

SUBJECT**Reuse of Railway Embankment Material at Teesworks MRP****DATE**18th March 2021**DEPARTMENT**

Site Evaluation and Restoration

COPIES TONeil Westwick (Lichfields)
David Simpson (HCSL)
Andrew Bligh (HCSL)**TO**Darren Edmends (STDC)
Anthony Greeley (Lichfields)**OUR REF**10035117-AUK-XX-XX-CO-ZZ-0279-01-
Railway_Bund_Memo**PROJECT NUMBER**

10035117

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Background

Earthworks are being undertaken at the Metals Recovery Processing (MRP) area on Teesworks South Bank (Figure 10035117-AUK-XX-XX-DR-ZZ-0127-01-MPA_SLP) by the site owner (South Tees Development Corporation (STDC)) to create a development platform for non-specific commercial / industrial redevelopment. A Materials Management Plan (MMP) (ref: 10035117-AUK-XX-XX-RP-ZZ-0219-02-MPA_MPP) has been put in place to allow the reuse of slag-rich Made Ground excavated from the MRP as the site is turned over to 6.3m AOD (to remove sub surface obstructions) prior to filling to create a development platform at 8.8m AOD.

As works under the MMP have progressed the removal of unsuitable materials and changes in STDC priorities concerning imported fill have resulted in a material deficit of 50,000m³ at the MRP to meet the 8.8m AOD development levels specified in the Planning approval [R/2020/0465/FFM].

The deficit is to be balanced using Made Ground from the removal of a railway embankment (as shown on Figure 2366_JSH037_As-Dug Railway Embankment) at the South Bank area of which the MRP plot is a part. An MMP is being prepared to facilitate the reuse of this material.

The reuse of the railway embankment material to create the final 8.8m AOD finish levels will include its use to construct a suitable surface cover / capping medium in line with the remedial strategy (10035117-AUK-XX-XX-RP-ZZ-0181-MPA_ROA and Strategy) for the MRP as previously agreed with Redcar and Cleveland Borough Council (RCBC).

Planning Considerations

The material is to be used in remedial earthworks under Planning permission R/2020/0465/FFM.

The excavation of the railway embankment is under Planning permission (R/2020/0357/OOM) which applies across the wider South Bank Area including the source and placement areas. Information provided by the contractor indicates the material has been stockpiled at South Bank but not on the MRP area.

Suitability for Use

The remedial strategy for the MRP agreed with RCBC dictates that concentrations of contaminants in surface soils, and hence the material imported under the MMP, must be below the assessment criteria (LQM S4UL and Arcadis derived) for human health via the direct contact and dust inhalation pathways. In addition, measurable quantities of asbestos fibres will be below the quantification limit of 0.001%.

Analysis of the railway embankment material has been conducted as part of a ground investigation across a portion of the Teesworks South Bank site, and further samples have been collected from the stockpiled material. The findings of the investigation are yet to be provided to RCBC but the relevant extracts below are presented in Appendix A.

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- Chemtech Environmental certificate 93029
- DETS Certificate 20-17606-1
- Trial Pit Location Plan
- Trial Pit Log SBA_AUK_TP110,
- Trial Pit Log SBA_AUK_TP122
- Table 2: Soil GAC Protective of Human Health - In-situ Railway Embankment
- Table 2: Soil GAC Protective of Human Health - Stockpiled Railway Embankment

Proposed Testing

The data collected to date indicates the railway embankment material is suitable for use. The remedial strategy agreed with RCBC indicated imported material should be tested every 2,000m³, however this assumes a natural fill material. As the railway embankment is a Made Ground additional testing of the material will be undertaken upon import at a frequency of one sample every 500m³.

Material identified as being unsuitable will not be used at the MRP and will be removed from site. Tracking records for earthworks will be maintained and presented as part of the MMP verification report.


Enc. 10035117-AUK-XX-XX-DR-ZZ-0127-01-MPA_SLP
2366_JSH037_As-Dug Railway Embankment

Appendix A

- Chemtech Environmental certificate 93029
- DETS Certificate 20-17606-1
- Trial Pit Location Plan
- Trial Pit Log SBA_AUK_TP110,
- Trial Pit Log SBA_AUK_TP122
- Table 2: Soil GAC Protective of Human Health - In-situ Railway Embankment
- Table 2: Soil GAC Protective of Human Health - Stockpiled Railway Embankment



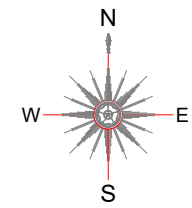
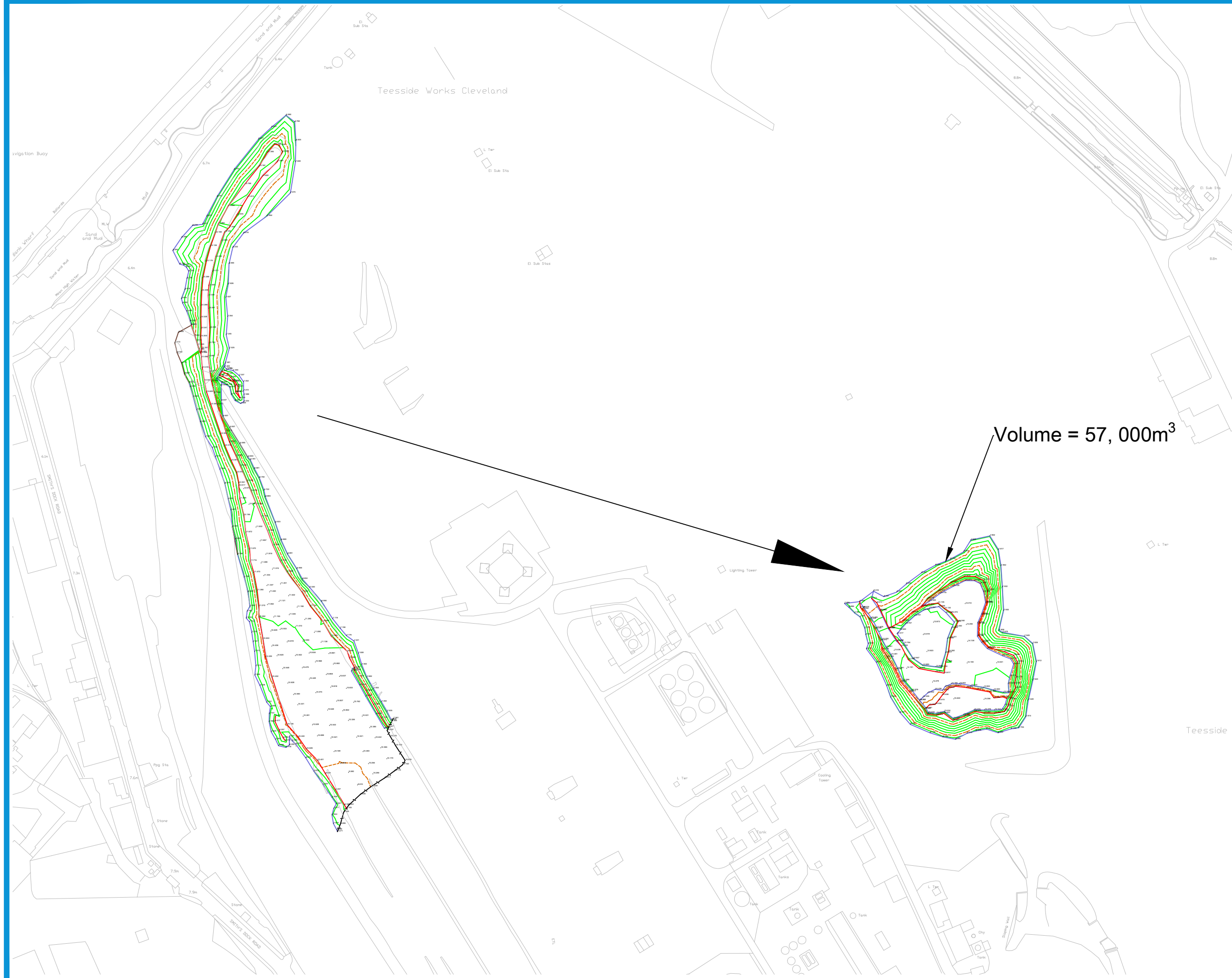
Legend

- Site Boundary
-  Metals Processing Area

Notes:
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CONTACT ARCADIS IN CASE OF ANY QUERIES.



Title: MPA - Site Location Plan	
Site: Redcar Steelworks - MPA	
Client: South Tees Development Corporation	
Project: 10035117	Figure 1
Date: 07/08/2020 Drawn By: JALM DRG No: 10035117-AUK-XX-XX-DR-ZZ-0127-01-MPA_SLP	



South Bank
Redcar

JOB TITLE

STDC

CLIENT

As-Dug Material
From Railway Embankment
South Bank

DRAWING TITLE

1:2500 @ A3

JSH

SCALE

DRAWN

05.03.21

DAS

DATE

APPROVED

Hall Construction Services Limited

Stotforth Hill House
Windlestone
Rushyford
County Durham
DL17 0NF
Tel: 01325 311013
Fax: 01325 311571

NOTES

REV	AMENDMENT	DRAWN	CHECKED

2366

PROJECT No.

JSH037

DRG No.

-

REV

0m 40m 80m 120m 160m 200m



ANALYTICAL TEST REPORT

Contract no: 93029
Contract name: Teesworks - MRP
Client reference: -
Clients name: Hall Construction
Clients address: Stotforth Hill House
Windlestone, Rushyford
County Durham
DL17 0NF
Samples received: 29 January 2021
Analysis started: 29 January 2021
Analysis completed: 05 February 2021
Report issued: 05 February 2021

Notes: Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

Key: U UKAS accredited test
M MCERTS & UKAS accredited test
\$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing
NAD No Asbestos Detected

Approved by: 
Rachael Burton
Customer Support Squad Leader

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
93029-1	SBW-SP002-S1	-	Sand with Gravel	-	-	13.4
93029-2	SBW-SP002-S2	-	Sand with Gravel	-	-	11.6
93029-3	SBW-SP003-S1	-	Sand with Gravel	-	-	13.6
93029-4	SBW-SP003-S2	-	Sand with Gravel	-	-	13.1
93029-5	SBW-SP003-S3	-	Sand with Gravel	-	-	12.3
93029-6	SBW-SP004-S1	-	Sand with Gravel	-	-	13.8
93029-7	SBW-SP004-S2	-	Sand with Gravel	-	-	10.6
93029-8	SBW-SP004-S3	-	Sand with Gravel	-	-	9.6
93029-9	SBW-SP004-S4	-	Sand with Gravel	-	-	15.3
93029-10	SBW-SP004-S5	-	Sand with Gravel	-	-	11.8
93029-11	MRA-AD-02-S3	-	Sand with Gravel	-	-	11.5
93029-12	MRA-AD-03-S1	-	Sand with Gravel	-	-	9.0
93029-13	MRA-AE-02-S1	-	Sand with Gravel	-	-	12.5

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SOILS

Lab number			93029-1	93029-2	93029-3	93029-4	93029-5	93029-6
Sample id			SBW-SP002-S1	SBW-SP002-S2	SBW-SP003-S1	SBW-SP003-S2	SBW-SP003-S3	SBW-SP004-S1
Depth (m)			-	-	-	-	-	-
Date sampled			28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Test	Method	Units						
Arsenic (total)	CE127 ^M	mg/kg As	32	44	42	54	20	37
Boron (water soluble)	CE063	mg/kg B	6.6	9.3	2.2	2.2	2.3	2.1
Cadmium (total)	CE127 ^M	mg/kg Cd	2.2	3.7	1.0	2.7	0.9	0.9
Chromium (total)	CE127 ^M	mg/kg Cr	435	345	305	167	196	94
Chromium (VI)	CE146	mg/kg CrVI	<1	<1	<1	<1	<1	<1
Copper (total)	CE127 ^M	mg/kg Cu	66	57	48	72	36	59
Lead (total)	CE127 ^M	mg/kg Pb	407	374	157	255	137	193
Mercury (total)	CE127 ^M	mg/kg Hg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel (total)	CE127 ^M	mg/kg Ni	49	34	37	70	25	50
Selenium (total)	CE127 ^M	mg/kg Se	5.0	10	3.5	4.9	3.6	2.4
Vanadium (total)	CE127 ^M	mg/kg V	544	537	249	241	187	265
Zinc (total)	CE127 ^M	mg/kg Zn	779	1039	528	930	427	594
pH	CE004 ^M	units	9.9	9.7	9.9	9.0	9.7	8.6
Sulphate (2:1 water soluble)	CE061	mg/l SO ₄	368	256	617	652	705	210
Sulphate (total)	CE062	mg/kg SO ₄	7306	7879	5464	6965	9960	3787
Sulphur (total)	CE119	mg/kg S	3533	4525	2949	3204	4416	1883
Cyanide (free)	CE077	mg/kg CN	<1	<1	<1	<1	<1	<1
Cyanide (total)	CE077	mg/kg CN	5.5	24	2.2	<1	<1	11
Thiocyanate	CE145 ^M	mg/kg SCN	1.6	4.2	1.6	<1	1.5	<1
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Organic Carbon (TOC)	CE197	% w/w C	1.3	1.5	2.6	1.9	2.5	18.0
Estimate of OMC (calculated from TOC)	CE197	% w/w	2.2	2.5	4.4	3.3	4.3	31.1
PAH								
Naphthalene	CE087 ^M	mg/kg	0.14	0.36	0.73	1.38	0.17	0.76
Acenaphthylene	CE087 ^M	mg/kg	0.26	0.39	0.23	<0.02	0.04	0.14
Acenaphthene	CE087 ^M	mg/kg	0.49	0.52	0.47	9.33	0.14	0.17
Fluorene	CE087 ^U	mg/kg	0.31	0.31	0.42	1.59	0.10	0.20
Phenanthrene	CE087 ^M	mg/kg	2.15	5.78	3.39	3.79	0.87	1.91
Anthracene	CE087 ^U	mg/kg	0.59	0.71	1.02	0.96	0.24	0.44
Fluoranthene	CE087 ^M	mg/kg	4.61	5.78	19.66	7.11	2.22	1.88
Pyrene	CE087 ^M	mg/kg	3.87	4.12	20.66	5.70	1.83	1.59
Benzo(a)anthracene	CE087 ^U	mg/kg	1.64	1.94	14.49	2.59	0.72	0.90
Chrysene	CE087 ^M	mg/kg	1.71	2.28	15.65	2.75	0.83	1.09
Benzo(b)fluoranthene	CE087 ^M	mg/kg	1.87	2.91	21.46	3.15	0.82	1.24
Benzo(k)fluoranthene	CE087 ^M	mg/kg	0.74	1.05	8.61	1.17	0.34	0.51
Benzo(a)pyrene	CE087 ^U	mg/kg	1.17	1.75	16.79	2.01	0.53	0.89
Indeno(123cd)pyrene	CE087 ^M	mg/kg	1.22	2.20	13.21	2.06	0.55	0.92
Dibenz(ah)anthracene	CE087 ^M	mg/kg	0.24	0.40	2.78	0.44	0.12	0.21
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.95	1.74	10.61	1.56	0.44	0.75
PAH (total of USEPA 16)	CE087	mg/kg	21.9	32.2	150	45.6	9.95	13.6

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SOILS

Lab number			93029-1	93029-2	93029-3	93029-4	93029-5	93029-6
Sample id			SBW-SP002-S1	SBW-SP002-S2	SBW-SP003-S1	SBW-SP003-S2	SBW-SP003-S3	SBW-SP004-S1
Depth (m)			-	-	-	-	-	-
Date sampled			28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021	28/01/2021
Test	Method	Units						
TPH								
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE068	mg/kg	<1	<1	<1	2	<1	<1
EPH Aromatic (>EC12-EC16)	CE068	mg/kg	<1	<1	<1	10	<1	<1
EPH Aromatic (>EC16-EC21)	CE068	mg/kg	13	18	46	20	6	7
EPH Aromatic (>EC21-EC35)	CE068	mg/kg	10	14	94	15	5	7
EPH Aromatic (>EC35-EC44)	CE068	mg/kg	<1	3	12	3	<1	<1
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE068	mg/kg	<4	<4	<4	<4	<4	<4
EPH Aliphatic (>C12-C16)	CE068	mg/kg	<4	4	6	17	<4	9
EPH Aliphatic (>C16-C35)	CE068	mg/kg	160	146	175	300	83	119
EPH Aliphatic (>C35-C44)	CE068	mg/kg	41	29	107	182	96	31
Subcontracted analysis								
Asbestos (qualitative)	\$	-	NAD	NAD	NAD	NAD	NAD	NAD

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SOILS

Lab number			93029-7	93029-8	93029-9	93029-10	93029-11	93029-12
Sample id			SBW-SP004-S2	SBW-SP004-S3	SBW-SP004-S4	SBW-SP004-S5	MRA-AD-02-S3	MRA-AD-03-S1
Depth (m)			-	-	-	-	-	-
Date sampled			28/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Test	Method	Units						
Arsenic (total)	CE127 ^M	mg/kg As	33	106	69	33	37	22
Boron (water soluble)	CE063	mg/kg B	1.5	2.2	2.7	2.5	2.9	2.3
Cadmium (total)	CE127 ^M	mg/kg Cd	0.6	0.9	2.2	3.6	4.6	0.5
Chromium (total)	CE127 ^M	mg/kg Cr	508	265	135	87	526	258
Chromium (VI)	CE146	mg/kg CrVI	<1	<1	<1	<1	<1	<1
Copper (total)	CE127 ^M	mg/kg Cu	47	94	73	47	61	16
Lead (total)	CE127 ^M	mg/kg Pb	135	200	382	300	852	58
Mercury (total)	CE127 ^M	mg/kg Hg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel (total)	CE127 ^M	mg/kg Ni	54	120	68	28	46	25
Selenium (total)	CE127 ^M	mg/kg Se	3.1	6.1	11	12	4.0	17
Vanadium (total)	CE127 ^M	mg/kg V	385	279	222	145	1581	306
Zinc (total)	CE127 ^M	mg/kg Zn	330	453	1128	2849	2760	173
pH	CE004 ^M	units	9.7	8.7	8.8	8.5	11.5	10.7
Sulphate (2:1 water soluble)	CE061	mg/l SO ₄	17	937	442	1956	22	1206
Sulphate (total)	CE062	mg/kg SO ₄	3600	7452	2765	7286	6163	10181
Sulphur (total)	CE119	mg/kg S	1832	3933	2935	5123	3469	7493
Cyanide (free)	CE077	mg/kg CN	<1	<1	8.0	<1	<1	<1
Cyanide (total)	CE077	mg/kg CN	<1	<1	46	4.9	54	<1
Thiocyanate	CE145 ^M	mg/kg SCN	1.4	1.1	6.7	2.3	2.6	4.0
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Organic Carbon (TOC)	CE197	% w/w C	1.4	1.8	7.4	4.7	5.9	0.6
Estimate of OMC (calculated from TOC)	CE197	% w/w	2.4	3.1	12.7	8.1	10.2	1.0
PAH								
Naphthalene	CE087 ^M	mg/kg	0.05	0.19	10.26	0.18	0.29	0.07
Acenaphthylene	CE087 ^M	mg/kg	<0.02	0.06	1.17	0.03	0.11	0.03
Acenaphthene	CE087 ^M	mg/kg	<0.02	0.06	2.56	0.06	0.10	0.07
Fluorene	CE087 ^U	mg/kg	<0.02	0.14	2.03	0.08	0.06	0.03
Phenanthrene	CE087 ^M	mg/kg	0.18	1.08	8.18	0.65	0.70	0.42
Anthracene	CE087 ^U	mg/kg	0.04	0.18	2.58	0.12	0.17	0.10
Fluoranthene	CE087 ^M	mg/kg	0.35	1.23	11.58	0.96	1.11	0.58
Pyrene	CE087 ^M	mg/kg	0.29	1.01	8.55	0.77	0.95	0.49
Benzo(a)anthracene	CE087 ^U	mg/kg	0.15	0.47	3.77	0.35	0.49	0.20
Chrysene	CE087 ^M	mg/kg	0.21	0.57	4.37	0.43	0.75	0.27
Benzo(b)fluoranthene	CE087 ^M	mg/kg	0.24	0.64	5.55	0.47	1.00	0.28
Benzo(k)fluoranthene	CE087 ^M	mg/kg	0.09	0.23	1.90	0.17	0.36	0.11
Benzo(a)pyrene	CE087 ^U	mg/kg	0.13	0.38	3.59	0.28	0.50	0.15
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.16	0.47	3.60	0.31	0.70	0.18
Dibenz(ah)anthracene	CE087 ^M	mg/kg	0.03	0.10	0.81	0.07	0.12	0.03
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.14	0.37	3.02	0.26	0.63	0.15
PAH (total of USEPA 16)	CE087	mg/kg	2.06	7.19	73.5	5.18	8.03	3.17

Chemtech Environmental Limited

SOILS

Lab number			93029-7	93029-8	93029-9	93029-10	93029-11	93029-12
Sample id			SBW-SP004-S2	SBW-SP004-S3	SBW-SP004-S4	SBW-SP004-S5	MRA-AD-02-S3	MRA-AD-03-S1
Depth (m)			-	-	-	-	-	-
Date sampled			28/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Test	Method	Units						
TPH								
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE068	mg/kg	<1	<1	11	<1	<1	<1
EPH Aromatic (>EC12-EC16)	CE068	mg/kg	<1	<1	5	<1	<1	<1
EPH Aromatic (>EC16-EC21)	CE068	mg/kg	<1	5	34	4	4	3
EPH Aromatic (>EC21-EC35)	CE068	mg/kg	2	4	25	3	5	2
EPH Aromatic (>EC35-EC44)	CE068	mg/kg	<1	<1	4	<1	<1	<1
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE068	mg/kg	<4	<4	9	<4	<4	<4
EPH Aliphatic (>C12-C16)	CE068	mg/kg	<4	<4	35	<4	6	<4
EPH Aliphatic (>C16-C35)	CE068	mg/kg	41	48	333	45	179	56
EPH Aliphatic (>C35-C44)	CE068	mg/kg	12	14	53	16	24	11
Subcontracted analysis								
Asbestos (qualitative)	\$	-	NAD	NAD	NAD	NAD	NAD	NAD

Chemtech Environmental Limited

SOILS

Lab number	93029-13		
Sample id	MRA-AE-02-S1		
Depth (m)	-		
Date sampled	29/01/2021		
Test	Method	Units	
Arsenic (total)	CE127 ^M	mg/kg As	46
Boron (water soluble)	CE063	mg/kg B	2.7
Cadmium (total)	CE127 ^M	mg/kg Cd	4.1
Chromium (total)	CE127 ^M	mg/kg Cr	685
Chromium (VI)	CE146	mg/kg CrVI	<1
Copper (total)	CE127 ^M	mg/kg Cu	49
Lead (total)	CE127 ^M	mg/kg Pb	714
Mercury (total)	CE127 ^M	mg/kg Hg	<0.5
Nickel (total)	CE127 ^M	mg/kg Ni	40
Selenium (total)	CE127 ^M	mg/kg Se	5.2
Vanadium (total)	CE127 ^M	mg/kg V	1580
Zinc (total)	CE127 ^M	mg/kg Zn	2325
pH	CE004 ^M	units	11.5
Sulphate (2:1 water soluble)	CE061	mg/l SO ₄	153
Sulphate (total)	CE062	mg/kg SO ₄	7697
Sulphur (total)	CE119	mg/kg S	4004
Cyanide (free)	CE077	mg/kg CN	<1
Cyanide (total)	CE077	mg/kg CN	58
Thiocyanate	CE145 ^M	mg/kg SCN	2.0
Phenols (total)	CE078	mg/kg PhOH	<0.5
Total Organic Carbon (TOC)	CE197	% w/w C	2.5
Estimate of OMC (calculated from TOC)	CE197	% w/w	4.4
PAH			
Naphthalene	CE087 ^M	mg/kg	0.21
Acenaphthylene	CE087 ^M	mg/kg	0.09
Acenaphthene	CE087 ^M	mg/kg	0.06
Fluorene	CE087 ^U	mg/kg	0.03
Phenanthrene	CE087 ^M	mg/kg	0.65
Anthracene	CE087 ^U	mg/kg	0.15
Fluoranthene	CE087 ^M	mg/kg	1.51
Pyrene	CE087 ^M	mg/kg	1.29
Benzo(a)anthracene	CE087 ^U	mg/kg	0.75
Chrysene	CE087 ^M	mg/kg	1.17
Benzo(b)fluoranthene	CE087 ^M	mg/kg	1.17
Benzo(k)fluoranthene	CE087 ^M	mg/kg	0.42
Benzo(a)pyrene	CE087 ^U	mg/kg	0.58
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.76
Dibenz(ah)anthracene	CE087 ^M	mg/kg	0.13
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.63
PAH (total of USEPA 16)	CE087	mg/kg	9.60

Chemtech Environmental Limited

SOILS

Lab number			93029-13
Sample id			MRA-AE-02-S1
Depth (m)			-
Date sampled			29/01/2021
Test	Method	Units	
TPH			
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01
EPH Aromatic (>EC10-EC12)	CE068	mg/kg	<1
EPH Aromatic (>EC12-EC16)	CE068	mg/kg	<1
EPH Aromatic (>EC16-EC21)	CE068	mg/kg	5
EPH Aromatic (>EC21-EC35)	CE068	mg/kg	6
EPH Aromatic (>EC35-EC44)	CE068	mg/kg	<1
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1
EPH Aliphatic (>C10-C12)	CE068	mg/kg	<4
EPH Aliphatic (>C12-C16)	CE068	mg/kg	5
EPH Aliphatic (>C16-C35)	CE068	mg/kg	178
EPH Aliphatic (>C35-C44)	CE068	mg/kg	21
Subcontracted analysis			
Asbestos (qualitative)	\$	-	NAD

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE127	Arsenic (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg As
CE063	Boron (water soluble)	Hot water extract, ICP-OES	Dry		0.5	mg/kg B
CE127	Cadmium (total)	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg Cd
CE127	Chromium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cr
CE208	Chromium (III)	Calculation: Cr (total) - Cr (VI)	Dry		1	mg/kg CrIII
CE146	Chromium (VI)	Acid extraction, Colorimetry	Dry		1	mg/kg CrVI
CE127	Copper (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cu
CE127	Lead (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Pb
CE127	Mercury (total)	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg Hg
CE127	Nickel (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ni
CE127	Selenium (total)	Aqua regia digest, ICP-MS	Dry	M	0.3	mg/kg Se
CE127	Vanadium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg V
CE127	Zinc (total)	Aqua regia digest, ICP-MS	Dry	M	5	mg/kg Zn
CE004	pH	Based on BS 1377, pH Meter	As received	M	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry		10	mg/l SO ₄
CE062	Sulphate (total)	Acid extraction, ICP-OES	Dry		100	mg/kg SO ₄
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		100	mg/kg S
CE077	Cyanide (free)	Extraction, Continuous Flow Colorimetry	As received		1	mg/kg CN
CE077	Cyanide (total)	Extraction, Continuous Flow Colorimetry	As received		1	mg/kg CN
CE145	Thiocyanate	Weak acid extraction, Colorimetry	Dry	M	1	mg/kg SCN
CE078	Phenols (total)	Extraction, Continuous Flow Colorimetry	As received		0.5	mg/kg PhOH
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
CE067	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	As received		0.01	mg/kg
CE068	EPH Aromatic (>EC10-EC12)	Solvent extraction, GC-FID	As received		1	mg/kg

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE068	EPH Aromatic (>EC12-EC16)	Solvent extraction, GC-FID	As received		1	mg/kg
CE068	EPH Aromatic (>EC16-EC21)	Solvent extraction, GC-FID	As received		1	mg/kg
CE068	EPH Aromatic (>EC21-EC35)	Solvent extraction, GC-FID	As received		1	mg/kg
CE068	EPH Aromatic (>EC35-EC44)	Solvent extraction, GC-FID	As received		1	mg/kg
CE067	VPH Aliphatic (>C5-C6)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C6-C8)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C8-C10)	Headspace GC-FID	As received		0.1	mg/kg
CE068	EPH Aliphatic (>C10-C12)	Solvent extraction, GC-FID	As received		4	mg/kg
CE068	EPH Aliphatic (>C12-C16)	Solvent extraction, GC-FID	As received		4	mg/kg
CE068	EPH Aliphatic (>C16-C35)	Solvent extraction, GC-FID	As received		4	mg/kg
CE068	EPH Aliphatic (>C35-C44)	Solvent extraction, GC-FID	As received		10	mg/kg
\$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
93029-1	SBW-SP002-S1	-	N	
93029-2	SBW-SP002-S2	-	N	
93029-3	SBW-SP003-S1	-	N	
93029-4	SBW-SP003-S2	-	N	
93029-5	SBW-SP003-S3	-	N	
93029-6	SBW-SP004-S1	-	N	
93029-7	SBW-SP004-S2	-	N	
93029-8	SBW-SP004-S3	-	N	
93029-9	SBW-SP004-S4	-	N	
93029-10	SBW-SP004-S5	-	N	
93029-11	MRA-AD-02-S3	-	N	
93029-12	MRA-AD-03-S1	-	N	
93029-13	MRA-AE-02-S1	-	N	



DETS

Certificate of Analysis

Certificate Number 20-17606-1

09-Oct-20

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 20-17606-1

Client Reference 4296

Order No (not supplied)

Contract Title South Bank Area A

Description 12 Soil samples, 2 Leachate samples.

Date Received 14-Sep-20

Date Started 14-Sep-20

Date Completed 09-Oct-20

Test Procedures Identified by prefix DETSn (details on request).

Notes **This report supersedes 20-17606, extra testing added**

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



THE ENVIRONMENT AGENCY'S
MONITORING CERTIFICATION SCHEME



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 20-17606-1

Client Ref 4296

Contract Title South Bank Area A

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
SBA_AUK_TP105	7	3	1725661	22/09/2020	Dark brown sandy, clayey GRAVEL (sample matrix outside MCERTS scope of accreditation)
SBA_AUK_TP110	2	0.6	1725662	22/09/2020	Dark brown gravelly SAND
SBA_AUK_TP113	8	3	1725663	22/09/2020	Dark brown gravelly SAND
SBA_AUK_TP122	7	3	1725664	22/09/2020	Dark brown gravelly SAND
SBA_AUK_TP129	3	1.2	1725665	22/09/2020	Dark brown gravelly SAND
SBA_AUK_TP137	1	0.00-0.10	1725666	22/09/2020	Dark brown gravelly SAND
SBA_AUK_TP143	1	0.00-0.10	1725667	22/09/2020	Dark brown gravelly SAND
SBA_AUK_TP148	1	0.00-0.10	1725668	22/09/2020	Dark brown gravelly SAND including some rootlets
SBA_AUK_TP150	2	0.3	1725669	22/09/2020	Dark brown gravelly SAND
SBA_AUK_TP153	9	4	1725670	22/09/2020	Dark brown gravelly SAND
SBA_AUK_TP154	3	0.6	1725671	22/09/2020	Dark brown sandy CLAY some tar
SBA_AUK_TP155	7	2.5	1725672	22/09/2020	Dark brown gravelly SAND

Summary of Chemical Analysis

Soil Samples

Our Ref 20-17606-1
 Client Ref 4296
 Contract Title South Bank Area A

Lab No	1725661	1725662	1725663	1725664
Sample ID	SBA_AUK_TP105	SBA_AUK_TP110	SBA_AUK_TP113	SBA_AUK_TP122
Depth	3.00	0.60	3.00	3.00
Other ID	7	2	8	7
Sample Type	ES	ES	ES	ES
Sampling Date	07/09/2020	07/09/2020	07/09/2020	07/09/2020
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Asbestos Quantification	DETSC 1102	0.001	%				
Metals							
Aluminium	DETSC 2301*	1	mg/kg	29000	30000	39000	53000
Antimony	DETSC 2301*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Arsenic	DETSC 2301#	0.2	mg/kg	11	8.3	8.7	5.9
Barium	DETSC 2301#	1.5	mg/kg	160	180	210	200
Beryllium	DETSC 2301#	0.2	mg/kg	3.1	3.5	4.2	5.4
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	3.4	2.4	2.5	3.0
Cadmium	DETSC 2301#	0.1	mg/kg	0.8	0.4	0.2	0.2
Chromium	DETSC 2301#	0.15	mg/kg	15	18	30	15
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	26	22	17	13
Iron	DETSC 2301	25	mg/kg	20000	15000	18000	19000
Lead	DETSC 2301#	0.3	mg/kg	86	26	23	17
Magnesium	DETSC 2301*	1	mg/kg	15000	16000	20000	25000
Manganese	DETSC 2301#	20	mg/kg	620	1700	2400	1200
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	1.3	< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	0.5	0.7	0.7	< 0.4
Nickel	DETSC 2301#	1	mg/kg	13	47	4.3	17
Silicon	DETSC 2301*	10	mg/kg	110000	98000	66000	59000
Vanadium	DETSC 2301#	0.8	mg/kg	43	38	87	56
Zinc	DETSC 2301#	1	mg/kg	870	190	140	69
Inorganics							
pH	DETSC 2008#		pH	8.9	9.2	10.0	10.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	0.2	780	1.4
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	7.7	0.2
Thiocyanate	DETSC 2130#	0.6	mg/kg	0.9	0.9	88	1.9
Organic matter	DETSC 2002#	0.1	%	1.3	2.5	3.6	1.1
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	1200	600	1000	1400
Sulphur (free)	DETSC 3049#	0.75	mg/kg	1.4	< 0.75	2100	44
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	0.20	< 0.01	< 0.01	0.13
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	2.3	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	10	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	45	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	58	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01



Summary of Chemical Analysis

Soil Samples

Our Ref 20-17606-1
 Client Ref 4296
 Contract Title South Bank Area A

Lab No	1725661	1725662	1725663	1725664
Sample ID	SBA_AUK_TP105	SBA_AUK_TP110	SBA_AUK_TP113	SBA_AUK_TP122
Depth	3.00	0.60	3.00	3.00
Other ID	7	2	8	7
Sample Type	ES	ES	ES	ES
Sampling Date	07/09/2020	07/09/2020	07/09/2020	07/09/2020
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	1600	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	32	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	49	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	190	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	1800	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	1900	< 10
PAHs							
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	0.10	1700	0.10
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	0.78	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05	17	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	0.04	3.2	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.54	5.4	0.12
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	0.14	1.0	0.05
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.93	9.0	0.34
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.77	6.9	0.30
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.43	2.4	0.22
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	0.54	2.9	0.23
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.70	3.5	0.26
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.31	1.1	0.14
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.45	2.1	0.18
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.23	1.0	0.12
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.06	0.27	0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	0.28	1.1	0.12
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	5.6	1800	2.2
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 20-17606-1
 Client Ref 4296
 Contract Title South Bank Area A

Lab No	1725665	1725666	1725667	1725668
Sample ID	SBA_AUK_TP129	SBA_AUK_TP137	SBA_AUK_TP143	SBA_AUK_TP148
Depth	1.20	0.00-0.10	0.00-0.10	0.00-0.10
Other ID	3	1	1	1
Sample Type	ES	ES	ES	ES
Sampling Date	07/09/2020	08/09/2020	08/09/2020	08/09/2020
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Asbestos Quantification	DETSC 1102	0.001	%			< 0.001	
Metals							
Aluminium	DETSC 2301*	1	mg/kg	33000	27000	18000	8800
Antimony	DETSC 2301*	1	mg/kg	< 1.0	3.3	8.2	6.1
Arsenic	DETSC 2301#	0.2	mg/kg	11	34	59	60
Barium	DETSC 2301#	1.5	mg/kg	370	360	530	380
Beryllium	DETSC 2301#	0.2	mg/kg	5.0	2.9	2.5	1.2
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.9	2.0	1.8	2.0
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	1.3	5.8	2.6
Chromium	DETSC 2301#	0.15	mg/kg	20	79	130	43
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	26	48	77	58
Iron	DETSC 2301	25	mg/kg	29000	86000	130000	79000
Lead	DETSC 2301#	0.3	mg/kg	19	410	1700	530
Magnesium	DETSC 2301*	1	mg/kg	18000	16000	14000	4500
Manganese	DETSC 2301#	20	mg/kg	6800	12000	22000	57000
Mercury	DETSC 2325#	0.05	mg/kg	0.22	0.23	1.1	0.95
Molybdenum	DETSC 2301#	0.4	mg/kg	1.8	2.5	4.3	7.3
Nickel	DETSC 2301#	1	mg/kg	13	34	34	46
Silicon	DETSC 2301*	10	mg/kg	68000	55000	52000	48000
Vanadium	DETSC 2301#	0.8	mg/kg	66	130	310	110
Zinc	DETSC 2301#	1	mg/kg	110	600	5000	1600
Inorganics							
pH	DETSC 2008#		pH	10.1	9.3	9.6	8.6
Cyanide, Total	DETSC 2130#	0.1	mg/kg	160	2.8	44	6.7
Cyanide, Free	DETSC 2130#	0.1	mg/kg	2.7	0.2	1.1	0.1
Thiocyanate	DETSC 2130#	0.6	mg/kg	19	2.1	4.7	1.4
Organic matter	DETSC 2002#	0.1	%	7.3	6.1	6.1	8.3
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	810	890	210	130
Sulphur (free)	DETSC 3049#	0.75	mg/kg	5.4	< 0.75	< 0.75	< 0.75
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	0.26	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	2.4	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	30	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	33	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01



Summary of Chemical Analysis

Soil Samples

Our Ref 20-17606-1
 Client Ref 4296
 Contract Title South Bank Area A

Lab No	1725665	1725666	1725667	1725668
Sample ID	SBA_AUK_TP129	SBA_AUK_TP137	SBA_AUK_TP143	SBA_AUK_TP148
Depth	1.20	0.00-0.10	0.00-0.10	0.00-0.10
Other ID	3	1	1	1
Sample Type	ES	ES	ES	ES
Sampling Date	07/09/2020	08/09/2020	08/09/2020	08/09/2020
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	4.0	2.4	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	3.2	3.9	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	14	16	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	30	58	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	51	80	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	51	110	< 10
PAHs							
Naphthalene	DETSC 3303#	0.03	mg/kg	0.49	0.17	0.13	0.05
Acenaphthylene	DETSC 3303#	0.03	mg/kg	0.12	0.08	0.06	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.07	0.14	0.13	0.04
Fluorene	DETSC 3303	0.03	mg/kg	0.05	0.11	0.11	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.66	1.2	0.99	0.24
Anthracene	DETSC 3303	0.03	mg/kg	0.13	0.25	0.22	0.05
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.59	2.3	1.6	0.37
Pyrene	DETSC 3303#	0.03	mg/kg	0.45	1.8	1.2	0.29
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.20	0.79	0.58	0.13
Chrysene	DETSC 3303	0.03	mg/kg	0.27	0.81	0.63	0.16
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.25	0.84	0.70	0.16
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.10	0.33	0.25	0.06
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.12	0.58	0.49	0.11
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.08	0.25	0.23	0.06
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.06	0.07	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.08	0.27	0.26	0.06
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	3.7	10	7.6	1.8
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 20-17606-1
 Client Ref 4296
 Contract Title South Bank Area A

Lab No	1725669	1725670	1725671	1725672
Sample ID	SBA_AUK_TP150	SBA_AUK_TP153	SBA_AUK_TP154	SBA_AUK_TP155
Depth	0.30	4.00	0.60	2.50
Other ID	2	9	3	7
Sample Type	ES	ES	ES	ES
Sampling Date	08/09/2020	08/09/2020	08/09/2020	08/09/2020
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Asbestos Quantification	DETSC 1102	0.001	%				
Metals							
Aluminium	DETSC 2301*	1	mg/kg	9500	34000	14000	15000
Antimony	DETSC 2301*	1	mg/kg	1.8	1.9	5.6	4.4
Arsenic	DETSC 2301#	0.2	mg/kg	14	25	91	71
Barium	DETSC 2301#	1.5	mg/kg	190	250	190	170
Beryllium	DETSC 2301#	0.2	mg/kg	1.2	5.0	1.9	2.1
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.0	3.1	6.9	3.1
Cadmium	DETSC 2301#	0.1	mg/kg	0.9	0.8	9.0	6.4
Chromium	DETSC 2301#	0.15	mg/kg	24	20	49	43
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	29	28	40	47
Iron	DETSC 2301	25	mg/kg	32000	34000	82000	81000
Lead	DETSC 2301#	0.3	mg/kg	270	150	1400	2300
Magnesium	DETSC 2301*	1	mg/kg	4100	18000	6600	6500
Manganese	DETSC 2301#	20	mg/kg	4800	24000	4100	7700
Mercury	DETSC 2325#	0.05	mg/kg	0.18	0.27	0.32	0.11
Molybdenum	DETSC 2301#	0.4	mg/kg	1.6	2.1	2.0	2.3
Nickel	DETSC 2301#	1	mg/kg	12	16	39	41
Silicon	DETSC 2301*	10	mg/kg	18000	43000	61000	71000
Vanadium	DETSC 2301#	0.8	mg/kg	74	59	150	130
Zinc	DETSC 2301#	1	mg/kg	710	470	6500	3400
Inorganics							
pH	DETSC 2008#		pH	10.2	10.1	8.9	8.8
Cyanide, Total	DETSC 2130#	0.1	mg/kg	9.5	1.4	8.0	1.8
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.5	< 0.1	0.3	< 0.1
Thiocyanate	DETSC 2130#	0.6	mg/kg	1.9	1.2	2.1	0.9
Organic matter	DETSC 2002#	0.1	%	6.3	2.0	22	2.7
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	140	1500	410	1000
Sulphur (free)	DETSC 3049#	0.75	mg/kg	12	44	2400	< 0.75
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.10	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	0.67	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	6.2	9.7
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	2.4	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	15	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	21	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 76.3	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	15	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	11	< 0.01



Summary of Chemical Analysis

Soil Samples

Our Ref 20-17606-1
 Client Ref 4296
 Contract Title South Bank Area A

Lab No	1725669	1725670	1725671	1725672
Sample ID	SBA_AUK_TP150	SBA_AUK_TP153	SBA_AUK_TP154	SBA_AUK_TP155
Depth	0.30	4.00	0.60	2.50
Other ID	2	9	3	7
Sample Type	ES	ES	ES	ES
Sampling Date	08/09/2020	08/09/2020	08/09/2020	08/09/2020
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	22	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	2600	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	1900	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	2300	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	1000	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	7900	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	8000	< 10
PAHs							
Naphthalene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	51000	0.35
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	1200	0.09
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	150	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	1200	0.09
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.13	0.06	28000	0.42
Anthracene	DETSC 3303	0.03	mg/kg	0.03	< 0.03	780	0.11
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.16	0.08	14000	0.39
Pyrene	DETSC 3303#	0.03	mg/kg	0.15	0.04	1300	0.29
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.10	0.03	560	0.15
Chrysene	DETSC 3303	0.03	mg/kg	0.11	0.04	510	0.16
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.11	0.04	380	0.18
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.06	< 0.03	220	0.06
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.08	< 0.03	390	0.13
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.06	< 0.03	140	0.07
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	44	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	130	0.07
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	1.1	0.30	99000	2.6
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	250	0.3

Summary of Chemical Analysis

Soil VOC/SVOC Samples

Our Ref 20-17606-1
 Client Ref 4296
 Contract Title South Bank Area A

Lab No	1725663	1725671
Sample ID	SBA_AUK_TP113	SBA_AUK_TP154
Depth	3.00	0.60
Other ID	8	3
Sample Type	ES	ES
Sampling Date	07/09/2020	08/09/2020
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
VOCs					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	23
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	0.43
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	0.02	29
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	0.18
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	30
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	1.0
Styrene	DETSC 3431*	0.01	mg/kg	0.05	19
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	0.38
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

Summary of Chemical Analysis

Soil VOC/SVOC Samples

Our Ref 20-17606-1

Client Ref 4296

Contract Title South Bank Area A

Lab No	1725663	1725671
Sample ID	SBA_AUK_TP113	SBA_AUK_TP154
Depth	3.00	0.60
Other ID	8	3
Sample Type	ES	ES
Sampling Date	07/09/2020	08/09/2020
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	0.63
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	0.19
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
SVOCs					
Phenol	DETSC 3433	0.1	mg/kg	< 2.0	400
Aniline	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 2.0	260
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 2.0	770
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 2.0	470
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 2.0	3700
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 2.0	3400
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0

Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 20-17606-1

Client Ref 4296

Contract Title South Bank Area A

Lab No	1725663	1725671
Sample ID	SBA_AUK_TP113	SBA_AUK_TP154
Depth	3.00	0.60
Other ID	8	3
Sample Type	ES	ES
Sampling Date	07/09/2020	08/09/2020
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
Diphenylamine	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
Di-n-octylphthalate	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 2.0	< 2.0
Azobenzene	DETSC 3433	0.1	mg/kg	< 2.0	< 2.0
Carbazole	DETSC 3433*	0.1	mg/kg	< 2.0	1900

Summary of Chemical Analysis

Leachate Samples

Our Ref 20-17606-1

Client Ref 4296

Contract Title South Bank Area A

Lab No	1725673	1725674
Sample ID	SBA_AUK_TP113	SBA_AUK_TP154
Depth	3.00	0.60
Other ID	8	3
Sample Type	ES	ES
Sampling Date	07/09/2020	08/09/2020
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Preparation					
Leachate 2:1 250g Non-WAC	DETSC 1009*			Y	Y
Metals					
Antimony, Dissolved	DETSC 2306	0.17	ug/l	0.25	0.47
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.57	1.1
Barium, Dissolved	DETSC 2306	0.26	ug/l	11	8.0
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	18	120
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	0.04
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	5.0	7.1
Iron, Dissolved	DETSC 2306	5.5	ug/l	140	38
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.36	0.34
Magnesium, Dissolved	DETSC 2306	0.02	mg/l	2.2	2.7
Manganese, Dissolved	DETSC 2306	0.22	ug/l	280	89
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01
Molybdenum, Dissolved	DETSC 2306	1.1	ug/l	< 1.1	< 1.1
Nickel, Dissolved	DETSC 2306	0.5	ug/l	< 0.5	0.6
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	< 0.6	1.4
Zinc, Dissolved	DETSC 2306	1.3	ug/l	9.5	13
Inorganics					
pH	DETSC 2008		pH	6.3	6.8
Cyanide, Total	DETSC 2130	40	ug/l	380	< 40
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.30	0.80
Chloride	DETSC 2055	0.1	mg/l	2.5	7.8
Sulphate as SO4	DETSC 2055	0.1	mg/l	54	27
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 10.0
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 10.0
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 10.0
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	30
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 10.0
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 10.0
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 10.0
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	780

Summary of Chemical Analysis

Leachate Samples

Our Ref 20-17606-1

Client Ref 4296

Contract Title South Bank Area A

Lab No	1725673	1725674
Sample ID	SBA_AUK_TP113	SBA_AUK_TP154
Depth	3.00	0.60
Other ID	8	3
Sample Type	ES	ES
Sampling Date	07/09/2020	08/09/2020
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	130
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	24
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	960
TPH Ali/Aro Total	DETSC 3072*	10	ug/l	< 10	990
PAHs					
Naphthalene	DETSC 3304	0.05	ug/l	11	2200
Acenaphthylene	DETSC 3304	0.01	ug/l	0.28	130
Acenaphthene	DETSC 3304	0.01	ug/l	2.4	4.8
Fluorene	DETSC 3304	0.01	ug/l	0.49	24
Phenanthrene	DETSC 3304	0.01	ug/l	0.33	36
Anthracene	DETSC 3304	0.01	ug/l	0.09	4.2
Fluoranthene	DETSC 3304	0.01	ug/l	0.43	14
Pyrene	DETSC 3304	0.01	ug/l	0.30	8.4
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	0.16	4.6
Chrysene	DETSC 3304	0.01	ug/l	0.19	3.1
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	0.27	4.4
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	0.09	2.0
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	0.18	4.2
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	0.20	2.8
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	0.04	0.49
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	0.15	2.1
PAH Total	DETSC 3304	0.2	ug/l	17	2400
Phenols					
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	2300

Summary of Asbestos Analysis

Soil Samples

Our Ref 20-17606-1

Client Ref 4296

Contract Title South Bank Area A

Lab No	Sample ID	Sample Location	Material Type	Result	Comment*	Analyst
1725661	SBA_AUK_TP105 7 3.00	SBA_AUK_TP105 SO_0300	SOIL	NAD	none	Colin Patrick
1725662	SBA_AUK_TP110 2 0.60	SBA_AUK_TP110 SO_0060	SOIL	NAD	none	Colin Patrick
1725663	SBA_AUK_TP113 8 3.00	SBA_AUK_TP113 SO_0300	SOIL	NAD	none	Colin Patrick
1725664	SBA_AUK_TP122 7 3.00	SBA_AUK_TP122 SO_0300	SOIL	NAD	none	Colin Patrick
1725665	SBA_AUK_TP129 3 1.20	SBA_AUK_TP129 SO_0120	SOIL	NAD	none	Colin Patrick
1725666	SBA_AUK_TP137 1 0.00-0.10	SBA_AUK_TP137 SO_0000	SOIL	NAD	none	Colin Patrick
1725667	SBA_AUK_TP143 1 0.00-0.10	SBA_AUK_TP143 SO_0000	SOIL	Chrysotile	small bundle of Chrysotile fibres	Colin Patrick
1725668	SBA_AUK_TP148 1 0.00-0.10	SBA_AUK_TP148 SO_0000	SOIL	NAD	none	Colin Patrick
1725669	SBA_AUK_TP150 2 0.30	SBA_AUK_TP150 SO_0030	SOIL	NAD	none	Colin Patrick
1725670	SBA_AUK_TP153 9 4.00	SBA_AUK_TP153 SO_0400	SOIL	NAD	none	Colin Patrick
1725671	SBA_AUK_TP154 3 0.60	SBA_AUK_TP154 SO_0060	SOIL	NAD	none	Colin Patrick
1725672	SBA_AUK_TP155 7 2.50	SBA_AUK_TP155 SO_0250	SOIL	NAD	none	Colin Patrick

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Summary of Asbestos Quantification Analysis

Soil Samples

Our Ref 20-17606-1

Client Ref 4296

Contract Title South Bank Area A

Lab No	1725667
Sample ID	SBA_AUK_TP143
Depth	0.00-0.10
Other ID	1
Sample Type	SOIL
Sampling Date	08/09/2020
Sampling Time	

Test	Method	Units	
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	< 0.001
Gravimetric Quantification (a)	DETSC 1102	Mass %	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	<0.001
Quantification by PCOM (c)	DETSC 1102	Mass %	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na
Breakdown of Gravimetric Analysis (a)			
Mass of Sample		g	683.45
ACMs present*		type	
Mass of ACM in sample		g	
% ACM by mass		%	
% asbestos in ACM		%	
% asbestos in sample		%	
Breakdown of Detailed Gravimetric Analysis (b)			
% Amphibole bundles in sample		Mass %	na
% Chrysotile bundles in sample		Mass %	<0.001
Breakdown of PCOM Analysis (c)			
% Amphibole fibres in sample		Mass %	na
% Chrysotile fibres in sample		Mass %	na
Breakdown of Potentially Respirable Fibre Analysis (d)			
Amphibole fibres		Fibres/g	na
Chrysotile fibres		Fibres/g	na

* Denotes test or material description outside of UKAS accreditation.
 % asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264.
 Recommended sample size for quantification is approximately 1kg
 # denotes deviating sample

Information in Support of the Analytical Results

Our Ref 20-17606-1
 Client Ref 4296
 Contract South Bank Area A

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1725661	SBA_AUK_TP105 3.00 SOIL	07/09/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1725662	SBA_AUK_TP110 0.60 SOIL	07/09/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1725663	SBA_AUK_TP113 3.00 SOIL	07/09/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1725664	SBA_AUK_TP122 3.00 SOIL	07/09/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1725665	SBA_AUK_TP129 1.20 SOIL	07/09/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1725666	SBA_AUK_TP137 0.00-0.10 SOIL	08/09/20	GJ 250ml, GJ 60ml, PT 1L		
1725667	SBA_AUK_TP143 0.00-0.10 SOIL	08/09/20	GJ 250ml, GJ 60ml, PT 1L		
1725668	SBA_AUK_TP148 0.00-0.10 SOIL	08/09/20	GJ 250ml, GJ 60ml, PT 1L		
1725669	SBA_AUK_TP150 0.30 SOIL	08/09/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1725670	SBA_AUK_TP153 4.00 SOIL	08/09/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1725671	SBA_AUK_TP154 0.60 SOIL	08/09/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1725672	SBA_AUK_TP155 2.50 SOIL	08/09/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1725673	SBA_AUK_TP113 3.00 LEACHATE	07/09/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1725674	SBA_AUK_TP154 0.60 LEACHATE	08/09/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

Table 2: Soil GAC Protective of Human Health - In-situ Railway Embankment

Location	MDL	Units	Human Health (Commercial Worker)	GAC Source	SBA_AUK_TP110	SBA_AUK_TP122
Depth (mbgl)					1	3
Date					07/09/2020	07/09/2020
Contaminant of Concern						
Metals						
Aluminium	1	mg/kg			30,000	53,000
Antimony	1	mg/kg	470	USEPA	0	0
Arsenic	0.2	mg/kg	640	S4UL	8	6
Barium	2	mg/kg	19,000	Arcadis	180	200
Beryllium	0.2	mg/kg	12	S4UL	4	5
Boron, Water Soluble	0.2	mg/kg	240,000	S4UL	2	3
Cadmium	0.1	mg/kg	190	S4UL	0	0
Chromium	0.15	mg/kg	8,600	S4UL	18	15
Chromium, Hexavalent	1	mg/kg	33	S4UL	< 1.0	< 1.0
Copper	0.2	mg/kg	68,000	S4UL	22	13
Iron	25	mg/kg			15,000	19,000
Lead	0.3	mg/kg	2,300	C4SL	26	17
Magnesium	1	mg/kg			16,000	25,000
Manganese	20	mg/kg			1,700	1,200
Mercury	0.05	mg/kg	58*	S4UL	< 0.05	< 0.05
Molybdenum	0.4	mg/kg	5,540	Arcadis	1	< 0.4
Nickel	1	mg/kg	980	S4UL	47	17
Silicon	10	mg/kg			98,000	59,000
Vanadium	0.8	mg/kg	9,000	S4UL	38	56
Zinc	1	mg/kg	730,000	S4UL	190	69
Inorganics						
pH		pH	-		9.2	10.9
Cyanide, Total	0.1	mg/kg	-		0.2	1.4
Cyanide, Free	0.1	mg/kg	66	DQRA	< 0.1	0.2
Thiocyanate	0.6	mg/kg	230	USEPA	0.9	1.9
Organic matter	0.1	%	-		2.5	1.1
Sulphate Aqueous Extract as SO4	10	mg/l	-		600	1400
Sulphur (free)	0.01	%	-		< 0.75	44
Petroleum Hydrocarbons						
Aliphatic C5-C6	0.01	mg/kg	3200**	S4UL	0.005	0.005
Aliphatic C6-C8	0.01	mg/kg	7800**	S4UL	0.005	0.005
Aliphatic C8-C10	0.01	mg/kg	2000**	S4UL	0.005	0.13
Aliphatic C10-C12	1.5	mg/kg	9700**	S4UL	0.75	0.75
Aliphatic C12-C16	1.2	mg/kg	59000**	S4UL	0.6	0.6
Aliphatic C16-C21	1.5	mg/kg	1,600,000	S4UL	0.75	0.75
Aliphatic C21-C35	3.4	mg/kg	1,600,000	S4UL	1.7	1.7
Aliphatic C5-C35	10	mg/kg	na		5	5
Aromatic C5-C7	0.01	mg/kg	26000**	S4UL	0.005	0.005
Aromatic C7-C8	0.01	mg/kg	56000**	S4UL	0.005	0.005
Aromatic C8-C10	0.01	mg/kg	3500**	S4UL	0.005	0.005
Aromatic C10-C12	0.9	mg/kg	16000**	S4UL	0.45	0.45
Aromatic C12-C16	0.5	mg/kg	36000**	S4UL	0.25	0.25
Aromatic C16-C21	0.6	mg/kg	28,000	S4UL	0.3	0.3
Aromatic C21-C35	1.4	mg/kg	28,000	S4UL	0.7	0.7
Aromatic C5-C35	10	mg/kg	na		5	5
TPH Ali/Aro Total	10	mg/kg	na		5	5
PAHs						
Naphthalene	0.03	mg/kg	1,900	Wood	0.1	0.1
Acenaphthylene	0.03	mg/kg	83000**	S4UL	0.04	<0.03
Acenaphthene	0.03	mg/kg	84000**	S4UL	0.05	<0.03
Fluorene	0.03	mg/kg	63000**	S4UL	0.04	<0.03
Phenanthrene	0.03	mg/kg	22,000	S4UL	0.54	0.12
Anthracene	0.03	mg/kg	520,000	S4UL	0.14	0.05
Fluoranthene	0.03	mg/kg	23,000	S4UL	0.93	0.34
Pyrene	0.03	mg/kg	54,000	S4UL	0.77	0.3
Benzo(a)anthracene	0.03	mg/kg	170	S4UL	0.43	0.22
Chrysene	0.03	mg/kg	350	S4UL	0.54	0.23
Benzo(b)fluoranthene	0.03	mg/kg	44	S4UL	0.7	0.26
Benzo(k)fluoranthene	0.03	mg/kg	1,200	S4UL	0.31	0.14
Benzo(a)pyrene	0.03	mg/kg	77	Wood	0.45	0.18
Indeno(1,2,3-c,d)pyrene	0.03	mg/kg	500	S4UL	0.23	0.12
Dibenzo(a,h)anthracene	0.03	mg/kg	3.5	S4UL	0.06	0.03
Benzo(g,h,i)perylene	0.03	mg/kg	3,900	S4UL	0.28	0.12
PAH - USEPA 16, Total	0.1	mg/kg	na		5.6	2.2
Phenols						
Phenol - Monohydric	0.3	mg/kg	760	S4UL	0.15	0.15
Asbestos						
Result	n/a	n/a	0.001	Arcadis	Not Detected	Not Detected

The following GACs have been used in order of availability:

S4UL: (Commercial End Use, LQM / CIEH (2015) The LQM / CIEH S4ULs for Human Health Risk Assessment. Copyright 1% SOM) Land Quality Management Limited reproduced with permission; Publication Number S4UL3223. All rights reserved.

C4SL: (Commercial End Use) Department for Environment, Food and Rural Affairs (DEFRA) (2014) SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document, December 2014

Arcadis Where published criteria above are not available, Arcadis has derived GAC based on EA guidance and assumptions in line with current industry standards and standard CLEA inputs for a commercial land use.

USEPA GAC based on US Environmental Protection Agency (USEPA) Regional Screening Levels (RSL). Available at <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables>

Wood derived GAC based on CLEA v1.07 were presented in the Wood 2019 report for benzo(a)pyrene and naphthalene. It is understood that these values were acceptable to the regulator for this site and as such they have been retained here.

Notes

GAC	Generic Assessment Criteria
na	Comprises multiple contaminant, no applicable GAC
123*	S4UL exceeds the vapour saturation limit
123**	S4UL exceeds the solubility saturation limit
-	No applicable GAC readily available
	Elements present naturally in soil with typically low toxicity
<MDL	Concentration less than the method detection limit
	Contaminant of Concern in excess of Human Health GAC

Table 2: Soil GAC Protective of Human Health - Stockpiled Railway Embankment

Contaminant of Concern	MDL	Units	Human Health (Commercial Worker)	GAC Source	SBW-SP004-S1	SBW-SP004-S2	SBW-SP004-S3	SBW-SP004-S4	SBW-SP004-S5
					28/01/2021	28/01/2021	29/01/2021	29/01/2021	29/01/2021
Metals									
Arsenic	1	mg/kg	640	S4UL	37	33	106	69	33
Boron, Water Soluble	0.5	mg/kg	240,000	S4UL	2	1	2	3	3
Cadmium	0.2	mg/kg	190	S4UL	1	1	1	2	4
Chromium	1	mg/kg	8,600	S4UL	94	508	265	135	87
Chromium, Hexavalent	1	mg/kg	33	S4UL	<1	<1	<1	<1	<1
Copper	1	mg/kg	68,000	S4UL	59	47	94	73	47
Lead	1	mg/kg	2,300	C4SL	193	135	200	382	300
Mercury	0.5	mg/kg	58*	S4UL	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel	1	mg/kg	980	S4UL	50	54	120	68	28
Selenium	0.3	mg/kg			2	3	6	11	12
Vanadium	1	mg/kg	9,000	S4UL	265	385	279	222	145
Zinc	5	mg/kg	730,000	S4UL	594	330	453	1,128	2,849
Inorganics									
pH		pH	-		9	10	9	9	9
Sulphate Aqueous Extract as SO4	10	mg/l	-		210	17	937	442	1,956
Sulphate (total)	100		-		3,787	3,600	7,452	2,765	7,286
Sulphur (free)	100	mg/kg	-		1,883	1,832	3,933	2,935	5,123
Cyanide, Free	1	mg/kg	66	DQRA	<1	<1	<1	8	<1
Cyanide, Total	1	mg/kg	-		11	<1	<1	46	5
Thiocyanate	1	mg/kg	230	USEPA	<1	1	1	7	2
Phenol - Monohydric	0.5	mg/kg	760	S4UL	<0.5	<0.5	<0.5	<0.5	<0.5
TOC	0.1	%	-		18	1	2	7	5
OMC			-		31	2	3	13	8
Petroleum Hydrocarbons									
Aromatic C5-C7	0.01	mg/kg	26000**	S4UL	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatic C7-C8	0.01	mg/kg	56000**	S4UL	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatic C8-C10	0.01	mg/kg	3500**	S4UL	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatic C10-C12	1	mg/kg	16000**	S4UL	<1	<1	<1	11	<1
Aromatic C12-C16	1	mg/kg	36000**	S4UL	<1	<1	<1	5	<1
Aromatic C16-C21	1	mg/kg	28,000	S4UL	7	<1	5	34	4
Aromatic C21-C35	1	mg/kg	28,000	S4UL	7	2	4	25	3
Aromatic C35-C44	1	mg/kg	na		<1	<1	<1	4	<1
Aliphatic C5-C6	0.01	mg/kg	3200**	S4UL	<0.1	<0.1	<0.1	<0.1	<0.1
Aliphatic C6-C8	0.01	mg/kg	7800**	S4UL	<0.1	<0.1	<0.1	<0.1	<0.1
Aliphatic C8-C10	0.01	mg/kg	2000**	S4UL	<0.1	<0.1	<0.1	<0.1	<0.1
Aliphatic C10-C12	4	mg/kg	9700**	S4UL	<4	<4	<4	9.11	<4
Aliphatic C12-C16	4	mg/kg	59000**	S4UL	8.51	<4	<4	34.81	<4
Aliphatic C16-C35	4	mg/kg	1,600,000	S4UL	119.32	40.69	48.47	332.84	44.53
Aliphatic C35-C44	4	mg/kg	1,600,000	S4UL	30.85	12.44	14.42	53.02	16.36
PAHs									
Naphthalene	0.02	mg/kg	1,900	Wood	0.76	0.05	0.19	10.26	0.18
Acenaphthylene	0.02	mg/kg	83000**	S4UL	0.14	<0.02	0.06	1.17	0.03
Acenaphthene	0.02	mg/kg	84000**	S4UL	0.17	<0.02	0.06	2.56	0.06
Fluorene	0.02	mg/kg	63000**	S4UL	0.2	<0.02	0.14	2.03	0.08
Phenanthrene	0.02	mg/kg	22,000	S4UL	1.91	0.18	1.08	8.18	0.65
Anthracene	0.02	mg/kg	520,000	S4UL	0.44	0.04	0.18	2.58	0.12
Fluoranthene	0.02	mg/kg	23,000	S4UL	1.88	0.35	1.23	11.58	0.96
Pyrene	0.02	mg/kg	54,000	S4UL	1.59	0.29	1.01	8.55	0.77
Benzo(a)anthracene	0.02	mg/kg	170	S4UL	0.9	0.15	0.47	3.77	0.35
Chrysene	0.02	mg/kg	350	S4UL	1.09	0.21	0.57	4.37	0.43
Benzo(b)fluoranthene	0.02	mg/kg	44	S4UL	1.24	0.24	0.64	5.55	0.47
Benzo(k)fluoranthene	0.02	mg/kg	1,200	S4UL	0.51	0.09	0.23	1.9	0.17
Benzo(a)pyrene	0.02	mg/kg	77	Wood	0.89	0.13	0.38	3.59	0.28
Indeno(1,2,3-c,d)pyrene	0.02	mg/kg	500	S4UL	0.92	0.16	0.47	3.6	0.31
Dibenzo(a,h)anthracene	0.02	mg/kg	3.5	S4UL	0.21	0.03	0.1	0.81	0.07
Benzo(g,h,i)perylene	0.02	mg/kg	3,900	S4UL	0.75	0.14	0.37	3.02	0.26
PAH - USEPA 16, Total	0.02	mg/kg	na		13.6	2.06	7.19	73.53	5.18
Asbestos									
Result	n/a	n/a	0.001	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

The following GACs have been used in order of availability:

S4UL: (Commercial End Use, 1% SOM) LQM / CIEH (2015) The LQM / CIEH S4ULs for Human Health Risk Assessment. Copyright Land Quality Department for Environment, Food and Rural Affairs
 C4SL: (Commercial End Use) Where published criteria above are not available, Arcadis
 USEPA GAC based on US Environmental Protection Agency
 Wood derived GAC based on CLEA v1.07 were presented in the Wood 2019 report for

Notes

GAC Generic Assessment Criteria
 na Comprises multiple contaminant, no applicable GAC
 123* S4UL exceeds the vapour saturation limit
 123** S4UL exceeds the solubility saturation limit
 - No applicable GAC readily available
 Elements present naturally in soil with typically low toxicity
 <0.1 Concentration less than the method detection limit
 - Not analysed
 Contaminant of Concern in excess of Human Health GAC



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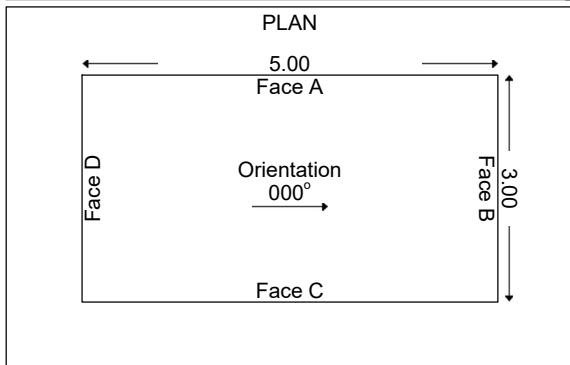
Tel: 0191 387 4700 Fax: 0191 387 4710
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TRIAL PIT RECORD

Status:-
PRELIM3

Project: South Bank Area A		Exploratory Hole No. SBA_AUK_TP110	
Client: South Tees Development Corporation		Location: Former Redcar Steelworks, Redcar E:453146.195 N:521749.647	
Method (Equipment): Machine Excavated (Komatsu 36t)		Ground Level (m): 8.197	Start Date: 07/09/2020
		Sheet: 1 of 3	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.40	J1			8.00		0.20	MADE GROUND (Brown slightly gravelly sand with many rootlets. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag. Slag content is 75-100%. Slag is vesicular).	
0.60	ES2							MADE GROUND (Grey green white brown sandy gravel, cobbles and boulders. Sand is fine to coarse and includes predominantly crushed slag. Gravel is fine to coarse angular and includes slag. Cobbles are subangular and include slag. Boulders are subangular and include slag. Slag content is 75-100%. Slag is vesicular. Engineer notes loosely compacted throughout).
0.80	B3							
1.00	PID	<0.1ppm						
1.40	J4							
1.80	B5							
2.00	PID	<0.1ppm					(3.80)	
2.40	J6							
2.80	B7							
3.00	PID	<0.1ppm						
3.40	J8							
3.80	B9			4.20		4.00		
4.00	PID	<0.1ppm					Terminated at 4.00m BGL - due to persistent collapse.	



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides and base unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by:	Logged by: D. Portsmouth	Contract No. 4296
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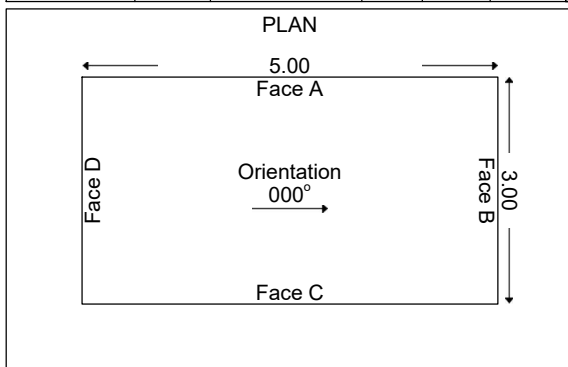
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 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL Tel: 01772 735 300 Fax: 01772 735 999

TRIAL PIT RECORD

Status:-
PRELIM3

Project: South Bank Area A		Exploratory Hole No. SBA_AUK_TP122	
Client: South Tees Development Corporation		Location: Former Redcar Steelworks, Redcar E:453090.741 N:522028.808	
Method (Equipment): Machine Excavated (Komatsu 36t)		Ground Level (m): 12.267	Start Date: 07/09/2020
		Sheet: 1 of 3	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.50	J1		Water	12.07	[Cross-hatch pattern]	0.20	MADE GROUND (Brown black sandy gravel. Sand is fine to coarse and includes predominantly ash. Gravel is fine to coarse subangular and includes slag. Slag content is 75-100%. Slag is vesicular).	
0.80	B2							MADE GROUND (Grey green white brown sandy gravel, cobbles and boulders. Sand is fine to coarse and includes predominantly crushed slag. Gravel is fine to coarse angular and includes slag. Cobbles are subangular and include slag. Boulders are subrounded and include slag. Slag content is 75-100%. Slag is vesicular. Engineer notes densely compacted throughout).
1.00	PID	<0.1ppm						
1.50	J3							
1.80	B4							
2.00	PID	<0.1ppm						
2.50	J5							
2.80	B6							
3.00	ES7							
3.00	PID	<0.1ppm						
3.50	J8							
3.80	B9							
4.00	PID	<0.1ppm						
4.50	J10			7.77		4.50	Complete at 4.50m BGL.	



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by:	Logged by: D. Portsmouth	Contract No. 4296
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