Phase II Ground Investigation

Penzance Harbour Modernisation Scheme

19 January 2023

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EXECUTIVE SUMMARY

Objectives	
Wheal Jane Consultancy was commissioned by Ward Williams Associates on behalf of MWJV Ltd to undertake an intrusive investigation on the site of a proposed development.	
Site Investigation	
Previous Investigations	A Phase I Desk Study was undertaken by WSP in April 2018 (Ref: 70028692). The desk study concluded the site was historically used as a historic harbour. It was concluded that an investigation would be required involving soil sampling and testing as well as ground gas and groundwater monitoring.
Site Works	Samples were taken during an intrusive investigation from three (3 No.) boreholes.
Ground Conditions	Full ground profiles were obtained, showing a distinct presence of made ground, overlying Mudstone and Blue Elvan.
Groundwater	Groundwater was encountered during the site investigation between 1.37mBGL and 3.76mBGL.

Conclusions

- It can be concluded that all contaminants tested are below the relevant generic acceptance criteria. The site is likely to be suitable for its intended use.
- It is considered that conventional strip foundations will not be appropriate at the site, due to the extent and geotechnical properties of the Made Ground and historic harbour wall across the site.
- Based on the site observations, In-situ and laboratory testing, it is considered that a piled foundation solution is appropriate, with end-bearing piles driven through the Made Ground/harbour wall and socketed a minimum of 3.00m into the competent bedrock, the underlying Mylor Slate Formation/Blue Elvan.

Recommendations

- As the site is situated in an area where between 10-30% of the properties are above the action level, it is recommended that full radon protective measures are installed on any proposed building.
- Suitable safety measures should be taken by those working on site to mitigate the risks associated with contaminated media including undertaking the appropriate risk assessments and ensuring all workers are wearing the correct PPE.
- Waste removed from site shall be disposed of at a suitable facility with the appropriate Waste Transfer Notices obtained for future records. Asbestos waste should be handled by a suitable waste contractor

1 INTRODUCTION

1.1 Instruction

1.1.1 Wheal Jane Consultancy (WJC) was commissioned by Ward Williams Associates on behalf of MWJV Ltd, to undertake a Phase II Ground Investigation at the site known as 'Penzance Harbour'.

1.1.2 This report has been prepared by Wheal Jane Consultancy solely for the benefit of the client. It shall not be relied upon or transferred to any third party without the prior written authorisation of WJC.

1.2 Scope and Objectives

1.2.1 The objective of this investigation is to quantify any land contamination based on in-situ data collected from the actual site which will then be interpreted and evaluated.

1.2.2 This investigation was developed to target the possible contamination related to the sites historic use and/or natural geology.

1.2.3 The objective of this investigation is also to evaluate the geotechnical parameters of the sub-surface material in order to aid foundation design.

1.2.4 The conclusions and recommendations of this report are valid for a period of 12 months from the date of issue. Outside of this time frame the report will require reviewing by a suitably qualified geoenvironmental engineer / environmental scientist, to ensure that the report complies with any changes to industry standards, policies and/or guidelines.

1.2.5 It is recommended that a copy of this report be submitted to the local authority for checking, prior to commissioning any further work which may be required.

1.2.6 This assessment has been undertaken with guidance from BS10175:2011 and Environment Agency report CLR11, and as such represents a Phase II Ground Investigation.

1.3 Limitations

1.3.1 Field work consisted of discrete sampling across the site, to assess the character and degree of contamination. Conditions of the ground at locations not included within the investigation may be different from the tested locations.

1.3.2 This report considers site conditions at the time of the ground investigation, but ground conditions may change with time. If future work discovers ground conditions that vary

significantly from the findings available in this report, the conclusions should be reviewed in the context of the new information.

1.3.3 Findings were assessed in the context of standards and methodology current at the time of reporting.

1.3.4 The findings and conclusions in this report are based upon information derived from a variety of sources. WJC cannot accept liability for the accuracy or completeness of any information derived from third party sources.

2 THE SITE

2.1 Site Location and Layout

2.1.1 The site is located at Penzance Harbour approximately 0.50km to the south east of the town centre. The site is approximately centred on National Grid Reference SW 47672 30016.

2.1.2 The site is irregular in shape and covers an area of approximately 0.25ha.

2.1.3 A site location plan (SLP) is contained in Figure 2.1, to the rear of the report.

2.1.4 The current site plan is contained in Figure 2.2, to the rear of the report.

2.2 Surrounding area

Direction	Land Use
North	Harbour
East	Harbour
South	Commercial
West	Commercial

2.3 Proposed Development

2.3.1 It is proposed to demolish the existing buildings and modernise the harbour.

2.3.2 A proposed development plan was not available at the time of completing this investigation.

3 SITE INVESTIGATION

3.1 Phase I Findings

3.1.1 A Phase I Desk Study was undertaken by WSP in April 2018 (Ref: 70028692).

3.1.2 The desk study concluded the site was historically used as a historic harbour. It was concluded that an investigation would be required involving soil sampling and testing as well as ground gas and groundwater monitoring.

3.2 Site Works

3.2.1 An intrusive site investigation was conducted from 5th to 10th October 2022. The investigation was overseen by a geoenvironmental engineer from Wheal Jane Consultancy.

3.2.2 The following table summarises the intrusive investigation techniques employed during the site investigation;

Table 3.1: Site Works

Exploratory Hole Type	Exploratory Hole ID	Hole Depths (mBGL)	Comments
Rotary Coring	RC01 – RC03	9.00 – 10.30	Undertaken for site coverage.

3.2.3 Exploratory hole logs are included as Appendix A.

3.2.4 A plan showing the location of the exploratory holes is provided as Figure 3.1.

3.3 Rotary Coring

3.3.1 Three (3 No) Rotary Boreholes, designated BH01 – BH03 inclusive, were advanced to depths of between 9.00 – 10.30mBGL using a Comacchio 205 drilling rig on 5th – 10th October 2022.

3.3.2 All boreholes were advanced using rotary percussive techniques until refusal, at which point rotary coring commenced.

3.3.3 The drilling equipment on this particular contract utilised air-mist as the flushing medium.

3.3.4 The locations of all Rotary Boreholes can be seen on the exploratory hole location plan, contained as Figure 3.1.

3.3.5 Logs are contained within Appendix A, and core Photographs are contained as Appendix B.

3.3.6 All boreholes were backfilled with bentonite.

3.4 Installations and Monitoring

3.4.1 Gas and groundwater monitoring standpipes were installed in the following exploratory holes in order to allow long term monitoring;

Table 3.2: Borehole Installations

Exploratory Hole	Seal (mBGL)	Filter Zone (mBGL)
RC01	0.00 – 1.00	1.00 – 9.00
RC02	0.00 – 1.00	1.00 – 9.20
RC03	0.00 – 1.00	1.00 – 10.30

3.4.2 Gas and Groundwater monitoring commenced on the 18th October 2022, with further visits on the 24th October, 1st November and 7th November.

3.4.3 In addition to groundwater levels, the following parameters were measured and recorded using a G505363 ground gas meter:

- % Vol of; O_2, H_2S, CO_2, CH_4, CO
- Flow Rate
- Barometric pressure

3.4.1 The results are included as Appendix C.

3.5 Geotechnical Sampling and Testing

3.5.1 Samples were dispatched to an accredited geotechnical laboratory in order to classify the geotechnical properties of the soils. The following tests were scheduled:

- Point Lode
- UCS
- pH & Water-Soluble Sulphate

3.5.2 All testing was carried out in accordance with the procedures set out in BS EN ISO/IEC 17025:2005.

3.5.3 All samples were tested by a UKAS accredited laboratory.

3.5.4 The results are included as Appendix D.

3.6 Chemical Sampling and Testing

3.6.1 The proposed end use of the site is for commercial use and the subsequent data analysis will be conducted using this setting to test for levels of contaminants against generic assessment criteria.

3.6.2 The Phase I report highlighted heavy metals, sulphates, pH, total petroleum hydrocarbons and polycyclic aromatic hydrocarbons as the primary contaminants of concern.

3.6.3 All retrieved samples were logged in accordance with BS5930;2015 and BS EN ISO 14689. Collection of media for environmental testing was obtained, stored in plastic tubs and glass jars and kept within a temperature controlled cool box before being dispatched for testing.

3.6.4 Samples were taken at varying depths and tested for potential contaminants including the following;

- Heavy Metals (As, B, Cd, Cr, Cu, Hg, Pb, Ni, Se, Zn)
- Sulphates
- Polyaromatic Hydrocarbons
- pH
- Total Petroleum Hydrocarbons
- Asbestos

3.6.1 All samples were tested by a UKAS and MCERT accredited laboratory.

3.6.2 The results are included as Appendix D.

4 GROUND CONDITIONS

4.1 General

4.1.1 The BGS 1:50,000-scale bedrock geological map Sheet 351 & 358, Penzance of the area shows the site to be underlain by the Mylor Slate Formation. Superficial marine beach deposits are also present on site. An Unnamed Igneous Intrusion, Devonian - Metagabbro and metamicrogabbro. Metamorphic bedrock formed between 419.2 and 358.9 million years ago during the Devonian period is also mapped nearby. This is often locally referred to as 'Blue Elvan'.

4.1.2 The following table represents a summary of the strata encountered beneath the site;

Table 4.1: Ground Conditions

Strata	Depth Encountered (mBGL)		Typical Thickness (m)	Brief Description & Comments
	From	To		
Made Ground (Surfacing)	0.00	0.18 – 0.35	0.276	Tarmac, concrete or cut Granite cobbles
Made Ground (Fill)	0.18 – 0.35	3.20 – 3.70	3.43	Grey and brown clayey, sandy GRAVEL of MUDSTONE & Very sandy, very gravelly CLAY
Superficial Deposits	3.20 – 3.70	5.20 – 6.10	2.13	Brown and dark grey slightly clayey, very sandy GRAVEL of MUDSTONE
Mylor Slate Formation	5.20 – 5.40	7.70 – 9.00	Unproven	Highly weathered, light blueish grey MUDSTONE & Clayey, sandy GRAVEL of MUDSTONE
Blue Elvan	6.10 – 7.70	9.20 – 10.30	Unproven	Slightly weathered BLUE ELVAN

4.2 Strength Classification Tests

4.2.1 Point load tests were completed at regular intervals within the unit to ascertain the Uniaxial Compressive Strength (UCS) and thus the strength of the material. Conversion

factors are available (for example as outlined in *Tomlinson*, Foundation Design and Construction, Table 1.4), however since UCS testing was completed on the same material, a site-specific conversion factor of 21 was deduced.

Table 4.2: Strength Classifications

Borehole	Depth (mBGL)	Test Method	Uniaxial Compressive Strength (Mpa)	Strength Classification (BS5930 & BS EN ISO 14689-1)	Strata
BH01	6.7-6.8	Point Load	1.89	Very Weak	Mylor Slate Formation
BH01	7.4-7.5	Point Load	4.41	Very Weak	Mylor Slate Formation
BH01	8-8.06	Point Load	2.52	Very Weak	Mylor Slate Formation
BH01	8.2-8.3	Point Load	8.40	Weak	Mylor Slate Formation
BH01	8.9-9.0	Point Load	1.68	Very Weak	Mylor Slate Formation
BH02	5.9-6.0	Point Load	2.31	Very Weak	Mylor Slate Formation
BH02	6.4-6.5	Point Load	36.75	Medium Strong	Mylor Slate Formation
BH02	7.0-7.1	Point Load	32.55	Medium Strong	Mylor Slate Formation
BH02	7.7-7.8	Point Load	107.1	Very Strong	Blue Elvan
BH02	9.1-9.2	Point Load	127.47	Very Strong	Blue Elvan
BH03	6.25-6.35	Point Load	7.35	Weak	Blue Elvan
BH03	6.45-6.6	Point Load	3.36	Very Weak	Blue Elvan
BH03	7.6-7.7	Point Load	5.46	Weak	Blue Elvan
BH03	9.2-9.3	Point Load	5.88	Weak	Blue Elvan
BH04	9.9-10.0	Point Load	2.10	Very Weak	Blue Elvan
BH02	8.20-8.50	UCS	64.5	Strong	Blue Elvan

4.3 Made Ground

4.3.1 All holes encountered horizons made ground of surface horizons of tarmac, concrete or cut granite cobbles between 0.18m and 0.35mBGL. Surface horizons of made ground were underlain by subsequent horizons of made ground, consisting of grey and brown

clayey, sandy GRAVEL of Mudstone and very sandy, very gravelly CLAY between 0.18m and 3.70mBGL.

4.3.2 No anthropogenic components were noted within the material. It is likely that this is imported fill material, used to increase the surface level behind harbour walls.

4.4 Superficial Deposits

4.4.1 Material described as Superficial Deposits were encountered across the site to depths of up to 6.10mBGL.

4.4.2 The unit may be generally described as brown and dark grey slightly clayey, very sandy GRAVEL of MUDSTONE.

4.5 Weathered Mylor Slate Formation

4.5.1 Material described as Weathered Mylor Slate Formation was encountered across the site to depths of up to 9.00mBGL. The typical thickness of this unit is unproven.

4.5.2 The unit may be generally described as highly weathered, light blueish grey MUDSTONE with frequent horizons of non-intact, clayey, sandy GRAVEL of MUDSTONE.

4.6 Weathered Blue Elvan

4.6.1 Material described as Weathered Blue Elvan was encountered across the site to depths of up to 10.30mBGL. The typical thickness of this unit is unproven.

4.6.2 The unit may be generally described as slightly weathered BLUE ELVAN.

4.7 Standard Penetration Tests (SPTs)

4.7.1 Standard Penetration Tests (SPTs) were completed during window sampling, prior to rotary coring in all boreholes (RC01 – RC03) at regular intervals within the Made Ground, Superficial Deposits, Weathered Mylor Slate Formation and Weathered Blue Elvan, and can be summarised below;

Table 4.3: Standard Penetration Tests within the Weathered Mylor Slate Formation

Depth (mBGL)	SPT 'N' Value		
	Min	**Max**	**Average**
1.20	2	4	**3.3**
2.20	5	6	**5.3**
3.20	7	13	**9.7**
4.20	14	29	**19.0**
5.20	22	50	**36.0**

5.50	50	50	**50.0**
6.20	48	48	**48.0**

4.8 Groundwater

4.8.1 Groundwater was encountered the following exploratory holes:

Table 4.4: Groundwater Encountered

Exploratory Hole	Groundwater Level (mBGL)	Stratum
RC01	1.90	Made Ground
RC02	1.45	Made Ground
RC03	3.10	Made Ground

5 GEOTECHNICAL ASSESSMENT

5.1 Introduction

5.1.1 It is proposed to demolish the existing structures and replace with modern buildings. Exact development proposal were not yet finalised at the time of completing this report.

5.1.2 At the time of writing this report, no definitive structural loads have been provided by the client.

5.2 Foundation Options

5.2.1 Based on the ground conditions encountered it is considered that conventional strip foundations will likely not be suitable to support the proposed new structures due to the significant depth to bedrock, presence of Made Ground with variable strength and location of the site area on the harbour wall which also overlies the historic harbour wall.

5.2.2 A piled foundation solution could be considered, with end-bearing piles driven through the Made Ground/Harbour wall and socketed within the underlying Mylor Slate Formation/Blue Elvan. It is considered that a socket of approximately 3m into the competent bedrock strata would be sufficient. It is recommended a local piling contractor should be contacted and available piling methods considered to ensure the minimum amount of vibrations so as not to damage the existing site area.

5.3 Floor Slabs

5.3.1 Based on the results of laboratory testing and on-site observations, it is considered that a ground bearing floor slab seated within the Made Ground would not be appropriate. Suspended floor slabs should therefore be considered.

5.3.2 Full radon protection should be incorporated into the floor slab in accordance with BRE guidelines.

5.4 Excavations and Earthworks

5.4.1 Excavations to at least 1.20m should be readily achievable with conventional soil excavating machinery. Excavations to this depth are unlikely to stand unsupported in the short term due to the presence of Made Ground.

5.4.2 Any excavations to greater than 1.20m which require personnel to enter should be supported.

5.4.3 Due to the fines content of the fill material, excavations should be covered during periods of inclement weather to prevent wetting and subsequent degradation.

5.4.4 It is considered that groundwater will not be encountered in shallow excavations.

5.5 Chemical Attack on Buried Concrete

5.5.1 Chemical testing indicates water soluble sulphate contents of 115-1720mg/l, with pH values of 7.5-8.2.

5.5.2 Based on the above results the site may be classified as falling into the Design Sulphate Class DS-1. The Aggressive Chemical Environment for Concrete (ACEC) class is based upon the pH and mobility of groundwater. The results indicate that the soils on site fall into class AC-1.

6 CONTAMINATION ASSESSMENT

6.1 Comparison with Generic Assessment Criteria (GACs)

6.1.1 The laboratory results are contained as Appendix D.

6.1.2 Results from the environmental testing can be compared against Generic Assessment Criteria (GAC) to form the basis of a GQRA. The GAC's used are taken from the LQM/CIEH 'Suitable 4 Use Levels' publication. In the absence of a suitable S4UL value (such as Lead), reference has been made to DEFRA's Category 4 Screening Levels (C4SL) where deemed justifiable. Given the proposed land use for this site, the commercial setting has been chosen for the appropriate set of criteria. A comparison table can be found below.

Table 6.1: Comparison of soil results against GAC's (Commercial 2.5% organic matter; based on the average value recorded – all values in mg/kg unless stated)

Contaminant	GAC's: S4UL's - Commercial (unless stated)	Minimum	Maximum	Exceedances
Metals				
Arsenic	640	17	140	0
Boron	240000	0.7	8.3	0
Cadmium	190	<0.2	<0.2	0
Chromium (III)	8600	23	73	0
Chromium (VI)	33	<1.8	<1.8	0
Copper	68000	49	310	0
Mercury (inorganic)	1100	<0.3	<0.3	0
Nickel	980	27	87	0
Lead	**2300**	17	150	0
Selenium	12000	<1.0	<1.0	0
Zinc	730000	73	870	0
General				
Asbestos	N/A	None Detected		0
pH	N/A	7.5	8.2	-

Organic Matter %	N/A	0.60	7.3	-
Sulphates (water soluble, g/l)	N/A	0.11	1.70	-
Cyanide (total)	23 (USEPA)	<1.00	<1.00	-
Phenols	380	<1.00	<1.00	0
Organics				
Polycyclic Aromatic Hydrocarbons (PAH, 16)				
Acenaphthene	97000	<0.05	0.25	0
Acenaphthylene	97000	<0.05	0.60	0
Anthracene	540000	<0.05	2.30	0
Benzo(a)anthracene	170	0.19	7.10	0
Benzo(a)pyrene	35	0.18	7.40	0
Benzo(b)fluoranthene	44	0.15	6.90	0
Benzo(ghi)perylene	4000	0.12	3.20	0
Benzo(k)fluoranthene	1200	0.09	7.40	0
Chrysene	350	0.16	7.30	0
Dibenzo(ah)anthracene	3.6	<0.05	0.84	0
Fluoranthene	23000	0.26	18.0	0
Fluorene	68000	<0.05	0.67	0
Indeno (123-cd) pyrene	510	0.09	3.00	0
Naphthalene	460	<0.05	0.44	0
Phenanthrene	22000	0.13	9.00	0
Pyrene	54000	0.23	15.00	0
PAH (Total 16)	N/A	1.71	89	-
Total Petroleum Hydrocarbons (TPH)				
Benzene	110000	<1.00	<1.00	0
Toluene	13000	<1.00	<1.00	0
Ethylbenzene	15000	<1.00	<1.00	0
o-xylene	14000	<1.00	<1.00	0

m & p-xylene	14000	<1.00	<1.00	0
Methyl Tertiary Butyl Ether (MTBE)	14000	<1.00	<1.00	0
Aliphatic >C5-C6	5900	<0.001	<0.001	0
Aliphatic >C6-C8	17000	<0.001	<0.001	0
Aliphatic >C8-C10	4800	<0.001	<0.001	0
Aliphatic >C10-C12	23000	<1.0	2.2	0
Aliphatic >C12-C16	82000	<2.0	7	0
Aliphatic >C16-C21	1700000	<8.0	13	0
Aliphatic >C21-C35	1700000	<8.0	9.4 70	0
Aromatic >C5-C7	46000	<0.001	<0.001	0
Aromatic >C7-C8	110000	<0.001	<0.001	0
Aromatic >C8-C10	8100	<0.001	<0.001	0
Aromatic >C10-C12	28000	<1.0	1.6	0
Aromatic >C12-C16	37000	<2.0	6.1	0
Aromatic >C16-C21	28000	<10	39	0
Aromatic >C21-C35	28000	<10	47	0
Aromatic >C35-C44	28000	<10	37	0
Total TPH	N/A	35	110	0

6.1.3 Soil pH values ranged from 7.50 to 8.20 with an average of 7.90.

6.1.4 Soil Organic Matter (SOM) testing was undertaken on 7 samples. An average value of 2.4% was calculated, resulting in a value of 2.5% SOM being adopted.

6.1.5 No asbestos was recorded during testing.

6.1.6 No elevated levels of VOCs, SVOCs, TPH or PAH were recorded.

6.2 Ground Gas Risk

6.2.1 To access the risk posed by ground gases at the site four rounds of gas monitoring were undertaken following the intrusive investigation at one-week intervals.

6.2.2 Concentrations of CH4, CO2, CO, H2S and O2 were recorded using a G505363 gas extraction monitor.

6.2.3 The measured concentrations of potential ground gases (volume in air) and flow rates (l/hr) have been used to calculate Gas Screening Values (GSVs). These have also been compared to CIRIA Report 665.

6.2.4 It is recommended that the gas risk should be assessed by the consideration of pathways as follows:

- Gas ingress into the property through the substructure and building up to hazardous levels.
- Future site user's exposure in garden areas, including any extensions, outbuildings or excavations for garden features.

6.2.5 The following table tabulates the ground gas parameters that have been recorded over 4nr rounds of gas monitoring. Full results are contained in Appendix C.

Table 6.2: Minimum and Maximum values taken from the 4nr gas monitoring visits.

	Minimum	Maximum
Flow rate (l/hr)	0.1	0.10
CH_4 (%v/v)	ND	ND
CO_2 (%v/v)	0.10	0.40
CO (ppmv)	ND	2.00
H_2S (%v/v)	ND	ND
O_2 (%v/v)	19.20	21.10

6.2.6 The maximum concentrations observed at the site were used to calculate the Gas Screening Value using the formula:

6.2.7 GSV (l/hr) = concentration of gas (% v/v converted to decimal) * flow rate (l/hr)

6.2.8 Carbon dioxide: 0.004 * 0.10 = 0.0004/hr (where flow rate is recorded as zero use limit of detection)

6.2.9 No concentration was observed for methane or hydrogen sulphide.

6.2.10 Concentrations of carbon monoxide (2ppmv) were encountered during the second and third monitoring visits only (24th October and 1st November) by Cormac Consultancy. No Carbon Monoxide was encountered during the first and final visits.

6.2.11 The type of development proposed is commercial, according to the CIRIA guidance document (C659, 'Assessing risks posed by hazardous ground gases to buildings'). A clear ventilated underfloor void is likely to be included in the building plans. Situation B, is for low rise developments with a ventilated underfloor void. Using the gas screening value obtained above and the typical maximum gas concentrations (carbon monoxide and carbon dioxide) the site should be categorised as 'green'.

6.3 Refined Conceptual Site Model

Table 6.3: Refined Conceptual Model

Preliminary Conceptual Model							
	Source(s)	Contaminant(s)	Pathway(s)	Receptor(s)	Probability	Consequence	Risk Assessment
On Site	Natural Geology	Radon gas	Ingress into proposed buildings	Future site users	High	Severe	**High Risk** – Development is within an area where between 10-30% of properties are affected.
		Heavy Metals	Dermal contact Soil and dust ingestion and inhalation Ground & surface waters	Future site users Site workers Site flora and fauna	Unlikely	Medium	**Low Risk –** Levels of all heavy metals were below the relevant generic assessment criteria for commercial end use.
	Historic Harbour	Heavy Metals (Arsenic, cadmium, copper, lead, zinc)	Dermal contact Soil and dust ingestion and inhalation	Future site users Site workers Site flora and fauna	Unlikely	Medium	**Low Risk –** Levels of all heavy metals were below the relevant generic assessment criteria for commercial end use.
		Polycyclic Aromatic Hydrocarbons	Dermal contact Soil and dust ingestion	Future site users Site workers Site flora and fauna	Unlikely	Medium	**Low Risk –** Levels of all PAHs were below the relevant generic assessment criteria for commercial end use.
		Asbestos	Dermal contact Soil and dust ingestion and inhalation	Future site users Site workers Site flora and fauna	Unlikely	Medium	**Low Risk –** Asbestos was not identified in any of the samples tested.

	VOCs & SVOCs	Dermal contact Soil and dust ingestion and inhalation	Future site users Site workers Site flora and fauna	Unlikely	Medium	**Low Risk –** Levels of all SVOCs & VOCs were below the relevant generic assessment criteria for commercial end use
	Total Petroleum Hydrocarbons	Dermal contact Soil and dust ingestion and inhalation Ground & surface waters	Future site users Site workers Site flora and fauna	Unlikely	Medium	**Low Risk –** Levels of all TPHs were below the relevant generic assessment criteria for commercial end use.
	Ground Gas	Ingress into proposed buildings	Future site users	Unlikely	Medium	**Low Risk –** No concentration was observed for methane or hydrogen sulphide. Concentrations of carbon monoxide (2ppmv) were encountered during the second and third monitoring visits only (24th October and 1st November) by Cormac Consultancy. No Carbon Monoxide was encountered during the first and final visits. The type of development proposed is commercial, according to the CIRIA guidance document (C659, 'Assessing risks posed by hazardous ground gases to buildings'). A clear ventilated underfloor void is likely to be included in the building plans. Situation B, is for low rise developments with a ventilated underfloor void. Using the gas screening value obtained above and the typical maximum gas concentrations (carbon monoxide and carbon dioxide) the site should be categorised as 'green'.

7 CONCLUSIONS

7.1.1 The site was subject to a Phase II Ground Investigation to determine the level and risk of potential contamination, as well as the stability and geotechnical parameters of the underlying material.

7.1.2 It can be concluded that all contaminants tested are below the relevant generic acceptance criteria. The site is likely to be suitable for its intended use.

7.1.3 It is considered that conventional strip foundations will not be appropriate at the site, due to the extent and geotechnical properties of the Made Ground and historic harbour wall across the site.

7.1.4 Based on the site observations, In-situ and laboratory testing, it is considered that a piled foundation solution is appropriate, with end-bearing piles driven through the Made Ground/harbour wall and socketed a minimum of 3.00m into the competent bedrock, the underlying Mylor Slate Formation/Blue Elvan.

8 RECOMMENDATIONS

8.1.1 As the site is situated in an area where between 10-30% of the properties are above the action level, it is recommended that full radon protective measures are installed on any proposed building.

8.1.2 Suitable safety measures should be taken by those working on site to mitigate the risks associated with contaminated media including undertaking the appropriate risk assessments and ensuring all workers are wearing the correct PPE.

8.1.3 Waste removed from site shall be disposed of at a suitable facility with the appropriate Waste Transfer Notices obtained for future records. Asbestos waste should be handled by a suitable waste contractor.

9 REFERENCE LIST

9.1.1 BSI (2011) BS 10175:2011 Investigation of Potentially Contaminated Sites - Code of Practice. London, British Standards Institution

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9.1.4 Chartered Institute of Environmental Health (CIEH) and Contaminated Land: Applications in Real Environments (CL:AIRE) (2008) Guidance on Comparing Soil Contamination Data with a Critical Concentration. London, CIEH

9.1.5 CIRIA (2001) CIRIA C552 - Contaminated land risk assessment: A guide to good practice. London, CIRIA

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9.1.14 Great Britain. Water Act (2003) London, The Stationery Office

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9.1.18 National House Building Council (NHBC), Environment Agency and Chartered Institute of Environmental Health (CIEH) (2008) Research & Development Publication 66: Guidance for the Safe Development of Housing on Land Affected by Contamination. Amersham, NHBC

9.1.19 Royal Institution of Chartered Surveyors (RICS) (2012) Japanese Knotweed and Residential Property. Coventry, RICS

10 NOTES

10.1.1 This report is concerned solely with the property, as defined by this report, or parts thereof examined.

10.1.2 The report should not be used in connection with adjacent properties.

10.1.3 In respect of site works, Wheal Jane Consultancy cannot accept any liabilities for any additional mine workings found outside the limits of any areas examined.

10.1.4 The information supplied by third parties which has been used in compiling this Phase 2 ground investigation report, is derived from a number of statutory and non-statutory sources. While every effort is made by the supplier to ensure accuracy, the supplier cannot guarantee the accuracy or completeness of such information or data, nor to identify all the factors that may be relevant.

10.1.5 The conclusions and recommendations relate to the type and extent of development outlined in this report for this specific property only and should not be taken as suitable for any other form or extent of development on this property without further consultation with Wheal Jane Consultancy.

10.1.6 This report is confidential to the client, the client's legal and professional advisors, and may not be reproduced or distributed without our permission other than to directly facilitate the sale or development of the property concerned.

10.1.7 We have no liability toward any person not party to commissioning this report.

10.1.8 Unless otherwise expressly stated, nothing in this report shall create or confer any rights or other benefits pursuant to the Contracts (Rights of Third Parties) Act 1999 in favour of any person other than the person commissioning this report.

10.1.9 This report is not an asbestos inspection that may fall within the control of Control of Asbestos Regulations 2006

FIGURES:

Title: **Site Location Plan**

Project: **Penzance Harbour Modernisation**

Client: **MWJV LTd**

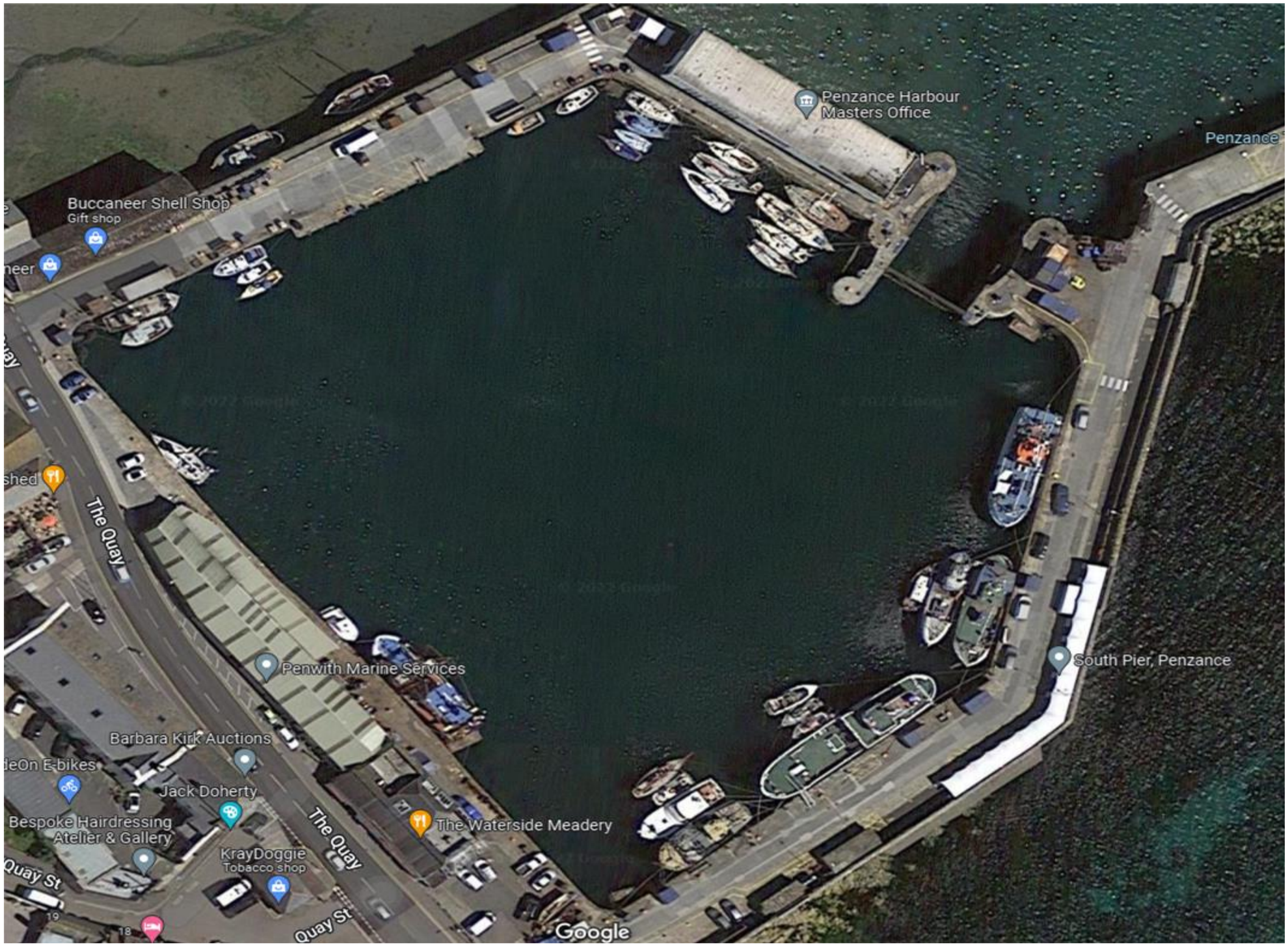
Report Title: **Geo**

Date: **5-10 October 2022**

Ref: **21155**

Figure: **2.1**

WHEAL JANE CONSULTANCY
GEOTECHNICAL, ENVIRONMENTAL & MINING SERVICES



N

Legend:

WHEAL JANE CONSULTANCY
GEOTECHNICAL, ENVIRONMENTAL & MINING SERVICES

Title:

Current Site Layout

Project:

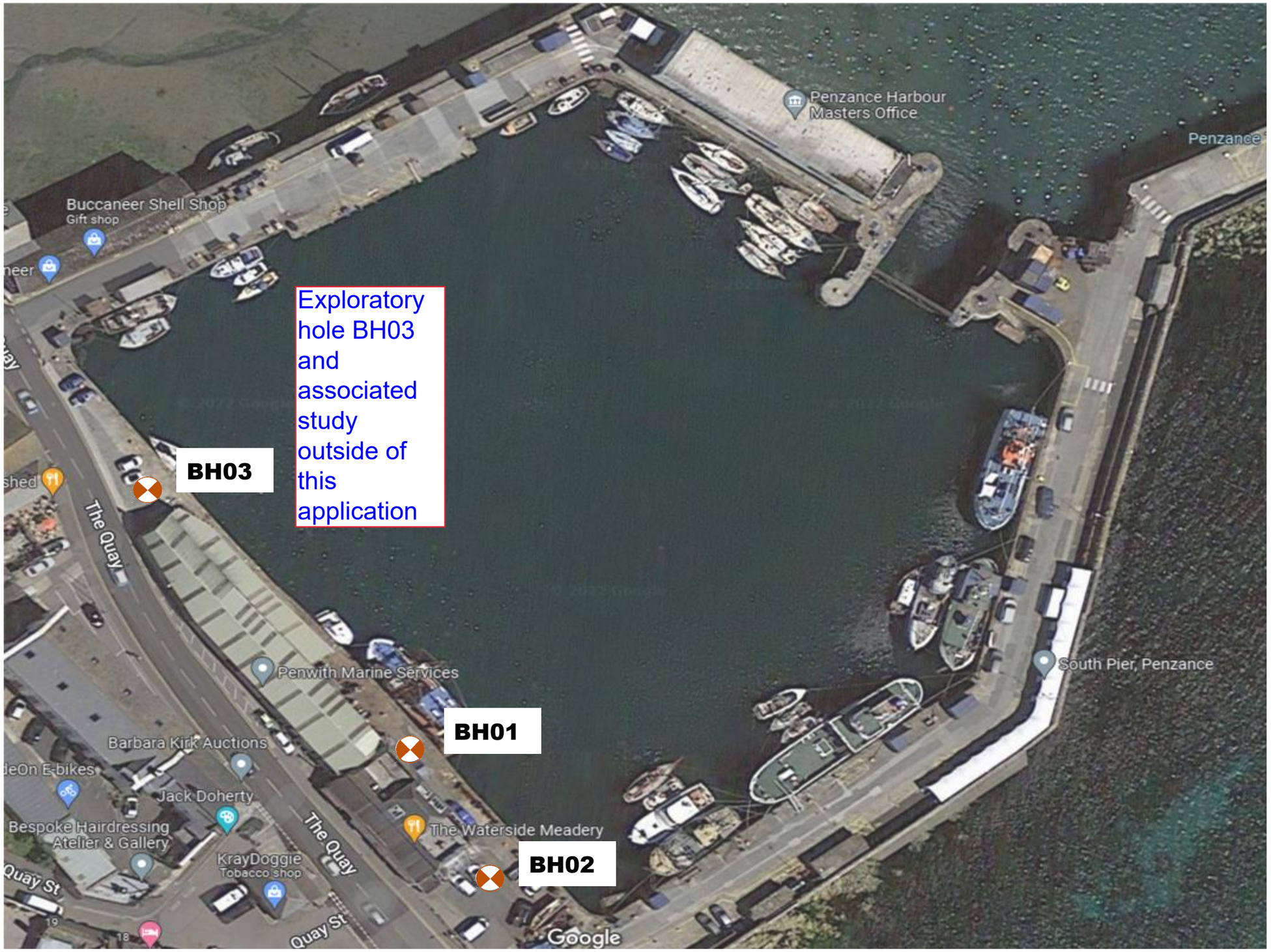
Penzance Harbour Modernisation

21155

Client:

MWJV LTd

Date:	5-10 October 2022
Scale:	NTS
Drawn by:	-
Revision:	A
Figure:	2.2



N

Legend:

Rotary Borehole

WHEAL JANE CONSULTANCY
GEOTECHNICAL, ENVIRONMENTAL & MINING SERVICES

Title:

Exploratory Hole Location Plan

Project:

Penzance Harbour Modernisation

21155

Client:

WWA

Date:	5-10 October 2022
Scale:	NTS
Drawn by:	-
Revision:	A
Figure:	3.1

APPENDIX A

Exploratory Hole Logs

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC01

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location Penzance Harbour	**Dates** 05/10/2022	**Engineer** Wheal Jane Consultancy	**Sheet** 1/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(0.18)	MADE GROUND. Light grey granite cobbles with cement between.			
						4.32	0.18	MADE GROUND. Dark grey slightly clayey, very sandy subangular to subrounded fine to coarse GRAVEL of Mudstone. Sand is fine to coarse.			
0.40					ES		(0.37)				
0.60-1.60					BS	3.95	0.55	MADE GROUND. Very loose, mid brown clayey, very sandy subangular to subrounded fine to coarse GRAVEL of Mudstone. Sand is fine to coarse.			
0.75					ES						
							(1.05)				
1.20 1.20-1.65					1,1/0,1,0,1 SPT N=2						
						2.90	1.60	MADEGROUND. Firm to stiff light and mid grey sandy, gravelly CLAY. Gravel is subangular to subrounded fine to coarse of Mudstone. Sand is fine to coarse.			
1.70					ES						
1.80					D		(0.40)				
					Water strike(1) at 1.90m.					▽1	

Remarks
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.
Groundwater encountered at 1.90mBGL
5.50 - 6.00mBGL > Open hole
1.20 - 5.50mBGL > Windowless sampled
0.00 - 1.20mBGL > Excavated with handtools
6.00 - 9.00mBGL > Rotary cored

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC01

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location Penzance Harbour	**Dates** 05/10/2022	**Engineer** Wheal Jane Consultancy	**Sheet** 2/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
2.00-3.70					BS	2.50	2.00	MADE GROUND. Loose mid brown clayey, very sandy angular to subangular fine to coarse GRAVEL of Mudstone. Sand is fine to coarse.			
2.20 2.20-2.65					1,2/1,1,1,2 SPT N=5		(1.70)				
3.20 3.20-3.65					2,3/3,2,2,2 SPT N=9						
3.70-4.00					BS	0.80	3.70	Loose becoming medium dense, mid brown clayey, very sandy angular to subangular fine to coarse GRAVEL of Mudstone. Sand is fine to coarse. Strata shows organisation from this level.			
							(0.50)				

Remarks
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.
Groundwater encountered at 1.90mBGL
5.50 - 6.00mBGL > Open hole
1.20 - 5.50mBGL > Windowless sampled
0.00 - 1.20mBGL > Excavated with handtools
6.00 - 9.00mBGL > Rotary cored

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy								Site: Penzance Harbour Modernisation			Borehole Number: RC01
Boring Method: Rotary Cored using GEO 205 COMMACHIO			Casing Diameter			Ground Level (mOD): 4.50		Client: WWA			Job Number: 21155
			Location: Penzance Harbour			Dates: 05/10/2022		Engineer: Wheal Jane Consultancy			Sheet: 3/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
4.20 4.20-4.65					3,5/4,4,3,3 SPT N=14	0.30	4.20	Medium dense dark grey slightly clayey, very sandy angular to subangular fine to coarse GRAVEL of Mudstone. Sand is fine to coarse. Mild organic aroma from this horizon.			
4.50-5.40					BS						
							(1.20)				
4.90					ES						
5.20						-0.90	5.40	Medium dense light to mid grey angular to subangular medium to coarse GRAVEL of Mudstone.			
							(0.10)				
5.50-5.95					11,14/18,32 Open hole 5.50 - 6.00mBGL SPT N=50	-1.00	5.50	Dense. No recovery.			
							(0.75)				
6.00											

Remarks
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.
Groundwater encountered at 1.90mBGL
5.50 - 6.00mBGL > Open hole
1.20 - 5.50mBGL > Windowless sampled
0.00 - 1.20mBGL > Excavated with handtools
6.00 - 9.00mBGL > Rotary cored

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC01

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location Penzance Harbour	**Dates** 05/10/2022	**Engineer** Wheal Jane Consultancy	**Sheet** 4/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						-1.75	6.25 (0.28)	Recovered as mid to dark grey, clayey, sandy, angular to subangular fine to coarse GRAVEL of very weathered mudstone. Sand is fine to coarse.			
6.25				NI							
6.53				90		-2.03	6.53 (0.27)	Extremely weak, very thinly laminated, moderately to highly weathered, light to dark blueish grey MUDSTONE. Horizontal to subhorizontal, extremely close discontinuities which are stepped, rough and slightly infilled with clayey, sandy, gravel. Fracture surfaces are reddish dark grey.			
6.70-6.80	85	45	0		CO						
6.80				NI		-2.30	6.80 (0.18)	Recovered as mid to dark grey, clayey, sandy, angular to subangular fine to coarse GRAVEL of very weathered mudstone. Sand is fine to coarse.			
6.98				90		-2.48	6.98 (0.08)	Extremely weak, very thinly laminated, moderately to highly weathered, light to dark blueish grey MUDSTONE. Horizontal to subhorizontal, extremely close discontinuities which are stepped, rough and slightly infilled with clayey, sandy, gravel. Fracture surfaces are reddish dark grey.			
7.06				NI		-2.56	7.06 (0.11)	Recovered as mid to dark grey, clayey, sandy, angular to subangular fine to coarse GRAVEL of very weathered mudstone. Sand is fine to coarse.			
7.17				80		-2.67	7.17 (0.17)	Extremely weak, very thinly laminated, moderately to highly weathered, light to dark blueish grey MUDSTONE. Horizontal to subhorizontal, extremely close discontinuities which are stepped, rough and slightly infilled with clayey, sandy, gravel. Fracture surfaces are reddish dark grey.			
7.34				NI	CO	-2.84	7.34 (0.16)	Recovered as mid to dark grey, clayey, sandy, angular to subangular fine to coarse GRAVEL of very weathered mudstone. Sand is fine to coarse.			
7.40-7.50											
7.50				85		-3.00	7.50 (0.19)	Extremely weak, very thinly laminated, moderately to highly weathered, light to dark blueish grey MUDSTONE. Horizontal to subhorizontal, extremely close discontinuities which are stepped, rough and slightly infilled with clayey, sandy, gravel. Fracture surfaces are reddish dark grey.			
7.69				NI		-3.19	7.69 (0.19)	Recovered as mid to dark grey, clayey, sandy, angular to subangular fine to coarse GRAVEL of very weathered mudstone. Sand is fine to coarse.			
7.88						-3.38	7.88	Extremely weak, very thinly laminated, moderately to highly weathered, light to dark blueish grey MUDSTONE. Horizontal to subhorizontal, extremely close discontinuities which are stepped,			

Remarks
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.
Groundwater encountered at 1.90mBGL
5.50 - 6.00mBGL > Open hole
1.20 - 5.50mBGL > Windowless sampled
0.00 - 1.20mBGL > Excavated with handtools
6.00 - 9.00mBGL > Rotary cored

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC01

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location Penzance Harbour	**Dates** 05/10/2022	**Engineer** Wheal Jane Consultancy	**Sheet** 5/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
8.00-8.06					CO			rough and slightly infilled with clayey, sandy, gravel. Fracture surfaces are reddish dark grey.			
				70			(0.52)				
8.20-8.30	100	51	0		CO						
8.40						-3.90	8.40				
				NI			(0.08)	Recovered as mid to dark grey, clayey, sandy, angular to subangular fine to coarse GRAVEL of very weathered mudstone. Sand is fine to coarse.			
8.48						-3.98	8.48				
				90			(0.13)	Extremely weak, very thinly laminated, moderately to highly weathered, light to dark blueish grey MUDSTONE. Horizontal to subhorizontal, extremely close discontinuities which are stepped, rough and slightly infilled with clayey, sandy, gravel. Fracture surfaces are reddish dark grey.			
8.61						-4.11	8.61				
				NI			(0.39)	Recovered as mid to dark grey, clayey, sandy, angular to subangular fine to coarse GRAVEL of very weathered mudstone. Sand is fine to coarse.			
8.90-9.00					CO						
9.00						-4.50	9.00	Complete at 9.00m			

Remarks
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.
Groundwater encountered at 1.90mBGL
5.50 - 6.00mBGL > Open hole
1.20 - 5.50mBGL > Windowless sampled
0.00 - 1.20mBGL > Excavated with handtools
6.00 - 9.00mBGL > Rotary cored

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC02

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location Penzance Harbour	**Dates** 06/10/2022	**Engineer** Wheal Jane Consultancy	**Sheet** 1/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						4.44	(0.06) 0.06	MADE GROUND. Dark grey tarmac.			
							(0.20)	MADE GROUND. Light grey granite cobbles with cement between.			
						4.24	0.26				
						4.20	(0.04) 0.30	MADE GROUND. Light grey concrete.			
							(0.50)	MADE GROUND. Mid brown, slightly orangish brown and dark grey, clayey, sandy subangular to subrounded fine to coarse GRAVEL of Mudstone. Sand is fine to coarse.			
0.60					ES						
0.80-2.90					BS	3.70	0.80	MADE GROUND. Very loose becoming loose dark grey, clayey, sandy subangular to subrounded fine to coarse GRAVEL of Mudstone. Sand is fine to coarse.			
1.20					0,1/1,0,2,1						
1.20-1.65					SPT N=4						
1.20					ES					▽1	
					Water strike(1) at 1.45m.						
1.60					D						
							(2.10)				

Remarks
5.80 - 9.20mBGL > Rotary cored
0.00 - 1.20mBGL > Excavated with handtools
1.20 - 5.20mBGL > Windowless sampled
5.20 - 5.80mBGL > Open hole
Groundwater encountered at 1.45mBGL
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC02

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location Penzance Harbour	**Dates** 06/10/2022	**Engineer** Wheal Jane Consultancy	**Sheet** 2/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
2.20 2.20-2.65					1,1/1,2,1,1 SPT N=5						
2.90-3.20					BS	1.60	2.90 (0.30)	MADE GROUND. Loose becoming medium dense orangish brown, clayey, sandy subangular to subrounded fine to coarse GRAVEL of Mudstone. Sand is fine to coarse.			
3.20 3.20-3.65 3.20-4.95					2,2/2,1,2,2 SPT N=7 BS	1.30	3.20	Medium dense, mid brown and mid grey clayey, very sandy angular to subrounded fine to coarse GRAVEL of Mudstone. Sand is fine to coarse.			
3.50					ES						

Remarks
5.80 - 9.20mBGL > Rotary cored
0.00 - 1.20mBGL > Excavated with handtools
1.20 - 5.20mBGL > Windowless sampled
5.20 - 5.80mBGL > Open hole
Groundwater encountered at 1.45mBGL
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC02

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location Penzance Harbour	**Dates** 06/10/2022	**Engineer** Wheal Jane Consultancy	**Sheet** 3/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(1.75)				
4.20 4.20-4.65					3,3/3,4,4,3 SPT N=14						
						-0.45	4.95	Firm to stiff dark grey and black sandy, gravelly CLAY. Gravel is angular to subangular fine to coarse of Mudstone. Sand is fine to coarse. Occasional fragments of wood. Mild organic aroma from this horizon.			
5.00					D						
							(0.25)				
5.10					ES						
5.20 5.20-5.65					10,11/24,26 SPT N=50	-0.70	5.20	Extremely weak to very weak, very thinly laminated, moderately to highly weathered, light blueish grey MUDSTONE. Horizontal to subhorizontal, extremely close discontinuities which are stepped, rough and slightly infilled with clayey, sandy, gravel. Fracture surfaces are dark grey and orangish grey.			
							(1.10)				
5.80											
5.90-6.00					CO						

Remarks
5.80 - 9.20mBGL > Rotary cored
0.00 - 1.20mBGL > Excavated with handtools
1.20 - 5.20mBGL > Windowless sampled
5.20 - 5.80mBGL > Open hole
Groundwater encountered at 1.45mBGL
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC02

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location Penzance Harbour	**Dates** 06/10/2022	**Engineer** Wheal Jane Consultancy	**Sheet** 4/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
				60							
6.30	90	61	0			-1.80	6.30				
6.40-6.50				80	CO		(0.60)	Medium strong to strong, very thinly laminated, moderately weathered, whiteish light blue and light grey MUDSTONE and QUARTZ. Horizontal to subhorizontal, extremely close discontinuities which are stepped, rough and slightly infilled with clayey, sandy, gravel. Fracture surfaces are dark grey and orangish grey.			
6.80											
6.90				NI		-2.40	6.90				
7.00-7.10					CO		(0.14)	Extremely weak to very weak, very thinly laminated, moderately to highly weathered, light blueish grey MUDSTONE. Horizontal to subhorizontal, extremely close discontinuities which are stepped, rough and slightly infilled with clayey, sandy, gravel. Fracture surfaces are dark grey and orangish grey.			
7.04				NI		-2.54	7.04				
7.17						-2.67	(0.13)	Recovered as mid to dark grey, slightly clayey, sandy, angular to subangular fine to coarse GRAVEL of very weathered mudstone. Sand is fine to coarse.			
7.23	80	15	0	50		-2.73	7.17 (0.06) 7.23	Very weak to weak, very thinly laminated, moderately to highly weathered, light blueish grey MUDSTONE. Horizontal to subhorizontal, extremely close discontinuities which are stepped, rough and slightly infilled with clayey, sandy, gravel. Fracture surfaces are dark grey and orangish grey.			
				150			(0.47)	Medium strong to strong, very thinly laminated, moderately weathered, whiteish light blue and light grey MUDSTONE and QUARTZ. Horizontal to subhorizontal, extremely close discontinuities which are stepped, rough and slightly infilled with clayey, sandy, gravel. Fracture surfaces are dark grey and orangish grey.			
7.70						-3.20	7.70				
7.70-7.80					CO			Strong to extremely strong, very thinly laminated, slightly weathered, whiteish grey to dark blueish grey BLUE ELVAN. Horizontal to subhorizontal, extremely close discontinuities which are stepped, rough and slightly infilled with clayey, sandy, gravel. Fracture surfaces are dark grey and orangish grey.			

Remarks
5.80 - 9.20mBGL > Rotary cored
0.00 - 1.20mBGL > Excavated with handtools
1.20 - 5.20mBGL > Windowless sampled
5.20 - 5.80mBGL > Open hole
Groundwater encountered at 1.45mBGL
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC02

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location Penzance Harbour	**Dates** 06/10/2022	**Engineer** Wheal Jane Consultancy	**Sheet** 5/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
8.20-8.50				210	CO						
	100	87	44				(1.50)				
8.95				NI							
9.03											
9.10-9.20				60	CO						
9.20						-4.70	9.20	Complete at 9.20m			

Remarks
5.80 - 9.20mBGL > Rotary cored
0.00 - 1.20mBGL > Excavated with handtools
1.20 - 5.20mBGL > Windowless sampled
5.20 - 5.80mBGL > Open hole
Groundwater encountered at 1.45mBGL
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC03

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location	**Dates**	**Engineer**	**Sheet**
	Penzance Harbour	07/10/2022-10/10/2022	Wheal Jane Consultancy	1/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(0.35)	MADE GROUND. Light grey concrete.			
						4.15	0.35	MADE GROUND. Mid brown, slightly orangish brown and dark grey, slightly clayey, slightly sandy subangular to subrounded fine to coarse GRAVEL of Mudstone. Sand is fine to coarse.			
							(0.40)				
0.75-1.50					BS	3.75	0.75	MADE GROUND. Very loose greyish brown, and dark grey, slightly clayey, very sandy subangular to subrounded fine to coarse GRAVEL of Mudstone. Sand is fine to coarse.			
0.85					ES						
							(0.75)				
1.20 1.20-1.65					1,1/1,1,1,1 SPT N=4						
1.50-2.00 1.50-3.00					BS BS	3.00	1.50	MADE GROUND. Loose dark grey and orangish brown clayey, sandy subangular to subrounded fine to coarse GRAVEL of Mudstone. Sand is fine to coarse.			
							(0.50)				

Remarks
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.
Groundwater encountered at 3.10mBGL
6.80 - 7.20mBGL > Open hole
1.20 - 6.80mBGL > Windowless sampled
0.00 - 1.20mBGL > Excavated with handtools
7.20 - 10.20mBGL > Rotary cored

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC03

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location Penzance Harbour	**Dates** 07/10/2022-10/10/2022	**Engineer** Wheal Jane Consultancy	**Sheet** 2/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
2.00					D	2.50	2.00	MADE GROUND. Firm to stiff orangish brown and grey very sandy, very gravelly CLAY. Gravel is subangular to subrounded fine to coarse of Mudstone. Sand is fine to coarse.			
2.20 2.20-2.65					2,1/2,1,1,2 SPT N=6		(1.00)				
3.00-3.40					BS Water strike(1) at 3.10m.	1.50	3.00	MADE GROUND. Medium dense dark grey and orangish brown clayey, sandy subangular to subrounded fine to coarse GRAVEL of Mudstone. Sand is fine to coarse.		▽1	
3.20 3.20-3.65					2,2/3,3,3,4 SPT N=13		(0.40)				
3.40-4.20					BS	1.10	3.40	Medium dense becoming dense mid grey and dark grey, very clayey, very sandy subangular to subrounded fine to coarse GRAVEL of Mudstone. Sand is fine to coarse.			

Remarks
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.
Groundwater encountered at 3.10mBGL
6.80 - 7.20mBGL > Open hole
1.20 - 6.80mBGL > Windowless sampled
0.00 - 1.20mBGL > Excavated with handtools
7.20 - 10.20mBGL > Rotary cored

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC03

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location	**Dates**	**Engineer**	**Sheet**
	Penzance Harbour	07/10/2022-10/10/2022	Wheal Jane Consultancy	3/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
4.20 4.20-4.65 4.20-5.20					5,5/6,9,7,7 SPT N=29 BS		(2.40)				
5.20 5.20-5.65 5.20-5.80					10,10/8,4,5,5 SPT N=22 BS						
						-1.30	5.80	Dark grey, slightly clayey, sandy subangular to subrounded fine to coarse GRAVEL of Mudstone. Sand is fine to coarse. Mild organic aroma from this horizon.			
							(0.30)				

Remarks
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.
Groundwater encountered at 3.10mBGL
6.80 - 7.20mBGL > Open hole
1.20 - 6.80mBGL > Windowless sampled
0.00 - 1.20mBGL > Excavated with handtools
7.20 - 10.20mBGL > Rotary cored

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC03

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location Penzance Harbour	**Dates** 07/10/2022-10/10/2022	**Engineer** Wheal Jane Consultancy	**Sheet** 4/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
6.00					ES						
						-1.60	6.10	Extremely weak to strong, very thinly laminated, slightly weathered, whiteish grey to dark blueish grey BLUE ELVAN. Verticle to subverticle, extremely close discontinuities which are stepped, rough and slightly infilled with clayey, sandy, gravel. Fracture surfaces are dark grey and orangish grey.			
6.20					8,8/16,10,11,11 SPT N=48						
6.20-6.65					CO						
6.25-6.35											
6.45-6.60					CO						
6.80											
7.20											
7.60-7.70					CO						
	100	77	8	80			(3.67)				

Remarks
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.
Groundwater encountered at 3.10mBGL
6.80 - 7.20mBGL > Open hole
1.20 - 6.80mBGL > Windowless sampled
0.00 - 1.20mBGL > Excavated with handtools
7.20 - 10.20mBGL > Rotary cored

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC03

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location	**Dates**	**Engineer**	**Sheet**
	Penzance Harbour	07/10/2022-10/10/2022	Wheal Jane Consultancy	5/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
8.40				20							
8.70				NI							
8.95				85							
9.20-9.30					CO						
9.30	100	84	14	110							
9.77				NI		-5.27	9.77 (0.05)	Recovered as light orangish brown, clayey, sandy, angular to subangular fine to coarse GRAVEL of weathered BLUE ELVAN. Sand is fine to coarse.			
9.82						-5.32	9.82				
9.90-10.00					CO			Extremely weak to strong, very thinly laminated, slightly weathered, whiteish grey to dark blueish grey BLUE ELVAN. Verticle to subverticle, extremely close discontinuities which are stepped, rough and slightly infilled with clayey, sandy,			

Remarks
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.
Groundwater encountered at 3.10mBGL
6.80 - 7.20mBGL > Open hole
1.20 - 6.80mBGL > Windowless sampled
0.00 - 1.20mBGL > Excavated with handtools
7.20 - 10.20mBGL > Rotary cored

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

Wheal Jane Consultancy

Site	Borehole Number
Penzance Harbour Modernisation	RC03

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Rotary Cored using GEO 205 COMMACHIO		4.50	WWA	21155
	Location Penzance Harbour	**Dates** 07/10/2022-10/10/2022	**Engineer** Wheal Jane Consultancy	**Sheet** 6/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
				110			(0.48)	gravel. Fracture surfaces are dark grey and orangish grey.			
10.20						-5.80	10.30	Complete at 10.30m			

Remarks
Gas and grounwater monitoring borehole installed with round flush cover. Gravel backfill & slotted pipe, followed by plain pipe with bentonite & concrete seal.
Groundwater encountered at 3.10mBGL
6.80 - 7.20mBGL > Open hole
1.20 - 6.80mBGL > Windowless sampled
0.00 - 1.20mBGL > Excavated with handtools
7.20 - 10.20mBGL > Rotary cored

Scale (approx)	Logged By
1:10	MJC

Figure No. 21155.RC01

APPENDIX B

Core Photographs

Core Run :	BH01 0.00-3.20m

Penzance Harbour	21155
Ground Investigation	Core Photographs
MWJV Ltd	October 2022

Core Run :	BH01 3.20-9.00m

Penzance Harbour	21155
Ground Investigation	Core Photographs
MWJV Ltd	October 2022

Core Run :	BH02 0.00-1.20m

Penzance Harbour	21155
Ground Investigation	Core Photographs
MWJV Ltd	October 2022

Core Run :	BH02 1.20-5.20m

Penzance Harbour	21155
Ground Investigation	Core Photographs
MWJV Ltd	October 2022

Core Run :	BH02 5.80-9.20m

Penzance Harbour	21155
Ground Investigation	Core Photographs
MWJV Ltd	October 2022

Core Run :	BH03 0.00-3.20m

Penzance Harbour	21155
Ground Investigation	Core Photographs
MWJV Ltd	October 2022

Core Run :	BH03 5.80-9.20m

Penzance Harbour	21155
Ground Investigation	Core Photographs
MWJV Ltd	October 2022

Core Run :	BH03 6.20-10.20m

Penzance Harbour	21155
Ground Investigation	Core Photographs
MWJV Ltd	October 2022

APPENDIX C

Ground Gas Monitoring Results

Penzance Harbour Monitoring

Gas/Groundwater Monitoring Results

Job Ref:

Date:	18/10/2022								
All measurements taken after 120 seconds.									
Borehole	O_2 %	CO_2 %	CH_4 %	CO ppm	H_2S ppm	Depth to water (m bgl)	Depth to base (m bgl)	Barometric pressure	Flow rate
BH01	21.1	0.1	0	0	0	3.07	8.94	1024	0.1
BH02	21.0	0.1	0	0	0	1.37	8.25	1025	0.1
BH03	21.1	0.1	0	0	0	3.76	10.60	1024	0.1

Date:	24/10/2022								
All measurements taken after 120 seconds.									
Borehole	O_2 %	CO_2 %	CH_4 %	CO ppm	H_2S ppm	Depth to water (m bgl)	Depth to base (m bgl)	Barometric pressure	Flow rate
BH01	19.2	0.3	0	2	0	1.55	8.79	1023	0.1
BH02	20.9	0.3	0	0	0	1.37	8.21	1024	0.1
BH03	20.7	0.2	0	0	0	2.58	10.65	1024	0.1

Date:	01/11/2022							
All measurements taken after 120 seconds.								
Borehole	O_2 %	CO_2 %	CH_4 %	CO ppm	H_2S ppm	Depth to water (m bgl)	Depth to base (m bgl)	Flow rate
BH01	19.5	0.4	0	2	0	2.13	8.91	0.1
BH02	20.9	0.2	0	0	0	2.34	9.24	0.1
BH03	21.0	0.2	0	0	0	2.76	10.92	0.1

Date:	07/11/2022							
All measurements taken after 120 seconds.								
Borehole	O_2 %	CO_2 %	CH_4 %	CO ppm	H_2S ppm	Depth to water (m bgl)	Depth to base (m bgl)	Flow rate
BH01	19.6	0.4	0	0	0	1.56	8.77	0.1
BH02	20.7	0.2	0	0	0	1.71	9.18	0.1
BH03	20.6	0.1	0	0	0	2.62	10.86	0.1

APPENDIX D
Laboratory Test Results

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Preliminary Report Number : 22-93763

Project / Site name:	Penzance Harbour	**Samples received on:**	19/10/2022
Your job number:	21155	**Samples instructed on/ Analysis started on:**	01/11/2022
Your order number:	21155	**Analysis completed by:**	not completed
Report Issue Number:	0	**Report issued on:**	11/11/2022
Samples Analysed:	10 soil samples		

Signed: [redacted]

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

Excel copies of reports are only valid when accompanied by this PDF certificate.
Preliminary reports provided at the request of the client should be considered as incomplete and have not been through the complete quality control procedure.
Results contained in preliminary reports may be subject to change and therefore should not be used as a basis for decision making, except at the risk of the client.
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: 22-93763
Project / Site name: Penzance Harbour
Your Order No: 21155

Lab Sample Number				2482721	2482722	2482723	2482724	2482725
Sample Reference				BH01	BH01	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.75	1.70	4.90	0.60
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	11	18	13	14
Total mass of sample received	kg	0.001	NONE	0.7	0.7	0.8	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	To follow	-	-	-	To follow
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8	7.9	-	8.2	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Thiocyanate as SCN	mg/kg	5	NONE	< 5.0	< 5.0	-	< 5.0	< 5.0
Total Sulphate as SO4	mg/kg	50	MCERTS	670	1000	1000	2700	2300
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	230	1000	920	2400	570
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.11	0.51	0.46	1.2	0.28
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	115	506	462	1210	283
Sulphide	mg/kg	1	NONE	11	7.8	7.7	230	1.4
Organic Matter (automated)	%	0.1	MCERTS	7.3	0.6	-	1.6	1.3
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	NONE	0.2	< 0.05	-	0.2	0.44
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	-	0.15	0.2
Acenaphthene	mg/kg	0.05	NONE	< 0.05	< 0.05	-	0.07	0.25
Fluorene	mg/kg	0.05	NONE	< 0.05	< 0.05	-	0.32	0.67
Phenanthrene	mg/kg	0.05	NONE	0.44	0.13	-	2.1	3.3
Anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	-	1.1	1.4
Fluoranthene	mg/kg	0.05	NONE	0.32	0.26	-	4.3	6.2
Pyrene	mg/kg	0.05	NONE	0.3	0.23	-	3.9	5.8
Benzo(a)anthracene	mg/kg	0.05	NONE	0.21	0.19	-	2	3.4
Chrysene	mg/kg	0.05	NONE	0.37	0.16	-	1.5	2.3
Benzo(b)fluoranthene	mg/kg	0.05	NONE	0.32	0.15	-	2.2	2.7
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.09	0.2	-	0.83	2.2
Benzo(a)pyrene	mg/kg	0.05	NONE	0.19	0.18	-	1.7	2.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.11	0.09	-	0.84	1.3
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	-	0.23	0.34
Benzo(ghi)perylene	mg/kg	0.05	NONE	0.12	0.12	-	0.81	1.3
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	2.67	1.71	-	22.4	34.4

Analytical Report Number: 22-93763
Project / Site name: Penzance Harbour
Your Order No: 21155

Lab Sample Number				2482721	2482722	2482723	2482724	2482725
Sample Reference				BH01	BH01	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.75	1.70	4.90	0.60
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	95	130	17	72	120
Boron (water soluble)	mg/kg	0.2	MCERTS	2.5	3.3	8.3	4.5	2.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	38	73	40	30	66
Copper (aqua regia extractable)	mg/kg	1	MCERTS	120	74	49	120	150
Lead (aqua regia extractable)	mg/kg	1	MCERTS	130	21	17	56	31
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	51	87	33	27	81
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140	170	73	90	180
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
p & m-xylene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
o-xylene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	37	-	-	35	-
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	-	< 1.0	-	-	To follow
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	-	< 2.0	-	-	To follow
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	-	< 8.0	-	-	To follow
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	-	< 8.0	-	-	To follow
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	-	< 10	-	-	To follow
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	-	< 1.0	-	-	To follow
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	-	< 2.0	-	-	To follow
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	-	< 10	-	-	To follow
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	-	< 10	-	-	To follow
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	-	< 10	-	-	To follow
VOCs								
Chloromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Chloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Bromomethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1-Dichloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0

Analytical Report Number: 22-93763
Project / Site name: Penzance Harbour
Your Order No: 21155

Lab Sample Number				2482721	2482722	2482723	2482724	2482725
Sample Reference				BH01	BH01	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.75	1.70	4.90	0.60
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
2,2-Dichloropropane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trichloromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1,1-Trichloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dichloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1-Dichloropropene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Benzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Tetrachloromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dichloropropane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Dibromomethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Bromodichloromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,3-Dichloropropane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Dibromochloromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dibromoethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Chlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
p & m-Xylene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Styrene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Tribromomethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
o-Xylene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Isopropylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Bromobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
n-Propylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
2-Chlorotoluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
4-Chlorotoluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
tert-Butylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
sec-Butylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,3-Dichlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
p-Isopropyltoluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dichlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Butylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Hexachlorobutadiene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0

SVOCs

Aniline	mg/kg	0.1	NONE	-	0.3	-	-	1.1
Phenol	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
2-Chlorophenol	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	NONE	-	0.3	-	-	0.3

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Lab Sample Number				2482721	2482722	2482723	2482724	2482725
Sample Reference				BH01	BH01	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.75	1.70	4.90	0.60
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
1,2-Dichlorobenzene	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2-Methylphenol	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Hexachloroethane	mg/kg	0.05	NONE	-	< 0.05	-	-	< 0.05
Nitrobenzene	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Isophorone	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
2-Nitrophenol	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Naphthalene	mg/kg	0.05	NONE	-	< 0.05	-	-	0.44
2,4-Dichlorophenol	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-	0.7
2-Chloronaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Dimethylphthalate	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Acenaphthylene	mg/kg	0.05	NONE	-	< 0.05	-	-	0.2
Acenaphthene	mg/kg	0.05	NONE	-	< 0.05	-	-	0.25
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Dibenzofuran	mg/kg	0.2	NONE	-	< 0.2	-	-	0.4
4-Chlorophenyl phenyl ether	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Diethyl phthalate	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
4-Nitroaniline	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Fluorene	mg/kg	0.05	NONE	-	< 0.05	-	-	0.67
Azobenzene	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Phenanthrene	mg/kg	0.05	NONE	-	0.13	-	-	3.3
Anthracene	mg/kg	0.05	NONE	-	< 0.05	-	-	1.4
Carbazole	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Anthraquinone	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Fluoranthene	mg/kg	0.05	NONE	-	0.26	-	-	6.2
Pyrene	mg/kg	0.05	NONE	-	0.23	-	-	5.8
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Benzo(a)anthracene	mg/kg	0.05	NONE	-	0.19	-	-	3.4
Chrysene	mg/kg	0.05	NONE	-	0.16	-	-	2.3
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	0.15	-	-	2.7
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	0.2	-	-	2.2
Benzo(a)pyrene	mg/kg	0.05	NONE	-	0.18	-	-	2.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	-	0.09	-	-	1.3
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	-	< 0.05	-	-	0.34
Benzo(ghi)perylene	mg/kg	0.05	NONE	-	0.12	-	-	1.3

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

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Lab Sample Number				2482726	2482727	2482728	2482729	2482730
Sample Reference				BH02	BH02	BH02	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	3.50	5.10	0.85	6.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	13	19	9.8	11
Total mass of sample received	kg	0.001	NONE	0.8	0.7	0.8	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	-	8	7.6	8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Thiocyanate as SCN	mg/kg	5	NONE	-	-	< 5.0	< 5.0	< 5.0
Total Sulphate as SO4	mg/kg	50	MCERTS	15000	920	3800	1800	2200
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	300	750	3400	1100	1600
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.15	0.38	1.7	0.56	0.82
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	152	377	1720	564	818
Sulphide	mg/kg	1	NONE	36	14	200	5.9	2100
Organic Matter (automated)	%	0.1	MCERTS	-	-	3.8	0.9	1.2
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	NONE	-	-	< 0.05	0.19	0.25
Acenaphthylene	mg/kg	0.05	NONE	-	-	< 0.05	0.23	0.6
Acenaphthene	mg/kg	0.05	NONE	-	-	< 0.05	0.1	0.14
Fluorene	mg/kg	0.05	NONE	-	-	< 0.05	0.28	0.54
Phenanthrene	mg/kg	0.05	NONE	-	-	0.24	3.4	9
Anthracene	mg/kg	0.05	NONE	-	-	0.09	1.1	2.3
Fluoranthene	mg/kg	0.05	NONE	-	-	0.73	7.6	18
Pyrene	mg/kg	0.05	NONE	-	-	0.71	7.2	15
Benzo(a)anthracene	mg/kg	0.05	NONE	-	-	0.43	4.1	7.1
Chrysene	mg/kg	0.05	NONE	-	-	0.6	3.1	7.3
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	-	0.52	4.5	6.9
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	-	0.41	2.4	7.4
Benzo(a)pyrene	mg/kg	0.05	NONE	-	-	0.52	4.1	7.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	-	-	0.24	2	3
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	-	-	< 0.05	0.47	0.84
Benzo(ghi)perylene	mg/kg	0.05	NONE	-	-	0.31	2.1	3.2
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	-	-	4.8	42.8	89

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Lab Sample Number				2482726	2482727	2482728	2482729	2482730
Sample Reference				BH02	BH02	BH02	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	3.50	5.10	0.85	6.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	42	110	120	97	140
Boron (water soluble)	mg/kg	0.2	MCERTS	1	6.7	7.8	0.7	4.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	43	44	42	38
Copper (aqua regia extractable)	mg/kg	1	MCERTS	140	150	210	120	330
Lead (aqua regia extractable)	mg/kg	1	MCERTS	36	46	120	83	150
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	46	78	54	64	39
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	78	320	200	250	870
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
p & m-xylene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
o-xylene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	-	-	-	-	110
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	-	-	< 1.0	To follow	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	-	-	< 2.0	To follow	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	-	-	< 8.0	To follow	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	-	-	< 8.0	To follow	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	-	-	10	To follow	-
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	-	-	< 1.0	To follow	-
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	-	-	4.8	To follow	-
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	-	-	39	To follow	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	-	-	47	To follow	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	-	-	92	To follow	-
VOCs								
Chloromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Chloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Bromomethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Vinyl Chloride	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1-Dichloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-

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Lab Sample Number				2482726	2482727	2482728	2482729	2482730
Sample Reference				BH02	BH02	BH02	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	3.50	5.10	0.85	6.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
2,2-Dichloropropane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Trichloromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1,1-Trichloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2-Dichloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1-Dichloropropene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Benzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Tetrachloromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2-Dichloropropane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Trichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Dibromomethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Bromodichloromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1,2-Trichloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,3-Dichloropropane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Dibromochloromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Tetrachloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2-Dibromoethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Chlorobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
p & m-Xylene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Styrene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Tribromomethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
o-Xylene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Isopropylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Bromobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
n-Propylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
2-Chlorotoluene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
4-Chlorotoluene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
tert-Butylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
sec-Butylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,3-Dichlorobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
p-Isopropyltoluene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2-Dichlorobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,4-Dichlorobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Butylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Hexachlorobutadiene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-

SVOCs

Aniline	mg/kg	0.1	NONE	-	-	0.3	0.5	-
Phenol	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
2-Chlorophenol	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
Bis(2-chloroethyl)ether	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
1,3-Dichlorobenzene	mg/kg	0.2	NONE	-	-	0.6	0.3	-

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Project / Site name: Penzance Harbour
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Lab Sample Number				2482726	2482727	2482728	2482729	2482730
Sample Reference				BH02	BH02	BH02	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	3.50	5.10	0.85	6.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
1,2-Dichlorobenzene	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
1,4-Dichlorobenzene	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
2-Methylphenol	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Hexachloroethane	mg/kg	0.05	NONE	-	-	< 0.05	< 0.05	-
Nitrobenzene	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
Isophorone	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
2-Nitrophenol	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
2,4-Dimethylphenol	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Naphthalene	mg/kg	0.05	NONE	-	-	< 0.05	0.19	-
2,4-Dichlorophenol	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
Hexachlorobutadiene	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
2-Chloronaphthalene	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
Dimethylphthalate	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
Acenaphthylene	mg/kg	0.05	NONE	-	-	< 0.05	0.23	-
Acenaphthene	mg/kg	0.05	NONE	-	-	< 0.05	0.1	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
Dibenzofuran	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Diethyl phthalate	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
4-Nitroaniline	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
Fluorene	mg/kg	0.05	NONE	-	-	< 0.05	0.28	-
Azobenzene	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Bromophenyl phenyl ether	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
Hexachlorobenzene	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Phenanthrene	mg/kg	0.05	NONE	-	-	0.24	3.4	-
Anthracene	mg/kg	0.05	NONE	-	-	0.09	1.1	-
Carbazole	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Dibutyl phthalate	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
Anthraquinone	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Fluoranthene	mg/kg	0.05	NONE	-	-	0.73	7.6	-
Pyrene	mg/kg	0.05	NONE	-	-	0.71	7.2	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Benzo(a)anthracene	mg/kg	0.05	NONE	-	-	0.43	4.1	-
Chrysene	mg/kg	0.05	NONE	-	-	0.6	3.1	-
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	-	0.52	4.5	-
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	-	0.41	2.4	-
Benzo(a)pyrene	mg/kg	0.05	NONE	-	-	0.52	4.1	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	-	-	0.24	2	-
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	-	-	< 0.05	0.47	-
Benzo(ghi)perylene	mg/kg	0.05	NONE	-	-	0.31	2.1	-

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

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* 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 *
2482721	BH01	None Supplied	0.4	Brown clay and loam with gravel.
2482722	BH01	None Supplied	0.75	Brown clay and sand with gravel.
2482723	BH01	None Supplied	1.7	Grey clay and sand with gravel.
2482724	BH01	None Supplied	4.9	Brown clay and loam with gravel.
2482725	BH02	None Supplied	0.6	Brown clay and loam with gravel.
2482726	BH02	None Supplied	1.2	Grey clay with gravel.
2482727	BH02	None Supplied	3.5	Brown clay and sand with gravel.
2482728	BH02	None Supplied	5.1	Brown clay and sand with gravel.
2482729	BH03	None Supplied	0.85	Brown sandy clay with gravel.
2482730	BH03	None Supplied	6	Black clay and loam with gravel.

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Project / Site name: Penzance Harbour

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
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	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
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 (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/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 (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
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
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Thiocyanate in soil	Determination of thiocyanate in soil by extraction in water followed by acidification followed by addition of ferric nitrate followed by discrete analyser (spectrophotometer).	In-house method	L082-PL	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE

Analytical Report Number : 22-93763
Project / Site name: Penzance Harbour

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
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
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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 30oC
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 - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report

Analytical Report Number : 22-93763
Project / Site name: Penzance Harbour

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.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH01	None Supplied	S	2482721	a	None Supplied	None Supplied	None Supplied
BH01	None Supplied	S	2482722	a	None Supplied	None Supplied	None Supplied
BH01	None Supplied	S	2482723	a	None Supplied	None Supplied	None Supplied
BH01	None Supplied	S	2482724	a	None Supplied	None Supplied	None Supplied
BH02	None Supplied	S	2482725	a	None Supplied	None Supplied	None Supplied
BH02	None Supplied	S	2482726	a	None Supplied	None Supplied	None Supplied
BH02	None Supplied	S	2482727	a	None Supplied	None Supplied	None Supplied
BH02	None Supplied	S	2482728	a	None Supplied	None Supplied	None Supplied
BH03	None Supplied	S	2482729	a	None Supplied	None Supplied	None Supplied
BH03	None Supplied	S	2482730	a	None Supplied	None Supplied	None Supplied

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Analytical Report Number : 22-93763

Project / Site name:	Penzance Harbour	**Samples received on:**	19/10/2022
Your job number:	21155	**Samples instructed on/ Analysis started on:**	01/11/2022
Your order number:	21155	**Analysis completed by:**	15/11/2022
Report Issue Number:	1	**Report issued on:**	25/11/2022
Samples Analysed:	10 soil samples		

Signed [redacted]

Izabela Wójcik
Reporting Specialist
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

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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: 22-93763
Project / Site name: Penzance Harbour
Your Order No: 21155

Lab Sample Number				2482721	2482722	2482723	2482724	2482725
Sample Reference				BH01	BH01	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.75	1.70	4.90	0.60
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	11	18	13	14
Total mass of sample received	kg	0.001	NONE	0.7	0.7	0.8	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SSZ	N/A	N/A	N/A	SSZ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8	7.9	-	8.2	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Thiocyanate as SCN	mg/kg	5	NONE	< 5.0	< 5.0	-	< 5.0	< 5.0
Total Sulphate as SO4	mg/kg	50	MCERTS	670	1000	1000	2700	2300
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	230	1000	920	2400	570
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.11	0.51	0.46	1.2	0.28
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	115	506	462	1210	283
Sulphide	mg/kg	1	NONE	11	7.8	7.7	230	1.4
Organic Matter (automated)	%	0.1	MCERTS	7.3	0.6	-	1.6	1.3

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.2	< 0.05	-	0.2	0.44
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	-	0.15	0.2
Acenaphthene	mg/kg	0.05	NONE	< 0.05	< 0.05	-	0.07	0.25
Fluorene	mg/kg	0.05	NONE	< 0.05	< 0.05	-	0.32	0.67
Phenanthrene	mg/kg	0.05	NONE	0.44	0.13	-	2.1	3.3
Anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	-	1.1	1.4
Fluoranthene	mg/kg	0.05	NONE	0.32	0.26	-	4.3	6.2
Pyrene	mg/kg	0.05	NONE	0.3	0.23	-	3.9	5.8
Benzo(a)anthracene	mg/kg	0.05	NONE	0.21	0.19	-	2	3.4
Chrysene	mg/kg	0.05	NONE	0.37	0.16	-	1.5	2.3
Benzo(b)fluoranthene	mg/kg	0.05	NONE	0.32	0.15	-	2.2	2.7
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.09	0.2	-	0.83	2.2
Benzo(a)pyrene	mg/kg	0.05	NONE	0.19	0.18	-	1.7	2.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.11	0.09	-	0.84	1.3
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	-	0.23	0.34
Benzo(ghi)perylene	mg/kg	0.05	NONE	0.12	0.12	-	0.81	1.3

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	2.67	1.71	-	22.4	34.4

Analytical Report Number: 22-93763
Project / Site name: Penzance Harbour
Your Order No: 21155

Lab Sample Number				2482721	2482722	2482723	2482724	2482725
Sample Reference				BH01	BH01	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.75	1.70	4.90	0.60
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	95	130	17	72	120
Boron (water soluble)	mg/kg	0.2	MCERTS	2.5	3.3	8.3	4.5	2.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	38	73	40	30	66
Copper (aqua regia extractable)	mg/kg	1	MCERTS	120	74	49	120	150
Lead (aqua regia extractable)	mg/kg	1	MCERTS	130	21	17	56	31
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	51	87	33	27	81
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140	170	73	90	180
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
p & m-xylene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
o-xylene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	37	-	-	35	-
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	-	< 1.0	-	-	2.2
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	-	< 2.0	-	-	7
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	-	< 8.0	-	-	13
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	-	< 8.0	-	-	70
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	-	< 10	-	-	92
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	-	< 1.0	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	-	< 2.0	-	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	-	< 10	-	-	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	-	< 10	-	-	37
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	-	< 10	-	-	40
VOCs								
Chloromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Chloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Bromomethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1-Dichloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
2,2-Dichloropropane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trichloromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0

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Lab Sample Number				2482721	2482722	2482723	2482724	2482725
Sample Reference				BH01	BH01	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.75	1.70	4.90	0.60
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,1,1-Trichloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dichloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1-Dichloropropene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Benzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Tetrachloromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dichloropropane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Dibromomethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Bromodichloromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,3-Dichloropropane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Dibromochloromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dibromoethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Chlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
p & m-Xylene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Styrene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Tribromomethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
o-Xylene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Isopropylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Bromobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
n-Propylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
2-Chlorotoluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
4-Chlorotoluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
tert-Butylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
sec-Butylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,3-Dichlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
p-Isopropyltoluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dichlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Butylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Hexachlorobutadiene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0

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Lab Sample Number				2482721	2482722	2482723	2482724	2482725
Sample Reference				BH01	BH01	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.75	1.70	4.90	0.60
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	0.3	-	-	1.1
Phenol	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
2-Chlorophenol	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	NONE	-	0.3	-	-	0.3
1,2-Dichlorobenzene	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2-Methylphenol	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Hexachloroethane	mg/kg	0.05	NONE	-	< 0.05	-	-	< 0.05
Nitrobenzene	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Isophorone	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
2-Nitrophenol	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Naphthalene	mg/kg	0.05	NONE	-	< 0.05	-	-	0.44
2,4-Dichlorophenol	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-	0.7
2-Chloronaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Dimethylphthalate	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Acenaphthylene	mg/kg	0.05	NONE	-	< 0.05	-	-	0.2
Acenaphthene	mg/kg	0.05	NONE	-	< 0.05	-	-	0.25
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Dibenzofuran	mg/kg	0.2	NONE	-	< 0.2	-	-	0.4
4-Chlorophenyl phenyl ether	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Diethyl phthalate	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
4-Nitroaniline	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Fluorene	mg/kg	0.05	NONE	-	< 0.05	-	-	0.67
Azobenzene	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Phenanthrene	mg/kg	0.05	NONE	-	0.13	-	-	3.3
Anthracene	mg/kg	0.05	NONE	-	< 0.05	-	-	1.4
Carbazole	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Anthraquinone	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Fluoranthene	mg/kg	0.05	NONE	-	0.26	-	-	6.2
Pyrene	mg/kg	0.05	NONE	-	0.23	-	-	5.8
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	< 0.3	-	-	< 0.3
Benzo(a)anthracene	mg/kg	0.05	NONE	-	0.19	-	-	3.4
Chrysene	mg/kg	0.05	NONE	-	0.16	-	-	2.3
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	0.15	-	-	2.7
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	0.2	-	-	2.2
Benzo(a)pyrene	mg/kg	0.05	NONE	-	0.18	-	-	2.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	-	0.09	-	-	1.3
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	-	< 0.05	-	-	0.34
Benzo(ghi)perylene	mg/kg	0.05	NONE	-	0.12	-	-	1.3

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Lab Sample Number				2482721	2482722	2482723	2482724	2482725
Sample Reference				BH01	BH01	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.75	1.70	4.90	0.60
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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

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Lab Sample Number				2482726	2482727	2482728	2482729	2482730
Sample Reference				BH02	BH02	BH02	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	3.50	5.10	0.85	6.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	13	19	9.8	11
Total mass of sample received	kg	0.001	NONE	0.8	0.7	0.8	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	8	7.6	8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Thiocyanate as SCN	mg/kg	5	NONE	-	-	< 5.0	< 5.0	< 5.0
Total Sulphate as SO4	mg/kg	50	MCERTS	15000	920	3800	1800	2200
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	300	750	3400	1100	1600
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.15	0.38	1.7	0.56	0.82
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	152	377	1720	564	818
Sulphide	mg/kg	1	NONE	36	14	200	5.9	2100
Organic Matter (automated)	%	0.1	MCERTS	-	-	3.8	0.9	1.2

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	-	-	< 0.05	0.19	0.25
Acenaphthylene	mg/kg	0.05	NONE	-	-	< 0.05	0.23	0.6
Acenaphthene	mg/kg	0.05	NONE	-	-	< 0.05	0.1	0.14
Fluorene	mg/kg	0.05	NONE	-	-	< 0.05	0.28	0.54
Phenanthrene	mg/kg	0.05	NONE	-	-	0.24	3.4	9
Anthracene	mg/kg	0.05	NONE	-	-	0.09	1.1	2.3
Fluoranthene	mg/kg	0.05	NONE	-	-	0.73	7.6	18
Pyrene	mg/kg	0.05	NONE	-	-	0.71	7.2	15
Benzo(a)anthracene	mg/kg	0.05	NONE	-	-	0.43	4.1	7.1
Chrysene	mg/kg	0.05	NONE	-	-	0.6	3.1	7.3
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	-	0.52	4.5	6.9
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	-	0.41	2.4	7.4
Benzo(a)pyrene	mg/kg	0.05	NONE	-	-	0.52	4.1	7.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	-	-	0.24	2	3
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	-	-	< 0.05	0.47	0.84
Benzo(ghi)perylene	mg/kg	0.05	NONE	-	-	0.31	2.1	3.2

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	-	-	4.8	42.8	89

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Lab Sample Number				2482726	2482727	2482728	2482729	2482730
Sample Reference				BH02	BH02	BH02	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	3.50	5.10	0.85	6.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	42	110	120	97	140
Boron (water soluble)	mg/kg	0.2	MCERTS	1	6.7	7.8	0.7	4.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	43	44	42	38
Copper (aqua regia extractable)	mg/kg	1	MCERTS	140	150	210	120	330
Lead (aqua regia extractable)	mg/kg	1	MCERTS	36	46	120	83	150
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	46	78	54	64	39
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	78	320	200	250	870
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
p & m-xylene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
o-xylene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	-	-	-	-	110
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	-	-	< 1.0	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	-	-	< 2.0	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	-	-	< 8.0	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	-	-	< 8.0	9.4	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	-	-	10	11	-
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	-	-	< 1.0	1.6	-
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	-	-	4.8	6.1	-
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	-	-	39	13	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	-	-	47	33	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	-	-	92	53	-
VOCs								
Chloromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Chloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Bromomethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Vinyl Chloride	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1-Dichloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
2,2-Dichloropropane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Trichloromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-

Analytical Report Number: 22-93763
Project / Site name: Penzance Harbour
Your Order No: 21155

Lab Sample Number				2482726	2482727	2482728	2482729	2482730
Sample Reference				BH02	BH02	BH02	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	3.50	5.10	0.85	6.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,1,1-Trichloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2-Dichloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1-Dichloropropene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Benzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Tetrachloromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2-Dichloropropane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Trichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Dibromomethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Bromodichloromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1,2-Trichloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,3-Dichloropropane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Dibromochloromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Tetrachloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2-Dibromoethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Chlorobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
p & m-Xylene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Styrene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Tribromomethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
o-Xylene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Isopropylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Bromobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
n-Propylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
2-Chlorotoluene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
4-Chlorotoluene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
tert-Butylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
sec-Butylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,3-Dichlorobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
p-Isopropyltoluene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2-Dichlorobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,4-Dichlorobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Butylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Hexachlorobutadiene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-

Analytical Report Number: 22-93763
Project / Site name: Penzance Harbour
Your Order No: 21155

Lab Sample Number				2482726	2482727	2482728	2482729	2482730
Sample Reference				BH02	BH02	BH02	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	3.50	5.10	0.85	6.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	0.3	0.5	-
Phenol	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
2-Chlorophenol	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
Bis(2-chloroethyl)ether	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
1,3-Dichlorobenzene	mg/kg	0.2	NONE	-	-	0.6	0.3	-
1,2-Dichlorobenzene	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
1,4-Dichlorobenzene	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
2-Methylphenol	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Hexachloroethane	mg/kg	0.05	NONE	-	-	< 0.05	< 0.05	-
Nitrobenzene	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
Isophorone	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
2-Nitrophenol	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
2,4-Dimethylphenol	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Naphthalene	mg/kg	0.05	NONE	-	-	< 0.05	0.19	-
2,4-Dichlorophenol	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
Hexachlorobutadiene	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
2-Chloronaphthalene	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
Dimethylphthalate	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
Acenaphthylene	mg/kg	0.05	NONE	-	-	< 0.05	0.23	-
Acenaphthene	mg/kg	0.05	NONE	-	-	< 0.05	0.1	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
Dibenzofuran	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Diethyl phthalate	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
4-Nitroaniline	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
Fluorene	mg/kg	0.05	NONE	-	-	< 0.05	0.28	-
Azobenzene	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Bromophenyl phenyl ether	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
Hexachlorobenzene	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Phenanthrene	mg/kg	0.05	NONE	-	-	0.24	3.4	-
Anthracene	mg/kg	0.05	NONE	-	-	0.09	1.1	-
Carbazole	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Dibutyl phthalate	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
Anthraquinone	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Fluoranthene	mg/kg	0.05	NONE	-	-	0.73	7.6	-
Pyrene	mg/kg	0.05	NONE	-	-	0.71	7.2	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	< 0.3	< 0.3	-
Benzo(a)anthracene	mg/kg	0.05	NONE	-	-	0.43	4.1	-
Chrysene	mg/kg	0.05	NONE	-	-	0.6	3.1	-
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	-	0.52	4.5	-
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	-	0.41	2.4	-
Benzo(a)pyrene	mg/kg	0.05	NONE	-	-	0.52	4.1	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	-	-	0.24	2	-
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	-	-	< 0.05	0.47	-
Benzo(ghi)perylene	mg/kg	0.05	NONE	-	-	0.31	2.1	-

Analytical Report Number: 22-93763
Project / Site name: Penzance Harbour
Your Order No: 21155

Lab Sample Number				2482726	2482727	2482728	2482729	2482730
Sample Reference				BH02	BH02	BH02	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	3.50	5.10	0.85	6.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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

Analytical Report Number : 22-93763
Project / Site name: Penzance Harbour

* 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 *
2482721	BH01	None Supplied	0.4	Brown clay and loam with gravel.
2482722	BH01	None Supplied	0.75	Brown clay and sand with gravel.
2482723	BH01	None Supplied	1.7	Grey clay and sand with gravel.
2482724	BH01	None Supplied	4.9	Brown clay and loam with gravel.
2482725	BH02	None Supplied	0.6	Brown clay and loam with gravel.
2482726	BH02	None Supplied	1.2	Grey clay with gravel.
2482727	BH02	None Supplied	3.5	Brown clay and sand with gravel.
2482728	BH02	None Supplied	5.1	Brown clay and sand with gravel.
2482729	BH03	None Supplied	0.85	Brown sandy clay with gravel.
2482730	BH03	None Supplied	6	Black clay and loam with gravel.

Analytical Report Number : 22-93763
Project / Site name: Penzance Harbour

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
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	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
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 (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/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 (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
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
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Thiocyanate in soil	Determination of thiocyanate in soil by extraction in water followed by acidification followed by addition of ferric nitrate followed by discrete analyser (spectrophotometer).	In-house method	L082-PL	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE

Analytical Report Number : 22-93763
Project / Site name: Penzance Harbour

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
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
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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 30oC.
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 - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Analytical Report Number : 22-93763
Project / Site name: Penzance Harbour

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.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH01	None Supplied	S	2482721	a	None Supplied	None Supplied	None Supplied
BH01	None Supplied	S	2482722	a	None Supplied	None Supplied	None Supplied
BH01	None Supplied	S	2482723	a	None Supplied	None Supplied	None Supplied
BH01	None Supplied	S	2482724	a	None Supplied	None Supplied	None Supplied
BH02	None Supplied	S	2482725	a	None Supplied	None Supplied	None Supplied
BH02	None Supplied	S	2482726	a	None Supplied	None Supplied	None Supplied
BH02	None Supplied	S	2482727	a	None Supplied	None Supplied	None Supplied
BH02	None Supplied	S	2482728	a	None Supplied	None Supplied	None Supplied
BH03	None Supplied	S	2482729	a	None Supplied	None Supplied	None Supplied
BH03	None Supplied	S	2482730	a	None Supplied	None Supplied	None Supplied

Test Report

South West Geotechnical Ltd
Unit 3 Brooklands,
Howden Road,
Tiverton,
Devon
EX16 5HW

Job No:	14666	**Date Received:**	07/11/22
Job Name:	Penzance Harbour	**Date Sent:**	17/11/22
Client Name:	Wheal Jane Ltd	**Transmittal Number:**	T8077
Client Job No:	21155	**Senders Initials:**	DT
Client Address	Old Mine Offices, Wheal Jane, Baldhu, Truro, Cornwall, TR3 6EE	**Report Revision No.**	1
		Sampled by SWG lab staff?	NO

Ref.	Test Detail	No. of Tests / Report No.
C3	Point Load Test on Regular Core and Irregular Specimens Tested in Accordance with the International Journal of Rock Mechanics and Mining	15
C4	ISRM: 1981: Part 2 Suggested Methods - Uniaxial Compressive Strength of Rock Materials	1

Sampling not performed by South West Geotechnical laboratory staff. Results apply to the samples as received.

Approved Signatories:

David Trowbridge (Laboratory Manager)

Matt Stokes (Senior Technician)

UKAS TESTING
8260
Accredited to ISO/IEC 17025:2017

Point Load Results Summary Sheet

Unit 3 Brooklands,
Howden Road,
Tiverton,
Devon
EX16 5HW

Project No.	Project Name
14666	Penzance Harbour
Client Job No.	**Client**
21155	Wheal Jane Ltd

Hole No.	Sample				Specimen Depth	Axial / Diametral / Irregular	THICKNESS (mm) - D	WIDTH (mm) - W	DIAMETER (mm) - D	BREAKING LOAD (kN) - P	D2e (mm2)	Is (MPa)	De	De/50	kPLT	Is 50 (MPa)	Sample Description
	Ref.	Top	Base	Type													
BH01		6.7	6.8	C		A	33.87	89.92		0.3	3877.91	0.08	62.27	1.25	1.10	0.09	Brown and light greyish MUDSTONE
BH01		7.4	7.5	C		D	88.12		89.74	1.3	8053.87	0.16	89.74	1.79	1.30	0.21	Light grey SANDSTONE
BH01		8	8.06	C		A	55.82	20.91		0.2	1486.03	0.13	38.55	0.77	0.89	0.12	Grey MUDSTONE
BH01		8.2	8.3	C		A	45.02	86.76		1.7	4973.19	0.34	70.52	1.41	1.17	0.40	Brown MUDSTONE
BH01		8.9	9	C		A	72.82	94.10		0.5	8724.30	0.06	93.40	1.87	1.32	0.08	Grey and orange MUDSTONE
BH02		5.9	6	C		A	89.41	75.06		0.7	8545.24	0.08	92.44	1.85	1.32	0.11	Brown and light greyish MUDSTONE
BH02		6.4	6.5	C		D	88.27		90.56	11	8201.11	1.34	90.56	1.81	1.31	1.75	Light grey SANDSTONE
BH02		7	7.1	C		A	91.60	59.17		8.5	6900.28	1.23	83.07	1.66	1.26	1.55	Greyish brown SANDSTONE
BH02		7.7	7.8	C		A	20.41	89.03		12	2313.14	5.19	48.10	0.96	0.98	5.10	Dark grey SANDSTONE
BH02		9.1	9.2	C		A	68.99	89.86		37	7893.67	4.69	88.85	1.78	1.30	6.07	Grey SANDSTONE

Wylie and Mah (1991) Rock Slope Engineering

Is = P/D2e
D2e = (4(WD))/p
De = √D2e

Is (50) =IskPLT
kPLT = (De/50)0.45

Where a description is followed by (X) this denotes a failure along an existing weakness

Samples tested in accordance with International Journal of Rock Mechanics and Mining.

Lab Sheet Reference: KL011R Point Load

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Point Load Results Summary Sheet

Unit 3 Brooklands,
Howden Road,
Tiverton,
Devon
EX16 5HW

Project No.	Project Name
14666	Penzance Harbour
Client Job No.	**Client**
21155	Wheal Jane Ltd

Hole No.	Sample				Specimen Depth	Axial / Diametral / Irregular	THICKNESS (mm) - D	WIDTH (mm) - W	DIAMETER (mm) - D	BREAKING LOAD (kN) - P	D2e (mm2)	Is (MPa)	De	De/50	kPLT	Is 50 (MPa)	Sample Description
	Ref.	Top	Base	Type													
BH03		6.25	6.35	C		A	80.87	88.02		2.4	9062.80	0.26	95.20	1.90	1.34	0.35	Light grey MUDSTONE
BH03		6.45	6.6	C		D	172.26		91.14	1	8305.89	0.12	91.14	1.82	1.31	0.16	Light grey and black MUDSTONE
BH03		7.6	7.7	C		A	73.07	91.46		1.7	8509.74	0.20	92.25	1.84	1.32	0.26	Light grey SANDSTONE
BH03		9.2	9.3	C		A	88.82	89.24		2.1	10091.70	0.21	100.46	2.01	1.37	0.28	Brown and dark grey MUDSTONE
BH03		9.9	10	C		D	77.48		88.90	0.6	7902.62	0.08	88.90	1.78	1.30	0.10	Brown MUDSTONE

Wylie and Mah (1991) Rock Slope Engineering

Is = P/D2e
D2e = (4(WD))/p
De = √D2e
Is (50) =IskPLT
kPLT = (De/50)0.45

Where a description is followed by (X) this denotes a failure along an existing weakness

Samples tested in accordance with International Journal of Rock Mechanics and Mining.

Lab Sheet Reference: KL011R Point Load

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Unit 3 Brooklands,
Howden Road,
Tiverton,
Devon EX16 5HW

Summary of Rock Testing

ISRM: 1981: Part 2 Suggested Methods - Uniaxial Compressive Strength of Rock materials

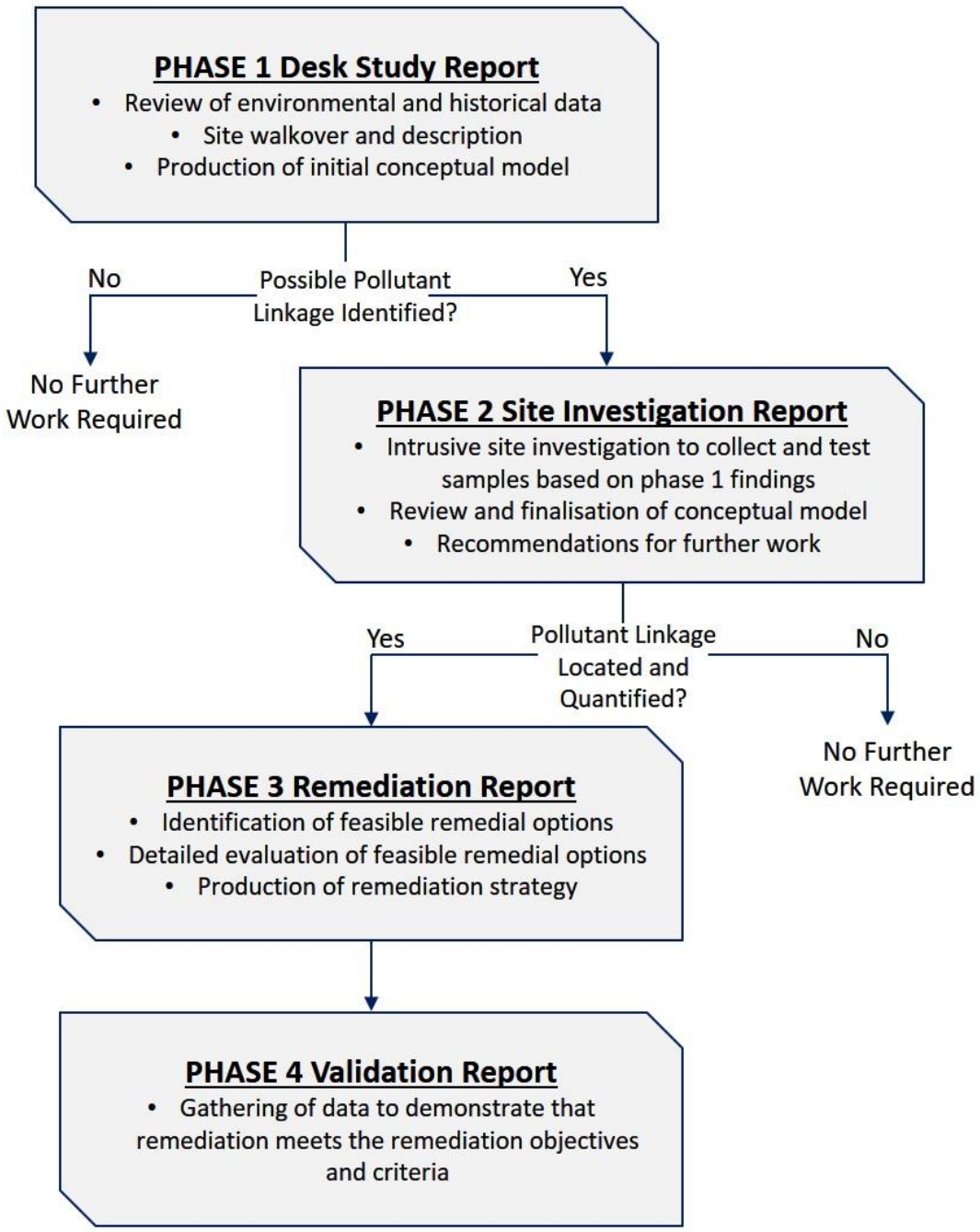
Project Name	Penzance Harbour	**Date of test**	16/11/22
Client	Wheal Jane Ltd	**Project No.**	14666
		Client Job No.	21155

Sample Details				Density			Uniaxial Compressive Strength				
Borehole No.	Sample Reference	Depth (m)	Description	Water Content (%)	Bulk (Mg/m3)	Dry (Mg/m3)	Diameter (mm)	Height (mm)	H/D Ratio	Load at Failure (kN)	UCS (Mpa)
BH02	-	8.20 - 8.50	Dark grey and green SANDSTONE	0.28	2.96	2.95	89.73	206.33	2.3	407.9	64.5

KL037 - Uniaxial Compressive Strength of Rock	Remarks	Approved By	Date
		David Trowbridge - Laboratory Manager	17/11/2022 16:17

The Phased Approach to Land Contamination

As set out in Contaminated Land Report 11 - Model Procedures for the Management of Land Contamination. Environment Agency Guidelines




Wheal Jane
Consultancy
Geotechnical, environmental
& mining services