyanide in soil	L080-PL	c
TP02	N/A	S	750471	bc	Monohydric phenols in soil	L080-PL	c
TP02	N/A	S	750471	bc	Speciated PAHs and/or Semi-volatile organic compounds in soil	L064B	c
TP02	N/A	S	750471	bc	Total petroleum hydrocarbons with carbon banding by GC-FID in soil	L076B	c
TP03	N/A	S	750470	bc	Asbestos identification in Soil	A001B	b
TP03	N/A	S	750470	bc	BTEX and/or Volatile organic compounds in soil	L073B	bc
TP03	N/A	S	750470	bc	Free cyanide in soil	L080-PL	c
TP03	N/A	S	750470	bc	Monohydric phenols in soil	L080-PL	c
TP03	N/A	S	750470	bc	Speciated PAHs and/or Semi-volatile organic compounds in soil	L064B	c
TP03	N/A	S	750470	bc	Total petroleum hydrocarbons with carbon banding by GC-FID in soil	L076B	c
TP04	N/A	L	750474	bc	One stage WAC 10:1 leachate preparation	L043B	b
TP04	N/A	S	750473	bc	Asbestos identification in Soil	A001B	b
TP04	N/A	S	750473	bc	BTEX and/or Volatile organic compounds in soil	L073B	bc
TP04	N/A	S	750473	bc	Free cyanide in soil	L080-PL	c
TP04	N/A	S	750473	bc	Monohydric phenols in soil	L080-PL	c
TP04	N/A	S	750473	bc	Speciated PAHs and/or Semi-volatile organic compounds in soil	L064B	c
TP04	N/A	S	750473	bc	Total petroleum hydrocarbons with carbon banding by GC-FID in soil	L076B	c
TP04	N/A	S	750474	bc	BTEX and/or Volatile organic compounds in soil	L073B	bc
TP04	N/A	S	750474	bc	Free cyanide in soil	L080-PL	c
TP04	N/A	S	750474	bc	Monohydric phenols in soil	L080-PL	c
TP04	N/A	S	750474	bc	Speciated PAHs and/or Semi-volatile organic compounds in soil	L064B	c
TP04	N/A	S	750474	bc	Total petroleum hydrocarbons with carbon banding by GC-FID in soil	L076B	c



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Analytical Report Number : 25-064232

Project / Site name:	Newport Docks	Samples received on:	27/11/2025
Your job number:	B075043	Samples instructed on/ Analysis started on:	28/11/2025
Your order number:	7021273	Analysis completed by:	08/12/2025
Report Issue Number:	1	Report issued on:	08/12/2025
Samples Analysed:	2 water samples		

Signed: _____

Anna Goc
PL Head of 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
air	- once the analysis is complete

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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: 25-064232
Project / Site name: Newport Docks

Lab Sample Number				763719	763720
Sample Reference				BH02	BH03
Sample Number				None Supplied	None Supplied
Water Matrix				Ground water	Ground water
Depth (m)				None Supplied	None Supplied
Date Sampled				24/11/2025	24/11/2025
Time Taken				1420	1400
Analytical Parameter (Water Analysis)	Units	Test Limit of detection	Test Accreditation Status		

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	7.3	7.2
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10
Sulphate as SO ₄	mg/l	0.045	ISO 17025	57.3	66.8
Chloride	mg/l	0.15	ISO 17025	16	160
Ammoniacal Nitrogen as NH ₃	µg/l	15	ISO 17025	200	640
Ammoniacal Nitrogen as NH ₄ ⁺	µg/l	15	ISO 17025	220	670
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	2.76	3.74
Nitrate as N	mg/l	0.01	ISO 17025	0.01	< 0.01
Nitrate as NO ₃	mg/l	0.05	ISO 17025	0.05	< 0.05
Nitrite as NO ₂	mgCaCO ₃ /l	3	ISO 17025	15	50
Alkalinity as CaCO ₃				390	460

Total Phenols

Total Phenols (Monohydric) Low Level	µg/l	1	NONE	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	0.14
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	0.02
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	0.07
Fluorene	µg/l	0.01	ISO 17025	< 0.01	0.08
Phenanthrene	µg/l	0.01	ISO 17025	0.06	0.28
Anthracene	µg/l	0.01	ISO 17025	< 0.01	0.07
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	0.26
Pyrene	µg/l	0.01	ISO 17025	0.03	0.22
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	0.1
Chrysene	µg/l	0.01	ISO 17025	< 0.01	0.11
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	0.13
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	0.05
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	0.07
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	0.04
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	0.05

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	1.69
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Analytical Report Number: 25-064232
Project / Site name: Newport Docks

Lab Sample Number	763719	763720
Sample Reference	BH02	BH03
Sample Number	None Supplied	None Supplied
Water Matrix	Ground water	Ground water
Depth (m)	None Supplied	None Supplied
Date Sampled	24/11/2025	24/11/2025
Time Taken	1420	1400
Analytical Parameter (Water Analysis)	Units	Test Limit of detection
		Test Accreditation Status

Heavy Metals / Metalloids

Antimony (dissolved)	µg/l	0.4	ISO 17025	0.4	0.5
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.97	2.79
Barium (dissolved)	µg/l	0.06	ISO 17025	160	260
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1	< 0.1
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.06	0.09
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	0.8	0.8
Lead (dissolved)	µg/l	0.2	ISO 17025	0.4	0.4
Mercury (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	2.8	2.7
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.9	6
Selenium (dissolved)	µg/l	0.6	ISO 17025	1.6	2.1
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.8	10
Boron (dissolved)	µg/l	10	ISO 17025	130	280

Petroleum Hydrocarbons

TPH - Aliphatic >EC5 - EC6 _{HS 1D AL}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH - Aliphatic >EC6 - EC8 _{HS 1D AL}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH - Aliphatic >EC8 - EC10 _{HS 1D AL}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH - Aliphatic >EC10 - EC12 _{EH 2D AL #1 #2}	µg/l	10	ISO 17025	29	< 10
TPH - Aliphatic >EC12 - EC16 _{EH 2D AL #1 #2}	µg/l	10	ISO 17025	21	< 10
TPH - Aliphatic >EC16 - EC21 _{EH 2D AL #1 #2}	µg/l	10	ISO 17025	< 10	< 10
TPH - Aliphatic >EC21 - EC35 _{EH 2D AL #1 #2}	µg/l	10	ISO 17025	< 10	< 10
Total TPH Aliphatic >EC10 - EC35 _{EH 2D AL #1 #2}	µg/l	10	NONE	50	< 10

TPH - Aromatic >EC5 - EC7 _{HS 1D AR}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH - Aromatic >EC7 - EC8 _{HS 1D AR}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH - Aromatic >EC8 - EC10 _{HS 1D AR}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH - Aromatic >EC10 - EC12 _{EH 2D AR #1 #2}	µg/l	10	ISO 17025	39	12
TPH - Aromatic >EC12 - EC16 _{EH 2D AR #1 #2}	µg/l	10	ISO 17025	30	15
TPH - Aromatic >EC16 - EC21 _{EH 2D AR #1 #2}	µg/l	10	ISO 17025	< 10	< 10
TPH - Aromatic >EC21 - EC35 _{EH 2D AR #1 #2}	µg/l	10	ISO 17025	< 10	< 10
Total TPH Aromatic >EC10 - EC35 _{EH 2D AR #1 #2}	µg/l	10	NONE	69	28

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0
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

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 25-064232

Project / Site name: Newport Docks

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited matrices: SW, PW, GW, 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	L012B	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, FSE, LL; PrW, DI PrW (Al, Cu, Fe, Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
BTEX and/or 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 USEPA 8260	L073B	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate followed by colorimetry. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L078-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by colorimetry using discrete analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate followed by colorimetry. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L078-PL	W	ISO 17025
Monohydric phenols (low level) in water	Determination of phenols in water by continuous flow analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Total cyanide in water	Determination of total cyanide in water by distillation followed by colorimetry. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Alkalinity of water (discrete analyser)	Determination of alkalinity of water by colorimetry using discrete analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on MEWAM & USEPA Method 310.2	L082B	W	NONE
Chloride in water	Determination of chloride in water by colorimetry using discrete analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Ammonia as NH3 in water	Determination of ammonium/ammonia/ammoniacal nitrogen by the colorimetric salicylate/nitroprusside method using discrete analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Ammonium as NH4 in water	Determination of ammonium/ammonia/ammoniacal nitrogen by the colorimetric salicylate/nitroprusside method using discrete analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Total Petroleum Hydrocarbons in water by HS-GC/MS	Determination of total petroleum hydrocarbons in water by headspace HS-GC/MS. Accredited matrices: SW, PW, GW	In-house method	L088-PL	W	ISO 17025
pH of water at 20°C (automated)	Determination of pH of water by electrochemical measurement. Accredited matrices: SW, PW, GW, FSE, LL	In-house method	L099-PL	W	ISO 17025
Total Petroleum Hydrocarbons with carbon banding in water by GCxGC-FID	Determination of total petroleum hydrocarbons in water by GCxGC FID with carbon banding aliphatic and aromatic C10-C35. Accredited matrices: SW, PW, GW	In-house method	L101B	W	ISO 17025

Analytical Report Number : 25-064232

Project / Site name: Newport Docks

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Petroleum Hydrocarbons with carbon banding in water by GCxGC-FID/GC-MS HS	Determination of total petroleum hydrocarbons in water by GCxGC-FID/GC-MS HS with carbon banding aliphatic and aromatic (Summed Bands). Accredited matrices: SW, PW, GW	Calculation	L101B/L088-PL	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds (including PAHs) in water by extraction in dichloromethane followed by GC-MS. Accredited matrices (PAHs): SW, PW, GW	In-house method based on USEPA 8270	L102B	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, PrW, DI PrW, FSE, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' 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.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

Analytical Report Number : 25-064232

Project / Site name: Newport Docks

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container/Insufficient material provided c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH02	N/A	W	763719	c	Ammonia as NH3 in water	L082B	c
BH02	N/A	W	763719	c	Ammonium as NH4 in water	L082B	c
BH02	N/A	W	763719	c	Nitrite in water	L082B	c
BH02	N/A	W	763719	c	pH of water at 20°C (automated)	L099-PL	c
BH03	N/A	W	763720	c	Ammonia as NH3 in water	L082B	c
BH03	N/A	W	763720	c	Ammonium as NH4 in water	L082B	c
BH03	N/A	W	763720	c	Nitrite in water	L082B	c
BH03	N/A	W	763720	c	pH of water at 20°C (automated)	L099-PL	c

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Analytical Report Number : 25-065777

Project / Site name:	Newport Docks	Samples received on:	04/12/2025
Your job number:	B075043	Samples instructed on/ Analysis started on:	05/12/2025
Your order number:	7021273	Analysis completed by:	18/12/2025
Report Issue Number:	1	Report issued on:	18/12/2025
Samples Analysed:	1 soil sample - 1 leachate sample		



Signed:

Matthew O'Connell
Key Account Manager
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
air	- once the analysis is complete

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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: 25-065777
Project / Site name: Newport Docks
Your Order No: 7021273

Lab Sample Number	772292			
Sample Reference	BH02			
Sample Number	None Supplied			
Water Matrix	N/A			
Depth (m)	0.50			
Date Sampled	02/12/2025			
Time Taken	1145			
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Stone Content	%	0.1	NONE	61.3
Moisture Content	%	0.01	NONE	7.5
Total mass of sample received	kg	0.1	NONE	0.6

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	WEM
Analysis completed	N/A	N/A	N/A	15/12/2025

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.1
Free Cyanide	mg/kg	1	MCERTS	< 1.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	320
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	160
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.031

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	0.69
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.06
Fluorene	mg/kg	0.05	MCERTS	0.11
Phenanthrene	mg/kg	0.05	MCERTS	0.84
Anthracene	mg/kg	0.05	MCERTS	0.11
Fluoranthene	mg/kg	0.05	MCERTS	0.55
Pyrene	mg/kg	0.05	MCERTS	0.49
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.44
Chrysene	mg/kg	0.05	MCERTS	0.56
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.58
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.16
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.35
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.21
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.09
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.3

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	5.56
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Analytical Report Number: 25-065777
Project / Site name: Newport Docks
Your Order No: 7021273

Lab Sample Number	772292			
Sample Reference	BH02			
Sample Number	None Supplied			
Water Matrix	N/A			
Depth (m)	0.50			
Date Sampled	02/12/2025			
Time Taken	1145			
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2.6
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (III)	mg/kg	1	NONE	65
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	65
Copper (aqua regia extractable)	mg/kg	1	MCERTS	45
Lead (aqua regia extractable)	mg/kg	1	MCERTS	34
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2.1
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	25
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	95

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	2.9
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	49
TPHCWG - Aliphatic >EC35 - EC44 _{EH_CU_1D_AL}	mg/kg	8.4	NONE	29
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	52
TPHCWG - Aliphatic >EC5 - EC44 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	81

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	< 0.020
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	4.5
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	42
TPHCWG - Aromatic >EC35 - EC44 _{EH_CU_1D_AR}	mg/kg	8.4	NONE	57
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	47
TPHCWG - Aromatic >EC5 - EC44 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	100

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0
o-Xylene	µg/kg	5	MCERTS	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 25-065777
Project / Site name: Newport Docks

Your Order No: 7021273

Lab Sample Number	772292			
Sample Reference	BH02			
Sample Number	None Supplied			
Water Matrix	N/A			
Depth (m)	0.50			
Date Sampled	02/12/2025			
Time Taken	1145			
Analytical Parameter (Leachate Analysis)	Units	Test Limit of detection	Test Accreditation Status	

General Inorganics

pH (automated)	pH Units	N/A	ISO 17025	7.5
Total Cyanide	µg/l	10	ISO 17025	< 10
Sulphate as SO ₄	mg/l	0.045	ISO 17025	4.67
Chloride	mg/l	0.15	ISO 17025	0.48
Ammoniacal Nitrogen as NH ₃	µg/l	15	NONE	< 15
Ammoniacal Nitrogen as NH ₄ ⁺	µg/l	15	NONE	< 15
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	8.1
Nitrate as NO ₃	mg/l	0.05	NONE	< 0.05
Nitrite as NO ₂	µg/l	5	ISO 17025	7.3
Alkalinity as CaCO ₃	mg CaCO ₃ /l	3	ISO 17025	30

Total Phenols

Total Phenols (monohydric) low level	µg/l	1	NONE	< 1.0
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Speciated PAHs

Naphthalene	µg/l	0.01	NONE	< 0.01
Acenaphthylene	µg/l	0.01	NONE	< 0.01
Acenaphthene	µg/l	0.01	NONE	< 0.01
Fluorene	µg/l	0.01	NONE	0.03
Phenanthrene	µg/l	0.01	NONE	0.02
Anthracene	µg/l	0.01	NONE	< 0.01
Fluoranthene	µg/l	0.01	NONE	< 0.01
Pyrene	µg/l	0.01	NONE	< 0.01
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16
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Analytical Report Number: 25-065777
Project / Site name: Newport Docks

Your Order No: 7021273

Lab Sample Number				772292
Sample Reference				BH02
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				0.50
Date Sampled				02/12/2025
Time Taken				1145
Analytical Parameter (Leachate Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Heavy Metals / Metalloids

Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7
Arsenic (dissolved)	µg/l	1	ISO 17025	1.2
Barium (dissolved)	µg/l	0.05	ISO 17025	15
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	28
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.8
Copper (dissolved)	µg/l	0.7	ISO 17025	1.6
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5
Molybdenum (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.3
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	3

Petroleum Hydrocarbons

TPH - Aliphatic >EC5 - EC6 _{HS_1D_AL}	µg/l	1	NONE	< 1.0
TPH - Aliphatic >EC6 - EC8 _{HS_1D_AL}	µg/l	1	NONE	< 1.0
TPH - Aliphatic >EC8 - EC10 _{HS_1D_AL}	µg/l	1	NONE	< 1.0
TPH - Aliphatic >EC10 - EC12 _{EH_2D_AL_#1_#2}	µg/l	10	NONE	< 10
TPH - Aliphatic >EC12 - EC16 _{EH_2D_AL_#1_#2}	µg/l	10	NONE	< 10
TPH - Aliphatic >EC16 - EC21 _{EH_2D_AL_#1_#2}	µg/l	10	NONE	< 10
TPH - Aliphatic >EC21 - EC35 _{EH_2D_AL_#1_#2}	µg/l	10	NONE	< 10
Total TPH Aliphatic >EC10 - EC35 _{EH_2D_AL_#1_#2}	µg/l	10	NONE	< 10

TPH - Aromatic >EC5 - EC7 _{HS_1D_AR}	µg/l	1	NONE	< 1.0
TPH - Aromatic >EC7 - EC8 _{HS_1D_AR}	µg/l	1	NONE	< 1.0
TPH - Aromatic >EC8 - EC10 _{EH_1D_AR_MS}	µg/l	1	NONE	< 1.0
TPH - Aromatic >EC10 - EC12 _{EH_2D_AR_#1_#2}	µg/l	10	NONE	39
TPH - Aromatic >EC12 - EC16 _{EH_2D_AR_#1_#2}	µg/l	10	NONE	22
TPH - Aromatic >EC16 - EC21 _{EH_2D_AR_#1_#2}	µg/l	10	NONE	< 10
TPH - Aromatic >EC21 - EC35 _{EH_2D_AR_#1_#2}	µg/l	10	NONE	140
Total TPH Aromatic >EC10 - EC35 _{EH_2D_AR_#1_#2}	µg/l	10	NONE	200

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	NONE	< 3.0
Benzene	µg/l	1	NONE	< 1.0
Toluene	µg/l	1	NONE	< 1.0
Ethylbenzene	µg/l	1	NONE	< 1.0
p & m-xylene	µg/l	1	NONE	< 1.0
o-xylene	µg/l	1	NONE	< 1.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 25-065777

Project / Site name: Newport Docks

* 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 *
772292	BH02	None Supplied	0.5	Brown loam and gravel with vegetation and stones

Analytical Report Number : 25-065777

Project / Site name: Newport Docks

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
Dissolved Organic Carbon in leachate	Determination of dissolved organic carbon in leachate by the measurement on a non-dispersive infrared analyser of carbon dioxide released by acidification	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	NONE
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	L038B	D	MCERTS
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	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
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	L039B	W	ISO 17025
One stage WAC 10:1 leachate preparation	One stage batch test at a liquid to solid ratio of 10 L/kg	BS EN 12457-2:2002	L043B	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in leachate	Determination of volatile organic compounds in leachate by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	NONE
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID in soil	Determination of total petroleum hydrocarbons in soil by GC-FID with carbon banding aliphatic and aromatic	In-house method	L076B	D	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil (Summed Bands)	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic (Summed Bands).	Calculation	L076B/L088-PL	D/W	NONE
Nitrite, leachate soluble, in leachate	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L082B	W	ISO 17025
Nitrate, leachate soluble, in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08	L078-PL	W	NONE

Analytical Report Number : 25-065777

Project / Site name: Newport Docks

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL/L130B	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Monohydric phenols (low level) in leachate	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
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	L080-PL	W	MCERTS
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Alkalinity in leachate	Determination of Alkalinity by discrete analyser (colorimetry)	In-house method based on MEWAM & USEPA Method 310.2	L082B	W	ISO 17025
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Ammonia as NH3 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Ammonium as NH4 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Total petroleum hydrocarbons with carbon banding by HS-GC/MS in leachate	Determination of total petroleum hydrocarbons in leachate by HS-GC/MS with carbon banding aliphatic and aromatic	In-house method	L088-PL	W	NONE
Total petroleum hydrocarbons with carbon banding by HS-GC/MS in soil	Determination of total petroleum hydrocarbons in soil by HS-GC/MS with carbon banding aliphatic and aromatic	In-house method	L088-PL	W	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 20°C in leachate (automated)	Determination of pH in leachate by electrometric measurement	In-house method	L099-PL	W	ISO 17025
Total petroleum hydrocarbons with carbon banding by GCxGC-FID	Determination of total petroleum hydrocarbons in leachate by GC x GC FID with carbon banding aliphatic and aromatic C10-C35	In-house method	L101B	W	NONE
Total petroleum hydrocarbons with carbon banding by GCxGC-FID/GC-MS HS	Determination of total petroleum hydrocarbons in leachate by GCxGC-FID/GC-MS HS with carbon banding aliphatic and aromatic (Summed Bands)	Calculation	L101B/L088-PL	W	NONE

Analytical Report Number : 25-065777

Project / Site name: Newport Docks

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated PAHs and/or Semi-volatile organic compounds in leachate	SVOCs and PAHs in leachate	In-house method	L102B		NONE
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate	In-house method	L009B	D	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' 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.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

Analytical Report Number : 25-065777

Project / Site name: Newport Docks

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container/Insufficient material provided c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH02	N/A	L	772292	b	One stage WAC 10:1 leachate preparation	L043B	b

APPENDIX D: GROUNDWATER AND GROUND GAS MONITORING RESULTS

Tetra Tech

LANDGAS AND GROUNDWATER MONITORING RESULTS

Hodge House, 114-116 St Mary Street, Cardiff, CF10 1DY



Site Name: NGED Newport Docks GI
Job No.: 784-B075043
Client: National Grid Electrical Distribution (NGED)

Date Monitored:
Monitoring Engineer:
Weather:

17/11/25
 SW
 Sunny

EQUIPMENT USED			
Type	Make	Serial	Last Calibrated
Gas Analyser	Landtec GA5000	G502044	Apr-25
Interface Meter	Solinst	122-004988-1	n/a

LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS												
Exploratory Hole No	Peak		Steady									
	CH ₄ (% vol)	CO ₂ (% vol)	CH ₄ (% vol)	CO ₂ (% vol)	O ₂ (% vol)	BAL (%)	PID (ppm)	H ₂ S (ppm)	HCN (ppm)	CO (ppm)	Time	Remarks
BH01 19mm	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	Flooded
BH01 50mm	9.5	1.7	9.5	1.7	12.8	76.1	nt	<1	nt	1	11:40	
BH02 19mm	0.5	0.2	0.5	0.2	21.2	78.3	nt	<1	nt	1	12:35	Flooded after 20 s
BH02 50mm	0.3	0.3	0.3	0.2	21.0	78.5	nt	<1	nt	<1	15:03	Testing after 45L purge
BH03 19mm	0.3	4.2	0.3	4.2	14.3	81.2	nt	<1	nt	1	13:30	
BH03 50mm	0.3	4.2	0.3	4.2	14.6	81	nt	<1	nt	1	13:45	

LANDGAS - PHYSICAL PARAMETERS							
Exploratory Hole No	Atmos Pressure (m bar)	Atmos Temp (°C)	BH Flow		BH Pressure		Remarks
			Peak (L/hr)	Steady (L/hr)	Peak (mbar)	Steady (mbar)	
BH01 19mm	nt	nt	nt	nt	nt	nt	Flooded
BH01 50mm	1022	7.0	0.60	0.60	0.00	0.00	
BH02 19mm	1022	8.0	nt	nt	0.03	0.03	Flooded after 20 s
BH02 50mm	1023	8.0	0.4	0.4	0.02	0.02	
BH03 19mm	1023	8.0	0.4	0.4	0.51	0.51	
BH03 50mm	1023	8.0	0.3	0.3	0.05	0.05	

AMBIENT ATMOSPHERIC CONDITIONS				ATMOSPHERIC PRESSURE CONDITIONS			
Parameter	Before Monitoring	After Monitoring					
CH ₄ (% vol)	0.4	0.2	3 days prior (m bar)			1008	
CO ₂ (% vol)	0.2	0.2	2 days prior (m bar)			1008	
O ₂ (% vol)	21.3	21.3	1 day prior (m bar)			1013	
PID (ppm)	nt	nt	during (m bar) am,midday,pm			1023, 1026, 1026	
Atmos Press. (m bar)	1022	1023	1 day post (m bar)			1014	

GROUNDWATER / NAPL - PHYSIO-CHEMICAL PARAMETERS													
Exploratory Hole No	Water Surface (mbgl)	Base Depth (mbgl)	LNAPL Surface (mbgl)	DNAPL Surface (mbgl)	Water Quality Indicators								Remarks
					ORP (mV)	SPC (µs/cm)	C (µs/cm)	Ph (value)	DO (mg/L)	Dissolved Solids (ppt)	Resistivity (Ω·cm)	Temp (°C)	
BH01 19mm	0.00	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	PRE BAIL
BH01 50mm	2.61	9.80	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	PRE BAIL
BH02 19mm	0.71	1.60	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	PRE BAIL
BH02 50mm	0.67	5.72	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	PRE BAIL
BH03 19mm	DRY	1.82	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	PRE BAIL
BH03 50mm	1.84	10.51	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	PRE BAIL

Notes nt = not tested
 nd = not detected

Data Compiled by: SW
 Data Checked by: CS

Tetra Tech

LANDGAS AND GROUNDWATER MONITORING RESULTS

Hodge House, 114-116 St Mary Street, Cardiff, CF10 1DY



Site Name: NGED Newport Docks GI
Job No.: 784-B075043
Client: National Grid Electrical Distribution (NGED)

Date Monitored:
Monitoring Engineer:
Weather:

24/11/25
 SW
 Cloudy

EQUIPMENT USED			
Type	Make	Serial	Last Calibrated
Gas Analyser	Landtec GA5000	G502044	Apr-25
Interface Meter	Solinst	122-004988-1	n/a

LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS												
Exploratory Hole No	Peak		Steady									
	CH ₄ (% vol)	CO ₂ (% vol)	CH ₄ (% vol)	CO ₂ (% vol)	O ₂ (% vol)	BAL (%)	PID (ppm)	H ₂ S (ppm)	HCN (ppm)	CO (ppm)	Time	Remarks
BH01 19mm	15.3	1.3	11.3	1.0	17.8	69.9	nt	<1	nt	2	14:28	
BH01 50mm	22.3	0.6	19.5	0.6	16.9	63	nt	<1	nt	2	11:18	
BH02 19mm	0.2	0.4	0.2	0.4	21.0	78.4	nt	<1	nt	1	13:44	Flooded after 25s
BH02 50mm	0.9	0.4	0.6	0.2	20.9	78.3	nt	<1	nt	1	12:30	Testing after 24L purge
BH03 19mm	0.3	4.1	0.3	4.1	14.7	80.9	nt	<1	nt	1	12:51	
BH03 50mm	0.3	4.3	0.2	4.3	14.5	81	nt	<1	nt	<1	13:04	

LANDGAS - PHYSICAL PARAMETERS							
Exploratory Hole No	Atmos Pressure (m bar)	Atmos Temp (°C)	BH Flow		BH Pressure		Remarks
			Peak (L/hr)	Steady (L/hr)	Peak (mbar)	Steady (mbar)	
BH01 19mm	993	7.0	1.0	1.0	1.06	1.06	
BH01 50mm	990	7.0	0.0	0.0	-0.48	-0.48	
BH02 19mm	992	7.0	nt	nt	0.10	0.10	Unable to flow test due to water infiltratuion
BH02 50mm	991	7.0	0.2	0.2	0.03	0.03	
BH03 19mm	992	7.0	0.0	0.0	0.02	0.02	
BH03 50mm	992	7.0	0.1	0.1	-0.03	-0.03	

AMBIENT ATMOSPHERIC CONDITIONS				ATMOSPHERIC PRESSURE CONDITIONS			
Parameter	Before Monitoring	After Monitoring					
CH ₄ (% vol)	0.5	0.2		3 days prior (m bar)		1027	
CO ₂ (% vol)	0.2	0.2		2 days prior (m bar)		1011	
O ₂ (% vol)	21.1	21.3		1 day prior (m bar)		998	
PID (ppm)	nt	nt		during (m bar) am,midday,pm		990, 997, 1004	
Atmos Press. (m bar)	990	993		1 day post (m bar)		1010	

GROUNDWATER / NAPL - PHYSIO-CHEMICAL PARAMETERS													
Exploratory Hole No	Water Surface (mbgl)	Base Depth (mbgl)	LNAPL Surface (mbgl)	DNAPL Surface (mbgl)	Water Quality Indicators								Remarks
					ORP (mV)	SPC (µs/cm)	C (µs/cm)	Ph (value)	DO (mg/L)	Dissolved Solids (ppt)	Resistivity (Ω·cm)	Temp (°C)	
BH01 19mm	0.72	1.10	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	PRE BAIL
BH01 50mm	2.31	9.62	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	PRE BAIL
BH02 19mm	0.73	1.56	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	PRE BAIL
BH02 50mm	0.74	5.68	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	PRE BAIL
BH03 19mm	DRY	1.83	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	PRE BAIL
BH03 50mm	1.81	10.46	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	PRE BAIL

Notes nt = not tested
 nd = not detected

Data Compiled by: SW
 Data Checked by: CS

Tetra Tech

LANDGAS AND GROUNDWATER MONITORING RESULTS

Hodge House, 114-116 St Mary Street, Cardiff, CF10 1DY



Site Name: NGED Newport Docks GI
Job No.: 784-B075043
Client: National Grid Electrical Distribution (NGED)

Date Monitored:
Monitoring Engineer:
Weather:

01/12/25
 SW
 Wet

EQUIPMENT USED			
Type	Make	Serial	Last Calibrated
Gas Analyser	Landtec GA5000	G502044	Apr-25
Interface Meter	Solinst	122-004988-1	n/a

LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS												
Exploratory Hole No	Peak		Steady									
	CH ₄ (% vol)	CO ₂ (% vol)	CH ₄ (% vol)	CO ₂ (% vol)	O ₂ (% vol)	BAL (%)	PID (ppm)	H ₂ S (ppm)	HCN (ppm)	CO (ppm)	Time	Remarks
BH01 19mm	3.4	2.0	3.4	1.4	10.3	84.9	nt	<1	nt	<1	11:06	
BH01 50mm	4.5	0.5	4.5	0.5	19.0	75.9	nt	<1	nt	<1	11:22	
BH02 19mm	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	Flooded
BH02 50mm	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	Flooded
BH03 19mm	0.1	3.8	0.1	3.8	13.4	82.7	nt	<1	nt	<1	12:05	
BH03 50mm	0.3	4.5	0.1	4.5	11.5	84.0	nt	<1	nt	<1	11:53	

LANDGAS - PHYSICAL PARAMETERS							
Exploratory Hole No	Atmos Pressure (m bar)	Atmos Temp (°C)	BH Flow		BH Pressure		Remarks
			Peak (L/hr)	Steady (L/hr)	Peak (mbar)	Steady (mbar)	
BH01 19mm	996	11.0	0.5	0.5	-0.09	-0.09	
BH01 50mm	996	11.0	18.4	18.4	-3.96	-3.96	
BH02 19mm	nt	nt	nt	nt	nt	nt	Flooded
BH02 50mm	nt	nt	nt	nt	nt	nt	Flooded
BH03 19mm	996	11	0.7	0.7	0	0	
BH03 50mm	996	11.0	0.5	0.5	-0.04	-0.04	

AMBIENT ATMOSPHERIC CONDITIONS				ATMOSPHERIC PRESSURE CONDITIONS			
Parameter	Before Monitoring	After Monitoring					
CH ₄ (% vol)	0.2	0.1	3 days prior (m bar)			1009	
CO ₂ (% vol)	0.2	0.2	2 days prior (m bar)			1002	
O ₂ (% vol)	21.2	21.3	1 day prior (m bar)			1014	
PID (ppm)	nt	nt	during (m bar) am,midday,pm			996, 995, 995	
Atmos Press. (m bar)	996	996	1 day post (m bar)			999	

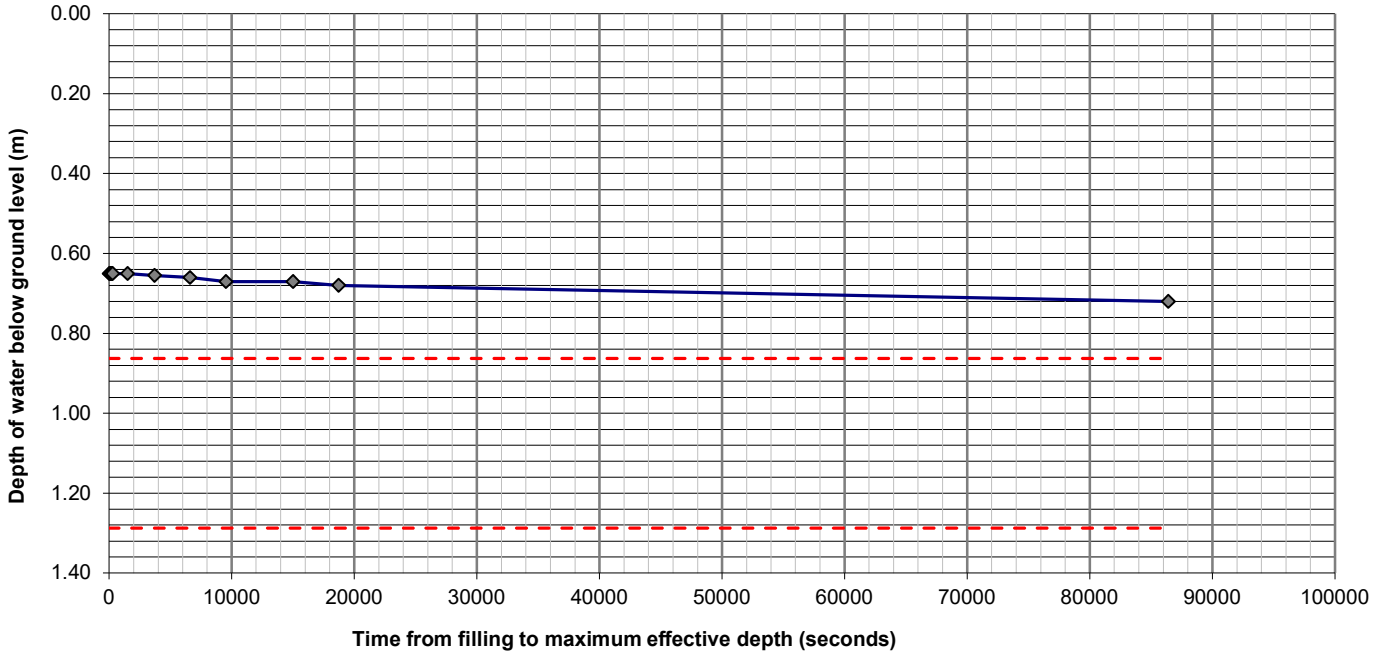
GROUNDWATER / NAPL - PHYSIO-CHEMICAL PARAMETERS													
Exploratory Hole No	Water Surface (mbgl)	Base Depth (mbgl)	LNAPL Surface (mbgl)	DNAPL Surface (mbgl)	Water Quality Indicators								Remarks
					ORP (mV)	SPC (µs/cm)	C (µs/cm)	Ph (value)	DO (mg/L)	Dissolved Solids (ppt)	Resistivity (Ω·cm)	Temp (°C)	
BH01 19mm	1.07	1.13	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	
BH01 50mm	1.83	9.67	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	
BH02 19mm	0.60	1.57	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	
BH02 50mm	0.62	5.55	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	
BH03 19mm	1.64	1.83	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	
BH03 50mm	1.65	9.62	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	

Notes nt = not tested
 nd = not detected

Data Compiled by: SW
 Data Checked by: CS

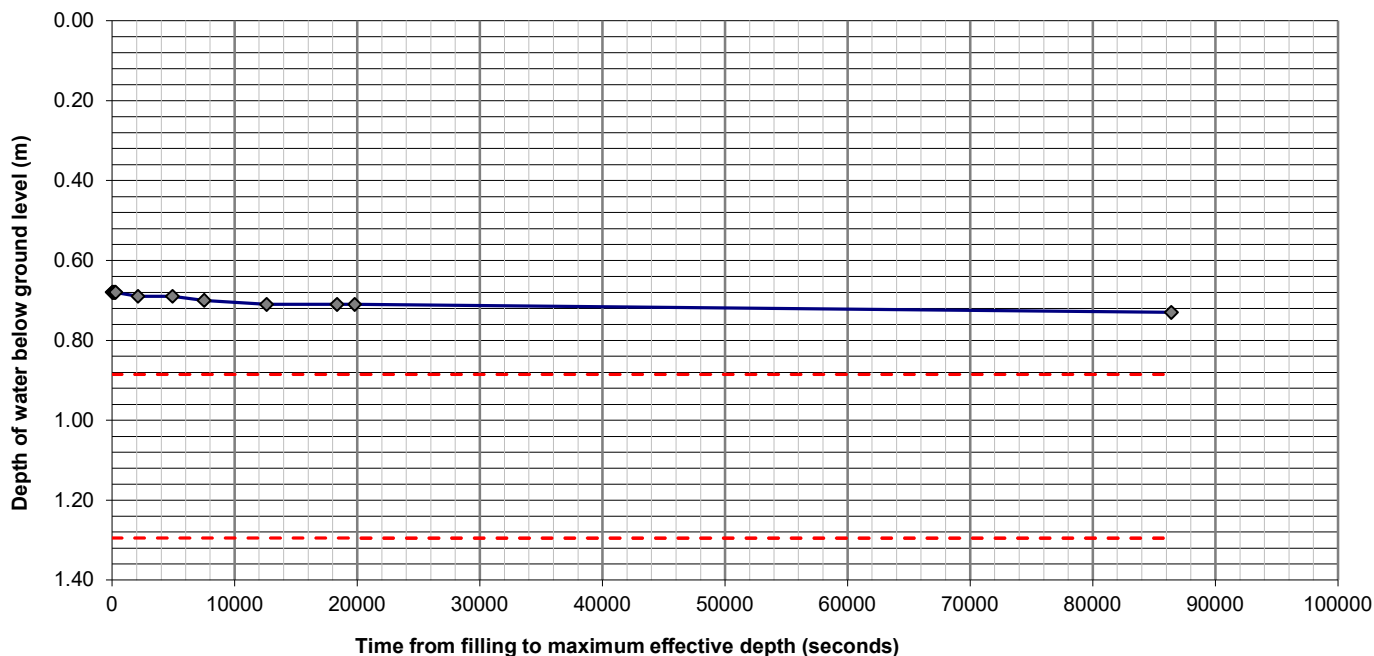
APPENDIX E: PERMEABILITY TESTING

SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION



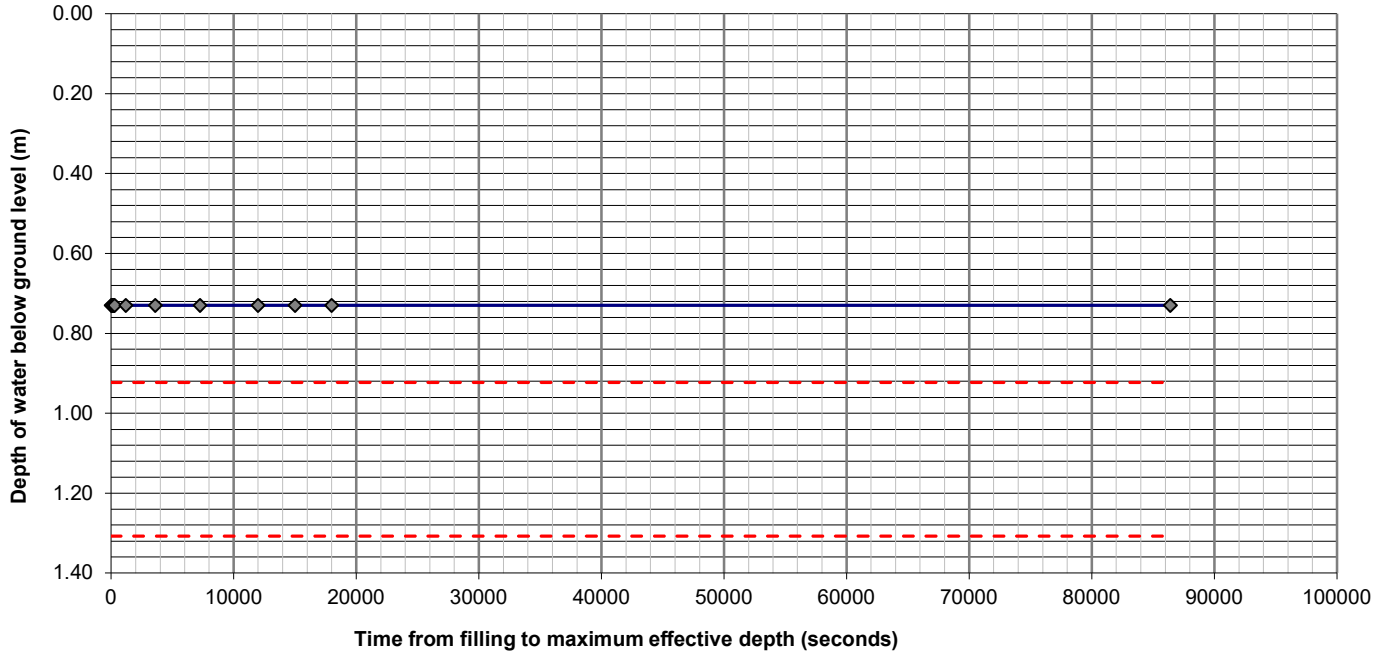
Time Elapsed (s)	Time Elapsed (mins)	Distance to water surface from ground level (m)	Pit construction			
			PIT LENGTH (m):	1.30	Open - No Gravel	
			PIT WIDTH (m):	0.60		
			PIT DEPTH (m):	1.50		
			INPUT PARAMETERS:			
			Total volume of pit	(m ³)	0.66	
60	1.00	0.650	Pit volume between 75% and 25% depths = L x W x ½D	(m ³)	0.33	
120	2.00	0.650	Effective depth of Pit	(m)	0.85	
180	3.00	0.650	Proportion of pit volume occupied by gravel solids	(0-1)	0.00	
240	4.00	0.650	Maximum potential volume of Water	(m ³)	0.66	
300	5.00	0.650	Level of water in pit at 75% effective depth (p ₇₅)	(m)	0.21	
1500	25.00	0.650	Level of water in pit at 25% effective depth (p ₂₅)	(m)	0.64	
3720	62.00	0.655				
6600	110.00	0.660				
9540	159.00	0.670	Effective volume between 75% & 25% depth V _{p75-25} = V x P _g	(m ³)	0.33	
15000	250.00	0.670	Surface area of pit up to 50% effective depth (A _{p50})	(m ²)	2.40	
18720	312.00	0.680				
86400	1440.00	0.720				

SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION



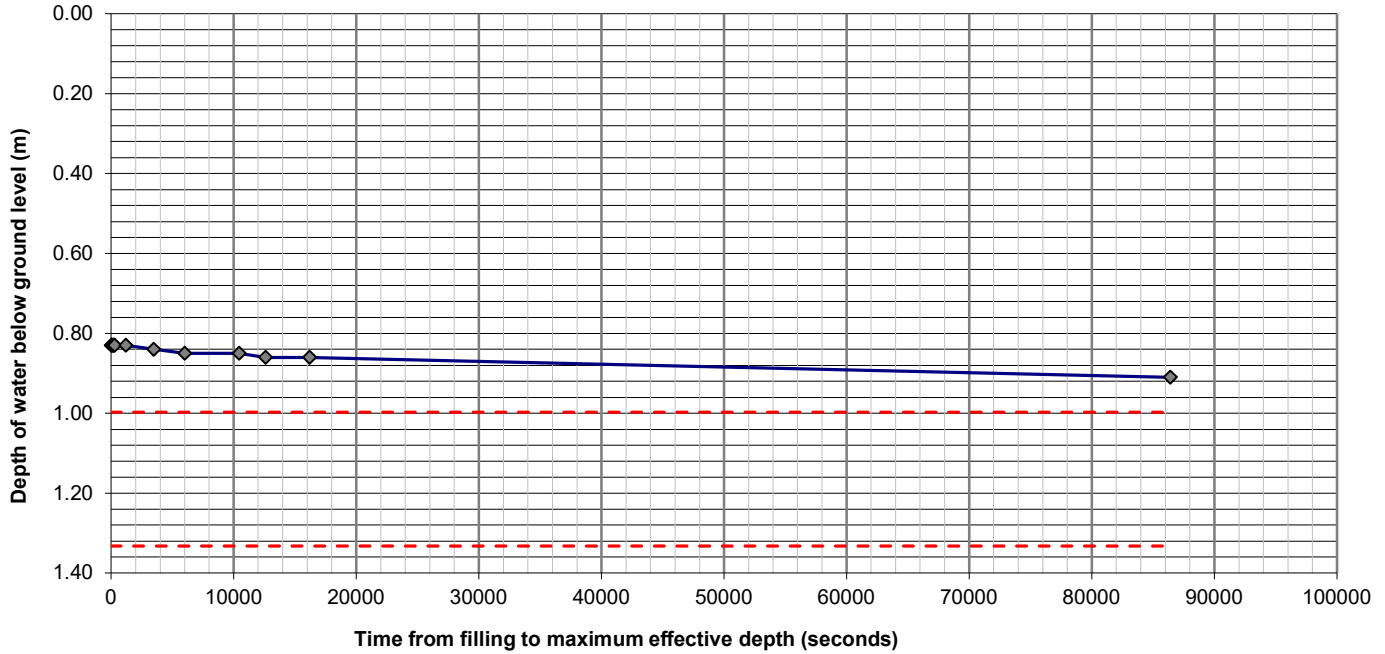
Time Elapsed (s)	Time Elapsed (mins)	Distance to water surface from ground level (m)	PIT LENGTH (m):	1.30	Pit construction	
			PIT WIDTH (m):	0.60	Open - No Gravel	
			PIT DEPTH (m):	1.50		
	0.00	0.680	INPUT PARAMETERS:			
60	1.00	0.680	Total volume of pit		(m ³)	0.64
120	2.00	0.680	Pit volume between 75% and 25% depths = L x W x ½D		(m ³)	0.32
180	3.00	0.680	Effective depth of Pit		(m)	0.82
240	4.00	0.680	Proportion of pit volume occupied by gravel solids		(0-1)	0.00
300	5.00	0.680	Maximum potential volume of Water		(m ³)	0.64
2100	35.00	0.690	Level of water in pit at 75% effective depth (p ₇₅)		(m)	0.21
4920	82.00	0.690	Level of water in pit at 25% effective depth (p ₂₅)		(m)	0.62
7500	125.00	0.700				
12600	210.00	0.710	Effective volume between 75% & 25% depth V _{p75-25} = V x P _g		(m ³)	0.32
18360	306.00	0.710	Surface area of pit up to 50% effective depth (A _{p50})		(m ²)	2.34
19800	330.00	0.710				
86400	1440.00	0.730	Time at 75% effective depth (p ₇₅)		(s)	#N/A
			Time at 25% effective depth (p ₂₅)		(s)	#N/A
			Time for outflow for 75% and 25% effective depth (Tp75-25)		(s)	#N/A
			OUTPUT:			
			SOIL INFILTRATION RATE (f)	V _{p75 - 25}	(m/s)	#N/A
				A _{p50} x T _{p75 - 25}		
			WATER INPUT: 600 l 5 mins			
			GEOLOGY OF TEST SECTION:			
			MADE GROUND			

SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION



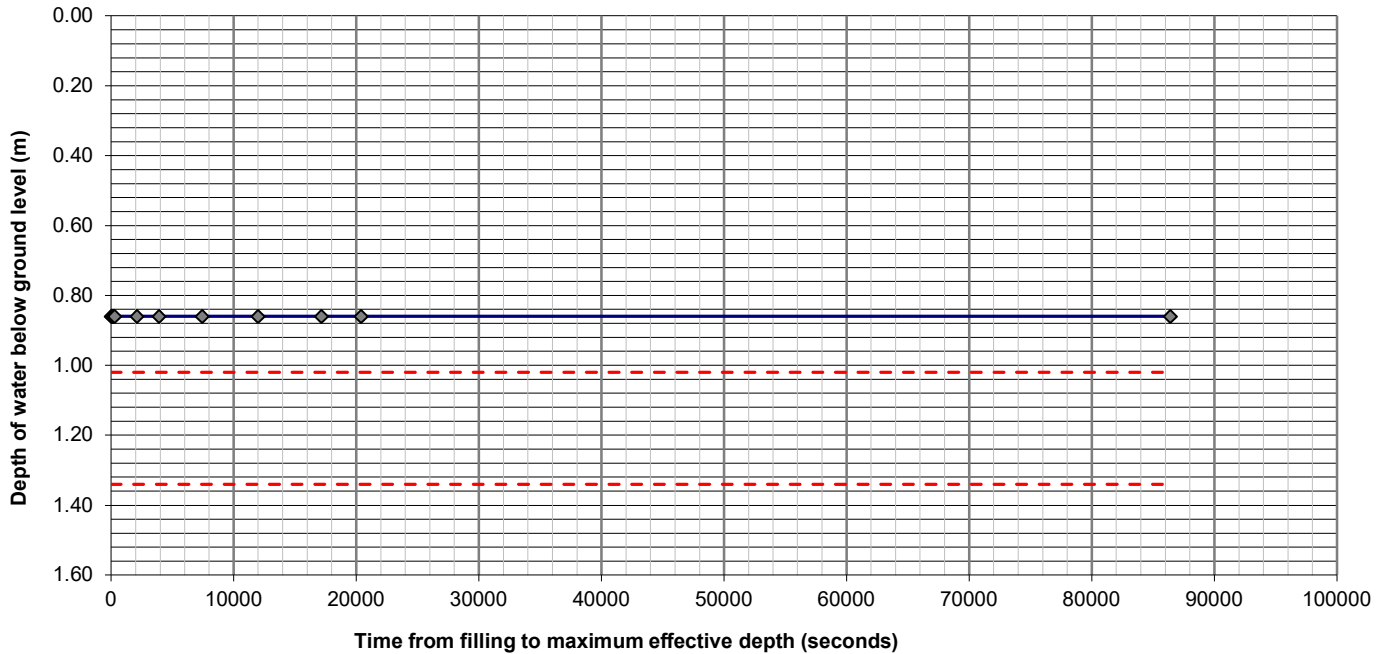
Time Elapsed (s)	Time Elapsed (mins)	Distance to water surface from ground level (m)	PIT LENGTH (m):				Pit construction	
			PIT WIDTH (m):	0.60	Open - No Gravel			
			PIT DEPTH (m):	1.50				
			INPUT PARAMETERS:					
			Total volume of pit		(m ³)	0.60		
60	1.00	0.730	Pit volume between 75% and 25% depths = L x W x ½D		(m ³)	0.30		
120	2.00	0.730	Effective depth of Pit		(m)	0.77		
180	3.00	0.730	Proportion of pit volume occupied by gravel solids		(0-1)	0.00		
240	4.00	0.730	Maximum potential volume of Water		(m ³)	0.60		
300	5.00	0.730	Level of water in pit at 75% effective depth (p ₇₅)		(m)	0.19		
1200	20.00	0.730	Level of water in pit at 25% effective depth (p ₂₅)		(m)	0.58		
3600	60.00	0.730						
7260	121.00	0.730	Effective volume between 75% & 25% depth V _{p75-25} = V x P _g		(m ³)	0.30		
12000	200.00	0.730	Surface area of pit up to 50% effective depth (A _{p50})		(m ²)	2.24		
15000	250.00	0.730						
18000	300.00	0.730	Time at 75% effective depth (p ₇₅)		(s)	#N/A		
86400	1440.00	0.730	Time at 25% effective depth (p ₂₅)		(s)	#N/A		
			Time for outflow for 75% and 25% effective depth (Tp75-25)		(s)	#N/A		
			OUTPUT:					
			SOIL INFILTRATION RATE (f)		V _{p75 - 25}	(m/s)	#N/A	
					A _{p50} x T _{p75 - 25}			
			WATER INPUT:		600 l		5 mins	
			GEOLOGY OF TEST SECTION:					
			MADE GROUND					

SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION



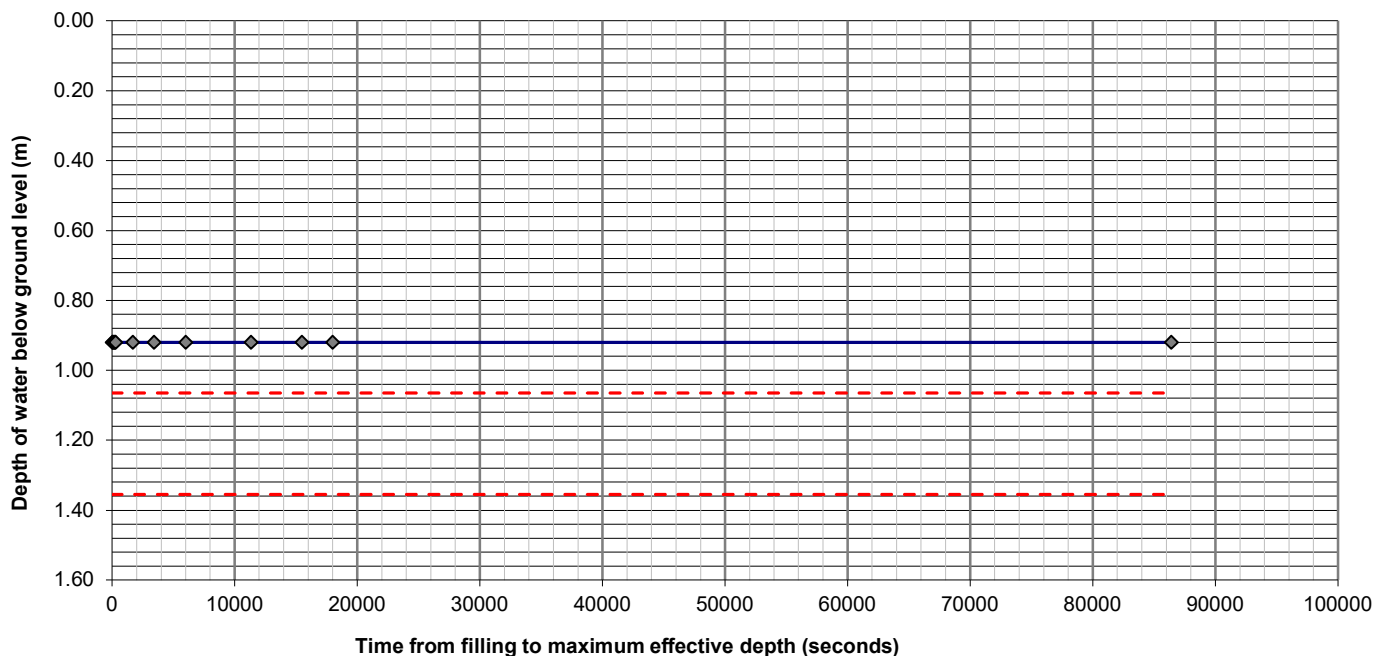
Time Elapsed (s)	Time Elapsed (mins)	Distance to water surface from ground level (m)	PIT LENGTH (m):			Pit construction		
			PIT WIDTH (m):		Open - No Gravel			
			PIT DEPTH (m):					
	0.00	0.830	INPUT PARAMETERS:					
60	1.00	0.830	Total volume of pit			(m ³)	0.52	
120	2.00	0.830	Pit volume between 75% and 25% depths = L x W x ½D			(m ³)	0.26	
180	3.00	0.830	Effective depth of Pit			(m)	0.67	
240	4.00	0.830	Proportion of pit volume occupied by gravel solids			(0-1)	0.00	
300	5.00	0.830	Maximum potential volume of Water			(m ³)	0.52	
1200	20.00	0.830	Level of water in pit at 75% effective depth (p ₇₅)			(m)	0.17	
3480	58.00	0.840	Level of water in pit at 25% effective depth (p ₂₅)			(m)	0.50	
6000	100.00	0.850						
10440	174.00	0.850	Effective volume between 75% & 25% depth V _{p75-25} = V x P _g			(m ³)	0.26	
12600	210.00	0.860	Surface area of pit up to 50% effective depth (A _{p50})			(m ²)	2.05	
16200	270.00	0.860						
86400	1440.00	0.910	Time at 75% effective depth (p ₇₅)			(s)	#N/A	
			Time at 25% effective depth (p ₂₅)			(s)	#N/A	
			Time for outflow for 75% and 25% effective depth (Tp75-25)			(s)	#N/A	
			OUTPUT:					
			SOIL INFILTRATION RATE (f)		V _{p75 - 25}		(m/s)	#N/A
					A _{p50} x T _{p75 - 25}			
			WATER INPUT:		600		l	5 mins
			GEOLOGY OF TEST SECTION:					
			MADE GROUND					

SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION



Time Elapsed (s)	Time Elapsed (mins)	Distance to water surface from ground level (m)	PIT LENGTH (m):		Pit construction		
			PIT WIDTH (m):		Open - No Gravel		
			PIT DEPTH (m):				
	0.00	0.860	INPUT PARAMETERS:				
60	1.00	0.860	Total volume of pit		(m ³)	0.50	
120	2.00	0.860	Pit volume between 75% and 25% depths = L x W x ½D		(m ³)	0.25	
180	3.00	0.860	Effective depth of Pit		(m)	0.64	
240	4.00	0.860	Proportion of pit volume occupied by gravel solids		(0-1)	0.00	
300	5.00	0.860	Maximum potential volume of Water		(m ³)	0.50	
2100	35.00	0.860	Level of water in pit at 75% effective depth (p ₇₅)		(m)	0.16	
3900	65.00	0.860	Level of water in pit at 25% effective depth (p ₂₅)		(m)	0.48	
7440	124.00	0.860					
12000	200.00	0.860	Effective volume between 75% & 25% depth V _{p75-25} = V x P _g		(m ³)	0.25	
17160	286.00	0.860	Surface area of pit up to 50% effective depth (A _{p50})		(m ²)	2.00	
20400	340.00	0.860					
86400	1440.00	0.860	Time at 75% effective depth (p ₇₅)		(s)	#N/A	
			Time at 25% effective depth (p ₂₅)		(s)	#N/A	
			Time for outflow for 75% and 25% effective depth (Tp75-25)		(s)	#N/A	
			OUTPUT:				
			SOIL INFILTRATION RATE (f)		V _{p75 - 25}	(m/s)	#N/A
					A _{p50} × T _{p75 - 25}		
			WATER INPUT:		600 l 5 mins		
			GEOLOGY OF TEST SECTION:				
			MADE GROUND				
			Compiled by: SA				
			Checked by: JC				

SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION



Time Elapsed (s)	Time Elapsed (mins)	Distance to water surface from ground level (m)	PIT LENGTH (m):	1.30	Pit construction	
			PIT WIDTH (m):	0.60	Open - No Gravel	
			PIT DEPTH (m):	1.50		
	0.00	0.920	INPUT PARAMETERS:			
60	1.00	0.920	Total volume of pit		(m ³)	0.45
120	2.00	0.920	Pit volume between 75% and 25% depths = L x W x ½D		(m ³)	0.23
180	3.00	0.920	Effective depth of Pit		(m)	0.58
240	4.00	0.920	Proportion of pit volume occupied by gravel solids		(0-1)	0.00
300	5.00	0.920	Maximum potential volume of Water		(m ³)	0.45
1680	28.00	0.920	Level of water in pit at 75% effective depth (p ₇₅)		(m)	0.15
3420	57.00	0.920	Level of water in pit at 25% effective depth (p ₂₅)		(m)	0.44
6000	100.00	0.920				
11340	189.00	0.920	Effective volume between 75% & 25% depth V _{p75-25} = V x P _g		(m ³)	0.23
15480	258.00	0.920	Surface area of pit up to 50% effective depth (A _{p50})		(m ²)	1.88
18000	300.00	0.920				
86400	1440.00	0.920	Time at 75% effective depth (p ₇₅)		(s)	#N/A
			Time at 25% effective depth (p ₂₅)		(s)	#N/A
			Time for outflow for 75% and 25% effective depth (Tp75-25)		(s)	#N/A
			OUTPUT:			
			SOIL INFILTRATION RATE (f)	V _{p75 - 25}	(m/s)	#N/A
				A _{p50} x T _{p75 - 25}		
			WATER INPUT: 600 l 5 mins			
			GEOLOGY OF TEST SECTION:			
			MADE GROUND			

APPENDIX F: CIRIA 552 RISK ASSESSMENT

The following tables are derived from CIRIA C552 and have been used to define the risk rating presented in the Qualitative Risk Assessment matrix.

Classification of consequence

Classification	Definition
Severe	Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution (note; Water Resources Act contains no scope for considering significant pollution) of sensitive water resource. Catastrophic damage to building/property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem. (Note the definitions of ecological systems within the Draft Circular on Contaminated Land DETR, 2000).
Medium	Chronic damage to human health ('significant harm', as defined In DETR, 2000). Pollution of sensitive water resources (note; Water Resources Act contains no scope for considering significant pollution). A significant change in a particular ecosystem, or an organism forming part of such an ecosystem. (Note the definitions of ecological systems within the Draft Circular on Contaminated Land DETR, 2000).
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm', as defined In DETR, 2000). Damage to sensitive buildings/structures/services or the environment.
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.

Classification of probability

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

Matrix of consequence against probability to gain a risk classification

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