



Certificate of Analysis

Certificate Number 14-19356

03-Nov-14

Client Alcontrol Laboratories
Units 7 & 8
Hawarden Business Park
Manor Road
Hawarden
Deeside
CH5 3US

Our Reference 14-19356

Client Reference 141025-71

Contract Title 141025-71

Description 50 Soil samples.

Date Received 29-Oct-14

Date Started 29-Oct-14

Date Completed 03-Nov-14

Test Procedures Asbestos Analysis DETSC 1101.

Notes Opinions and interpretations are outside the scope of UKAS 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. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read 'Rob Brown'.

Rob Brown
Business Manager



Summary of Asbestos Analysis

Soil Samples

Our Ref 14-19356
 Client Ref 141025-71
 Contract Title 141025-71

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
721131	10268813 SP5_1	SOIL	NAD	none	Andrew Little
721132	10269241 SP5_10	SOIL	NAD	none	Andrew Little
721133	10269179 SP5_11	SOIL	NAD	none	Andrew Little
721134	10268322 SP5_12	SOIL	NAD	none	Andrew Little
721135	10268955 SP5_13	SOIL	NAD	none	Andrew Little
721136	10268165 SP5_14	SOIL	NAD	none	Andrew Little
721137	10268182 SP5_15	SOIL	NAD	none	Andrew Little
721138	10268938 SP5_16	SOIL	NAD	none	Andrew Little
721139	10268309 SP5_17	SOIL	Chrysotile	Free Chrysotile fibres present	Andrew Little
721140	10268975 SP5_18	SOIL	NAD	none	Andrew Little
721141	10269135 SP5_19	SOIL	NAD	none	Andrew Little
721142	10268440 SP5_2	SOIL	NAD	none	Andrew Little
721143	10268522 SP5_20	SOIL	NAD	none	Andrew Little
721144	10268332 SP5_21	SOIL	NAD	none	Andrew Little
721145	10269161 SP5_22	SOIL	NAD	none	Andrew Little
721146	10268833 SP5_23	SOIL	NAD	none	Andrew Little
721147	10269167 SP5_24	SOIL	NAD	none	Andrew Little
721148	10269165 SP5_25	SOIL	NAD	none	Andrew Little
721149	10269134 SP5_26	SOIL	NAD	none	Andrew Little
721150	10268840 SP5_27	SOIL	NAD	none	Andrew Little
721151	10268952 SP5_28	SOIL	NAD	none	Andrew Little
721152	10268965 SP5_29	SOIL	NAD	none	Andrew Little
721153	10268933 SP5_3	SOIL	NAD	none	Andrew Little
721154	10268315 SP5_30	SOIL	NAD	none	Andrew Little
721155	10268314 SP5_31	SOIL	NAD	none	Andrew Little
721156	10268948 SP5_32	SOIL	NAD	none	Andrew Little
721157	10268327 SP5_33	SOIL	NAD	none	Andrew Little
721158	10268904 SP5_34	SOIL	NAD	none	Andrew Little
721159	10269150 SP5_35	SOIL	NAD	none	Andrew Little
721160	10268422 SP5_36	SOIL	NAD	none	Andrew Little
721161	10268320 SP5_37	SOIL	NAD	none	Andrew Little
721162	10268306 SP5_38	SOIL	NAD	none	Andrew Little
721163	10269170 SP5_39	SOIL	NAD	none	Andrew Little
721164	10268461 SP5_4	SOIL	NAD	none	Andrew Little
721165	10268489 SP5_40	SOIL	NAD	none	Andrew Little
721166	10269175 SP5_41	SOIL	NAD	none	Andrew Little
721167	10268204 SP5_42	SOIL	NAD	none	Andrew Little
721168	10269138 SP5_43	SOIL	NAD	none	Andrew Little
721169	10269183 SP5_44	SOIL	NAD	none	Andrew Little
721170	10268761 SP5_45	SOIL	NAD	none	Andrew Little
721171	10269126 SP5_46	SOIL	NAD	none	Andrew Little
721172	10268170 SP5_47	SOIL	NAD	none	Andrew Little
721173	10268890 SP5_48	SOIL	NAD	none	Andrew Little
721174	10269258 SP5_49	SOIL	NAD	none	Andrew Little
721175	10268198 SP5_5	SOIL	NAD	none	Andrew Little
721176	10268917 SP5_50	SOIL	NAD	none	Andrew Little
721177	10268193 SP5_6	SOIL	NAD	none	Andrew Little

Summary of Asbestos Analysis Soil Samples

Our Ref 14-19356
Client Ref 141025-71
Contract Title 141025-71

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
721178	10269151 SP5_7	SOIL	NAD	none	Andrew Little
721179	10268168 SP5_8	SOIL	NAD	none	Andrew Little
721180	10269147 SP5_9	SOIL	NAD	none	Andrew Little

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.

Information in Support of the Analytical Results

Our Ref 14-19356
 Client Ref 141025-71
 Contract 141025-71

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
721131	10268813 SOIL	24/10/14	PT 500ml		
721132	10269241 SOIL	24/10/14	PT 500ml		
721133	10269179 SOIL	24/10/14	PT 500ml		
721134	10268322 SOIL	24/10/14	PT 500ml		
721135	10268955 SOIL	24/10/14	PT 500ml		
721136	10268165 SOIL	24/10/14	PT 500ml		
721137	10268182 SOIL	24/10/14	PT 500ml		
721138	10268938 SOIL	24/10/14	PT 500ml		
721139	10268309 SOIL	24/10/14	PT 500ml		
721140	10268975 SOIL	24/10/14	PT 500ml		
721141	10269135 SOIL	24/10/14	PT 500ml		
721142	10268440 SOIL	24/10/14	PT 500ml		
721143	10268522 SOIL	24/10/14	PT 500ml		
721144	10268332 SOIL	24/10/14	PT 500ml		
721145	10269161 SOIL	24/10/14	PT 500ml		
721146	10268833 SOIL	24/10/14	PT 500ml		
721147	10269167 SOIL	24/10/14	PT 500ml		
721148	10269165 SOIL	24/10/14	PT 500ml		
721149	10269134 SOIL	24/10/14	PT 500ml		
721150	10268840 SOIL	24/10/14	PT 500ml		
721151	10268952 SOIL	24/10/14	PT 500ml		
721152	10268965 SOIL	24/10/14	PT 500ml		
721153	10268933 SOIL	24/10/14	PT 500ml		
721154	10268315 SOIL	24/10/14	PT 500ml		
721155	10268314 SOIL	24/10/14	PT 500ml		
721156	10268948 SOIL	24/10/14	PT 500ml		
721157	10268327 SOIL	24/10/14	PT 500ml		
721158	10268904 SOIL	24/10/14	PT 500ml		
721159	10269150 SOIL	24/10/14	PT 500ml		
721160	10268422 SOIL	24/10/14	PT 500ml		
721161	10268320 SOIL	24/10/14	PT 500ml		
721162	10268306 SOIL	24/10/14	PT 500ml		
721163	10269170 SOIL	24/10/14	PT 500ml		
721164	10268461 SOIL	24/10/14	PT 500ml		
721165	10268489 SOIL	24/10/14	PT 500ml		
721166	10269175 SOIL	24/10/14	PT 500ml		
721167	10268204 SOIL	24/10/14	PT 500ml		
721168	10269138 SOIL	24/10/14	PT 500ml		
721169	10269183 SOIL	24/10/14	PT 500ml		
721170	10268761 SOIL	24/10/14	PT 500ml		
721171	10269126 SOIL	24/10/14	PT 500ml		
721172	10268170 SOIL	24/10/14	PT 500ml		
721173	10268890 SOIL	24/10/14	PT 500ml		
721174	10269258 SOIL	24/10/14	PT 500ml		
721175	10268198 SOIL	24/10/14	PT 500ml		
721176	10268917 SOIL	24/10/14	PT 500ml		
721177	10268193 SOIL	24/10/14	PT 500ml		
721178	10269151 SOIL	24/10/14	PT 500ml		
721179	10268168 SOIL	24/10/14	PT 500ml		

Information in Support of the Analytical Results

Our Ref 14-19356
 Client Ref 141025-71
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721180	10269147 SOIL	24/10/14	PT 500ml		
Key: P-Plastic 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 and/or inappropriate containers 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.					

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



Certificate of Analysis

Certificate Number 14-21946

08-Dec-14

Client Alcontrol Laboratories
Units 7 & 8
Hawarden Business Park
Manor Road
Hawarden
Deeside
CH5 3US

Our Reference 14-21946

Client Reference 141025-71

Contract Title 141025-71

Description 30 Soil samples.

Date Received 28-Nov-14

Date Started 28-Nov-14

Date Completed 08-Dec-14

Test Procedures Asbestos Analysis DETSC 1101.

Notes Opinions and interpretations are outside the scope of UKAS 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. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read 'Rob Brown'.

Rob Brown
Business Manager



Summary of Asbestos Analysis

Soil Samples

Our Ref 14-21946
 Client Ref 141025-71
 Contract Title 141025-71

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
739259	10449211 SP_51	SOIL	NAD	none	Jeff Cruddas
739260	10450512 SP_52	SOIL	NAD	none	Jeff Cruddas
739261	10449241 SP_53	SOIL	NAD	none	Jeff Cruddas
739262	10449194 SP_54	SOIL	NAD	none	Jeff Cruddas
739263	10449200 SP_55	SOIL	Chrysotile	Chrysotile present as fibre bundles	Jeff Cruddas
739264	10449244 SP_56	SOIL	NAD	none	Jeff Cruddas
739265	10449068 SP_57	SOIL	Chrysotile	Chrysotile present as small clump and fibre bundles	Jeff Cruddas
739266	10449114 SP_58	SOIL	NAD	none	Jeff Cruddas
739267	10449204 SP_59	SOIL	NAD	none	Jeff Cruddas
739268	10450508 SP_60	SOIL	NAD	none	Jeff Cruddas
739269	10449225 SP_61	SOIL	NAD	none	Jeff Cruddas
739270	10450466 SP_62	SOIL	NAD	none	Jeff Cruddas
739271	10450469 SP_63	SOIL	NAD	none	Jeff Cruddas
739272	10450484 SP_64	SOIL	NAD	none	Jeff Cruddas
739273	10449094 SP_65	SOIL	NAD	none	Jeff Cruddas
739274	10449235 SP_66	SOIL	NAD	none	Jeff Cruddas
739275	10450540 SP_67	SOIL	NAD	none	Jeff Cruddas
739276	10450546 SP_68	SOIL	NAD	none	Jeff Cruddas
739277	10449217 SP_69	SOIL	NAD	none	Jeff Cruddas
739278	10450526 SP_70	SOIL	Chrysotile	Chrysotile present as fibre bundle	Jeff Cruddas
739279	10450248 SP_71	SOIL	NAD	none	Jeff Cruddas
739280	10450242 SP_72	SOIL	NAD	none	Jeff Cruddas
739281	10449044 SP_73	SOIL	NAD	none	Jeff Cruddas
739282	10450233 SP_74	SOIL	NAD	none	Jeff Cruddas
739283	10450274 SP_75	SOIL	NAD	none	Jeff Cruddas
739284	10450314 SP_76	SOIL	NAD	none	Jeff Cruddas
739285	10450339 SP_77	SOIL	Chrysotile	Chrysotile present as fibre bundle	Jeff Cruddas
739286	10450357 SP_78	SOIL	NAD	none	Jeff Cruddas
739287	10450236 SP_79	SOIL	NAD	none	Jeff Cruddas
739288	10449989 SP_80	SOIL	NAD	none	Jeff Cruddas

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.

Information in Support of the Analytical Results

Our Ref 14-21946
Client Ref 141025-71
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Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
739259	10449211 SOIL	24/11/14	PT 500ml		
739260	10450512 SOIL	24/11/14	PT 500ml		
739261	10449241 SOIL	24/11/14	PT 500ml		
739262	10449194 SOIL	24/11/14	PT 500ml		
739263	10449200 SOIL	24/11/14	PT 500ml		
739264	10449244 SOIL	24/11/14	PT 500ml		
739265	10449068 SOIL	24/11/14	PT 500ml		
739266	10449114 SOIL	24/11/14	PT 500ml		
739267	10449204 SOIL	24/11/14	PT 500ml		
739268	10450508 SOIL	24/11/14	PT 500ml		
739269	10449225 SOIL	24/11/14	PT 500ml		
739270	10450466 SOIL	24/11/14	PT 500ml		
739271	10450469 SOIL	24/11/14	PT 500ml		
739272	10450484 SOIL	24/11/14	PT 500ml		
739273	10449094 SOIL	24/11/14	PT 500ml		
739274	10449235 SOIL	24/11/14	PT 500ml		
739275	10450540 SOIL	24/11/14	PT 500ml		
739276	10450546 SOIL	24/11/14	PT 500ml		
739277	10449217 SOIL	24/11/14	PT 500ml		
739278	10450526 SOIL	24/11/14	PT 500ml		
739279	10450248 SOIL	24/11/14	PT 500ml		
739280	10450242 SOIL	24/11/14	PT 500ml		
739281	10449044 SOIL	24/11/14	PT 500ml		
739282	10450233 SOIL	24/11/14	PT 500ml		
739283	10450274 SOIL	24/11/14	PT 500ml		
739284	10450314 SOIL	24/11/14	PT 500ml		
739285	10450339 SOIL	24/11/14	PT 500ml		
739286	10450357 SOIL	24/11/14	PT 500ml		
739287	10450236 SOIL	24/11/14	PT 500ml		
739288	10449989 SOIL	24/11/14	PT 500ml		

Key: P-Plastic 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 and/or inappropriate containers 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.

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



SDG:	141025-71	Location:	Coed Darcy	Order Number:	CD0912
Job:	H_ATKINS_LDC-271	Customer:	Atkins Global Ltd	Report Number:	298178
Client Reference:	stockpile 115	Attention:	Barney Irlam	Superseded Report:	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.
7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP -No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.
11. Results relate only to the items tested.
12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.
13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.
14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill /made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
\$	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

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

Visual Estimation Of Fibre Content

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

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

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

Technical note

Appendix Summary of data

Coed Darcy_Monitor Phase 31
Proposed Upfill Materials

	Arsenic as As, dry weight mg/kg	Cadmium as Cd, dry weight mg/kg	Chromium as Cr, dry weight mg/kg	Copper as Cu, dry weight mg/kg	Lead as Pb, dry weight mg/kg	Mercury as Hg, dry weight mg/kg	Nickel as Ni, dry weight mg/kg	Selenium as Se, dry weight mg/kg	Vanadium as V, dry weight mg/kg	Zinc as Zn, dry weight mg/kg	VPH >C5 - C6, aliphatic mg/kg	VPH >C6 - C8, aliphatic mg/kg	VPH >C8 - C10, aliphatic mg/kg	EPH >C10 - C12, aliphatic mg/kg	EPH >C12 - C16, aliphatic mg/kg	EPH >C16 - C21, aliphatic mg/kg	EPH >C21 - C35, aliphatic mg/kg	VPH >C6 - C7, aromatic mg/kg	VPH >C7 - C8, aromatic mg/kg	VPH >C8 C10, aromatic mg/kg	EPH >C10 C12, aromatic mg/kg	EPH >C12 C16, aromatic mg/kg	EPH >C16 C21, aromatic mg/kg	EPH >C21 C35, aromatic mg/kg	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	m,p-Xylene mg/kg	o-Xylene mg/kg
Sample Ref																													
Cimla																													
Groves Road - 1	13.8	0.134	14.4	30.6	45	<0.14	19.2	1.18	17.2	111	0.0194	0.0125	0.0513	0.104	0.1	0.152	4.62	0.01	0.01	0.0353	0.0695	1.44	4.46	26.3	0.01	0.00798	0.003	0.006	0.003
Groves Road - 2	14.6	0.12	14.4	29.4	30.9	<0.14	19.1	1	17.1	87.1	0.01	0.01	0.01	0.01	0.1	0.1	0.1	0.01	0.01	0.01	0.948	1.58	10.9	0.01	0.002	0.003	0.006	0.003	
Groves Road - 3	15.1	0.215	18	28.8	38.1	<0.14	18.8	1.31	26.5	127	0.01	0.0104	0.0173	0.023	0.1	0.351	0.789	0.01	0.01	0.0138	0.0161	0.1	14.7	0.1	0.01	0.002	0.003	0.006	0.003
Groves Road - 4	26.7	0.394	15.6	42.6	44.1	<0.14	15.5	1.48	20.8	97.4	0.01	0.01	0.01	0.01	0.199	1.77	4.01	0.01	0.01	0.01	1.68	3.77	12.8	0.01	0.002	0.003	0.006	0.003	
SP3_1	15.6	0.0252	13	37.5	36.4	<0.14	17.1	1	17.2	96.7	0.04	0.04	0.04	0.04	1.42	4.36	39.2	0.04	0.04	0.04	0.04	0.356	2.22	24	0.04	0.008	0.012	0.024	0.012
SP3_10	17.3	0.02	14.9	37.1	42.2	<0.14	18.4	1	18.3	108	0.04	0.04	0.04	0.04	0.86	3.64	39.7	0.04	0.04	0.04	0.04	0.306	1.73	31.4	0.04	0.008	0.012	0.024	0.012
SP3_11	24	0.02	20.7	36.6	44.3	<0.14	19.1	1.08	26.4	118	0.04	0.04	0.04	0.04	0.1	2.26	25.5	0.04	0.04	0.04	0.04	0.1	4.74	32.5	0.04	0.008	0.012	0.024	0.012
SP3_12	15.7	0.02	16.9	18.7	21	<0.14	21.6	1.1	23.3	85.4	0.04	0.04	0.04	0.04	0.1	0.1	3.4	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.008	0.012	0.024	0.012
SP3_13	20.9	0.198	15.5	44.4	51.3	<0.14	17.5	1.07	22.1	121	0.04	0.04	0.04	0.04	0.1	2	14	0.04	0.04	0.04	0.04	0.1	1.6	20.6	0.04	0.0206	0.012	0.024	0.012
SP3_14	21.8	0.244	19	45	53.3	<0.14	16.7	1.41	27.6	117	0.04	0.04	0.04	0.04	0.1	3.44	67.6	0.04	0.04	0.04	0.04	0.1	3.58	71.9	0.04	0.008	0.012	0.024	0.012
SP3_15	13.1	0.02	20.4	16.3	18.6	<0.14	23.3	1	31.7	82.1	0.04	0.0597	0.048	0.0503	0.1	0.1	0.176	0.04	0.04	0.04	0.04	0.1	0.1	1.25	0.04	0.008	0.012	0.024	0.012
SP3_16	14.5	0.02	16.3	16.7	16.5	<0.14	23.6	1	23.7	90.1	0.04	0.04	0.04	0.04	0.594	0.1	0.1	0.04	0.04	0.04	0.04	0.1	0.1	1.39	0.04	0.008	0.012	0.024	0.012
SP3_17	15.3	0.02	15.8	20.3	21.9	<0.14	20.2	1.2	22.6	81.3	0.04	0.04	0.04	0.04	0.1	0.1	1.5	0.04	0.04	0.04	0.04	0.1	0.1	2.25	0.04	0.008	0.012	0.024	0.012
SP3_18	26.1	0.28	18.6	49.8	56.6	<0.14	19.1	1	23.1	138	0.04	0.04	0.04	0.04	0.1	1.25	10.4	0.04	0.04	0.04	0.04	0.1	0.701	6.92	0.04	0.008	0.012	0.024	0.012
SP3_19	20.9	0.195	42.8	45	44.7	<0.14	15.8	1	92.5	121	0.04	0.04	0.04	0.04	0.91	1.35	19	0.04	0.04	0.04	0.04	0.1	0.876	16.1	0.04	0.008	0.012	0.024	0.012
SP3_2	18.8	0.02	13.6	33.8	36	<0.14	17.9	1	17.4	98.5	0.04	0.04	0.04	0.04	0.354	2.56	22.7	0.04	0.04	0.04	0.04	0.221	1.97	14.5	0.04	0.0106	0.012	0.024	0.012
SP3_20	22	0.103	21.7	46.5	41.3	<0.14	14.3	1	31.9	113	0.04	0.04	0.04	0.04	0.1	0.1	3.44	0.04	0.04	0.04	0.04	0.1	0.3	9.39	0.04	0.008	0.012	0.024	0.012
SP3_21	18.4	0.02	14.2	37.6	34.1	<0.14	19.2	1	18.2	106	0.04	0.04	0.04	0.04	0.1	0.1	3.93	0.04	0.04	0.04	0.04	0.471	1.59	11.2	0.04	0.008	0.012	0.024	0.012
SP3_22	15.6	0.02	13	29.4	27.4	<0.14	16.2	1	16.3	84.3	0.04	0.04	0.04	0.04	0.1	1.42	20.2	0.04	0.04	0.04	0.04	0.1	1.8	29.5	0.04	0.008	0.012	0.024	0.012
SP3_23	15	0.0857	22.4	28.3	33.9	<0.14	18.1	1	25.5	87	0.04	0.04	0.04	0.04	0.1	1.59	11.5	0.04	0.04	0.04	0.04	0.1	0.582	10.4	0.04	0.008	0.012	0.024	0.012
SP3_24	13.9	0.02	13.8	26.5	24.7	<0.14	17.1	1	17.6	74.3	0.04	0.04	0.04	0.04	0.1	1.31	7.96	0.04	0.04	0.04	0.04	0.1	0.507	9.58	0.04	0.008	0.012	0.024	0.012
SP3_25	16.3	0.02	12.7	32	32.8	<0.14	16.8	1	16.2	112	0.04	0.04	0.04	0.04	0.198	0.943	14	0.04	0.04	0.04	0.04	0.498	1.32	10.8	0.04	0.008	0.012	0.024	0.012
SP3_26	16	0.02	13.2	30.2	28.4	<0.14	17.9	1	16.9	82.4	0.04	0.04	0.04	0.04	0.1	0.1	4.59	0.04	0.04	0.04	0.04	0.1	2.19	15	0.04	0.008	0.012	0.024	0.012
SP3_27	12.6	0.0492	23.3	23.6	24.8	<0.14	17.3	1	27.6	82.7	0.04	0.04	0.04	0.04	0.1	1.36	10.2	0.04	0.04	0.04	0.04	0.1	0.1	3.58	0.04	0.008	0.012	0.024	0.012
SP3_28	17.4	0.17	14.5	34.9	34.6	<0.14	19.2	1.04	18.6	99.5	0.04	0.04	0.04	0.04	0.1	0.1	12.6	0.04	0.04	0.04	0.04	0.1	0.486	19.6	0.04	0.008	0.012	0.024	0.012
SP3_29	18.2	0.0342	14	27.2	29.3	<0.14	17.8	1	17.6	80.2	0.04	0.04	0.04	0.04	0.1	0.611	13.3	0.04	0.04	0.04	0.04	0.1	1.34	19.3	0.04	0.008	0.012	0.024	0.012
SP3_3	16.5	0.02	13.9	28.6	28.2	<0.14	18.7	1	16.5	92.																			

	SP5_18	12	0.0561	11.9	20.9	20	<0.14	18.8	<1	17.5	65.3	0.04	0.04	0.04	0.04	1.28	1.1	8.65	0.04	0.04	0.04	0.04	2.18	3.63	12.4	0.04	0.008	0.012	0.024	0.012
	SP5_19	11.5	<0.02	15.1	11.9	15.2	<0.14	23.1	<1	22.7	76.7	0.04	0.04	0.04	0.04	0.1	0.1	1.57	0.04	0.04	0.04	0.04	0.1	1.09	7.01	0.04	0.008	0.012	0.024	0.012
	SP5_2	13.7	<0.02	16.4	19.4	15.1	<0.14	22.5	1.04	24.3	88	0.04	0.04	0.04	0.04	0.1	0.1	1.63	0.04	0.04	0.04	0.04	0.1	0.738	3.84	0.04	0.008	0.012	0.024	0.012
	SP5_20	10.7	0.115	12.6	23.9	21.3	<0.14	18.9	<1	17	75.3	0.04	0.04	0.04	0.04	0.618	0.184	2.59	0.04	0.04	0.04	0.04	1.79	3.05	10.1	0.04	0.008	0.012	0.024	0.012
	SP5_21	10.2	<0.02	17	12.2	11.2	<0.14	18.9	<1	24.8	61.4	0.04	0.04	0.04	0.04	0.1	0.1	4.21	0.04	0.04	0.04	0.04	0.479	0.763	3.28	0.04	0.008	0.012	0.024	0.012
	SP5_22	10.6	<0.02	13.5	12.8	8.25	<0.14	30.1	<1	18.8	88.6	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.04	0.04	0.04	0.1	0.673	2.88	0.04	0.008	0.012	0.024	0.012
	SP5_23	12.4	<0.02	15.2	16.4	12.8	<0.14	20.7	<1	21.5	79.2	0.04	0.04	0.04	0.04	0.1	0.1	6.08	0.04	0.04	0.04	0.04	0.925	1.45	5.43	0.04	0.008	0.012	0.024	0.012
	SP5_24	10.3	<0.02	15.4	12.1	14	<0.14	27.2	<1	20	73.3	0.04	0.04	0.04	0.04	0.1	0.1	1.17	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.008	0.012	0.024	0.012
	SP5_25	10.5	<0.02	23.9	11.6	9.18	<0.14	18.8	<1	32.4	47.7	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.008	0.012	0.024	0.012
	SP5_26	12.8	<0.02	13.2	26	22.1	<0.14	20.5	<1	18.7	86.7	0.04	0.04	0.04	0.04	5.51	3.9	10.5	0.04	0.04	0.04	0.04	0.867	5.22	19.8	0.04	0.008	0.012	0.024	0.012
	SP5_27	13	<0.02	15.3	17.5	13.9	<0.14	21.6	1.15	23	84.1	0.04	0.04	0.04	0.04	0.643	0.57	3.78	0.04	0.04	0.04	0.04	0.569	1.4	7.18	0.04	0.008	0.012	0.024	0.012
	SP5_28	7.53	0.0714	9.15	18.7	15.5	<0.14	14	<1	13.1	56.6	0.04	0.04	0.04	0.04	0.1	0.1	4.14	0.04	0.04	0.04	0.04	2	3.55	10.8	0.04	0.008	0.012	0.024	0.012
	SP5_29	12.1	<0.02	19.6	13.5	16.2	<0.14	16.7	<1	29.2	68.6	0.04	0.04	0.04	0.04	0.1	1.59	10.4	0.04	0.04	0.04	0.04	0.376	0.725	5.16	0.04	0.008	0.012	0.024	0.012
	SP5_3	8.84	<0.2	16.7	14.9	<7	<0.14	31.3	<10	20.6	83.6	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.04	0.04	0.04	0.1	0.1	1.86	0.04	0.008	0.012	0.024	0.012
	SP5_30	11.3	<0.02	16.3	19	12.9	<0.14	19.4	<1	20.5	91.1	0.04	0.04	0.04	0.04	3.19	3.7	10.2	0.04	0.04	0.04	0.04	2.78	4.21	12.4	0.04	0.008	0.012	0.024	0.012
	SP5_31	9.62	<0.02	11.9	10.2	5.41	<0.14	15.8	<1	15.3	61.5	0.04	0.04	0.04	0.04	0.1	0.1	5.29	0.04	0.04	0.04	0.04	1.01	1.33	4.6	0.04	0.008	0.012	0.024	0.012
	SP5_32	13.6	<0.02	20.6	16.1	19.5	<0.14	22.5	1.14	28.5	78.8	0.04	0.04	0.04	0.04	0.1	0.282	1.76	0.04	0.04	0.04	0.04	0.952	1.28	5.09	0.04	0.008	0.012	0.024	0.012
	SP5_33	13.1	<0.02	16.7	19	21.4	<0.14	28.2	<1	22.2	90.8	0.04	0.04	0.04	0.04	0.1	0.1	3.21	0.04	0.04	0.04	0.04	0.717	1.13	5.68	0.04	0.008	0.012	0.024	0.012
	SP5_34	12.4	0.0491	20.7	17.2	23.8	<0.14	20.3	<1	29.7	82.6	0.04	0.04	0.04	0.04	0.1	0.473	0.482	0.04	0.04	0.04	0.04	0.1	0.1	5.96	0.04	0.008	0.012	0.024	0.012
	SP5_35	14.2	<0.02	21	14.1	18	<0.14	21.3	1.4	28.4	76.7	0.04	0.04	0.0545	0.04	0.1	0.1	0.1	0.04	0.04	0.04	0.04	0.386	0.502	4.27	0.04	0.008	0.012	0.024	0.012
	SP5_36	8.32	<0.02	15.1	10	14.2	<0.14	14.3	<1	22.4	60.4	0.04	0.04	0.04	0.04	0.1	0.49	2.41	0.04	0.04	0.04	0.04	0.1	0.956	5.99	0.04	0.008	0.012	0.024	0.012
	SP5_37	11.5	<0.02	20.5	15.5	20	<0.14	21	<1	28.1	73.2	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.04	0.04	0.04	0.1	0.1	4.08	0.04	0.008	0.012	0.024	0.012
	SP5_38	12.4	<0.02	21.9	12.2	19.4	<0.14	22.4	<1	31.7	81.7	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.04	0.04	0.04	0.1	0.436	2.89	0.04	0.008	0.012	0.024	0.012
	SP5_39	12.1	<0.02	15.7	19.2	19.2	<0.14	25.2	<1	22.5	89	0.04	0.04	0.04	0.04	2.96	1.7	5.15	0.04	0.04	0.04	0.04	0.776	1.24	4.82	0.04	0.008	0.012	0.024	0.012
	SP5_4	10.2	<0.02	16.9	11.6	11.7	<0.14	14.9	<1	25.3	58.6	0.04	0.04	0.04	0.04	0.1	0.1	7.08	0.04	0.04	0.04	0.04	0.529	0.865	4.39	0.04	0.008	0.012	0.024	0.012
	SP5_40	4.62	0.0312	5.74	6.86	7.72	<0.14	9.05	<1	7.53	31	0.04	0.04	0.04	0.04	0.1	0.1	1.45	0.04	0.04	0.04	0.04	0.747	1.03	5.41	0.04	0.008	0.012	0.024	0.012
	SP5_41	11	<0.02	14.8	14.3	15.4	<0.14	29.6	<1	20.5	75.3	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.04	0.04	0.04	0.1	0.1	1.63	0.04	0.008	0.012	0.024	0.012
	SP5_42	12	<0.02	16.8	17.2	18.7	<0.14	26.5	<1	21.5	90	0.04	0.04	0.04	0.04	0.1	0.1	0.728	0.04	0.04	0.04	0.04	0.1	0.64	3.43	0.04	0.008	0.012	0.024	0.012
	SP5_43	14	<0.02	22.5	14.9	20	<0.14	22.5	<1	32	79.6	0.04	0.04	0.04	0.04	0.1	0.1	0.737	0.04	0.04	0.04	0.04	0.1	0.355	3.25	0.04	0.008	0.012	0.024	0.012
	SP5_44	15.6	0.176	24.3	19.6	25	<0.14	21.5	<1	33.9	91.9	0.04	0.04	0.04	0.04	0.1	0.1	1.04	0.04	0.04	0.04	0.04	0.1	0.889	6.84	0.04	0.008	0.012	0.024	0.012
	SP5_45	13.5	0.0683	19.9	14	20.6	<0.14	20.9	<1	30.4	82.1	0.04	0.04	0.04	0.04	0.1	0.1	0.318	0.04	0.04	0.04	0.04	0.1	0.552	4.83	0.04	0.008	0.012	0.024	0.012
	SP5_46	10.7	0.0476	14.4	11.4	16.1	<0.14	16.9	<1	20.8	65.6	0.04	0.04	0.04	0.04	0.1	0.1	1.37	0.04	0.04	0.04	0.04	0.584	0.867	6.23	0.04	0.008	0.012	0.024	0.012
	SP5_47	12.8	<0.02	15.5	18.6	30.3	<0.14	24.6	1.02	19.9	87.6	0.04	0.04	0.04	0.04	0.1	0.1	2.97	0.04	0.04	0.04	0.04	0.1	1.17	6.45	0.04	0.008	0.012	0.024	0.012
	SP5_48	12.4	<0.02	16.2	18.1	19.8	<0.14	27.1	<1	21.2	90.2	0.04	0.04	0.04	0.04	1.62	1.66	17.5	0.04	0.04	0.04	0.04	0.1	0.1	12.6	0.04	0.008	0.012	0.024	0.012
	SP5_49	11.5	<0.02	14.7	16	18.7	<0.14	28.7	<1	17.7	92.7	0.04	0.04	0.04	0.04	0.805	0.1	1.01	0.04	0.04	0.04	0.04	0.645	0.934	4.44	0.04	0.008	0.012	0.024	0.012
	SP5_5	10.3	<0.02	17.4	12	14.7	<0.14	19.7	<1	22	61.1	0.04	0.04	0.04	0.04	0.1	0.1	3.74	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.008	0.012	0.024	0.012
	SP5_50	13.4	<0.2	17.2	16.8	10.3	<0.14	32.1	<10	23.7	101	0.04	0.04	0.04	0.04	0.1	0.1	1.38	0.04	0.04	0.04	0.04	0.1	0.285	3.5	0.04	0.008	0.012	0.024	0.012
	SP5_51	13.9	<0.02	14.6	16.3	20	<0.14	34	<1	22	95.3	0.04	0.04	0.04	0.04	1.05	0.181	0.1	0.04	0.04	0.04	0.04	1.19	2.51	8.02	0.04	0.008	0.012	0.024	0.012
	SP5_52	12.3	<0.02	16.4	18.6	8.52	<0.14	32.3	1.15	21.3	105	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.04	0.04	0.04	0.745	1.39	7.03	0.04	0.008	0.012	0.024	0.012
	SP5_53	13.2	<0.02	15.3	17.1	6.37	<0.14	25.7	<1	19.8	99.3	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.04	0.04	0.04	1.34	2.65	9.14	0.04	0.008	0.012	0.024	0.012
	SP5_54	12	<0.02	19.4	16.9	8.48	<0.14	27.7	<1	25.9	102	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.04	0.04	0.04	0.1	0.1	0.1	0.04	0.008	0.012	0.024	0.012
	SP5_55	14.1	0.104	16.6	16.1	18.3	<0.14	29.3	<1	27	88.9	0.04	0.04	0.04	0.04	0.986	0.179	1.39	0.04	0.04	0.04	0.04	0.644	0.912	2.49	0.04	0.008	0.012	0.024	0.012
	SP5_56	9.74	<0.02	14.5	12.9	7.71	<0.14	24.5	<1	16.1	84.8	0.04	0.04	0.04	0.04	0.639	0.1	0.1	0.04	0.04	0.04	0.04	1.54	2.47	10.9	0.04	0.008	0.012	0.024	0.012
	SP5_57	11	0.081	15.8	16.3	17.6	<0.14	33.1	<1	20.2	91.7	0.04	0.04	0.04	0.04	1.81	1.13	3.49	0.04	0.04	0.04	0.04	0.							

Coed Darcy_Monitor Phase 31
Proposed Upfill Materials

Sample	Acenaphthylene	Acenaphthene	Anthracene	Benzo(a)Anthracene	Benzo(b)Fluoranthene	Benzo(k)Fluoranthene	Benzo(a)Pyrene	Benzo(ghi)Perylene	Chrysene	Fluoranthene	Fluorene	Indeno(123-cd)Pyrene	Phenanthrene	Pyrene	Naphthalene	Dibenzo(ah)Anthracene
	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Cimla																
Groves Road - 1	<12	28.5	41.1	130	186	48.3	100	62.5	181	283	38.1	47.4	238	227	35.6	<23
Groves Road - 2	<12	25.3	43.7	131	172	68.5	135	105	181	315	31.9	82.2	201	256	31.3	29.3
Groves Road - 3	<12	27.1	40.1	186	298	86	159	109	261	339	33	87	250	279	24.2	35.4
Groves Road - 4	<12	28.4	48.2	162	191	60.6	131	85.6	213	387	46.9	70.4	332	276	47.5	<23
SP3_1	<12	<8	21.8	103	184	53.8	111	92.9	148	171	12.4	73.1	134	146	21	21
SP3_10	<12	11.1	32.2	118	267	80.5	159	107	202	306	18.5	92.9	198	242	23.1	23.1
SP3_11	<12	<8	<16	47.8	84.6	29.8	63.3	46.5	77.9	121	<10	37.7	96.4	96.6	15.6	15.6
SP3_12	<12	<8	<16	45	58.4	<14	32	<24	46.3	68	<10	<18	61.5	52.6	<9	<9
SP3_13	<12	<8	24.1	133	214	64.8	103	80.5	144	197	14.2	65.1	168	153	25	25
SP3_14	<12	26.2	101	174	212	84	170	104	226	446	45.3	88.1	540	312	21.6	21.6
SP3_15	<12	<8	<16	21.8	29.2	<14	<15	<24	19.7	38.5	<10	<18	42.3	31.4	<9	<9
SP3_16	<12	<8	<16	39.8	40.8	<14	18.4	<24	28.7	30.1	<10	<18	41.1	22.1	<9	<9
SP3_17	<12	<8	<16	<14	41.4	<14	19.1	<24	35.2	40	<10	<18	50	29.7	<9	<9
SP3_18	<12	<8	<16	36.9	90.3	33.5	67	52.7	79.9	129	<10	39.9	106	106	20.8	20.8
SP3_19	<12	<8	<16	62.9	104	32.6	61.8	55.1	89.6	123	<10	41.9	111	98.2	16.2	16.2
SP3_2	<12	<8	<16	65.2	129	58.7	82	62.7	121	148	<10	50	128	127	16.9	16.9
SP3_20	<12	<8	21.4	155	256	75.3	130	104	147	162	12.3	85.4	122	133	22.1	22.1
SP3_21	<12	13.9	24.4	94.9	181	64.7	102	91.1	155	205	15.6	68.4	177	171	22.9	22.9
SP3_22	<12	<8	19.2	64.1	108	56.9	74.8	66.5	102	144	<10	53.8	106	112	13	13
SP3_23	<12	<8	<16	56.3	99.7	34.4	62.8	52.7	82.1	116	<10	40.9	98.4	99.1	20.4	20.4
SP3_24	<12	<8	<16	89.3	159	32.7	73.7	59	94.6	112	<10	48.9	100	85.7	17.4	17.4
SP3_25	<12	17.8	42.4	173	297	94.5	174	133	244	372	27.8	108	258	302	28.9	28.9
SP3_26	<12	12.5	27.6	119	227	88.1	129	102	191	244	21.2	77.2	206	209	29.3	29.3
SP3_27	<12	<8	<16	35.2	82.4	30.9	56.4	40.5	65.7	92.4	<10	35.3	73	76.5	<9	<9
SP3_28	<12	73.8	71.6	132	384	132	294	182	321	429	61.1	148	352	323	36	36
SP3_29	<12	13.9	28.9	139	198	60.9	114	77.3	131	166	15.3	65.7	154	129	17.9	17.9
SP3_3	<12	<8	<16	91	168	49.3	105	85.4	126	124	<10	71.1	101	114	19.6	19.6
SP3_30	<12	17.9	43.6	161	230	119	182	140	228	319	23.2	107	249	271	33	33
SP3_31	<12	<8	<16	68	118	36.8	64.4	54.2	83.9	124	<10	44.8	95.4	104	12.8	12.8
SP3_32	<12	<8	<16	78.3	117	32.4	78.3	49.5	68.4	76.5	<10	38.5	61.8	61.2	11.2	11.2
SP3_33	<12	11.1	27	144	195	67.9	113	89.8	125	183	20.1	76	145	138	26.2	26.2
SP3_34	<12	<8	<16	44	81.9	34.3	49.2	41.9	69.6	89.8	<10	33.9	88.1	73.2	13.3	13.3
SP3_35	<12	<8	<16	23.6	45.1	18.1	27	<24	45.4	56.2	<10	<18	51	45.4	14.4	14.4
SP3_36	<12	<8	<16	46.4	73.6	29.6	44.7	45.1	63.5	97.1	<10	32.2	69	83.4	<9	<9
SP3_37	<12	<8	<16	38.1	97.2	27	42.2	38.2	57.3	61.5	<10	29.3	48	49.6	<9	<9
SP3_38	<12	<8	<16	65.9	145	66.4	87.8	98.3	97.4	105	<10	76.7	67.4	110	21.5	21.5
SP3_39	<12	<8	<16	93.4	144	39.2	90	74.5	88.4	97.5	<10	49.1	66.3	100	<9	<9
SP3_4	<12	<8	<16	29.8	57.7	<14	26.6	<24	48.1	64	<10	<18	68.9	49.7	<9	<9
SP3_40	<12	16.3	29.4	217	406	124	225	180	222	232	17.7	145	143	199	20.9	20.9
SP3_5	<12	10.4	20.4	95.6	138	49.3	86.1	67.2	146	167	14.3	55	145	126	20.1	20.1
SP3_6	<12	<8	<16	15.6	30.8	<14	21.4	<24	19.4	36.3	<10	<18	41	27.6	<9	<9
SP3_7	<12	<8	<16	68.2	96.5	40.3	66.8	52.2	116	145	<10	40.8	129	121	17.8	17.8
SP3_8	<12	10.3	21.2	119	179	77.6	128	91.7	157	154	15.5	75.9	117	137	17.6	17.6
SP3_9	<12	<8	<16	26.9	48.1	25.1	29.7	32.4	44.1	46.9	<10	23	45.1	36.9	<9	<9
Kenfig																
K - 1	<12	<8	<16	33.4	41.9	<14	20.8	<24	26.7	36.9	<10	<18	31.5	28.4	<9	<23
K - 2	<12	<8	<16	28.9	55.8	<14	21	<24	41.1	42.8	<10	<18	60.3	32.2	11	<23
K - 3	<12	<8	<16	24	43.8	<14	21.6	<24	28.7	38.6	<10	<18	48.2	27.6	<9	<23
K - 4	<12	<8	<16	22.6	21.3	<14	<15	<24	16.5	<17	<10	<18	43.6	<15	<9	<23
SP5_1	<12	<8	<16	<14	33.8	<14	21.8	<24	15.7	47.3	<10	<18	94.5	34.6	32.8	<23
SP5_10	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	17.7	<15	<9	<23
SP5_11	<12	<8	<16	20.5	28.8	<14	18.6	<24	25.5	42.2	<10	<18	87.5	32.1	31	<23
SP5_12	<12	<8	<16	70.2	95.9	41.5	82.8	58	98.5	130	<10	47	121	99	37.8	<23
SP5_13	<12	<8	<16	48.2	78.5	23.6	46.7	44.5	52.4	90.2	<10	31.3	91.2	65.5	14.6	<23
SP5_14	<12	<8	<16	37.1	68.1	23.7	44.8	40.6	43.7	74.8	<10	33.9	86.1	54.5	17.6	<23
SP5_15	<12	<8	<16	23	26.9	<14	<15	<24	15.4	48.7	<10	<18	32.9	35	<9	<23
SP5_16	<12	<8	<16	33.6	33.4	24	29.1	<24	23.4	74.1	<10	22	48.9	50.8	<9	<23
SP5_17	<12	<8	<16	36.9	57.7	17.4	43.6	37.1	37.4	58.8	<10	26.8	114	46.2	34	<23
SP5_18	<12	<8	<16	53.2	72.8	28.1	44.9	46	59.3	102	<10	33.7	211	81.7	78.1	<23
SP5_19	<12	<8	<16	34.6	56.3	<14	38.3	35.8	42.3	63.6	<10	26.3	67	46.7	13.3	<23
SP5_2	<12	<8	<16	24.1	32.9	<14	30.1	<24	38.7	50.1	<10	<18	72.5	43.8	17.6	<23
SP5_20	<12	<8	<16	75.6	93.2	33.4	58.9	58.2	82.8	143	<10	34.2	213	127	73.1	<23
SP5_21	<12	<8	<16	<14	<15	<14	<15	<24	<10	26.2	<10	<18	30.9	18.6	<9	<23
SP5_22	<12	<8	<16	<14	21.6	<14	<15	<24	<10	23.4	<10	<18	39.5	17.2	<9	<23
SP5_23	<12	<8	<16	40.4	55	20.3	31.3	31.6	38.9	71.6	<10	<18	101	54.6	28.1	<23
SP5_24	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	33.5	<15	<9	<23
SP5_25	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	45.6	<15	18.2	<23
SP5_26	<12	<8	<16	64.1	90.2	35.8	58.5	57.5	58.4	116	15.3	40.2	260	93.8	90.2	<23
SP5_27	<12	<8	<16	38.1	74.6	28.9	50.4	41.4	74.1	90.1	<10	26.9	159	64.3	52.5	<23
SP5_28	<12	10.2	26	110	132	56	110	78.2	101	160	16.5	61	268	128	84.9	<23
SP5_29	<12	<8	<16	19.4	33.6	<14	23.8	<24	19.1	40.3	<10	<18	38.6	30.7	<9	<23
SP5_3	<12	<8	<16	23.2	26.8	<14	21.7	<24	31.9	47.3	<10	<18	81.1	34	24.6	<23
SP5_30	<12	<8	19.9	65.5	81.3	40	63.9	57.4	96.1	162	13.1	39.6	267	130	77.5	<23
SP5_31	<12	<8	<16	26.1	30	<14	22.9	<24	27.8	53.3	<10	<18	75.9	40.5	18.5	<23
SP5_32	<12	<8	<16	<14	29.9	<14	<15	<24	23	39	<10	<18	37.3	29	<9	<23
SP5_33	<12	<8	<16	37.6	59.9	18.3	33.7	<24	51	48.4	<10	<18	117	36.5	77.5	<23
SP5_34	<12	<8	<16	<14	19.4	<14	<15	<24	19.8	30.8	<10	<18	31.5	23	<9	<23
SP5_35	<12	<8	<16	19	<15	<14	<15	<24	12.5	30.2	<10	<18	33.6	21.7	<9	<23

SP5_36	<12	<8	<16	<14	30.2	<14	<15	<24	12.3	27.5	<10	<18	55.4	21.5	12.6	<23
SP5_37	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	19.5	<15	<9	<23
SP5_38	<12	<8	<16	21.3	<15	<14	<15	<24	12.8	<17	<10	<18	27.7	<15	<9	<23
SP5_39	<12	<8	<16	17	29.6	<14	<15	<24	18	35.1	<10	<18	79.6	27	16.5	<23
SP5_4	<12	<8	<16	<14	31.9	<14	23.6	<24	22.4	43.9	<10	<18	46.3	35	<9	<23
SP5_40	<12	<8	<16	21.6	30.2	<14	<15	<24	25.5	34.8	<10	<18	83.5	27.2	28	<23
SP5_41	<12	<8	<16	<14	22.4	<14	<15	<24	13.7	30.2	<10	<18	64.5	22.2	16.1	<23
SP5_42	<12	<8	<16	<14	31	<14	<15	<24	20.3	37.1	<10	<18	71.7	28.5	17.3	<23
SP5_43	<12	<8	<16	<14	24	<14	<15	<24	14.7	30.5	<10	<18	37.8	20.8	<9	<23
SP5_44	<12	<8	<16	45.4	49.9	21.6	40.7	35.1	38.7	86.7	<10	25.8	68.9	64	12.1	<23
SP5_45	<12	<8	<16	20.1	27.8	<14	<15	<24	20	33.2	<10	<18	43.4	25.9	<9	<23
SP5_46	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	33.1	<15	<9	<23
SP5_47	<12	<8	<16	<14	24.8	<14	<15	<24	13.2	31.4	<10	<18	71.8	23.4	21.8	<23
SP5_48	<12	<8	<16	20.4	38.6	<14	26.7	<24	30.1	62.7	<10	<18	112	57.9	22.1	<23
SP5_49	<12	<8	64.5	<14	32.4	<14	<15	<24	16.3	28.1	<10	<18	63.7	22	18.8	<23
SP5_5	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	18.7	<15	<9	<23
SP5_50	<12	<8	<16	<14	18.9	<14	<15	<24	13.6	20.9	<10	<18	49.3	<15	<9	<23
SP5_51	<12	<8	<16	19.6	34.5	<14	17.1	<24	27.8	40.4	<10	<18	67.5	29.5	17.8	<23
SP5_52	<12	<8	<16	<14	34.1	<14	28	<24	18.5	44.4	<10	<18	77.3	32	18.5	<23
SP5_53	<12	<8	<16	20.3	31.4	<14	24.8	<24	22	39.7	<10	<18	73.4	30.9	20.1	<23
SP5_54	<12	<8	<16	<14	45.6	<14	22.2	<24	<10	39	<10	<18	84.8	29.7	13.2	<23
SP5_55	<12	<8	<16	23.1	44.9	<14	32	<24	31.9	50	<10	<18	67.8	37.4	13.5	<23
SP5_56	<12	28.1	58.5	277	248	105	194	119	282	438	24.7	106	365	286	27.8	44.7
SP5_57	<12	<8	<16	26.5	36.5	<14	21.9	<24	23	44.2	<10	<18	129	37.5	34	<23
SP5_58	<12	<8	<16	<14	38	<14	24.4	<24	<10	49.4	<10	<18	78.3	37.2	14.5	<23
SP5_59	<12	<8	<16	<14	32	<14	19.2	<24	<10	41.3	<10	<18	61.3	29.3	13.9	<23
SP5_6	<12	<8	<16	<14	<15	<14	<15	<24	<10	24.6	<10	<18	25	19.9	<9	<23
SP5_60	<12	<8	<16	48.4	55.2	23.1	41.8	33.9	57.2	84.6	<10	25.2	117	67.2	21.3	<23
SP5_61	<12	<8	<16	<14	40.5	<14	34.2	<24	20.4	68.9	<10	<18	84.1	51.9	10.7	<23
SP5_62	<12	<8	<16	34.5	72.8	22.2	43.3	45	27.4	64.4	<10	31.7	126	46.7	40.7	<23
SP5_63	<12	<8	<16	19.8	48.5	<14	30.1	31.7	25.8	53.8	<10	22.8	86.9	42.7	22.9	<23
SP5_64	<12	<8	<16	27.3	45.7	<14	23.6	<24	36.9	44.7	<10	<18	87.3	35	25.4	<23
SP5_65	<12	<8	<16	34.5	61.7	23.7	43.9	40.8	32.3	86.7	<10	29.6	126	62.4	30.1	<23
SP5_66	<12	<8	<16	20.6	50.5	20.1	33.8	33.9	19.2	61.1	<10	22.5	82.9	44.1	20.7	<23
SP5_67	<12	<8	<16	58.6	104	34.5	55.6	48.5	83	81	<10	34.3	143	66.6	37.6	<23
SP5_68	<12	<8	<16	75.5	141	37.8	68.6	69.4	91.9	105	12.6	44.6	242	86.5	89.1	<23
SP5_69	<12	<8	<16	<14	53.1	<14	26.1	33.5	<10	39.9	<10	24	99	28.2	20.2	<23
SP5_7	<12	<8	<16	46.8	69.1	24.5	48.6	37.5	48.7	92.9	<10	29.9	78.7	66.3	10.9	<23
SP5_70	<12	<8	<16	24.2	64.7	17	46.4	40.5	25.9	64.1	<10	31.8	103	46	28.2	<23
SP5_71	<12	33.6	25.5	134	162	62.5	119	97.9	165	214	31.9	70.3	230	151	30.4	<23
SP5_72	<12	<8	<16	31.5	77.1	19	42.3	34.9	58.4	60.1	<10	25.7	118	48.2	36.3	<23
SP5_73	<12	<8	<16	18.8	47	<14	24.9	29.3	12.9	40.5	<10	<18	99	30.4	22	<23
SP5_74	<12	<8	<16	29.8	65.1	15.9	30.2	33.3	43.3	44.9	<10	22.9	93	34.8	24	<23
SP5_75	<12	<8	<16	53.4	111	41.9	56.5	56.4	78.8	91.1	<10	38.3	132	67.7	29.4	<23
SP5_76	<12	<8	<16	57	65.7	26.9	54.3	43.9	42.6	88.2	<10	36.6	106	64.6	29.2	<23
SP5_77	<12	<8	<16	34.5	73.5	25.3	36.1	35.2	54	62.1	<10	24.1	112	49.6	29.1	<23
SP5_78	<12	<8	<16	22	55.1	16.4	31.1	30.1	24.3	43.9	<10	24.1	57.9	30.2	10.6	<23
SP5_79	24.5	<8	20.1	101	138	42.4	89	65.2	88.3	129	<10	48.7	169	107	41.7	<23
SP5_8	<12	19.7	<16	57.2	72.2	27.7	44	42.1	55.2	99.3	12.2	29.5	88.1	74	27.9	<23
SP5_80	<12	<8	<16	23.8	44.7	<14	27.7	<24	22.7	45	<10	21.4	78.3	33.4	14.5	<23
SP5_9	<12	<8	<16	20.2	41.3	<14	26.9	30	13.8	41.8	<10	<18	97	32.6	24	<23
Lougher (1)																
SP114_1	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	27.7	<15	<9	<23
SP114_10	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	21.8	<15	<9	<23
SP114_11	<12	11	<16	39.9	63.9	<14	23.4	<24	76.1	98	19	<18	251	74.4	67	<23
SP114_12	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	34	<15	<9	<23
SP114_13	<12	<8	<16	19.4	38.5	22.9	50.8	30	14.2	77.8	<10	28.2	88.1	64.8	26.6	<23
SP114_14	<12	<8	<16	<14	26.6	<14	<15	<24	<10	39.2	<10	<18	110	30.7	43	<23
SP114_15	<12	<8	<16	<14	21.8	<14	<15	<24	12.2	30.1	<10	<18	89.6	21.3	25.6	<23
SP114_16	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	<15	<15	<9	<23
SP114_17	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	27.6	<15	<9	<23
SP114_18	<12	<8	<16	<14	18.7	<14	<15	<24	<10	20.7	<10	<18	58.6	<15	<9	<23
SP114_19	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	57	<15	21.1	<23
SP114_2	<12	<8	<16	<14	25.2	<14	<15	<24	13.3	39.5	<10	<18	57.9	37.1	15.4	<23
SP114_20	<12	<8	<16	<14	18.9	<14	<15	<24	13.8	31.6	<10	<18	81.6	22.6	27.4	<23
SP114_3	<12	20.2	<16	46.8	44.2	20	30.6	<24	39	83.5	<10	<18	70.7	55.6	<9	<23
SP114_4	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	29.9	<15	<9	<23
SP114_5	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	25.6	<15	<9	<23
SP114_6	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	<15	<15	<9	<23
SP114_7	<12	<8	<16	<14	18.2	<14	<15	<24	<10	20.2	<10	<18	51.5	21.1	16.2	<23
SP114_8	<12	<8	<16	<14	36.4	<14	20.9	<24	<10	69.8	<10	<18	130	53.1	46.7	<23
SP114_9	<12	<8	<16	<14	<15	<14	<15	<24	<10	<17	<10	<18	30.6	<15	<9	<23

Coed Darcy_Monitor Phase 31
Proposed Upfill Materials

Sample Ref	Asbestos Quantification - Total - %	Chrysotile (White) Asbestos	Amosite (Brown) Asbestos	Crocidolite (Blue) Asbestos
<i>Cimla</i>				
Groves Road - 1		Not Detected	Not Detected	Not Detected
Groves Road - 2		Not Detected	Not Detected	Not Detected
Groves Road - 3		Not Detected	Not Detected	Not Detected
Groves Road - 4		Not Detected	Not Detected	Not Detected
SP3_1		Not Detected	Not Detected	Not Detected
SP3_10		Not Detected	Not Detected	Not Detected
SP3_11	<0.001	Detected	Not Detected	Not Detected
SP3_12		Not Detected	Not Detected	Not Detected
SP3_13		Not Detected	Not Detected	Not Detected
SP3_14		Not Detected	Not Detected	Not Detected
SP3_15		Not Detected	Not Detected	Not Detected
SP3_16		Not Detected	Not Detected	Not Detected
SP3_17		Not Detected	Not Detected	Not Detected
SP3_18		Not Detected	Not Detected	Not Detected
SP3_19	<0.001	Detected	Not Detected	Not Detected
SP3_2		Not Detected	Not Detected	Not Detected
SP3_20		Not Detected	Not Detected	Not Detected
SP3_21		Not Detected	Not Detected	Not Detected
SP3_22		Not Detected	Not Detected	Not Detected
SP3_23		Not Detected	Not Detected	Not Detected
SP3_24		Not Detected	Not Detected	Not Detected
SP3_25		Not Detected	Not Detected	Not Detected
SP3_26	<0.001	Detected	Not Detected	Not Detected
SP3_27	<0.001	Detected	Not Detected	Not Detected
SP3_28		Not Detected	Not Detected	Not Detected
SP3_29		Not Detected	Not Detected	Not Detected
SP3_3		Not Detected	Not Detected	Not Detected
SP3_30		Not Detected	Not Detected	Not Detected
SP3_31	<0.001	Detected	Not Detected	Not Detected
SP3_32		Not Detected	Not Detected	Not Detected
SP3_33		Not Detected	Not Detected	Not Detected
SP3_34		Not Detected	Not Detected	Not Detected
SP3_35		Not Detected	Not Detected	Not Detected
SP3_36		Not Detected	Not Detected	Not Detected
SP3_37		Not Detected	Not Detected	Not Detected
SP3_38		Not Detected	Not Detected	Not Detected
SP3_39		Not Detected	Not Detected	Not Detected
SP3_4		Not Detected	Not Detected	Not Detected
SP3_40		Not Detected	Not Detected	Not Detected
SP3_5		Not Detected	Not Detected	Not Detected
SP3_6		Not Detected	Not Detected	Not Detected
SP3_7		Not Detected	Not Detected	Not Detected
SP3_8		Not Detected	Not Detected	Not Detected
SP3_9		Not Detected	Not Detected	Not Detected
<i>Lougher (1)</i>				
SP114_1		Not Detected	Not Detected	Not Detected
SP114_10		Not Detected	Not Detected	Not Detected
SP114_11		Not Detected	Not Detected	Not Detected
SP114_12		Not Detected	Not Detected	Not Detected
SP114_13		Not Detected	Not Detected	Not Detected
SP114_14		Not Detected	Not Detected	Not Detected
SP114_15		Not Detected	Not Detected	Not Detected
SP114_16		Not Detected	Not Detected	Not Detected
SP114_17		Not Detected	Not Detected	Not Detected

[illegible]

SP5_48		Not Detected	Not Detected	Not Detected
SP5_49		Not Detected	Not Detected	Not Detected
SP5_5		Not Detected	Not Detected	Not Detected
SP5_50		Not Detected	Not Detected	Not Detected
SP5_51		Not Detected	Not Detected	Not Detected
SP5_52		Not Detected	Not Detected	Not Detected
SP5_53		Not Detected	Not Detected	Not Detected
SP5_54		Not Detected	Not Detected	Not Detected
SP5_55	<0.001	Detected	Not Detected	Not Detected
SP5_56		Not Detected	Not Detected	Not Detected
SP5_57	<0.001	Detected	Not Detected	Not Detected
SP5_58		Not Detected	Not Detected	Not Detected
SP5_59		Not Detected	Not Detected	Not Detected
SP5_6		Not Detected	Not Detected	Not Detected
SP5_60		Not Detected	Not Detected	Not Detected
SP5_61		Not Detected	Not Detected	Not Detected
SP5_62		Not Detected	Not Detected	Not Detected
SP5_63		Not Detected	Not Detected	Not Detected
SP5_64		Not Detected	Not Detected	Not Detected
SP5_65		Not Detected	Not Detected	Not Detected
SP5_66		Not Detected	Not Detected	Not Detected
SP5_67		Not Detected	Not Detected	Not Detected
SP5_68		Not Detected	Not Detected	Not Detected
SP5_69		Not Detected	Not Detected	Not Detected
SP5_7		Not Detected	Not Detected	Not Detected
SP5_70	<0.001	Detected	Not Detected	Not Detected
SP5_71		Not Detected	Not Detected	Not Detected
SP5_72		Not Detected	Not Detected	Not Detected
SP5_73		Not Detected	Not Detected	Not Detected
SP5_74		Not Detected	Not Detected	Not Detected
SP5_75		Not Detected	Not Detected	Not Detected
SP5_76		Not Detected	Not Detected	Not Detected
SP5_77	<0.001	Detected	Not Detected	Not Detected
SP5_78		Not Detected	Not Detected	Not Detected
SP5_79		Not Detected	Not Detected	Not Detected
SP5_8		Not Detected	Not Detected	Not Detected
SP5_80		Not Detected	Not Detected	Not Detected
SP5_9		Not Detected	Not Detected	Not Detected

Appendix K

TEST CERTIFICATE

Results of Analysis Carried Out By Chemtest

Quarry Farm View Bowbridge Lane
Newark Nottinghamshire NG24 3BZ
t: 01636 705100 f: 01636 640640
e: newark @ enverity . co . uk

Client: Atkins Ltd
Client Address: Suite 27
Llan Coed House
Llandarcy
SA10 6FG

Certificate Number: NL4465-5/1/801
Client Reference: N/A
Job Number: NL4465-5

Contact: Barney Irlam

Site Name: Llandarcy
Site Address: Coed Darcy

Analysis carried out by Chemtest on the following samples

Laboratory Reference	Client Reference	Location	Test Requested
NL4465-5/1	1	PITP057 B	Naphthalene
NL4465-5/2	2	PITP057 E	Naphthalene
NL4465-5/3	3	PITP057 W	Naphthalene
NL4465-5/4	4	PITP057 S	Naphthalene
NL4465-5/5	5	PITP057 N	Naphthalene
NL4465-5/6	6	PITP057 FILL	Naphthalene

Approved Signatory: C. Reynolds - Laboratory Manager

Signed:



for and on behalf of Enverity

Form Number: EN/C/801 Version 12

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Registered in England & Wales
Registration Number: 6930692
Reg Office: Diasma, Willie Snaith Rd
Newmarket, Suffolk, CB8 7SQ



Final Report

Report Number: 14-17383 Issue-1

Initial Date of Issue: 07-Jan-15

Client: Enverity

Client Address: Quarry Farm View
Bowbridge Lane
Newark
Nottinghamshire
NG24 3BZ

Contact(s): Barney Irlam
Paul Taylor

Project: Coed Darcy

Quotation No.:

Date Received: 23-Dec-14

Order No.:

Date Instructed: 05-Jan-15

No. of Samples: 6

Results Due: 09-Jan-15

Turnaround:
(Weekdays) 5

Date Approved: 07-Jan-15

Approved By:

Details: Phil Hellier, Project Director

Results Summary - Soil

Project: Coed Darcy

Client: Enverity	Chemtest Job No.:				14-17383	14-17383	14-17383	14-17383	14-17383	14-17383
Quotation No.:	Chemtest Sample ID.:				85547	85548	85549	85550	85551	85552
Order No.:	Client Sample Ref.:									
	Client Sample ID.:				PITP057_B	PITP057_E	PITP057_W	PITP057_S	PITP057_N	PITP057_FILL
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):									
	Bottom Depth(m):									
	Date Sampled:				10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14
Determinand	Accred.	SOP	Units	LOD						
Moisture	N	2030	%	0.02	12	10	8.8	7.1	11	11
Naphthalene	U	2700	mg/kg	0.1	0.22	< 0.10	< 0.10	< 0.10	0.90	< 0.10

Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVCOs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at our Coventry laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 60 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

TEST CERTIFICATE

Results of Analysis Carried Out By Chemtest

Quarry Farm View Bowbridge Lane
Newark Nottinghamshire NG24 3BZ
t: 01636 705100 f: 01636 640640
e: newark @ enverity . co . uk

Client: Atkins Ltd
Client Address: Suite 27
Llan Coed House
Llandarcy
SA10 6FG

Certificate Number: NL4465-3/1/801
Client Reference: N/A
Job Number: NL4465-3

Contact: Barney Irlam

Site Name: Llandarcy
Site Address: Coed Darcy

Analysis carried out by Chemtest on the following samples

Laboratory Reference	Client Reference	Location	Test Requested
NL4465-3/1	1	SMH-98 S	Zinc
NL4465-3/2	2	SMH-98 W	Zinc
NL4465-3/3	3	SMH-98 N	Zinc
NL4465-3/4	4	SMH-98 E	Zinc
NL4465-3/5	5	SMH-78 S	Zinc
NL4465-3/6	6	SMH-78 W	Zinc
NL4465-3/7	7	SMH-78 N	Zinc
NL4465-3/8	8	SMH-78 E	Zinc
NL4465-3/9	9	SMH-176 S	Cadmium & Zinc
NL4465-3/10	10	SMH-176 W	Cadmium & Zinc

Approved Signatory: C. Reynolds - Laboratory Manager

Signed:



for and on behalf of Enverity

Form Number: EN/C/801 Version 12

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TEST CERTIFICATE

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Quarry Farm View Bowbridge Lane
Newark Nottinghamshire NG24 3BZ
t: 01636 705100 f: 01636 640640
e: newark @ enverity . co . uk

Client: Atkins Ltd
Client Address: Suite 27
Llan Coed House
Llandarcy
SA10 6FG

Certificate Number: NL4465-3/11/801
Client Reference: N/A
Job Number: NL4465-3

Contact: Barney Irlam

Site Name: Llandarcy
Site Address: Coed Darcy

Analysis carried out by Chemtest on the following samples

Laboratory Reference	Client Reference	Location	Test Requested
NL4465-3/11	11	SMH-176 N	Cadmium & Zinc
NL4465-3/12	12	SMH-176 E	Cadmium & Zinc
NL4465-3/13	13	SMH-154 S	Cadmium, Selenium & Zinc
NL4465-3/14	14	SMH-154 W	Cadmium, Selenium & Zinc
NL4465-3/15	15	SMH-154 N	Cadmium, Selenium & Zinc
NL4465-3/16	16	SMH-154 E	Cadmium, Selenium & Zinc
NL4465-3/17	17	SMH-193 S	Copper
NL4465-3/18	18	SMH-193 W	Copper
NL4465-3/19	19	SMH-193 N	Copper
NL4465-3/20	20	SMH-193 E	Copper

Approved Signatory: C. Reynolds - Laboratory Manager

Signed:



for and on behalf of Enverity

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Newark Nottinghamshire NG24 3BZ
t: 01636 705100 f: 01636 640640
e: newark @ enverity . co . uk

Client: Atkins Ltd
Client Address: Suite 27
Llan Coed House
Llandarcy
SA10 6FG

Certificate Number: NL4465-3/21/801
Client Reference: N/A
Job Number: NL4465-3

Contact: Barney Irlam

Site Name: Llandarcy
Site Address: Coed Darcy

Analysis carried out by Chemtest on the following samples

Laboratory Reference	Client Reference	Location	Test Requested
NL4465-3/21	21	SMH-160 S	Speciated PAH
NL4465-3/22	22	SMH-160 W	Speciated PAH
NL4465-3/23	23	SMH-160 N	Speciated PAH
NL4465-3/24	24	SMH-160 E	Speciated PAH
NL4465-3/25	25	SMH-134 S	Speciated PAH
NL4465-3/26	26	SMH-134 W	Speciated PAH
NL4465-3/27	27	SMH-134 N	Speciated PAH
NL4465-3/28	28	SMH-134 E	Speciated PAH
NL4465-3/29	29	SMH-157 S	Speciated PAH
NL4465-3/30	30	SMH-157 W	Speciated PAH

Approved Signatory: C. Reynolds - Laboratory Manager

Signed:



for and on behalf of Enverity

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Newark Nottinghamshire NG24 3BZ
t: 01636 705100 f: 01636 640640
e: newark @ enverity . co . uk

Client: Atkins Ltd
Client Address: Suite 27
Llan Coed House
Llandarcy
SA10 6FG

Certificate Number: NL4465-3/31/801
Client Reference: N/A
Job Number: NL4465-3

Contact: Barney Irlam

Site Name: Llandarcy
Site Address: Coed Darcy

Analysis carried out by Chemtest on the following samples

Laboratory Reference	Client Reference	Location	Test Requested
NL4465-3/31	31	SMH-157 N	Speciated PAH
NL4465-3/32	32	SMH-157 E	Speciated PAH
NL4465-3/33	33	SMH-121 S	Speciated PAH
NL4465-3/34	34	SMH-121 W	Speciated PAH
NL4465-3/35	35	SMH-121 N	Speciated PAH
NL4465-3/36	36	SMH-121 E	Speciated PAH
NL4465-3/37	37	SMH-89 S	Speciated PAH
NL4465-3/38	38	SMH-89 W	Speciated PAH
NL4465-3/39	39	SMH-89 N	Speciated PAH
NL4465-3/40	40	SMH-89 E	Speciated PAH

Approved Signatory: C. Reynolds - Laboratory Manager

Signed:



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Results of Analysis Carried Out By Chemtest

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t: 01636 705100 f: 01636 640640
e: newark @ enverity . co . uk

Client: Atkins Ltd
Client Address: Suite 27
Llan Coed House
Llandarcy
SA10 6FG

Certificate Number: NL4465-3/41/801

Client Reference: N/A

Job Number: NL4465-3

Contact: Barney Irlam

Site Name: Llandarcy
Site Address: Coed Darcy

Analysis carried out by Chemtest on the following samples

Laboratory Reference	Client Reference	Location	Test Requested
NL4465-3/41	41	SMH-103 S	TPH CWG
NL4465-3/42	42	SMH-103 W	TPH CWG
NL4465-3/43	43	SMH-103 N	TPH CWG
NL4465-3/44	44	SMH-103 E	TPH CWG

Approved Signatory: C. Reynolds - Laboratory Manager

Signed:



for and on behalf of Enverity

Form Number: EN/C/801 Version 12

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Newmarket, Suffolk, CB8 7SQ



Final Report

Report Number: 14-16650 Issue-1

Initial Date of Issue: 18-Dec-14

Client: Enverity

Client Address: Quarry Farm View
Bowbridge Lane
Newark
Nottinghamshire
NG24 3BZ

Contact(s): Paul Taylor
Barney Irlam

Project: COED DARCY

Quotation No.: **Date Received:** 15-Dec-14

Order No.: **Date Instructed:** 15-Dec-14

No. of Samples: 55 **Results Due:** 19-Dec-14

Turnaround:
(Weekdays) 5

Date Approved: 18-Dec-14

Approved By:

Details: Keith Jones, Technical Manager

Results Summary - Soil

Project: COED DARCY

Client: Enverity	Chemtest Job No.:					14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650
Quotation No.:	Chemtest Sample ID.:					81088	81090	81091	81092	81093	81095	81096	81097	81098	81100
Order No.:	Client Sample Ref.:														
	Client Sample ID.:					SMH-98 S	SMH-98 W	SMH-98 N	SMH-98 E	SMH-78 S	SMH-78 W	SMH-78 N	SMH-78 E	SMH-176 S	SMH-176 W
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):														
	Bottom Depth(m):														
	Date Sampled:					11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14
Determinand	Accred.	SOP	Units	LOD											
Moisture	N	2030	%	0.02	13	11	12	13	15	16	9.1	17	14	13	15
Cadmium	U	2450	mg/kg	0.1									0.96	0.74	5.5
Copper	U	2450	mg/kg	0.5											
Selenium	U	2450	mg/kg	0.2											
Zinc	U	2450	mg/kg	0.5	230	230	210	230	250	240	290	280	240	190	230
Aliphatic TPH >C5-C6	N	2675	mg/kg	0.1											
Aliphatic TPH >C6-C8	N	2675	mg/kg	0.1											
Aliphatic TPH >C8-C10	U	2675	mg/kg	0.1											
Aliphatic TPH >C10-C12	U	2675	mg/kg	1											
Aliphatic TPH >C12-C16	U	2675	mg/kg	1											
Aliphatic TPH >C16-C21	U	2675	mg/kg	1											
Aliphatic TPH >C21-C35	U	2675	mg/kg	1											
Aliphatic TPH >C35-C44	U	2675	mg/kg	1											
Total Aliphatic Hydrocarbons	U	2675	mg/kg	5											
Aromatic TPH >C5-C7	N	2675	mg/kg	0.1											
Aromatic TPH >C7-C8	N	2675	mg/kg	0.1											
Aromatic TPH >C8-C10	U	2675	mg/kg	0.1											
Aromatic TPH >C10-C12	N	2675	mg/kg	1											
Aromatic TPH >C12-C16	U	2675	mg/kg	1											
Aromatic TPH >C16-C21	U	2675	mg/kg	1											
Aromatic TPH >C21-C35	N	2675	mg/kg	1											
Aromatic TPH >C35-C44	N	2675	mg/kg	1											
Total Aromatic Hydrocarbons	U	2675	mg/kg	5											
Total Petroleum Hydrocarbons	U	2675	mg/kg	10											
Naphthalene	U	2700	mg/kg	0.1											
Acenaphthylene	U	2700	mg/kg	0.1											
Acenaphthene	U	2700	mg/kg	0.1											
Fluorene	U	2700	mg/kg	0.1											
Phenanthrene	U	2700	mg/kg	0.1											
Anthracene	U	2700	mg/kg	0.1											
Fluoranthene	U	2700	mg/kg	0.1											
Pyrene	U	2700	mg/kg	0.1											
Benzo[a]anthracene	U	2700	mg/kg	0.1											

Results Summary - Soil

Project: COED DARCY

Client: Enverity	Chemtest Job No.:				14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650
Quotation No.:	Chemtest Sample ID.:				81088	81090	81091	81092	81093	81095	81096	81097	81098
Order No.:	Client Sample Ref.:												
	Client Sample ID.:				SMH-98 S	SMH-98 W	SMH-98 N	SMH-98 E	SMH-78 S	SMH-78 W	SMH-78 N	SMH-78 E	SMH-176 S
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):												
	Bottom Depth(m):												
	Date Sampled:				11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14
Determinand	Accred.	SOP	Units	LOD									
Chrysene	U	2700	mg/kg	0.1									
Benzo[b]fluoranthene	U	2700	mg/kg	0.1									
Benzo[k]fluoranthene	U	2700	mg/kg	0.1									
Benzo[a]pyrene	U	2700	mg/kg	0.1									
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.1									
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.1									
Benzo[g,h,i]perylene	U	2700	mg/kg	0.1									
Total Of 16 PAH's	U	2700	mg/kg	2									

Results Summary - Soil

Project: COED DARCY

Client: Enverity	Chemtest Job No.:					14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650
Quotation No.:	Chemtest Sample ID.:					81102	81103	81105	81106	81107	81108	81110	81111	81112
Order No.:	Client Sample Ref.:													
	Client Sample ID.:					SMH-176 E	SMH-154 S	SMH-154 W	SMH-154 N	SMH-154 E	SMH-193 S	SMH-193 W	SMH-193 N	SMH-193 E
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):													
	Bottom Depth(m):													
	Date Sampled:					11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14
Determinand	Accred.	SOP	Units	LOD										
Moisture	N	2030	%	0.02	16	16	18	16	17	9.6	11	17	18	19
Cadmium	U	2450	mg/kg	0.1	1.1	1.2	0.93	1.2	1.2					
Copper	U	2450	mg/kg	0.5						23	28	30	33	
Selenium	U	2450	mg/kg	0.2		< 0.20	< 0.20	< 0.20	< 0.20					
Zinc	U	2450	mg/kg	0.5	310	320	250	310	260					
Aliphatic TPH >C5-C6	N	2675	mg/kg	0.1										
Aliphatic TPH >C6-C8	N	2675	mg/kg	0.1										
Aliphatic TPH >C8-C10	U	2675	mg/kg	0.1										
Aliphatic TPH >C10-C12	U	2675	mg/kg	1										
Aliphatic TPH >C12-C16	U	2675	mg/kg	1										
Aliphatic TPH >C16-C21	U	2675	mg/kg	1										
Aliphatic TPH >C21-C35	U	2675	mg/kg	1										
Aliphatic TPH >C35-C44	U	2675	mg/kg	1										
Total Aliphatic Hydrocarbons	U	2675	mg/kg	5										
Aromatic TPH >C5-C7	N	2675	mg/kg	0.1										
Aromatic TPH >C7-C8	N	2675	mg/kg	0.1										
Aromatic TPH >C8-C10	U	2675	mg/kg	0.1										
Aromatic TPH >C10-C12	N	2675	mg/kg	1										
Aromatic TPH >C12-C16	U	2675	mg/kg	1										
Aromatic TPH >C16-C21	U	2675	mg/kg	1										
Aromatic TPH >C21-C35	N	2675	mg/kg	1										
Aromatic TPH >C35-C44	N	2675	mg/kg	1										
Total Aromatic Hydrocarbons	U	2675	mg/kg	5										
Total Petroleum Hydrocarbons	U	2675	mg/kg	10										
Naphthalene	U	2700	mg/kg	0.1										1.2
Acenaphthylene	U	2700	mg/kg	0.1										0.32
Acenaphthene	U	2700	mg/kg	0.1										0.95
Fluorene	U	2700	mg/kg	0.1										0.84
Phenanthrene	U	2700	mg/kg	0.1										7.0
Anthracene	U	2700	mg/kg	0.1										0.76
Fluoranthene	U	2700	mg/kg	0.1										5.6
Pyrene	U	2700	mg/kg	0.1										4.8
Benzo[a]anthracene	U	2700	mg/kg	0.1										1.7

Results Summary - Soil

Project: COED DARCY

Client: Enverity	Chemtest Job No.:				14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650
Quotation No.:	Chemtest Sample ID.:				81102	81103	81105	81106	81107	81108	81110	81112
Order No.:	Client Sample Ref.:											
	Client Sample ID.:				SMH-176 E	SMH-154 S	SMH-154 W	SMH-154 N	SMH-154 E	SMH-193 S	SMH-193 W	SMH-193 N
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):											
	Bottom Depth(m):											
	Date Sampled:				11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14
Determinand	Accred.	SOP	Units	LOD								
Chrysene	U	2700	mg/kg	0.1								1.8
Benzo[b]fluoranthene	U	2700	mg/kg	0.1								1.6
Benzo[k]fluoranthene	U	2700	mg/kg	0.1								< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.1								1.2
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.1								1.3
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.1								0.15
Benzo[g,h,i]perylene	U	2700	mg/kg	0.1								1.3
Total Of 16 PAH's	U	2700	mg/kg	2								31

Results Summary - Soil

Project: COED DARCY

Client: Enverity	Chemtest Job No.:				14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650
Quotation No.:	Chemtest Sample ID.:				81115	81116	81117	81118	81120	81121	81122	81123	81125
Order No.:	Client Sample Ref.:												
	Client Sample ID.:				SMH-160 W	SMH-160 N	SMH-160 E	SMH-134 S	SMH-134 W	SMH-134 N	SMH-134 E	SMH-157 S	SMH-157 W
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):												
	Bottom Depth(m):												
	Date Sampled:				11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14
Determinand	Accred.	SOP	Units	LOD									
Moisture	N	2030	%	0.02	18	17	18	19	19	18	17	18	18
Cadmium	U	2450	mg/kg	0.1									
Copper	U	2450	mg/kg	0.5									
Selenium	U	2450	mg/kg	0.2									
Zinc	U	2450	mg/kg	0.5									
Aliphatic TPH >C5-C6	N	2675	mg/kg	0.1									
Aliphatic TPH >C6-C8	N	2675	mg/kg	0.1									
Aliphatic TPH >C8-C10	U	2675	mg/kg	0.1									
Aliphatic TPH >C10-C12	U	2675	mg/kg	1									
Aliphatic TPH >C12-C16	U	2675	mg/kg	1									
Aliphatic TPH >C16-C21	U	2675	mg/kg	1									
Aliphatic TPH >C21-C35	U	2675	mg/kg	1									
Aliphatic TPH >C35-C44	U	2675	mg/kg	1									
Total Aliphatic Hydrocarbons	U	2675	mg/kg	5									
Aromatic TPH >C5-C7	N	2675	mg/kg	0.1									
Aromatic TPH >C7-C8	N	2675	mg/kg	0.1									
Aromatic TPH >C8-C10	U	2675	mg/kg	0.1									
Aromatic TPH >C10-C12	N	2675	mg/kg	1									
Aromatic TPH >C12-C16	U	2675	mg/kg	1									
Aromatic TPH >C16-C21	U	2675	mg/kg	1									
Aromatic TPH >C21-C35	N	2675	mg/kg	1									
Aromatic TPH >C35-C44	N	2675	mg/kg	1									
Total Aromatic Hydrocarbons	U	2675	mg/kg	5									
Total Petroleum Hydrocarbons	U	2675	mg/kg	10									
Naphthalene	U	2700	mg/kg	0.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.15	< 0.10
Acenaphthene	U	2700	mg/kg	0.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.1	< 0.10	< 0.10	< 0.10	< 0.10	0.12	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.1	0.50	0.27	0.54	0.47	0.69	0.42	0.31	1.1	0.30
Anthracene	U	2700	mg/kg	0.1	0.11	< 0.10	0.14	0.12	0.19	0.14	< 0.10	0.27	< 0.10
Fluoranthene	U	2700	mg/kg	0.1	0.96	0.60	1.1	1.1	1.4	0.84	0.64	2.4	0.76
Pyrene	U	2700	mg/kg	0.1	0.90	0.54	1.1	0.94	1.3	0.82	0.59	2.1	0.67
Benzo[a]anthracene	U	2700	mg/kg	0.1	0.54	0.34	0.49	0.51	0.71	0.39	0.22	1.0	0.24

Results Summary - Soil

Project: COED DARCY

Client: Enverity	Chemtest Job No.:					14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650
Quotation No.:	Chemtest Sample ID.:					81115	81116	81117	81118	81120	81121	81122	81123	81125
Order No.:	Client Sample Ref.:													
	Client Sample ID.:					SMH-160 W	SMH-160 N	SMH-160 E	SMH-134 S	SMH-134 W	SMH-134 N	SMH-134 E	SMH-157 S	SMH-157 W
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):													
	Bottom Depth(m):													
	Date Sampled:					11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14
Determinand	Accred.	SOP	Units	LOD										
Chrysene	U	2700	mg/kg	0.1	0.68	0.39	0.27	0.61	1.4	0.45	0.23	1.1	0.50	0.31
Benzo[b]fluoranthene	U	2700	mg/kg	0.1	0.48	0.39	0.55	0.70	1.0	0.56	0.44	1.1	0.36	0.60
Benzo[k]fluoranthene	U	2700	mg/kg	0.1	0.21	0.15	0.16	0.26	0.31	0.36	0.24	0.32	0.14	0.16
Benzo[a]pyrene	U	2700	mg/kg	0.1	0.34	0.25	0.34	0.41	0.46	0.37	0.28	0.71	0.32	0.43
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.1	< 0.10	< 0.10	0.43	0.32	0.71	0.37	< 0.10	0.60	0.42	0.41
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.1	< 0.10	< 0.10	< 0.10	0.13	0.42	0.14	< 0.10	0.31	0.11	0.14
Benzo[g,h,i]perylene	U	2700	mg/kg	0.1	< 0.10	< 0.10	0.25	0.72	2.4	0.69	< 0.10	0.83	0.23	0.42
Total Of 16 PAH's	U	2700	mg/kg	2	4.7	2.9	5.4	6.3	11	5.6	3.0	12	4.1	6.1

Results Summary - Soil

Project: COED DARCY

Client: Enverity	Chemtest Job No.:					14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650
Quotation No.:	Chemtest Sample ID.:					81127	81128	81130	81131	81132	81133	81135	81136	81137
Order No.:	Client Sample Ref.:													
	Client Sample ID.:					SMH-157 E	SMH-121 S	SMH-121 W	SMH-121 N	SMH-121 E	SMH-89 S	SMH-89 W	SMH-89 N	SMH-89 E
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):													
	Bottom Depth(m):													
	Date Sampled:					11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14
Determinand	Accred.	SOP	Units	LOD										
Moisture	N	2030	%	0.02	18	18	18	17	18	19	17	19	19	19
Cadmium	U	2450	mg/kg	0.1										
Copper	U	2450	mg/kg	0.5										
Selenium	U	2450	mg/kg	0.2										
Zinc	U	2450	mg/kg	0.5										
Aliphatic TPH >C5-C6	N	2675	mg/kg	0.1									< 0.10	< 0.10
Aliphatic TPH >C6-C8	N	2675	mg/kg	0.1									< 0.10	< 0.10
Aliphatic TPH >C8-C10	U	2675	mg/kg	0.1									< 0.10	< 0.10
Aliphatic TPH >C10-C12	U	2675	mg/kg	1									< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2675	mg/kg	1									< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2675	mg/kg	1									< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2675	mg/kg	1									< 1.0	< 1.0
Aliphatic TPH >C35-C44	U	2675	mg/kg	1									< 1.0	< 1.0
Total Aliphatic Hydrocarbons	U	2675	mg/kg	5									< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2675	mg/kg	0.1									< 0.10	< 0.10
Aromatic TPH >C7-C8	N	2675	mg/kg	0.1									< 0.10	< 0.10
Aromatic TPH >C8-C10	U	2675	mg/kg	0.1									< 0.10	< 0.10
Aromatic TPH >C10-C12	N	2675	mg/kg	1									< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2675	mg/kg	1									< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2675	mg/kg	1									< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2675	mg/kg	1									< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2675	mg/kg	1									< 1.0	< 1.0
Total Aromatic Hydrocarbons	U	2675	mg/kg	5									< 5.0	< 5.0
Total Petroleum Hydrocarbons	U	2675	mg/kg	10									< 10	< 10
Naphthalene	U	2700	mg/kg	0.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.10	
Acenaphthylene	U	2700	mg/kg	0.1	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.93	
Acenaphthene	U	2700	mg/kg	0.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.44	
Fluorene	U	2700	mg/kg	0.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.11	1.9	
Phenanthrene	U	2700	mg/kg	0.1	0.65	0.37	0.23	0.59	0.52	0.39	0.40	0.87	13	
Anthracene	U	2700	mg/kg	0.1	0.17	0.11	< 0.10	0.13	0.12	0.13	< 0.10	0.24	3.5	
Fluoranthene	U	2700	mg/kg	0.1	1.4	0.91	0.53	1.0	0.92	0.92	0.70	1.8	13	
Pyrene	U	2700	mg/kg	0.1	1.2	0.79	0.49	0.90	0.78	0.85	0.61	1.6	11	
Benzo[a]anthracene	U	2700	mg/kg	0.1	0.54	0.37	0.28	0.35	0.21	0.32	0.27	0.76	5.5	

Results Summary - Soil

Project: COED DARCY

Client: Enverity	Chemtest Job No.:					14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650	14-16650
Quotation No.:	Chemtest Sample ID.:					81127	81128	81130	81131	81132	81133	81135	81136	81137
Order No.:	Client Sample Ref.:													
	Client Sample ID.:					SMH-157 E	SMH-121 S	SMH-121 W	SMH-121 N	SMH-121 E	SMH-89 S	SMH-89 W	SMH-89 N	SMH-89 E
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):													
	Bottom Depth(m):													
	Date Sampled:					11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14	11-Dec-14
Determinand	Accred.	SOP	Units	LOD										
Chrysene	U	2700	mg/kg	0.1	0.35	0.25	0.34	0.23	0.24	0.30	0.23	0.53	5.8	
Benzo[b]fluoranthene	U	2700	mg/kg	0.1	0.65	0.50	0.36	0.42	0.50	0.39	0.31	1.1	5.5	
Benzo[k]fluoranthene	U	2700	mg/kg	0.1	0.24	0.16	0.17	0.16	0.20	0.15	< 0.10	0.33	2.1	
Benzo[a]pyrene	U	2700	mg/kg	0.1	0.47	0.34	0.20	0.34	0.20	0.31	0.23	0.61	3.6	
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.1	0.41	0.30	0.24	0.25	0.22	0.28	< 0.10	0.53	2.7	
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.18	0.78	
Benzo[g,h,i]perylene	U	2700	mg/kg	0.1	0.45	0.25	0.39	0.55	0.25	0.32	< 0.10	0.44	2.2	
Total Of 16 PAH's	U	2700	mg/kg	2	6.6	4.4	3.2	4.9	4.2	4.4	2.8	9.1	72	

Project: COED DARCY

Client: Enverity	Chemtest Job No.:				14-16650	14-16650
Quotation No.:	Chemtest Sample ID.:				81141	81142
Order No.:	Client Sample Ref.:					
	Client Sample ID.:				SMH-103 N	SMH-103 E
	Sample Type:				SOIL	SOIL
	Top Depth (m):					
	Bottom Depth(m):					
	Date Sampled:				11-Dec-14	11-Dec-14
Determinand	Accred.	SOP	Units	LOD		
Moisture	N	2030	%	0.02	11	20
Cadmium	U	2450	mg/kg	0.1		
Copper	U	2450	mg/kg	0.5		
Selenium	U	2450	mg/kg	0.2		
Zinc	U	2450	mg/kg	0.5		
Aliphatic TPH >C5-C6	N	2675	mg/kg	0.1	< 0.10	< 0.10
Aliphatic TPH >C6-C8	N	2675	mg/kg	0.1	< 0.10	< 0.10
Aliphatic TPH >C8-C10	U	2675	mg/kg	0.1	< 0.10	< 0.10
Aliphatic TPH >C10-C12	U	2675	mg/kg	1	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2675	mg/kg	1	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2675	mg/kg	1	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2675	mg/kg	1	< 1.0	< 1.0
Aliphatic TPH >C35-C44	U	2675	mg/kg	1	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	U	2675	mg/kg	5	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2675	mg/kg	0.1	< 0.10	< 0.10
Aromatic TPH >C7-C8	N	2675	mg/kg	0.1	< 0.10	< 0.10
Aromatic TPH >C8-C10	U	2675	mg/kg	0.1	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	2675	mg/kg	1	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2675	mg/kg	1	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2675	mg/kg	1	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2675	mg/kg	1	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2675	mg/kg	1	< 1.0	< 1.0
Total Aromatic Hydrocarbons	U	2675	mg/kg	5	< 5.0	< 5.0
Total Petroleum Hydrocarbons	U	2675	mg/kg	10	< 10	< 10
Naphthalene	U	2700	mg/kg	0.1		
Acenaphthylene	U	2700	mg/kg	0.1		
Acenaphthene	U	2700	mg/kg	0.1		
Fluorene	U	2700	mg/kg	0.1		
Phenanthrene	U	2700	mg/kg	0.1		
Anthracene	U	2700	mg/kg	0.1		
Fluoranthene	U	2700	mg/kg	0.1		
Pyrene	U	2700	mg/kg	0.1		
Benzo[a]anthracene	U	2700	mg/kg	0.1		

Project: COED DARCY

Client: Enverity	Chemtest Job No.:		14-16650	14-16650
Quotation No.:	Chemtest Sample ID.:		81141	81142
Order No.:	Client Sample Ref.:			
	Client Sample ID.:		SMH-103 N	SMH-103 E
	Sample Type:		SOIL	SOIL
	Top Depth (m):			
	Bottom Depth(m):			
	Date Sampled:		11-Dec-14	11-Dec-14
Determinand	Accred.	SOP	Units	LOD
Chrysene	U	2700	mg/kg	0.1
Benzo[b]fluoranthene	U	2700	mg/kg	0.1
Benzo[k]fluoranthene	U	2700	mg/kg	0.1
Benzo[a]pyrene	U	2700	mg/kg	0.1
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.1
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.1
Benzo[g,h,i]perylene	U	2700	mg/kg	0.1
Total Of 16 PAH's	U	2700	mg/kg	2

Report Information

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- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVCOs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at our Coventry laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 60 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

TEST CERTIFICATE

Results of Analysis Carried Out By Chemtest

Quarry Farm View Bowbridge Lane
Newark Nottinghamshire NG24 3BZ
t: 01636 705100 f: 01636 640640
e: newark @ enverity . co . uk

Client: Atkins Ltd
Client Address: Suite 27
Llan Coed House
Llandarcy
SA10 6FG

Certificate Number: NL4465-2/1/801
Client Reference: N/A
Job Number: NL4465-2

Contact: Barney Irlam

Site Name: Llandarcy
Site Address: Coed Darcy

Analysis carried out by Chemtest on the following samples

Laboratory Reference	Client Reference	Location	Test Requested
NL4465-2/1	1	PITP121 N	Asbestos Identification
NL4465-2/2	2	PITP121 B	Asbestos Identification
NL4465-2/3	3	PITP 121 W	Asbestos Identification
NL4465-2/4	4	PITP121 E	Asbestos Identification
NL4465-2/5	5	PITP121 FILL	Asbestos Identification
NL4465-2/6	6	PITP121 S	Asbestos Identification
NL4465-2/7	7	PITP30 E	Asbestos Identification
NL4465-2/8	8	PITP30 B	Asbestos Identification
NL4465-2/9	9	PITP30 S	Asbestos Identification
NL4465-2/10	10	PITP30 W	Asbestos Identification

Approved Signatory: C. Reynolds - Laboratory Manager

Signed:



for and on behalf of Enverity

Form Number: EN/C/801 Version 12

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Newmarket, Suffolk, CB8 7SQ

TEST CERTIFICATE

Results of Analysis Carried Out By Chemtest

Quarry Farm View Bowbridge Lane
Newark Nottinghamshire NG24 3BZ
t: 01636 705100 f: 01636 640640
e: newark @ enverity . co . uk

Client: Atkins Ltd
Client Address: Suite 27
Llan Coed House
Llandarcy
SA10 6FG

Certificate Number: NL4465-2/11/801
Client Reference: N/A
Job Number: NL4465-2

Contact: Barney Irlam

Site Name: Llandarcy
Site Address: Coed Darcy

Analysis carried out by Chemtest on the following samples

Laboratory Reference	Client Reference	Location	Test Requested
NL4465-2/11	11	PITP30 N	Asbestos Identification
NL4465-2/12	12	PITP30 FILL	Asbestos Identification
NL4465-2/13	13	PITP37 B	Asbestos Identification
NL4465-2/14	14	PITP37 S	Asbestos Identification
NL4465-2/17	17	PITP37 S	Asbestos Identification
NL4465-2/15	15	PITP37 FILL	Asbestos Identification
NL4465-2/16	16	PITP37 E	Asbestos Identification
NL4465-2/18	18	PITP37 N	Asbestos Identification
NL4465-2/19	19	PITP37 W	Asbestos Identification
NL4465-2/20	20	PITP044 FILL	Asbestos Identification

Approved Signatory: C. Reynolds - Laboratory Manager

Signed:



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t: 01636 705100 f: 01636 640640
e: newark @ enverity . co . uk

Client: Atkins Ltd
Client Address: Suite 27
Llan Coed House
Llandarcy
SA10 6FG

Certificate Number: NL4465-2/21/801

Client Reference: N/A

Job Number: NL4465-2

Contact: Barney Irlam

Site Name: Llandarcy
Site Address: Coed Darcy

Analysis carried out by Chemtest on the following samples

Laboratory Reference	Client Reference	Location	Test Requested
NL4465-2/21	21	PITP044 W	Asbestos Identification
NL4465-2/22	22	PITP044 N	Asbestos Identification
NL4465-2/23	23	PITP044 E	Asbestos Identification
NL4465-2/24	24	PITP044 S	Asbestos Identification

Approved Signatory: C. Reynolds - Laboratory Manager

Signed:



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Newmarket, Suffolk, CB8 7SQ



Final Report

Report Number: 14-16457 Issue-1

Initial Date of Issue: 22-Dec-14

Client: Enverity

Client Address: Quarry Farm View
Bowbridge Lane
Newark
Nottinghamshire
NG24 3BZ

Contact(s): Paul Taylor
Barney Irlam

Project: COED DARCY

Quotation No.: Q14-02412

Date Received: 11-Dec-14

Order No.:

Date Instructed: 12-Dec-14

No. of Samples: 24

Results Due: 19-Dec-14

Turnaround:
(Weekdays) 5

Date Approved: 22-Dec-14

Approved By:



Details: Keith Jones, Technical Manager

Results Summary - Soil

Project: COED DARCY

Client: Enverity	Chemtest Job No.:					14-16457	14-16457	14-16457	14-16457	14-16457	14-16457	14-16457	14-16457	14-16457
Quotation No.: Q14-02412	Chemtest Sample ID.:					79997	79998	79999	80000	80001	80002	80003	80004	80005
Order No.:	Client Sample Ref.:													
	Client Sample ID.:					PITP121 N	PITP121 B	PITP121 W	PITP121 E	PITP121 FILL	PITP121 S	PITP30 E	PITP30 B	PITP30 S
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					1.00	1.20	1.00	1.00		1.00	1.50	1.70	1.50
	Bottom Depth(m):													
	Date Sampled:					10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14
Determinand	Accred.	SOP	Units	LOD										
ACM Type	U	2192			-		-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry	U	2192	%	0.001	-		-	-	-	-	-	-	-	-
Total Asbestos	N	2192	%	0.001	-		-	-	-	-	-	-	-	-
Moisture	N	2030	%	0.02	15	10	9.6	14	11	16	9.0	8.7	8.2	7.3

Results Summary - Soil

Project: COED DARCY

Client: Enverity	Chemtest Job No.:				14-16457	14-16457	14-16457	14-16457	14-16457	14-16457	14-16457	14-16457	14-16457	14-16457
Quotation No.: Q14-02412	Chemtest Sample ID.:				80007	80008	80009	80010	80011	80012	80013	80014	80015	80016
Order No.:	Client Sample Ref.:													
	Client Sample ID.:				PITP30 N	PITP30 FILL	PITP37 B	PITP37 S	PITP37 FILL	PITP37 E	PITP37 S	PITP37 N	PITP37 W	PITP044 FILL
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.50		1.00	0.80		0.80	0.80	0.80	0.80	
	Bottom Depth(m):													
	Date Sampled:				10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14
Determinand	Accred.	SOP	Units	LOD										
ACM Type	U	2192			-	-		-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry	U	2192	%	0.001	-	-		-	-	-	-	-	-	-
Total Asbestos	N	2192	%	0.001	-	-		-	-	-	-	-	-	-
Moisture	N	2030	%	0.02	8.9	11	9.3	9.7	11	9.2	8.3	8.9	9.2	8.9

Results Summary - Soil

Project: COED DARCY

Client: Enverity	Chemtest Job No.:				14-16457	14-16457	14-16457	14-16457
Quotation No.: Q14-02412	Chemtest Sample ID.:				80017	80018	80019	80020
Order No.:	Client Sample Ref.:							
	Client Sample ID.:				PITP044 W	PITP044 N	PITP044 E	PITP044 S
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.9	0.9	0.9	0.9
	Bottom Depth(m):							
	Date Sampled:				10-Dec-14	10-Dec-14	10-Dec-14	10-Dec-14
Determinand	Accred.	SOP	Units	LOD				
ACM Type	U	2192			-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry	U	2192	%	0.001	-	-	-	-
Total Asbestos	N	2192	%	0.001	-	-	-	-
Moisture	N	2030	%	0.02	9.6	10	9.8	7.0

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Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

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- C - Sample not received in appropriate containers
- D - Broken Container

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All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

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Coed Darcy

Validation Report
Monitor Phase 32

St Modwen Developments Limited



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Document history

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Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
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1	Response to Monitor RFI	DKH	MP	MW	MP	Oct 2015

Client signoff

Client	St Modwen Developments Limited
Project	Coed Darcy
Document title	Monitor Phase 32 Validation Report
Job no.	5122307
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Appendices

Appendix A.	Summary of Adopted Thresholds
Appendix B.	Exploratory Hole Logs
Appendix C.	Laboratory Analytical Results – Ground Investigation
Appendix D.	Technical notes of stockpiles used
Appendix E.	Photo Sheet
Appendix F.	RBSL Failure Excavations

Drawings

5041216-REM-DWG-1943 - Phase Boundary Plan
5041216-REM-DWG-1944 - Monitor Phase 32 - Historical Layout
5041216-REM-DWG-1945 - Monitor Phase 32 - Historical Exploratory Hole Locations
5041216-REM-DWG-1946 - Monitor Phase 32 - Recent Exploratory Hole Locations
5041216-REM-DG-REM-C-2115 - Monitor Phase 32 Pre works Topographic Survey
5041216-REM-DG-REM-C-2106 - Monitor Phase 32 Post works Topographic Survey
5041216-REM-DG-REM-C-2107 - Monitor Phase 32 Base of Excavation Survey
5041216-REM-DG-REM-C-2114 – Monitor Phase 32 backfill Isopachyte Survey
5041216-REM-DG-REM-C-2122 – Monitor Phase 32 pre works and base of excavation Isopachyte Survey

Glossary of Terms

Term	Meaning / Definition
CSM	Conceptual Site Model
RBSL	Risk Based Screening Level
ACM	Asbestos Containing Material
TPH	Total Petroleum Hydrocarbons
PAH	Polycyclic Aromatic Hydrocarbons
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
FFL	Finished Floor Level
mAOD	metres Above Ordnance Datum
RAP	Remedial Action Plan
VO	Visual/Olfactory Observations
BGL	Below Ground Level

1. Introduction

1.1. Background

Atkins Limited has been commissioned by St. Modwen Developments Ltd (St. Modwen) to provide consultancy advice with regard to the redevelopment of the former Llandarcy Oil Refinery as Coed Darcy.

The purpose of this report is to provide data relating to Monitor Phase 32 to confirm the suitability of this area for redevelopment in line with the specific requirements of the Section 106 Agreement (S106) in order for St. Modwen to achieve sign off by the Monitor. For the purpose of Monitor sign off, this area proposed as Monitor Phase 32 is shown on Drawing 5041216-REM-DWG-1943.

Based upon the current Masterplan, it is understood that Monitor Phase 32 is proposed for a residential end use and associated highways within the final development. In the short term, part of Monitor Phase 32 is occupied by a site compound for the next phase of residential housing to be constructed by St. Modwen Homes to the south-east of Phase 32. It is assumed that as part of the decommissioning of the compound that any plant, machinery and specific compound covering will be removed as part of the plot preparation works.

In the absence of detailed information relating to any proposed layout and/or finished floor levels (FFL) across this area, the following assessment assumes that existing ground levels represent a depth of 1m below FFL for the purpose of comparison with the requirements of the S106.

1.2. Aims and Objectives

This report provides an overview of the site including information regarding the site setting, local geology and hydrogeology, identified contamination and discussion of any remedial works undertaken, where required.

This information will be presented in such a way that it will enable the Monitor to sign off Phase 32 as suitable for its proposed future use.

In the long term, it is anticipated that the suitability of land quality will need to be reassessed once detailed development proposals for each area are defined. Planning Condition 44 of the Outline Planning Permission for the site (P2005/0393) requires that:

Prior to the submission of the first reserved matters application on each phase of development, notwithstanding the provisions of Condition 26, a phase specific remediation strategy focusing upon the remediation requirements of that area shall be submitted to and approved in writing by the Local Planning Authority. The submitted documents shall include the results from the site investigation and risk assessment; and using the above information a method statement shall be submitted detailing remediation measures and a detailed programme for the submission of verification reports upon completion of the remedial works confirming implementation of agreed measures, together with proposals for future monitoring and reporting. The approved details shall be fully implemented on site, in line with a schedule of works that shall form part of the details submitted to the Local Planning Authority for approval.

In line with the detailed information relating to historical and recent ground investigation and laboratory analysis for Monitor Phase 32, as provided in the following report, it is envisaged that this document would form part of any later planning submission for this part of the site in line with the requirements of Planning Condition 44.

1.3. Scope of Work

The scope of works includes:

- A review of all readily available information including geological, hydrogeological, historical site plans, Environment Agency and British Geological Society (BGS) records.
- A review of available historical maps relating to Monitor Phase 32 and adjacent areas;
- A review of historical (1998-2004) and recent (2014) ground investigation information relating to Monitor Phase 32;
- Details of any remedial works undertaken, and
- Details of all validation in order to confirm that the remedial works were successfully carried out and to demonstrate that this area is now suitable for use in line with the required criteria.

1.4. Soil Quality Assessment Standards

To maintain consistency of approach, the assessment standards for historical and recent data are those stated in the S106 Agreement for Coed Darcy. The visual and aesthetic classification system, as previously defined by BP within the S106, is provided as Table 1.1.

Atkins proposes to continue this system for the classification of all soils encountered, to aid assessment of each area in terms of the required remediation requirements. The assigned classifications for each strata are quoted on the trial pit logs for recent ground investigation by Atkins (refer to Section 5).

Table 1.1 – Scale of Aesthetic Criteria

Class	Visual	Olfactory
0	No visible staining of soil, no visible suspect ACM*.	No detectable odour on soil.
1	Occasional staining of soil, no visible suspect ACM*.	Faint odour on soil.
2	Frequent staining of soil.	Distinct but not strong odour on soil.
3	Occasional heavy staining of soil.	Strong odour on soil.
4	Heavy staining of soil.	Strong odour discernible in ambient air.
5	Visible hydrocarbon present.	Overwhelming odour.

* visible suspect ACM refers to asbestos containing material visible to the naked eye which a reasonable and prudent person used to managing asbestos may suspect to be asbestos-containing.

The S106 for the proposed development presents a series of Risk Based Screening levels (RBSLs). These levels are defined in the S106 as being the 'minimum base level standard' for redevelopment remediation works (Schedule 8, Part 2, Paragraph 2,5).

In order to update the assessment of contamination in line with current UK guidance, these RBSLs are also now supplemented by a series of Remedial Target Concentrations (RTCs) derived by Atkins (Atkins reference: 5041216-REM-REP-000216 v3). A summary of the adopted thresholds for Monitor Phase 32 are presented in Appendix A.

Details of the required frequencies of testing, as stated within the S106, are presented in Section 7.

Compliance with the redevelopment remediation requirements stated within Schedule 8 of the S106 (refer to Section 4) form the basis for obtaining the relevant sign off from the Monitor.

1.5. Information Sources

Information, reviewed as part of the following assessment, has been obtained from the following sources:

- URS BP Llandarcy Refinery Desk Study 44382742/BRRP0001, July 2007
- URS Report FR1287 Final Factual Report for Ground Investigation, August 2005
- Section 106 Deed of Planning Obligations (Dewey & LeBoeuf report GNP/NJR/13773-2), February 2008.

1.6. Limitations

As previously indicated, this report has been prepared with the sole intention of providing sufficient information to enable St. Modwen to obtain Monitor sign off for Monitor Phase 32 in accordance with criteria set out in the Coed Darcy Section 106 Agreement. Whilst the report may be relevant for submission as part of a reserved matters planning application, additional reports and submissions may be required as part of any future plot development.

The investigation works undertaken and summarised within this report represent a sampling exercise to determine ground conditions, in line with the required methodology outlined within the S106. The proposed works were carried out predominantly to investigate contamination across this area and do not include a review of any geotechnical issues or constraints that may exist which would need to be taken into account as part of any proposed redevelopment.

In addition, it should be noted that ground and groundwater conditions can vary over time and between sampling points. Whilst this report provides information relating to the removal of identified pipework and below ground structures encountered during the works, unidentified pipework and/or structures may still exist in situ.

2. The Site

2.1. Location and Description

Monitor Phase 32 (the site) is an irregular shaped parcel of land covering approximately 1.9ha (hectares), shown on Drawing 5041216-REM-DWG-1943.

Monitor Phase 32 is located towards the western end of the Middle Terrace area of the former Llandarcy Oil Refinery. The site is located within part of the former operations and processing area of the site. Existing hardstanding and infrastructure from within Monitor Phase 32 has been historically removed by Hawk, on behalf of St. Modwen, and this area currently comprises an area of bare ground at the time of writing. As indicated, part of Monitor Phase 32 is currently in use as a site compound for St. Modwen Homes in association with the next phase of proposed residential housing to be constructed south-east of the site. The remainder of the site is currently unoccupied.

Ground levels across Monitor Phase 32 fall towards the north, with elevations of approximately 65m/66m Above Ordnance Datum (mAOD) on the southern boundary reducing gradually to 60mAOD towards the north, shown on drawing 5041216-ATK-DR-C-REM-DWG-2106.

2.2. Historical Land Use

Construction of Llandarcy Oil refinery commenced in 1917 but was temporarily suspended during the war due to the lack of men and resources. Construction started again in 1919 with production beginning in 1921. The refinery was officially opened in 1922.

The purpose of the refinery was to produce motor spirit, kerosene, gas fuel oil, fuel residue and lubricating oil and wax from imported crude oil. Between the wars, the oil industry developed rapidly. By 1939, the refinery had little of the original plant in operation.

In the mid 1980's a number of rationalisations occurred with the closure of the refinery being formally announced in 1997.

Based upon the information in URS Report 44382742/BRRP0001, Monitor Phase 32 was formerly used for a number of processes and operations. The site can be considered as three areas for the purpose of describing the history. Historical land use of Monitor Phase 32, based on the information available, is shown on Drawing 5041216-REM-DWG-1944. The activities undertaken in each of the three areas are summarised below:

- Northern Area – Part of the No.2 Catalytic reformer is shown to have been present in this area from the mid-1950s to 1989. The primary process for this activity was the conversion of low octane fuels in higher octane fuels called reformates. An electrical substation (No. 10) is also located in the east of this area. The north of this area encroaches on the former No1 Crude Distillation Unit which was in use from the 1950s to the 1970s.
- Central Area –shown to have historically been occupied by part of the catalytic cracking plant and deodoriser from the mid-1950s until 1989. Within this area, heavy feedstock under high temperature and pressure were split into shorter chain hydrocarbons. Associated infrastructure and tanks are also shown in this area and the NS (North South) pipe route was aligned directly adjacent to the eastern boundary of this central area.
- Southern Area – historically comprised the EW (East West) pipe route and part of the Top Terrace Process Plant from the 1950s to the 1970s. The area is shown to have been occupied by the propane de-asphalting plant, electrical substation No. 9 and part of the No. 4 Vacuum Distillation Unit. An access road runs east-west through the north of the area.

Existing tanks and above ground infrastructure were removed from Monitor Phase 32, prior to acquisition of the refinery by St. Modwen in 2008. It is not known, therefore, what condition these were in when they were removed in terms of the potential for historical spillage and leakages within this area.

2.3. Published Geology

A review of published geological information (BGS map 247, Swansea (1:50,000 scale) indicates Monitor Phase 32 to be underlain by:

- Till (Diamicton), a heterogeneous deposit of glacial origin, which extends across the whole area.
- South Wales Upper Coal Measures Formation, specifically the Hughes Member, which is described by the BGS as *'green-grey, lithic arenites ("Pennant sandstones") with thin mudstone/siltstone and seatearth interbeds and mainly thin coals'*.

2.4. Hydrogeology and Hydrology

2.4.1. Groundwater

Environment Agency data suggests that the Till (Diamicton) underlying Monitor Phase 32 is classified as 'Unproductive Strata'. These are defined as:

'...rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.'

The underlying sandstone bedrock is classified as a 'Secondary A Aquifer'. This is defined as:

'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.'

Groundwater flow within Monitor Phase 32 is assumed to be towards the north west, based upon available monitoring data and information contained within URS Report FR1287.

2.4.2. Surface Waters

The closest water feature to Monitor Phase 32 is the Crymlyn Bog, which lies approximately 370m to the west.

South Site Reservoir lies approximately 375m to the north west of Monitor Phase 32.

There is currently no formal drainage on the site. Informal surface water control ditches feed eventually into a temporary system which transfers all water to the North Site Reservoir located to the north of the site.

2.5. Landfills and Waste Management Facilities

There are no landfills immediately adjacent the Site. St. Modwen is currently in the process of restoring the closed landfill associated with the former Llandarcy Oil Refinery, located 460m to the south-west of Monitor Phase 32. Discussions are ongoing with Natural Resources Wales relating to the surrender process of Environmental Permit No. EPR/AP3990LR.

2.6. Sensitive Land Uses

Crymlyn Bog Site of Special Scientific Interest (SSSI) lies within the flood plain of the Neath river estuary and represents the most extensive area of lowland fen in Wales. This lies approximately 370m to the west of the site.

Crymlyn Bog SSSI is internationally important for its very wet mires often identified by an unstable 'quaking' surface. Bottle sedge and bogbean are important components of some stands, together with common cottongrass, water horsetail, star sedge, mud sedge, and in places, the nationally rare slender cottongrass. Crymlyn Bog supports the largest area of calcium-rich fen dominated by great fen sedge vegetation in south Wales. Some of these stands are dominated by great fen sedge, but other areas display a more diverse vegetation in which tufted-sedge, royal fern and a range of tall-herb fen species are prominent. Some of these stands are unique in a Welsh context. In addition there are areas of wet woodland with alder and willow being the dominant species (<http://www.ccg.gov.uk/landscape--wildlife>)

3. Historical Ground Investigation by URS

3.1. Recorded Ground Conditions

3.1.1. Historical Exploratory Holes (URS, 1998-2004)

The locations of 24 No. historical exploratory holes reported to have been carried out within Monitor Phase 32 by URS on behalf of the previous site owner BP, are shown on Drawing 5041216-REM-DWG-1945.

Made Ground was historically recorded within the majority of the exploratory holes from ground level to depths up to 2.3m bgl (WSMW047 in the north west of Monitor Phase 32). Where encountered, the Made Ground is reported to have typically comprised a blackish brown gravelly sand or sandy gravel of sandstone gravel with anthropogenic inclusions of brick, concrete, ash, clinker and wood.

Superficial Deposits were found to underlie the Made Ground within ten of the exploratory holes and are described as a mixture of silts, sands and gravels.

Competent sandstone bedrock is reported to have been encountered underlying the Superficial Deposits within eight of the exploratory holes at depths between 0.1m and 1.8m bgl.

Recorded groundwater strikes ranged in depth from 0.9m bgl to 2.75m bgl, however this is potentially perched water rather than true groundwater which is assumed to be in the (deeper) bedrock.

Contamination is described to have been observed within the majority of the exploratory holes with heavy staining and/or strong hydrocarbons odours typically observed towards the base of the Made Ground. Free product was recorded in conjunction with groundwater ingress in WSTP039, WSTP045, WSTP296 and WSTP297. Free product was also observed at 0.3m bgl in WSTP090, and associated with a severed pipe at 0.3m bgl in WSTP153. Free product was also reported at the base of MSTP151 and MSTP163.

3.1.2. Historical Exploratory Holes (Atkins, 2011)

Atkins undertook 6 No. trial pits across the central area of Monitor Phase 32 in 2011. All trial pits encountered Made Ground ranging in depth from 0.4m to 1.15m bgl. The Made Ground is typically described as gravelly sand with brick, concrete and sandstone inclusions. Sandstone bedrock was recorded directly under the Made Ground. The depth to bedrock was noted to be a maximum of 1.15m bgl, with no discernible dip or trend.

Groundwater ingress was encountered in 5 No. trial pits and ranged in depth between 0.4m to 1.1m bgl. The groundwater was typically encountered on top of the sandstone bedrock so is assumed to represent perched groundwater rather than the actual main groundwater level.

Heavy staining was noted within MTV018 (VO 5,1) within Made Ground encountered between ground level and 0.4m bgl. Free product was observed on in-gressing groundwater at 0.40m depth in Made Ground in MTV018 and on groundwater within bedrock at 0.60m depth in MTV019. The highest VO score recorded within the remainder of the exploratory holes was (2,1) recorded within MTV023 between 0.30m and 2.0m depth.

3.2. Soil and Groundwater Contamination

Visual and olfactory evidence was observed in many of the historical exploratory holes. Review of the limited data available shows that exceedances were recorded in the laboratory data when compared to the adopted thresholds for retention at depths within a residential area.

TPH Aromatic and Aliphatic C8-C10 was recorded above the soil RBSL in WSMW048, WSMW082 and WSTP050 and TPH Aliphatic C8-C10 was recorded above the RBSL in WSTP039. Naphthalene was recorded above the RBSL in WSTP153 and a trace concentration of amosite asbestos was recorded in WSMW082 (pit) at 0.3m.

Exceedances of the RBSL for groundwater in a residential land use were recorded in WSMW026 for TPH Aromatic C5-C7, TPH Aliphatic C8-C10 and TPH Aliphatic C10-C12 and in WSMW048 for TPH Aromatic C5-C7 and TPH Aliphatic C8-C10. Free product was identified in the historical wells during groundwater monitoring.

TPH exceedances were recorded within MTV023 within Made Ground and natural ground. Asbestos in the form of Chrysotile and Amosite was identified in MTV018, MTV020, MTV021, and MTV022.

4. Plot Preparation and Backfilling Works

4.1. Introduction

4.1.1. Works Summary and Programme

Following the historic investigation summarised above, Monitor Phase 32 underwent a programme of reclamation between summer 2013 and winter 2015. These works comprised the excavation of in situ soils down to bedrock across the whole of the Site.

Works were initiated in 2013 to prepare the Road 50 corridor and create a housing plot to the south of Road 50. This prepared housing plot formed Monitor Phase 33 (the St. Modwen Homes plot). Works to prepare Monitor Phase 33 extended westwards into the area now forming the southern area of Monitor Phase 32. This area is shown unshaded on Drawing 5041216-REM-DWG-1946 and was excavated to bedrock and backfilled with selected arising's by summer 2014 to create a uniform development plateau.

Works on the northern area, marked grey on Drawing 5041216-REM-DWG-1946, was initiated to provide an area for a works compound. Excavation commenced in December 2014 and was backfilled to create a level prepared surface by February 2015.

4.1.2. Reclamation Process and Rock Exposure

During the reclamation, excavated soils were segregated initially based on visual inspection for their potential re-use as suitable fill materials within a proposed residential area. Unsuitable materials, i.e. those exhibiting V/O >2, were taken to the treatment areas on the Southern Tank Farm, within the wider Coed Darcy site.

Remnant structures, such as concrete and brickwork, were removed from this area and taken to a stockpile for crushing. Recovered pipework and other unsuitable materials, such as wood and other metal, were removed from this area for recovery and disposal off site.

The earthworks balance for the whole reclamation process is as follows:

Total cut = 41,721 m³

Total fill = 28,557m³ (21,976m³ North 6,581m³ South)

Pre-works ground levels are shown on Drawing 5041216-ATK-DR-C-REM-2115. An as-built Base of Excavation drawing is presented as Drawing 5041216-ATK-DR-C-REM-2107. The post works levels are presented on drawing 5041216-ATK-DR-REM-2106. An isopachyte showing depth of fill is presented as drawing 5041216-ATK-REM-2114.

On removal of the overlying soils, the exposed sandstone surface was then inspected in line with the Scale of Aesthetic Criteria defined in the S106. Photographs can also be seen of the bedrock on the Appendix E photo sheet. Bedrock was exposed in all areas of the Site.

Southern Area

On exposure the southern area formed a broad level plateau with notable local undulations reaching to the base of the cliff which forms the southern boundary of the Site. There was local evidence of hydrocarbon staining and small scale product seepages although these were found to be non-persistent when removed and observed over a period.

Northern Area

Within the northern area the exposed bedrock profile was notably undulating with some evidence of previous excavations into which refinery process pipework would have been placed. This is shown in Appendix E Photo Sheet.

At the surface of the bedrock in many locations, most notably the suspected pipe runs, were oily residues including free product. Impacted rock was scraped and broken out to remove the gross contamination. In the north of this area the bedrock profile dropped steeply and mirrored the general fall in topography. In this area bedrock quality at the surface appeared good although local sheens and oily seepages were observed emanating from some bedding planes where the bedrock fell away to the north.

Bedrock Inspections

Given the extent of oily residues at the surface of the bedrock in the northern area an extended time was allowed prior to backfilling for monitoring and visual inspections of the exposed sandstone bedrock. Inspections took place across most of the northern area between December 2014 and February 2015 prior to backfilling.

Across the majority of the exposed northern area no free phase was observed to remain at the surface with the exception of minor sheens. Some localised areas of dark sandstone were identified as comprising thin traces of carbonaceous material rather than as a result of hydrocarbon staining.

In the far north, some minor oily seepages persisted at the time of completion of the backfilling in February 2015. This area was not backfilled and observation continued through spring and summer 2015. Observations over this extended period indicate that apart from minor sheens there were no further oily discharges.

The nature of backfill materials across Monitor Phase 32 are discussed in Section 4.2. Photographs of the exposed bedrock are provided in Appendix E.

4.2. Backfilling Works

4.2.1. Introduction

In line with the programme of works across Monitor Phase 32, backfilling works took place in two main phases.

In the northern area materials used for backfilling were sourced from pre-validated stockpiles. In the southern area backfilling commenced with excavated materials pre-selected on a visual basis. Additional in-situ validation was undertaken on the southern backfill by a series of machine excavated trial pits.

A recent topographical survey is presented in Drawing 5041216-ATK-DR-C-REM 2106.

4.2.2. Stockpile Validation Sampling

Materials from the following stockpiles were used as backfill to Monitor Phase 32, details of which are presented in Appendix D.

- Stockpile 109a – 3,273m³ - 40 samples taken with a validation frequency of 1 per 87m³ (a single exceedance of the asbestos RBSL dictated that this material was only used in those areas which could reasonably be guaranteed to be below -2m FFL i.e. the southern part of the northern area)
- Stockpile 119 – 3,400m³ - 40 samples taken with a validation frequency of 1 per 85m³
- Stockpile 126 – 3,839m³ - 39 samples with a validation frequency of 1 per 98m³
- Stockpile 127 – 4,919m³ - Rock backfill - visually validated using the V/O criteria before placement.
- Stockpile 129 – 2,000m³ - 20 samples taken with a validation frequency of 1 per 100m³
- Stockpile 130 – 2,700m³ - 28 samples taken with a validation frequency of 1 per 96m³

Not all material from each stockpile was utilised. Usage depended also on geotechnical suitability and weather conditions at the time of placement.

Backfilling of the northern and southern areas are discussed separately below.

4.2.3. Northern Area (SMH Compound)

Backfilling of the Northern Area commenced progressively in January 2015 using material determined to be suitable for use as a general fill material from Stockpile 127 (SP127). This material was primarily used to infill irregularities in the bedrock surface in order to provide a flat surface on which to bulk backfill.

The material within SP127 was coarse granular gravels and cobbles of site won sandstone. This material was validated based on a visual and olfactory basis prior to use and during placement. No evidence of any material possessing a VO classification of >2 were recorded.

Following the placement of material from SP127, material from SP126, SP109a, SP119, SP129 and SP130 validated for use within a >1m below FFL residential end use, was placed as bulk backfill. Although tested in the stockpiles, the material was additionally inspected on placement to remove any erroneous oversize or unacceptable materials including local V/O failures. The material generally comprised re-worked natural materials and was rolled in place.

Chemical screening data for the material and for site won 6F2 is presented within Appendix D. The backfilling to the compound area was completed with a capping of between 0.5 and 0.7m of crushed site won 6F2, which it is understood will be removed when the compound is dismantled.

Surveying records indicate the placement of:

- 3,264m³ of SP127
- 15,217m³ of SP109a, SP119, SP126, SP127, SP129, and SP130
- 3,500m³ of 6F2

4.2.4. Southern Area

Backfilling works within the Southern Area commenced with the placement and rolling broken bedrock materials from stockpile SP127 as detailed in Section 4.2.2. These piles were visually inspected and validated for reuse using the aesthetic criteria.

Bulk up-filling utilised site won material selected on a visual and olfactory basis. Due to the use of additional materials not tested in stockpiles prior to re-use, a series of machine excavated trial pits were undertaken as an additional validation of the suitability of materials across this part of Monitor Phase 32 (see Section 4.3 below).

Surveying records indicate the placement of:

- 1655m³ of SP127
- 4926m³ selected site won material

4.3. Southern Area - Backfill Validation

With the aim of supplementing and updating the limited historical investigation, a total of 52 machine excavated trial pits were undertaken across the southern area of Monitor Phase 32 by ESG in March 2015.

The locations of all of the recent trial pits are shown on drawing 5041216-REM-DWG-0001946.

Copies of all exploratory hole logs, for the recent investigation works by ESG, are presented in Appendix B.

4.3.1. Recorded Ground Conditions

Consistent with plot preparatory works and the removal of in situ soils from across this area, Made Ground was encountered in every trial pit across the Monitor Phase 32 southern area.

The Made Ground typically consisted of greyish brown slightly silty gravelly sand to gravelly silt, containing brick, sandstone and concrete fragments. Made Ground was observed from surface to a maximum depth of 2.1m bgl.

Materials described as 'superficial deposits' are suggested to have been encountered in one trial pit (IP4080-307) and described as grey sandy fine to coarse gravel, with a cobble content of angular sandstone. Due to the re-use of suitable site won sandstone as backfill (SP127) it is considered likely that these represent fill materials rather than in situ soils.

All trial pits terminated on sandstone bedrock, encountered beneath Monitor Phase 32 as a weathered zone comprising sandy tabular sandstone gravel, cobbles and occasional boulders. The depth to bedrock varies across the reported area, ranging from 0.6m bgl to 2.1m bgl, being generally shallower towards the south.

Water strikes (described as pooling or fast flow) were recorded in six of the trial pits excavated in the Monitor Phase 32 southern area, at depths ranging from 1.25m bgl to 1.9m bgl. It is considered that this represents perched water within fill materials overlying the sandstone bedrock.

Recorded visual/olfactory classes are reported to vary between 0 and 2. Trial pit IP4080-307 recorded a VO score of 3, 3 for the superficial deposits between 1.2m to 1.4m bgl under the Made Ground. This was associated with a fast inflow of water with oil being described on the surface. (Note: The soil sample taken at 1.2m bgl had no exceedances above the RBSL for deep residential.) See Section 4.4 for further discussion of this V/O exceedance.

4.3.2. Laboratory Analysis

A total of 84 No. soil samples representing identified soils from across the Monitor Phase 32 southern area and were analysed by Alcontrol Laboratories for a general suite of contaminants in line with the adopted thresholds. Copies of the laboratory data are supplied in Appendix C.

A generic suite comprising the majority of determinands listed in the RBSLs, was scheduled on all soil samples collected during the ground investigation.

Once determined, should final floor levels be proposed to lie at or below the current ground levels, the availability of this additional data will enable a reassessment of the relevant data without the need for further investigation and/or additional sampling.

The analytical suite comprised:

- Metals - arsenic, cadmium, chromium, copper, lead, nickel, mercury, selenium, vanadium, zinc (all samples);
- pH (all samples);
- Polycyclic Aromatic Hydrocarbons (all samples);
- Speciated Petroleum Hydrocarbons plus BTEX hydrocarbons (all samples);
- Soil Organic Matter (selected samples);
- Volatile Organic Compounds (selected samples based on recorded odours of possible solvent origin); and
- Asbestos screen and identification (samples within top 1m from existing ground level only, assuming that current levels represent 1m below FFL and the asbestos RBSL does not apply at depths greater than 2m below FFL in any land use scenario).

4.3.3. Comparison with Risk Based Screening Levels

No chemical exceedances against the deep (>1m below FFL) residential Risk Based Screening Levels were identified in the laboratory data, supplied in Appendix C.

No visible asbestos containing material was observed in the soils during the ground investigation.

A total of 55 samples underwent laboratory analysis for asbestos. Asbestos fibres were detected in 42 samples and underwent quantitative analysis, as summarised in Table 4.1 below. The loose fibres were identified in microscopic analysis although visible ACM was not recorded during the ground investigation.

Concentrations lie below the permitted RBSL for shallow (<2m below FFL) soils within in a residential area (0.02%) and these soils are thus considered suitable for retention on site.

Table 4.1 - Summary of asbestos identified in Monitor Phase 32

Location	Depth (mbgl)	Type	Quantity
IP4067	0.5	Chrysotile	<0.001
IP4069	0.5	Chrysotile	<0.001
IP4072	0.5	Amosite	<0.001
IP4073	0.5	Chrysotile	NDP
IP4074	0.5	Chrysotile, Amosite	NDP
IP4075	0.5	Chrysotile	0.0043
IP4076	0.5	Chrysotile	<0.001
IP4077	0.5	Chrysotile	<0.001
IP4078	0.5	Chrysotile, Crocidolite	<0.001
IP4079	0.5	Chrysotile, Crocidolite	<0.001

Location	Depth (mbgl)	Type	Quantity
IP408	0.5	Chrysotile	<0.001
IP408	1.0	Chrysotile	<0.001
IP4080	0.6	Chrysotile	<0.001
IP4081	0.5	Chrysotile	<0.001
IP4082	0.5	Chrysotile	<0.001
IP4084	0.5	Chrysotile	<0.001
IP4087	0.5	Chrysotile, Amosite	<0.001
IP4091	0.5	Chrysotile, Amosite	<0.001
IP4092	0.05	Chrysotile	<0.001
IP4093	0.5	Chrysotile	<0.001
IP4094	0.5	Chrysotile	NDP
IP4099	0.5	Chrysotile, Amosite	0.001
IP4100	0.5	Chrysotile	<0.001
IP4101	0.5	Chrysotile	0.0028
IP4102	0.5	Chrysotile	0.0015
IP4103	0.5	Chrysotile	0.001
IP4105	0.5	Chrysotile, Amosite	<0.001
IP4105	1.0	Chrysotile	<0.001
IP4107	0.5	Chrysotile, Crocidolite	0.0037
IP4109	0.5	Chrysotile	0.0034
IP4109	1.0	Chrysotile, Amosite	0.0022
IP4110	0.5	Chrysotile	0.0015
IP4110	1.0	Chrysotile	<0.001
IP4111	0.5	Chrysotile	0.0014
IP4112	0.5	Chrysotile, Amosite	<0.001
IP4112	1.0	Chrysotile, Amosite	0.0018
IP4112	1.0	Chrysotile, Amosite	<0.001
IP4113	0.5	Chrysotile	<0.001
IP4114	0.5	Chrysotile, Crocidolite	<0.001
IP4115	0.5	Chrysotile	<0.001
IP4116	0.5	Crocidolite	<0.001
IP4118	0.5	Chrysotile, Amosite	<0.001

4.4. Follow Up Ground Investigation - September 2015

A follow-up investigation was conducted into conditions around Trial Pit IP4080-307 which previously identified possible free product (and V/O 3,3). The location was revisited with another larger excavation to check the V/O score and presence of free product.

The excavation measured 12m by 10m and 1.5m deep terminating on bedrock, see Photo Sheet E. No free product was identified and no V/O scores >2 were recorded. During excavation, 5 samples were taken which are representative of the excavation. Laboratory data is supplied in Appendix F and photos are on Photo Sheet E.

4.4.1. Laboratory Analysis and Results

A total of 5 soil samples representing identified soils from the excavation were submitted to Alcontrol Laboratories and analysed for a suite of contaminants considered appropriate for the former use of the area. This is supplied in Appendix F.

The analytical suite comprised:

- Speciated Total Petroleum Hydrocarbons plus BTEX hydrocarbons (all samples);

In line with the proposed end use of this area as residential as detailed in Section 6.1, the results of laboratory analysis have been compared with the adopted chemical thresholds for deep soil (>1m below FFL) in a residential setting. No exceedances of the thresholds were recorded.

5. Validation

5.1. Requirements of the S106

Monitor Phase 32 is shown as a residential development based on the current Masterplan.

Following the review of available data, the Monitor Phase 32 area is considered to represent a **'residential end use where groundwater is in rock'** scenario, as outlined in the S106.

Based upon this classification, the following remediation requirements are stated in the S106 (Schedule 8, Section 4.0) as being the minimum remediation requirements required in order to release this area for redevelopment as residential housing.

- *All oil saturated soils should be removed.*
- *All soils must be remediated so as to meet the RBSLs for TPH, BTEX and PAHs at the relevant depth relative to FFL and aesthetic criteria Class 2 or better at greater than 1m below FFL.*
- *The aesthetic quality of soils shall be Class 1 or better for at least the first metre below FFL.*
- *Soils where there is visible ash and clinker, or metal concentrations above RBSLs, are to be removed so that none is retained within the first metre below FFL in garden areas.*
- *Where it is not practicable to address groundwater contamination within bedrock, this must be controlled eg, where seeps, sheens and iron staining discharge from the bedrock. Acceptable methodologies for remediation may include, but are not limited to, the use of land drainage via interceptors. Control measures should result in no visible discharge at the surface and little or no odour observable.*
- *All soils potentially containing dispersed asbestos fibres or visible ACM must be removed or remediated to meet in bulk, considering both dispersed fibres and pieces of ACM, the appropriate ACM RBSL, or to meet the requirements of relevant Environmental Authorities, whichever is the more conservative.*

S106 requirements for a residential end use where groundwater is in soil (Schedule 8, Part 3, Para 5.6) requires the following:

- *'All soil potentially containing dispersed asbestos fibres or visible ACM must be removed or remediated to meet in bulk...the appropriate ACM, or the requirements of the relevant Environmental Authorities, whichever is the most conservative, to a minimum depth of 2m below FFL'.*

Schedule 10, Paragraph 6 of the S106 states that 'Irrespective of the Intended Use of each Phase or part thereof, all existing buried services at the Property shall be removed and the routes of those services shall be backfilled with material no more permeable than the general material in the vicinity'. Where required, it is envisaged that such works would be carried out in conjunction with other remedial works within an area.

5.2. Validation Requirements of the S106

The S106 (Schedule 8, Part 3, Section 8) sets out the requirements for validation testing which need to be complied with to enable Monitor sign off as part of the ongoing redevelopment of the former Llandarcy Oil Refinery.

Details of relevant frequencies relating to Monitor Phase 32 are presented in Table 5.1.

Table 5.1 - Minimum Validation Testing Frequencies - Residential End Use

Testing for the Validation Suite ¹ at the following frequency:	Deeper Soils (Residential >1m below FFL)
Imported quarried material	1 per 1000m ³ ex situ, composite of 5 regular sub-samples
Imported soil from verified greenfield site	1 per 500m ³ ex situ, composite of 5 regular sub-samples
Imported soil from characterised brownfield site ¹	1 per 50m ³ ex situ, composite of 5 sub-samples
0.5-1m below FFL in-situ	n/a
>1m below FFL in-situ	Regular grid of 1 per 100m ² , sample over 1m depth
Stockpiled excavated site materials for re-use	1 per 100m ³ ex situ, composite of 5 sub-samples
Face of remedial excavations <1m deep	n/a
Face of remedial excavations >1m deep	1 per 10m ² , minimum of 1 per face, worst case VO sample
Along redundant service excavations	1 per 20m of trench, worst case VO sample
Soil treated ex-situ and homogenised	1 per 200m ³ , composite of 5 regular sub-samples

¹ Validation suite to reflect prior use of the originating brownfield site and the design and purpose of the relevant area of Coed Darcy.

VO = visual/olfactory (i.e. aesthetic) observation

As previously stated, in the absence of any information relating to proposed development levels for this area, it has been assumed that current ground level within Monitor Phase 32 (Drawing 5041216-REM-DWG-2106) represents a level of 1m below FFL for the purpose of comparison with the requirements of the S106.

5.3. Sampling Frequencies

5.3.1. Ground Investigation

5.3.1.1. Northern Area

As discussed in Section 4.2.2, the rock fill from SP127 was validated with use of the V/O scoring criteria, no exceedances >2 were identified and subsequently no samples were taken. Material used as bulk backfill was taken from stockpiles which were tested at frequencies of between 85m³ and 100m³ which complies with the required sampling frequency of 1 sample per 100m³.

5.3.1.2. Southern Area

The locations of recent ground investigation trial pits across the southern part of Monitor Phase 32 are shown on Drawing 5041216-REM-DWG-1946. Relevant exploratory logs are presented in Appendix B.

A total of 52 trial pits have been undertaken within Monitor Phase 32.

A total of 84 environmental samples from Monitor Phase 32 have been subject to laboratory analysis (refer to Appendix C).

Based on an approximate area of 5,000 m², 52 trial pits equates to an approximate frequency of one pit per 96m². Given the calculated backfill volume of 6,581m³, a total of 89 samples equates to an approximate sample validation frequency of 1 test per 74m³.

The validation frequencies are compliant with minimum frequency of 1 test per 100m³ for stockpiled excavated site material for re-use, and 1 test per 100m² for in situ materials >1m below FFL.

5.4. Summary

A summary of the status of Monitor Phase 32, in line with the requirements of the S106 is presented in Table 5.2 below:

Table 5.2 – Validation Summary

Requirement	Status	Comment
Chemical quality of soils in situ	Complete	See Section 6.3. Testing frequency compliant with proposed frequency for Monitor Phase 32.
VO quality of soils in situ	Complete	Observations of backfill when placed and subsequent validation testing of the in-situ materials indicate materials to be compliant with the V/O requirements for residential >1m FFL.
Observations of groundwater for the presence of free phase product	Complete	Groundwater is considered to lie within the bedrock. Observations of bedrock on exposure and subsequent validation excavations indicate the absence of significant free phase.
Chemical and VO quality of imported material	N/A	No materials from outside the Coed Darcy site were imported to Monitor Phase 32 during the works. Materials used include validated stockpile soils and backfill validated in-situ which was tested and validated at the appropriate frequency of less than 1 sample per 100m ³ .
Compliance with adopted thresholds	Complete	No exceedances of chemical thresholds for the appropriate depth interval were recorded.
Removal of oil saturated soils	Complete	All oil saturated soils, including the upper margins of the impacted bedrock were removed.
Asbestos Assessment	Complete	Asbestos analysis was undertaken at an appropriate frequency on backfill soils with no samples recording concentrations above the asbestos RBSL. There were no observations of visible asbestos during reclamation or backfilling works.
Control of seeps, sheens and iron staining from bedrock	N/A	Exposed bedrock section in the north exhibited some minor groundwater seepage but did not appear to contain significant sheens or iron staining.

6. Summary

Atkins has been commissioned by St. Modwen Developments Ltd to undertake an assessment of an area of the former refinery with a view to enabling Monitor sign-off for this area in terms of a proposed commercial end use. For the purpose of Monitor Sign off, this area shall be referred to as Monitor Phase 32.

Based upon the findings of recent investigations and in line with the scope of recent remedial works undertaken, this area has been validated in accordance with the S106 and Monitor Phase 32 has been deemed to be suitable for residential end use >1m below FFL in line with the requirements of the S106.

It should be noted that recent ground investigation works focussed predominantly on contamination across this area and further assessment to assess potential geotechnical constraints within this Phase should be carried out prior to any proposed development.

Appendices

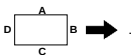
Appendix A. Summary of Adopted Thresholds

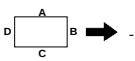
Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Benzo(a)pyrene	>sat	>sat
Benzene	0.4	0.4
Toluene	52	52
Ethylbenzene	140	140
Xylene	58	58
TPH aromatic C7-C8	146	146
TPH aromatic C8-C10	71	209
TPH aromatic C10-C12	1390	1390
TPH aromatic C12-C16	>sat	>sat
TPH aliphatic C6-C8	>sat	>sat
TPH aliphatic C8-C10	42.5	125
TPH aliphatic C10-C12	>sat	>sat
TPH aliphatic C12-C16	>sat	>sat
TPH aliphatic C16-C21	>sat	>sat
TPH aliphatic C21-C35	>sat	>sat
TPH aromatic C16-C21	>sat	>sat
TPH aromatic C21-C35	>sat	>sat
Total TPH (Phase 1)	9180	9180
Total TPH (Process Area)	4100	4100
Total TPH (North Tank Farm)	3800	3800
Total TPH (South Tank Farm)	2790	2790
1,2-Dichloroethane	0.0111	0.0176
1,1,1-Trichloroethane	10.8	25.9
Tetrachloroethene	2.3	6.12
Trichloroethene	0.188	0.463
Vinyl chloride	0.00093	0.00129
Dichloromethane	4.19	6.04
Cis-1,2-Dichloroethene	0.206	0.392
Trans-1,2 Dichloroethene	0.332	0.689
Acenaphthene	>sat	>sat
Anthracene	>sat	>sat
Benzo(a)anthracene	>sat	>sat
Benzo(b)fluoranthene	>sat	>sat
Benzo(g,h,i)perylene	>sat	>sat
Benzo(k)fluoranthene	>sat	>sat
Chrysene	>sat	>sat
Dibenz(ah)anthracene	>sat	>sat
Fluoranthene	>sat	>sat
Fluorene	>sat	>sat
Indeno(1,2,3-cd)pyrene	>sat	>sat
Pyrene	>sat	>sat
Phenol	1030	2340
Mercury (methyl)	27.7	62.5
Mercury (elemental)	0.291	0.87
Naphthalene	2.8	8.02
TPH aromatic C5-C7	0.46	0.987
TPH aliphatic C5-C6	112	246
1,1,1,2-Tetrachloroethane	1.84	5.09
1,1,2,2-Tetrachloroethane	4.71	11.3
Carbon tetrachloride	0.0309	0.0801
Chlorobenzene	17.9	47.9

Notes

- Where the lower of the vapour or aqueous saturation limits have been exceeded by the RTC calculated, the hazard quotient is considered to be less than 1 and as such >sat has been presented
- Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
- TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered and therefore no RTC value has been presented here
- 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
- Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
- TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- Asbestos has not been considered here as it is being considered in a separate report
- Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
- TPH aromatic C5-C7 is considered to comprise benzene only

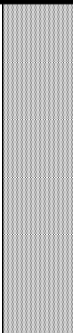
Appendix B. Exploratory Hole Logs

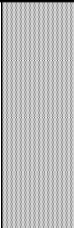
Logged NK Checked AP		Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit form GL to 0.60m. Terminated on bedrock.		Dimensions and Orientation Width 1.00 m Length 2.00 m 		Ground Level - Coordinates - National Grid - Chainage -	
Samples and Tests			Strata					
Depth	Type & No.	Date Records	Description			Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Brown silty gravelly fine to coarse SAND with medium cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone, concrete and brick. Cobbles are subangular to subrounded of sandstone, concrete and brick. (VO = 1,0) 0.60 m Bedrock			(0.60)		
			EXPLORATORY HOLE ENDS AT 0.60 m			0.60		
Depth	Type & No.	Records Date						
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)			Stability Stable Shoring None Weather Sunny		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:22:39 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited			Trial Pit IP4067-35 Sheet 1 of 1		

Logged NK Checked AP		Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 0.90m. Terminated on bedrock.		Dimensions and Orientation Width 1.00 m Length 2.00 m 		Ground Level - Coordinates - National Grid - Chainage -	
Samples and Tests			Strata					
Depth	Type & No.	Date Records	Description			Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Soft dark brown sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone, concrete and brick. Cobbles are subangular to subrounded of sandstone, concrete and brick. (VO = 1,1)			(0.90)		
			EXPLORATORY HOLE ENDS AT 0.90 m 0.90 m Bedrock.			0.90		
Depth	Type & No.	Records Date						
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)			Stability Stable Shoring None Weather Sunny		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:22:43 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited			Trial Pit IP4068-37 Sheet 1 of 1		

Logged JH Checked AP		Start 26/03/2015 End 26/03/2015		Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 0.90m. Terminated on bedrock.		Dimensions and Orientation Width 1.60 m Length 3.50 m  000 (Deg)		Ground Level Coordinates National Grid Chainage	
Samples and Tests			Strata						
Depth	Type & No.	Date Records	Description				Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Firm brown grey slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subangular of sandstone and brick. (VO = 0,0)				(0.90)		
			EXPLORATORY HOLE ENDS AT 0.90 m 0.90 m Bedrock.				0.90		
Depth	Type & No.	Records Date							
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)				Stability Stable Shoring None Weather Windy		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:22:47 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited				Trial Pit IP4069-52 Sheet 1 of 1		

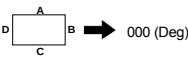
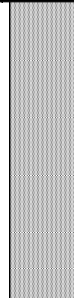
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Logged JH Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.10m. Terminated on bedrock.	Dimensions and Orientation Width 1.60 m Length 3.50 m A B C D ➔ 000 (Deg)	Ground Level Coordinates National Grid Chainage		
Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		(MADE GROUND) Firm brownish grey slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. Cobbles are subangular to subrounded of sandstone. (VO = 1,0)	(1.10)		
			EXPLORATORY HOLE ENDS AT 1.10 m	1.10		
Depth	Type & No.	Records Date				
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)	Stability Stable Shoring None Weather Rain/ Windy		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:22:55 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited	Trial Pit IP4071-32 Sheet 1 of 1		

Logged JH Checked AP		Start 26/03/2015 End 26/03/2015		Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 0.75m. Terminated on bedrock.		Dimensions and Orientation Width 1.60 m Length 3.50 m A B C D ➡ 000 (Deg)			Ground Level Coordinates National Grid Chainage		
Samples and Tests				Strata							
Depth	Type & No.	Date Records	Description					Depth, Level/ (Thickness)	Legend	Backfill/ Instruments	
0.50	ES 1		1 (MADE GROUND) Firm brownish grey slightly sandy gravelly sILT with medium cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subangular to subrounded of sandstone. (VO = 0,0)					(0.75)			
			EXPLORATORY HOLE ENDS AT 0.75 m					0.75			

Logged JH Checked AP		Start 26/03/2015 End 26/03/2015		Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.20m. Terminated on bedrock.		Dimensions and Orientation Width 1.60 m Length 3.50 m A B C D ➔ 360 (Deg)			Ground Level Coordinates National Grid Chainage			- - -
Samples and Tests			Strata									
Depth	Type & No.	Date Records	Description						Depth, Level/ (Thickness)	Legend	Backfill/ Instruments	
0.50	ES 1		1 (MADE GROUND) Firm brownish grey slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. Cobbles are subangular of sandstone and brick. (VO = 0,0)						(1.20)			
			EXPLORATORY HOLE ENDS AT 1.20 m						1.20			
		</										

Logged JH Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.10m. Terminated on bedrock.	Dimensions and Orientation Width 1.60 m Length 3.50 m A B C D ➔ 000 (Deg)	Ground Level Coordinates National Grid Chainage		
Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 Firm grey brown slightly sandy gravelly SILT with medium cobble content. sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone, brick and concrete. Cobbles are subangular of sandstone and brick. (VO = 0,1)	(1.10)		
			EXPLORATORY HOLE ENDS AT 1.10 m	1.10		
Depth	Type & No.	Records Date				
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)		Stability Stable Shoring None Weather Sunny	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:23:09 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited		Trial Pit IP4074-14 Sheet 1 of 1	

Logged JH Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.00m. Terminated on bedrock.	Dimensions and Orientation Width 1.60 m Length 3.50 m 		Ground Level Coordinates National Grid Chainage
Samples and Tests			Strata		
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Firm brownish grey slightly sandy, gravelly SILT with high cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are angular to subrounded of sandstone. (VO = 1,0)	(1.00)	 
			EXPLORATORY HOLE ENDS AT 1.00 m	1.00	
Depth	Type & No.	Records Date			
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)		Stability Stable Shoring None Weather Rain
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited		Trial Pit IP4075-26 Sheet 1 of 1

Logged JH Checked AP		Start 26/03/2015 End 26/03/2015		Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.40m. Terminated on bedrock.		Dimensions and Orientation Width 1.60 m Length 3.50 m A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 000 (Deg)		Ground Level Coordinates National Grid Chainage	
Samples and Tests			Strata						
Depth	Type & No.	Date Records	Description			Depth, Level/ (Thickness)	Legend	Backfill/ Instruments	
0.50	ES 1		1 (MADE GROUND) Firm brownish grey slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subangular to subrounded of sandstone. (VO = 0,0)			(1.40)			
			EXPLORATORY HOLE ENDS AT 1.40 m			1.40			
			</						

Logged JH Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.10m. Terminated on bedrock.	Dimensions and Orientation Width 1.60 m Length 3.50 m A D B C ➔ 000 (Deg)	Ground Level Coordinates National Grid Chainage	- - -
Samples and Tests			Strata		
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Firm brownish grey slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subrounded of sandstone. (VO = 0,0)	(1.10)	
			EXPLORATORY HOLE ENDS AT 1.10 m	1.10	
Depth	Type & No.	Records Date			
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)	Stability Stable Shoring None Weather Windy	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:23:21 ESG			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited	Trial Pit IP4077-40 Sheet 1 of 1	

Logged JH Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 0.90m. Terminated on bedrock.	Dimensions and Orientation Width 1.60 m Length 3.50 m		Ground Level Coordinates National Grid Chainage
Samples and Tests			Strata		
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Firm brownish grey slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. Cobbles are subangular of sandstone. (VO = 0,1)	(0.90)	
			EXPLORATORY HOLE ENDS AT 0.90 m 0.90 m Bedrock.	0.90	
Depth	Type & No.	Records Date			
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)		Stability Stable Shoring None Weather Sunny
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:23:25			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited		Trial Pit IP4078-54 Sheet 1 of 1

[illegible]

Trial Pit Log



Logged LF Checked AP		Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.40m. Terminated on bedrock.		Dimensions and Orientation Width 1.00 m Length 2.00 m A B C D B → 000 (Deg)		Ground Level Coordinates National Grid Chainage		- - -
Samples and Tests			Strata						
Depth	Type & No.	Date Records	Description				Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Brown slightly clayey sandy angular to subrounded, fine to coarse GRAVEL of sandstone, brick and concrete with high cobble content. Sand is fine to coarse. Cobbles are angular to subangular of sandstone and brick. (VO = 2,2)				(1.20)		
1.40	ES 2		2 Grey sandy angular to subangular fine to coarse GRAVEL of sandstone with low cobble content. Sand is fine to coarse. Cobbles are angular of sandstone. (VO = 5, 3) 1.40 m Bedrock. - EXPLORATORY HOLE ENDS AT 1.40 m				1.20 1.40		
Depth	Type & No.	Records Date							
Groundwater Entries No. Struck Post Strike Behaviour (m) 1 1.30 Fast inflow. Thick hydrocarbon on surface.			Depth Related Remarks * From to (m)				Stability Stable Shoring None Weather Sun, Windy		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited				Trial Pit IP4080-307 Sheet 1 of 1		



Trial Pit Log



Logged NK Checked AP		Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 0.90m. Terminated on bedrock.	Dimensions and Orientation Width 1.00 m Length 2.50 m A B C D	Ground Level - Coordinates - National Grid - Chainage -
Samples and Tests			Strata		
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend
0.50	ES 1		1 (MADE GROUND) Dark grey mottled brown gravelly fine to coarse SAND with medium cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone, concrete and brick. Cobbles are subangular to subrounded of sandstone, concrete and brick. (VO = 2,2)	(0.90)	
			EXPLORATORY HOLE ENDS AT 0.90 m	0.90	
			0.90 m Bedrock		
Depth	Type & No.	Records Date			
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)	Stability Stable Shoring None Weather Sunny	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. (c) ESG www.esg.co.uk 426.4807/04/2015 11:23:41			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited	Trial Pit IP4081-25 Sheet 1 of 1	

Logged NK Checked AP		Start 26/03/2015 End 26/03/2015		Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 0.80m. Terminated on bedrock.		Dimensions and Orientation Width 1.00 m Length 2.00 m A B C →		Ground Level - Coordinates - National Grid - Chainage -		
Samples and Tests			Strata							
Depth	Type & No.	Date Records	Description					Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Soft brown sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone, concrete and brick. Cobbles are subangular to subrounded of brick. (VO = 0,0)					(0.80)		
			EXPLORATORY HOLE ENDS AT 0.80 m					0.80		

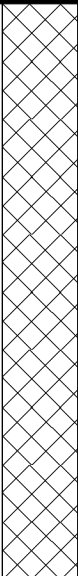
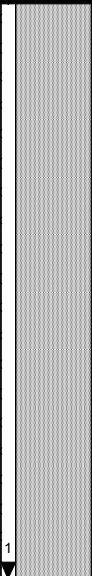
Logged NK Checked AP		Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 0.60m. Terminated on bedrock.		Dimensions and Orientation Width 1.00 m Length 2.00 m A B C D ➔		Ground Level Coordinates National Grid Chainage		
Samples and Tests			Strata						
Depth	Type & No.	Date Records	Description				Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Dark brown mottled light brown gravelly fine to coarse SAND with medium cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. Cobbles are subangular to subrounded of sandstone and brick. (VO = 0,0)				(0.60)		
			EXPLORATORY HOLE ENDS AT 0.60 m				0.60		

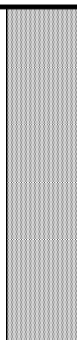
Trial Pit Log

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Logged NK Checked AP		Start 26/03/2015 End 26/03/2015		Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit form GL to 1.20m. Terminated on bedrock.		Dimensions and Orientation Width 1.00 m Length 2.50 m A B C →		Ground Level Coordinates National Grid Chainage		
Samples and Tests			Strata							
Depth	Type & No.	Date Records	Description					Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Brown slightly silty gravelly fine to coarse SAND with medium cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone, concrete and brick. Cobbles are subangular to subrounded of sandstone, concrete and brick. (VO = 0,0)					(1.20)		
			EXPLORATORY HOLE ENDS AT 1.20 m					1.20		
Depth	Type & No.	Records Date								
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)					Stability Stable Shoring None Weather Sunny		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:23:59 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited					Trial Pit IP4085-19 Sheet 1 of 1		

Scale 1:25

Logged NK Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.90m. Terminated on bedrock.	Dimensions and Orientation Width 1.00 m Length 2.50 m A B C D ➡	Ground Level Coordinates National Grid Chainage		
Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Soft dark brown sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone, concrete and brick. Cobbles are subangular to subrounded of sandstone, concrete and brick. (VO = 1,1)	(1.90)		
1.50	ES 2					
			EXPLORATORY HOLE ENDS AT 1.90 m	1.90		
Depth	Type & No.	Records Date				
Groundwater Entries No. Struck Post Strike Behaviour (m) 1 1.90 Pit flooded.			Depth Related Remarks * From to (m)	Stability Stable Shoring None Weather Sunny		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:24:06 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited	Trial Pit IP4087-31 Sheet 1 of 1		

Logged NK Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit form GL to 1.10m. Terminated on bedrock.	Dimensions and Orientation Width 1.00 m Length 2.00 m A B C D E	Ground Level Coordinates National Grid Chainage		
Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Dark brown silty gravelly fine to coarse SAND with medium cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subangular to subrounded of sandstone. Frequent metal fragments. (VO = 1,1)	(1.10)		
			EXPLORATORY HOLE ENDS AT 1.10 m	1.10		
Depth	Type & No.	Records Date				
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)		Stability Stable Shoring None Weather Sunny	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:24:10 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited		Trial Pit IP4088-33 Sheet 1 of 1	

Trial Pit Log



Logged LF Checked AP		Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.10m. Terminated on bedrock.	Dimensions and Orientation Width 1.00 m Length 2.00 m A B C D B → 000 (Deg)		Ground Level Coordinates National Grid Chainage		- - -
Samples and Tests			Strata					
Depth	Type & No.	Date Records	Description			Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Brown sandy clayey, occasionally slightly clayey, angular to subrounded, fine to coarse GRAVEL of sandstone and brick with medium cobble content. Sand is fine to coarse. Cobbles are angular to subangular of sandstone and brick. (VO = 2,2)			(1.10)		
1.10	ES 2		EXPLORATORY HOLE ENDS AT 1.10 m 1.10 m Bedrock.			1.10		
Depth	Type & No.	Records Date						
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)			Stability Stable Shoring None Weather Sun/Wind		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:24:13			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited			Trial Pit IP4089-308 Sheet 1 of 1		

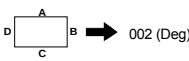
Logged JH Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.10m. Terminated on bedrock.	Dimensions and Orientation Width 1.60 m Length 3.50 m		Ground Level Coordinates National Grid Chainage	-	-	-
Samples and Tests			Strata					
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments		
0.50	ES 1		1 (MADE GROUND) Firm greyish brown slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone. (VO = 0,0)	(1.10)				
			EXPLORATORY HOLE ENDS AT 1.10 m 1.10 m Bedrock	1.10				
Depth	Type & No.	Records Date						
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)			Stability Stable Shoring None Weather Windy		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited			Trial Pit IP4090-56 Sheet 1 of 1		

Logged JH Checked AP		Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.10m. Terminated on bedrock.	Dimensions and Orientation Width 1.60 m Length 2.80 m A B C D E F 000 (Deg)		Ground Level Coordinates National Grid Chainage		
Samples and Tests			Strata					
Depth	Type & No.	Date Records	Description			Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Firm brownish grey slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. Cobbles are subangular to subrounded of sandstone. (VO = 0,0)			(1.10)		
			EXPLORATORY HOLE ENDS AT 1.10 m			1.10		
Depth	Type & No.	Records Date						
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)			Stability Stable Shoring None Weather Windy		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:24:20 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited			Trial Pit IP4091-42 Sheet 1 of 1		

[illegible]

Logged JH Checked AP		Start 26/03/2015 End 26/03/2015		Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.20m. Terminated on bedrock.		Dimensions and Orientation Width 1.60 m Length 3.50 m A B C D ➔ 000 (Deg)		Ground Level Coordinates National Grid Chainage		
Samples and Tests			Strata							
Depth	Type & No.	Date Records	Description					Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Firm brown grey slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. Cobbles are subangular to subrounded of sandstone and brick. (VO = 1,0)					(1.20)		
			EXPLORATORY HOLE ENDS AT 1.20 m					1.20		
Depth	Type & No.	Records Date								
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)					Stability Stable Shoring None Weather Windy		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:24:31 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited					Trial Pit IP4093-24 Sheet 1 of 1		

Logged JH Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.40m. Terminated on bedrock.	Dimensions and Orientation Width 1.30 m Length 3.50 m A B C D ➔ 000 (Deg)	Ground Level Coordinates National Grid Chainage	- - -	
Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 Firm brownish grey slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subrounded to well rounded of sandstone. (VO = 0,0)	(1.40)		
			EXPLORATORY HOLE ENDS AT 1.40 m	1.40		

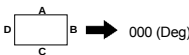
Logged JH Checked AP		Start 26/03/2015 End 26/03/2015		Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.40m. Terminated on bedrock.		Dimensions and Orientation Width 1.60 m Length 3.50 m 		Ground Level Coordinates National Grid Chainage	
Samples and Tests			Strata						
Depth	Type & No.	Date Records	Description				Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Firm brownish grey slightly sandy gravelly SILT. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subangular to subrounded of sandstone and brick. (VO = 0,0)				(1.40)		
			EXPLORARY HOLE ENDS AT 1.40 m				1.40		
Depth	Type & No.	Records Date							
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)				Stability Stable Shoring None Weather Sunny		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:25:09 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited				Trial Pit IP4095-18 Sheet 1 of 1		

Logged JH Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit form GL to 1.40m. Terminated on bedrock.	Dimensions and Orientation Width 1.60 m Length 3.50 m 000 (Deg)		Ground Level Coordinates National Grid Chainage	-	-	-
Samples and Tests			Strata					
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments		
0.50	ES 1		1 (MADE GROUND) Brownish grey slightly sandy, gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. Cobbles are subangular to subrounded of sandstone. (VO = 0,1)	(1.40)				
			EXPLORARY HOLE ENDS AT 1.40 m 1.40 m Bedrock.	1.40				
Depth	Type & No.	Records Date						
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)			Stability Stable Shoring None Weather Rain		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:25:22			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited			Trial Pit IP4096-22 Sheet 1 of 1		

[illegible]

Logged JH	Start 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.30m. Terminated on bedrock.	Dimensions and Orientation Width 1.60 m Length 3.50 m	A B C D 005 (Deg)	Ground Level Coordinates National Grid Chainage	
Checked AP	End 26/03/2015					
Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Firm brownish grey slightly sandy gravelly SILT with medium cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subangular to subrounded of sandstone and brick. (VO = 0,0)	(1.30)		
			EXPLOATORY HOLE ENDS AT 1.30 m	1.30		

[illegible]

Logged LF Checked AP		Start 26/03/2015 End 26/03/2015		Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 0.70m. Terminated on bedrock.		Dimensions and Orientation Width 1.00 m Length 2.00 m 		Ground Level Coordinates National Grid Chainage	
Samples and Tests			Strata						
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments			
0.50	ES 1		1 (MADE GROUND) Brown sandy slightly clayey angular to subrounded, fine to coarse GRAVEL of sandstone and brick with high cobble content. Sand is fine to coarse. Cobbles are angular to rounded of sandstone. (VO = 1,2) EXPLORARY HOLE ENDS AT 0.70 m	(0.70) 0.70	 	 			
Depth	Type & No.	Records Date							
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)		Stability Stable Shoring None Weather Sun/Wind				
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited		Trial Pit IP4100-309 Sheet 1 of 1				

Trial Pit Log



Logged LF Checked AP		Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.20m. Terminated on bedrock.	Dimensions and Orientation Width 1.00 m Length 2.00 m A B C D 000 (Deg)		Ground Level Coordinates National Grid Chainage	
Samples and Tests			Strata				
Depth	Type & No.	Date Records	Description		Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Brown sandy slightly clayey angular to subrounded, fine to coarse GRAVEL of sandstone, brick and concrete with high cobble content. Sand is fine to coarse. Cobbles are angular to subangular of sandstone. (VO = 2,2)		(1.20)		
1.20	ES 2		EXPLORATORY HOLE ENDS AT 1.20 m 1.20 m Bedrock		1.20		
Depth	Type & No.	Records Date					
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)		Stability Stable Shoring None Weather Showers		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:25:44			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited		Trial Pit IP4101-306 Sheet 1 of 1		

Logged NK Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.40m. Terminated on bedrock.	Dimensions and Orientation Width 1.00 m Length 2.50 m A D B C ➔	Ground Level Coordinates National Grid Chainage	- - -
Samples and Tests			Strata		
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Soft dark brown sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. Cobbles are subangular to subrounded of sandstone and brick. (VO = 1,2)	(1.40)	
			EXPLORATORY HOLE ENDS AT 1.40 m	1.40	
Depth	Type & No.	Records Date			
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)	Stability Stable Shoring None Weather Sunny	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:25:53 ESG			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited	Trial Pit IP4102-29 Sheet 1 of 1	

Trial Pit Log



Logged NK Checked AP		Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 2.00m. Terminated on bedrock.	Dimensions and Orientation Width 1.00 m Length 2.50 m A B C D		Ground Level Coordinates National Grid Chainage	
Samples and Tests			Strata				
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments	
0.50	ES 1		1 (MADE GROUND) Soft brown sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone, concrete and brick. Cobbles are subangular to subrounded of sandstone, concrete and brick. (VO = 0,0)	(1.40)			
1.50	ES 2		2 (MADE GROUND) Dark grey slightly silty gravelly fine to coarse SAND with medium cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. Cobbles are subangular to subrounded of sandstone and brick. (VO = 2,2)	1.40 (0.60)			
			EXPLORATORY HOLE ENDS AT 2.00 m	2.00			
			2.00 m Bedrock				
Depth	Type & No.	Records Date					
Groundwater Entries No. Struck Post Strike Behaviour (m) 1 2.00 Pooling at base. Slight hydrocarbon sheen.			Depth Related Remarks * From to (m)		Stability Stable Shoring None Weather Sunny		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. (c) ESG www.esg.co.uk 426.4807/04/2015 11:25:57			Project Coed Darcy Site-wide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited		Trial Pit IP4103-21 Sheet 1 of 1		

Trial Pit Log



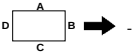
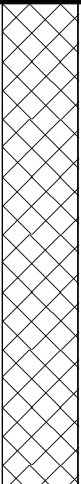
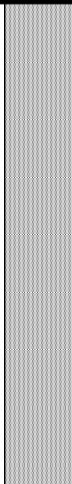
Logged NK Checked AP		Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.60m. Terminated on bedrock.	Dimensions and Orientation Width 1.00 m Length 2.50 m A B C D		Ground Level Coordinates National Grid Chainage	
Samples and Tests			Strata				
Depth	Type & No.	Date Records	Description		Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Soft dark brown sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone, concrete and brick. Cobbles are subangular to subrounded of sandstone, concrete and brick. (VO = 0,0)		(1.60)		
1.50	ES 2		EXPLORATORY HOLE ENDS AT 1.60 m		1.60		
			1.60 m Bedrock				
Depth	Type & No.	Records Date					
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)		Stability Stable Shoring None Weather Sunny		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. (c) ESG www.esg.co.uk 426.4807/04/2015 11:26:01 AGS			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited		Trial Pit IP4104-17 Sheet 1 of 1		

Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:26:05 

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Trial Pit Log



Logged NK Checked AP		Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit form GL to 1.60m. Terminated on bedrock.	Dimensions and Orientation Width 1.00 m Length 2.50 m 		Ground Level - Coordinates - National Grid - Chainage -
Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Soft brown mottled dark grey sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone, concrete and brick. Cobbles are subangular to subrounded of sandstone, concrete and brick. (VO = 1,1)	(1.60)		
1.50	ES 2		EXPLORATORY HOLE ENDS AT 1.60 m	1.60		
			1.60 m Bedrock			
Depth	Type & No.	Records Date				
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)		Stability Stable Shoring None Weather Sunny	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25			Project Coed Darcy Site-wide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited		Trial Pit IP4107-41 Sheet 1 of 1	



Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:26:16 

Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:26:19 

Logged LF Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.70m. Terminated on bedrock.	Dimensions and Orientation Width 1.00 m Length 2.00 m A B C D ➔ 000 (Deg)	Ground Level Coordinates National Grid Chainage	- - -	
Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Brown sandy clayey angular to rounded, fine to coarse GRAVEL of sandstone, brick and concrete with high cobble content. Sand is fine to coarse. Cobbles are angular to subrounded of sandstone and brick. (VO = 2,2)	(1.70)		
1.00	ES 2					
1.70	ES 3					
			EXPLORATORY HOLE ENDS AT 1.70 m	1.70		
			1.70 m Bedrock			
Depth	Type & No.	Records Date				
Groundwater Entries No. Struck Post Strike Behaviour (m) 1 1.50 Fast inflow.			Depth Related Remarks * From to (m)	Stability Stable Shoring None Weather Showers		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:26:22 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited	Trial Pit IP4110-304 Sheet 1 of 1		

Logged NK Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit form GL to 1.60m. Terminated on bedrock.	Dimensions and Orientation Width 1.00 m Length 2.50 m 	Ground Level - Coordinates - National Grid - Chainage -		
Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Soft brown sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of sandstone, concrete and brick. Cobbles are subangular to subrounded of sandstone and brick. (VO = 0,1)	(1.60)		
1.50	ES 2			1.60		
			EXPLORATORY HOLE ENDS AT 1.60 m	1.60		
Depth	Type & No.	Records Date				
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)	Stability Stable Shoring None Weather Sunny		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:26:27 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited	Trial Pit IP4111-27 Sheet 1 of 1		

Trial Pit Log



Logged JH Checked AP		Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.60m. Terminated on bedrock.	Dimensions and Orientation Width 1.60 m Length 3.50 m A B C D 000 (Deg)		Ground Level Coordinates National Grid Chainage	
Samples and Tests			Strata				
Depth	Type & No.	Date Records	Description		Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Firm brownish grey slightly sandy gravelly SILT with medium cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. Cobbles are subangular to subrounded of sandstone. (VO = 0,0)		(1.60)		
1.50	ES 2		EXPLORATORY HOLE ENDS AT 1.60 m		1.60		
			1.60 m Bedrock				
Depth	Type & No.	Records Date					
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)		Stability Stable Shoring None Weather Sunny		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. (c) ESG www.esg.co.uk 426.4807/04/2015 11:26:31 AGS			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited		Trial Pit IP4112-20 Sheet 1 of 1		

Logged LF	Start 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.80m. Terminated on bedrock.	Dimensions and Orientation Width 1.00 m Length 2.00 m		A B C 000 (Deg)	Ground Level Coordinates National Grid Chainage	
Samples and Tests			Strata				
Depth	Type & No.	Date Records	Description		Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Brown sandy slightly clayey angular to subrounded, fine to coarse GRAVEL of sandstone, brick and concrete with high cobble content. Sand is fine to coarse. Cobbles are angular to subangular of sandstone and brick. (VO = 2,2)		(1.80)		
1.00	ES 2						
1.80	ES 3						
			EXPLORATORY HOLE ENDS AT 1.80 m		1.80		

Trial Pit Log



Logged LF Checked AP		Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.20m. Terminated on bedrock.	Dimensions and Orientation Width 1.00 m Length 2.00 m A B C D B → 000 (Deg)		Ground Level Coordinates National Grid Chainage		- - -
Samples and Tests			Strata					
Depth	Type & No.	Date Records	Description			Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Brown sandy slightly clayey angular to subrounded, fine to coarse GRAVEL of sandstone and brick with high cobble content. Cobbles are angular to rounded of sandstone. Sand is fine to coarse. (VO = 1,2)			(1.20)		
1.20	ES 2		EXPLORATORY HOLE ENDS AT 1.20 m 1.20' m Bedrock.			1.20		
Depth	Type & No.	Records Date						
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)			Stability Stable Shoring None Weather Windy		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. (c) ESG www.esg.co.uk 426.4807/04/2015 11:26:46			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited			Trial Pit IP4113-310 Sheet 1 of 1		

Scale 1:25

Logged JH Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.40m. Terminated on bedrock.	Dimensions and Orientation Width 1.60 m Length 3.50 m A B C D ➔ 002 (Deg)	Ground Level Coordinates National Grid Chainage	- - -	
Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Firm brownish grey slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subangular of sandstone and brick. (VO = 0,0)	(1.40)		
			EXPLORATORY HOLE ENDS AT 1.40 m	1.40		
Depth	Type & No.	Records Date				
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)	Stability Stable Shoring None Weather Windy		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:27:08 			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited	Trial Pit IP4115-46 Sheet 1 of 1		

Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:27:30 

Logged JH Checked AP	Start 26/03/2015 End 26/03/2015	Equipment, Methods and Remarks Komatsu PC210 Machine excavated trial pit from GL to 1.20m. Terminated on bedrock.	Dimensions and Orientation Width 1.60 m Length 3.50 m A B C D ➡ 000 (Deg)	Ground Level Coordinates National Grid Chainage	- - -
Samples and Tests			Strata		
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend Backfill/ Instruments
0.50	ES 1		1 (MADE GROUND) Brownish grey slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subangular to subrounded of sandstone and rare brick. (VO = 0,0)	(1.20)	
			EXPLORATORY HOLE ENDS AT 1.20 m	1.20	
Depth	Type & No.	Records Date			
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)	Stability Stable Shoring None Weather Rain	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESG www.esg.co.uk 426.4807/04/2015 11:27:34 ESG			Project Coed Darcy Sitewide Trial Pitting Project No. H4039-14 Carried out for St Modwen Developments Limited	Trial Pit IP4118-28 Sheet 1 of 1	

Appendix C. Laboratory Analytical Results – Ground Investigation

Monitor Phase 32

[illegible]

Monitor Phase 32

Trial Pit	SDG ID	Sample Depth	Date Sampled	Received On	Acanaphthene		Acanaphthylene		Anthracene		Benz(a)anthracene		Benz(a)pyrene		Benz(b)fluoranthene		Benz(g,h,i)perylene		Benz(k)fluoranthene		Chrysene		Dibenz(a,h)anthracene		Fluoranthene		Fluorene		Indeno(1,2,3-cd)pyrene		Naphthalene		PAH Total Detected USEPA 16	
					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
P4067_35	150330-16	0.50	27/03/2015	30/03/2015	17	22	55.8	149	180	216	144	79.3	356	56.9	160	67.6	102	123	2300	262	308													
P4068_37	150330-16	0.50	27/03/2015	30/03/2015	28.3	20.9	63.8	169	192	221	144	86.8	211	46.9	206	68.2	108	93.5	2240	223	352													
P4069_52	150330-16	0.50	27/03/2015	30/03/2015	9.74	+12	31.4	70.6	76.3	113	60.7	41.8	114	+23	85.9	30.6	44.4	40.2	680	120	141													
P4070_50	150330-16	0.50	27/03/2015	30/03/2015	12.8	+12	42.8	158	183	204	129	67.7	304	46.6	161	36.2	74.3	160	180	229														
P4071_32	150330-16	0.50	26/03/2015	30/03/2015	29.1	20.1	113	352	401	490	329	417	87.7	99.3	48.1	87.7	242	120	4300	364	631													
P4072_30	150330-16	0.50	27/03/2015	30/03/2015	48.9	14.8	83.8	276	267	336	191	132	327	62.4	490	71.8	151	95.6	3210	288	468													
P4073_12	150330-16	0.50	27/03/2015	30/03/2015	19.9	13.7	61.3	147	195	240	163	78.3	369	63.3	163	50.4	120	69.7	2360	265	314													
P4074_14	150330-16	0.50	27/03/2015	30/03/2015	12.8	+12	37.2	147	224	280	175	81.2	332	74.7	164	33	130	43.1	2320	175	321													
P4075_26	150330-16	0.50	27/03/2015	30/03/2015	30.6	16.7	205	143	147	180	122	72.3	101	42.1	237	63.2	87.3	106	2300	300	493													
P4076_34	150330-16	0.50	27/03/2015	30/03/2015	131	33.9	243	183	224	315	175	86.5	228	95.3	287	126	129	131	3370	355	690													
P4077_40	150330-16	0.50	27/03/2015	30/03/2015	86.3	14.9	192	189	265	344	144	87.3	329	47.9	279	68.1	105	100	2600	319	492													
P4078_54	150330-16	0.50	27/03/2015	30/03/2015	117	+12	232	143	149	216	124	75	100	34.4	253	166	92.3	128	2690	353	485													
P4079_39	150330-16	0.50	27/03/2015	30/03/2015	36.7	22.2	171	194	218	221	158	115	201	63.6	273	65	112	88.2	2710	244	522													
P408_302	150330-16	0.50	27/03/2015	30/03/2015	20.9	18.8	69.2	214	266	315	199	111	433	267	67.6	596	269	67.4	3590	269	424													
P408_302	150330-16	1.00	27/03/2015	30/03/2015	20.3	17.1	54.5	176	210	310	302	199	302	265	48.5	225	92.5	9020	253	350														
P408_302	150330-16	2.00	27/03/2015	30/03/2015	36.1	21.9	99	604	739	800	638	308	634	164	1290	56.4	628	78.8	7760	761	1020													
P408_307	150330-16	0.60	27/03/2015	30/03/2015	119	24.2	259	274	275	324	233	114	312	78.6	417	125	168	120	3870	420	612													
P408_307	150330-16	1.20	27/03/2015	30/03/2015	93.3	+12	66.4	69.6	70.1	134	49.9	45.1	152	+23	131	73	36.2	26.6	1320	189	173													
P4091_25	150330-16	0.50	27/03/2015	30/03/2015	353	+12	661	296	370	402	262	162	388	90.6	608	368	187	154	6470	1000	1180													
P4092_13	150330-16	0.50	27/03/2015	30/03/2015	32.1	23.2	67.1	182	274	379	228	132	294	72.6	238	71.9	166	84.4	2900	274	380													
P4092_15	150330-16	0.50	27/03/2015	30/03/2015	61	32.9	159	593	719	899	511	153	1720	124	400	67.4	998	1440	1480	1440														
P4094	150330-16	0.50	27/03/2015	30/03/2015	42	15.5	48.8	161	261	361	173	407	361.5	464	65.4	210	65.1	3620	367	507														
P4095_19	150330-16	0.50	27/03/2015	30/03/2015	+8	+12	72.6	129	267	329	267	162	273	78.5	351	+10	212	73.9	3370	327	462													
P4095_23	150330-16	0.50	27/03/2015	30/03/2015	34.5	28.2	110	203	207	260	199	86.6	248	44.8	300	68	111	118	2840	315	507													
P4097_31	150330-16	0.50	27/03/2015	30/03/2015	27.3	27.8	86.1	213	217	278	143	67.4	374	60.1	299	93.8	101	99	2970	333	511													
P4097_31	150330-16	1.50	27/03/2015	30/03/2015	+8	+12	39.7	44	41.8	55.5	36.3	22.7	22.3	+23	75.5	17.5	25.8	30.9	632	62.2	138													
P4098_33	150330-16	0.50	27/03/2015	30/03/2015	27.3	16.3	164	864	941	1099	137	3770	173	415	96.2	155	154	8670	597	925														
P4099_308	150330-16	0.50	27/03/2015	30/03/2015	34.4	24.4	198	269	344	370	237	127	363	76.1	303	116	101	3310	362	476														
P4099_308	150330-16	1.10	27/03/2015	30/03/2015	54.4	17.2	129	460	609	650	350	213	519	100	697	82.3	276	140	5480	493	635													
P4099_308	150330-16	0.50	27/03/2015	30/03/2015	78.6	25	193	369	460	509	350	213	519	100	697	82.3	276	140	5480	493	635													
P4099_308	150330-16	0.50	27/03/2015	30/03/2015	78.6	25	193	369	460	509	350	213	519	100	697	82.3	276	140	5480	493	635													
P4099_308	150330-16	0.50	27/03/2015	30/03/2015	78.6	25	193	369	460	509	350	213	519	100	697	82.3	276	140	5480	493	635													
P4099_308	150330-16	0.50	27/03/2015	30/03/2015	78.6	25	193	369	460	509	350	213	519	100	697	82.3	276	140	5480	493	635													
P4099_308	150330-16	0.50	27/03/2015	30/03/2015	78.6	25	193	369	460	509	350	213	519	100	697	82.3	276	140	5480	493	635													
P4099_308	150330-16	0.50	27/03/2015	30/03/2015	78.6	25	193	369	460	509	350	213	519	100	697	82.3	276	140	5480	493	635													
P4099_308	150330-16	0.50	27/03/2015	30/03/2015	78.6	25	193	369	460	509	350	213	519	100	697	82.3	276	140	5480	493	635													
P4099_308	150330-16	0.50	27/03/2015	30/03/2015	78.6	25	193	369	460	509	350	213	519	100	697	82.3	276	140	5480	493	635													
P4099_308	150330-16	0.50	27/03/2015	30/03/2015	78.6	25	193	369	460	509	350	213	519	100	697	82.3	276	140	5480	493	635													
P4099_308	150330-16	0.50	27/03/2015	30/03/2015	78.6	25	193	369	460	509	350	213	519	100	697	82.3	276	140	5480	493	635													
P4099_308	150330-16	0.50	27/03/2015	30/03/2015	78.6	25	193	369	460	509	350	213	519	100	697</																			

Monitor Phase 32

Trial Pit	SDG ID	Sample Depth	Date Sampled	Received On	Phenol µg/kg	Pentachlorophenol µg/kg	n-Nitroso-n-dipropylamine µg/kg	Nitrobenzene µg/kg	Isophorone µg/kg	Hexachloroethane µg/kg	Hexachlorocyclopentadiene µg/kg	Hexachlorobutadiene µg/kg	Hexachlorobenzene µg/kg	n-Dioctyl phthalate µg/kg	Dioctyl phthalate µg/kg	Diethyl phthalate µg/kg	n-Butyl phthalate µg/kg	Dibenzofuran µg/kg	Carbazole µg/kg	Butylbenzyl phthalate µg/kg	bis(2-Ethylhexyl) phthalate µg/kg	bis(2-Chloroethoxy)methane µg/kg	bis(2-Chloroethyl)ether µg/kg	Arobenzene µg/kg	4-Nitrophenol µg/kg	4-Nitroaniline µg/kg	4-Methylphenol µg/kg
				Residential +1m 1638000																							
P4067_35	150330-16	0.50	27/03/2015	30/03/2015		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
P4068_37	150330-16	0.50	27/03/2015	30/03/2015																							
P4069_52	150330-16	0.50	27/03/2015	30/03/2015																							
P4070_50	150330-16	0.50	27/03/2015	30/03/2015																							
P4071_32	150330-16	0.50	26/03/2015	30/03/2015																							
P4072_30	150330-16	0.50	27/03/2015	30/03/2015																							
P4073_12	150330-16	0.50	27/03/2015	30/03/2015																							
P4074_14	150330-16	0.50	27/03/2015	30/03/2015																							
P4075_26	150330-16	0.50	27/03/2015	30/03/2015	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	2900	<100	<100	<100	<100	<100	
P4076_34	150330-16	0.50	27/03/2015	30/03/2015	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	144	<100	<100	<100	<100	<100	
P4077_40	150330-16	0.50	27/03/2015	30/03/2015																							
P4078_54	150330-16	0.50	27/03/2015	30/03/2015	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	234	<100	<100	<100	<100	<100	
P4079_39	150330-16	0.50	27/03/2015	30/03/2015	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
P408_362	150330-16	0.50	27/03/2015	30/03/2015	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
P408_362	150330-16	1.00	27/03/2015	30/03/2015																	<100	<100	<100	<100	<100	<100	<100
P408_362	150330-16	2.00	27/03/2015	30/03/2015	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
P408_367	150330-16	0.60	27/03/2015	30/03/2015																							
P409_307	150330-16	1.20	27/03/2015	30/03/2015																							
P4091_25	150330-16	0.50	27/03/2015	30/03/2015																							
P4092_13	150330-16	0.50	27/03/2015	30/03/2015																							
P4092_15	150330-16	0.50	27/03/2015	30/03/2015	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
P4094	150330-16	0.50	27/03/2015	30/03/2015																							
P4095_19	150330-16	0.50	27/03/2015	30/03/2015																							
P4096_23	150330-16	0.50	27/03/2015	30/03/2015																							
P4097_31	150330-16	0.50	27/03/2015	30/03/2015																							
P4097_31	150330-16	1.50	27/03/2015	30/03/2015	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
P4098_33	150330-16	1.50	27/03/2015	30/03/2015																							
P4099_398	150330-16	0.50	27/03/2015	30/03/2015	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
P4099_398	150330-16	1.10	27/03/2015	30/03/2015																							
P4099_398	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_42	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.05	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	117	<100	<100	<100	<100	<100	
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/2015	30/03/2015																							
P4099_36	150330-16	0.50	27/03/201																								

Monitor Phase 32

[illegible]

Monitor Phase 32

[illegible]

Monitor Phase 32

Trial Pit	ROD ID.	Sample Depth	Date Sampled	Received On	Residential 1 mi		1,1-Dichloroethane µg/kg	cis-1,2-Dichloroethene µg/kg	2,2-Dichloropropane µg/kg	Bromochloromethane µg/kg	Chloroform µg/kg	1,1,1-Trichloroethane µg/kg	1,1-Dichloropropene µg/kg	Carbon tetrachloride µg/kg	1,2-Dichloroethane µg/kg	Benzene µg/kg	Trichloroethene µg/kg	1,2-Dichloropropene µg/kg	Dibromomethane µg/kg	Bromodichloromethane µg/kg	cis-1,3-Dichloropropene µg/kg	Toluene µg/kg	trans-1,3-Dichloropropene µg/kg	1,1,2-Trichloroethane µg/kg	1,3-Dichloropropane µg/kg	Tetrachloroethene µg/kg	Dibromochloromethane µg/kg	1,2-Dibromoethane µg/kg	Chlorobenzene µg/kg	1,1,1,2-Tetrachloroethane µg/kg	Ethylbenzene µg/kg	m-Xylene µg/kg	o-Xylene µg/kg	Styrene µg/kg	
IP4067_35	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4068_37	150330-16	0.55	27/03/2015	30/03/2015																															
IP4069_52	150330-16	0.55	27/03/2015	30/03/2015																															
IP4070_50	150330-16	0.55	27/03/2015	30/03/2015																															
IP4071_32	150330-16	0.55	26/03/2015	30/03/2015																															
IP4072_30	150330-16	0.55	27/03/2015	30/03/2015																															
IP4073_12	150330-16	0.55	27/03/2015	30/03/2015																															
IP4074_14	150330-16	0.55	27/03/2015	30/03/2015																															
IP4075_20	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4076_34	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4077_40	150330-16	0.55	27/03/2015	30/03/2015																															
IP4078_54	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4079_30	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4080_302	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4081_25	150330-16	0.55	27/03/2015	30/03/2015																															
IP4082_13	150330-16	0.55	27/03/2015	30/03/2015																															
IP4082_15	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4084	150330-16	0.55	27/03/2015	30/03/2015																															
IP4085_18	150330-16	0.55	27/03/2015	30/03/2015																															
IP4086_23	150330-16	0.55	27/03/2015	30/03/2015																															
IP4087_31	150330-16	0.55	27/03/2015	30/03/2015																															
IP4087_31	150330-16	1.55	27/03/2015	30/03/2015																															
IP4088_33	150330-16	1.55	27/03/2015	30/03/2015																															
IP4089_308	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4089_308	150330-16	1.15	27/03/2015	30/03/2015																															
IP4090_86	150330-16	0.55	27/03/2015	30/03/2015																															
IP4091_42	150330-16	0.55	27/03/2015	30/03/2015																															
IP4092_36	150330-16	0.05	27/03/2015	30/03/2015																															
IP4093_24	150330-16	0.55	27/03/2015	30/03/2015																															
IP4094_16	150330-16	0.55	27/03/2015	30/03/2015																															
IP4095_18	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4096_22	150330-16	0.55	27/03/2015	30/03/2015																															
IP4097_38	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4098_44	150330-16	0.55	27/03/2015	30/03/2015																															
IP4099_58	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4100_309	150330-16	0.55	27/03/2015	30/03/2015																															
IP4101_306	150330-16	0.55	27/03/2015	30/03/2015																															
IP4101_306	150330-16	1.25	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4102_29	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4103	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4103	150330-16	1.55	27/03/2015	30/03/2015																															
IP4104_17	150330-16	0.55	27/03/2015	30/03/2015																															
IP4104_17	150330-16	1.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4105_300	150330-16	0.55	27/03/2015	30/03/2015																															
IP4105_300	150330-16	1.05	27/03/2015	30/03/2015																															
IP4105_300	150330-16	1.55	27/03/2015	30/03/2015																															
IP4107	150330-16	0.55	27/03/2015	30/03/2015			<80	<60	<100		<100		<70		<100		<50	<80	<80	<100		<90	<70	<100		<70	<50	<100	<100	<50	<100	<40	<100	<100	<100
IP4107	150330-16	1.55	27/03/2015	30/03/2015																															
IP4109_303	150330-16	0.55	27/03/2015	30/03/2015																															
IP4109_303	150330-16	1.05	27/03/2015	30/03/2015																															
IP4110_304	150																																		

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Total Pit	SID ID.	Sample Depth	Date Sampled	Received On	Bromofom µg/kg	Isopropylbenzene µg/kg	1,1,2,2-Tetrachloroethane µg/kg	1,2,3-Trichloropropane µg/kg	Bromobenzene µg/kg	Propylbenzene µg/kg	2-Chlorotoluene µg/kg	1,3,5-Trimethylbenzene µg/kg	4-Chlorotoluene µg/kg	tert-Butylbenzene µg/kg	1,2,4-Trimethylbenzene µg/kg	sec-Butylbenzene µg/kg	4-Isopropyltoluene µg/kg	1,3-Dichlorobenzene µg/kg	1,4-Dichlorobenzene µg/kg	n-Butylbenzene µg/kg	1,2-Dichlorobenzene µg/kg	1,2-Dibromo-3-chloropropane µg/kg	Tert-amyl methyl ether µg/kg	1,2,4-Trichlorobenzene µg/kg	Hexachlorobutadiene µg/kg	Naphthalene µg/kg	1,2,3-Trichlorobenzene µg/kg	
				Residential - 1 mi																								
IP4067_35	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<100	<100	<100	<100	<80	<100	<100	<140	<90	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4068_37	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4069_52	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4070_50	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4071_32	150330-16	0.50	26/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4072_30	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4073_12	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4074_14	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4075_26	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4076_34	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4077_40	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4078_54	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4079_20	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4080_32	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4081_302	150330-16	2.00	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4082_307	150330-16	0.80	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4083_307	150330-16	1.20	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4084_307	150330-16	1.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4085_13	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4086_15	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4087_19	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4088_23	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4089_23	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4090_31	150330-16	1.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4091_33	150330-16	1.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4092_308	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4093_308	150330-16	1.10	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4094_56	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4095_56	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4096_12	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4097_38	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4098_38	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4099_308	150330-16	1.10	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4100_56	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4101_42	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4102_36	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4103_24	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4104_16	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4105_16	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4106_16	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4107_38	150330-16	0.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4108_30	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4109_30	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4110_30	150330-16	1.50	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4111_304	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<110	-	<140	<100	-	<200	<130	<200
IP4112_304	150330-16	1.70	27/03/2015	30/03/2015	<100	<50	<100	<160	<100	<100	<90	<80	<100	<140	<90	<100	<100	<100	<80	<50	<110	<100	<140	<100	<200	<200	<130	<200
IP4113_27	150330-16	0.50	27/03/2015	30/03/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-									

Monitor Phase 32

Trial Pit	SDG ID	Sample Depth	Date Sampled	Received On	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - Gravimetric - %	Date of Analysis	Analysed By	Asbestos Quantification - Detailed Gravimetric - %	Asbestos Quantification - PCOM Evaluation - %	Additional Asbestos Components (Using TM44)	Additional Asbestos Components (Using TM44)	Comments	Analysts Comments	Analysts Comments	Chrysotile (White) Asbestos	Amosite (Brown) Asbestos	Asbestos Quantification - Total - %	Asbestos Quantification - Total - %	Crocidolite (Blue) Asbestos	Fibrous Anthophyllite	Fibrous Tremolite	Fibrous Actinolite	Non-Asbestos Fibre
				Residential +1m		<0.001			<0.001			None				N/C			<0.001					
IP4067_35	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4068_37	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4069_52	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4070_50	150330-16	0.50	27/03/2015			<0.001			<0.001			Fibre bundles in soil				N/C			<0.001					
IP4071_32	150330-16	0.50	26/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4072_30	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4073_12	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4074_14	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4075_26	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4076_34	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4077_40	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4078_54	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4079_39	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP408_362	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP408_362	150330-16	1.00	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP408_362	150330-16	2.00	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP408_367	150330-16	0.60	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_207	150330-16	1.20	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_25	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_13	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_15	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_16	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_19	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_23	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_31	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_31	150330-16	1.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_33	150330-16	1.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_38	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_38	150330-16	1.10	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_38	150330-16	0.50	27/03/2015			<0.001			<0.001			in loose fibres in soil				N/C			<0.001					
IP409_42	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_26	150330-16	0.05	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_24	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_16	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_19	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_22	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_38	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_38	150330-16	1.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_44	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP409_58	150330-16	0.50	27/03/2015			0.0012			0.0028			Amosite							0.004					
IP410_39	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP410_39	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4101_306	150330-16	1.20	27/03/2015			<0.001	24/8/15	Chris Swindells	<0.001			None	Loose fibres in soil			N/C	Detected	Not Detected	<0.001	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
IP4102_29	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4103	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4103	150330-16	1.50	27/03/2015			<0.001			<0.001			Amosite							<0.001					
IP4104_17	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4104_17	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4105_300	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4105_300	150330-16	1.00	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4105_300	150330-16	1.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4107	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4107	150330-16	1.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4109_303	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4109_303	150330-16	1.00	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4109_303	150330-16	2.00	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4110_304	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4110_304	150330-16	1.00	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4110_304	150330-16	1.70	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4111_27	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4111_27	150330-16	1.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4112_305	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4112_305	150330-16	1.00	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4112_305	150330-16	1.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4113_310	150330-16	1.20	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4114_80	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4115_46	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4116_48	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4117_20	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4117_20	150330-16	1.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP4118_28	150330-16	0.50	27/03/2015			<0.001			<0.001			None				N/C			<0.001					
IP5802_7	150330-14	0.5																						

Appendix D. Technical notes of stockpiles used

Technical Note SP109a

Subject	Coed Darcy Stockpile 109a Validation		
Reference	5041216	Revision	
Author	Daniel Hopkins	Checker	Matt Timmins
Issued to	-	Reviewer	
Date	18 th May 2015	Authoriser	

Introduction

Atkins Ltd has been instructed by St Modwen Developments to control the management and testing of stockpiled material for reuse within the Coed Darcy development. This technical note provides information on stockpile 109a and its suitability for reuse within the site.

The Outline Planning Permission (Ref. 1) grants the redevelopment of the Former Llandarcy oil refinery as a mixed use development, comprising a range of residential, commercial and retail properties, community areas and public open space.

Stockpile Chemical Testing

A total of 40 No. samples were taken by Atkins Ltd and Environmental Scientifics Group Ltd (ESG) and scheduled for laboratory analysis by Alcontrol. The samples were tested for the following determinands (Table 1.) with full results in Appendix A.

Table 1. Soils List of determinands

Arsenic (total)	Cadmium (total)	Chromium (total)
Chromium (hexavalent)	Copper (total)	Lead (total)
Mercury (total)	Nickel (total)	Selenium (total)
Zinc (total)	pH	Total Organic Carbon
BTEX	Total Petroleum Hydrocarbons -CWG	USEPA 16 Polycyclic Aromatic Hydrocarbons
Total Phenols (monohydric)	Asbestos (Quantification)	

The samples were screened against deep (>1m) residential Coed Darcy Risk Based Screening Levels (RBSL) and Remediation Target Criteria (RTCs). One exceedance was detected for asbestos.

The results of the chemical testing were screened against Coed Darcy RBSLs and RTCs for a residential end use (>1m below finished floor level) (Appendix B). One sample (sample 37) tested positive for Chrysotile with subsequent quantification indicating a concentration of 0.0454% (Atkins RTC/RBSL 0.02%).

References

Neath Port Talbot County Council Approval of Outline Planning Permission. Reference Number P2005/0393 March 2005

Appendices

Appendix A Screening sheet of samples

Appendix B Coed Darcy Risk Based Screening Levels for deep >1m Residential

Appendix A – Screening sheet

ALcontrol Laboratories

				Customer Sample ID		1	10	11	12	13	14	15
				Depth		0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
SDG(s):				AGS Id								
Customer:				Sample Type		SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Client Reference / Location:				Sampled Date		20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014
Order no:				Sample Received Date		24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014
				Final Instruction Date		16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014
All results expressed on a dry weight basis				Report Completed Date		05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015
				SDG		141124-12	141124-12	141124-12	141124-12	141124-12	141124-12	141124-12
				Lab Sample Number		10434140	10434148	10434154	10434159	10434163	10434167	10434172
				Sample Temperature		8.8	8.8	8.8	8.8	8.8	8.8	8.8
Analysis	Test	Method	Units	LOD	1% RBSL >1m RESI	MAX						
	Actinolite*	SUB (ASB)	-				Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Amosite*	SUB (ASB)	-				Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Anthophyllite*	SUB (ASB)	-				Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Chrysotile*	SUB (ASB)	-				Not Detected	Not Detected	Not Detected	Not Detected	Detected	Detected
	Crocidolite*	SUB (ASB)	-				Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Tremolite*	SUB (ASB)	-				Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Non-Asbestos Fibres Detected	SUB (ASB)	-				Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Sample Description											
		Colour	PM024	-			Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
		Grain Size	PM024	-			0.1 - 2 mm	0.063 - 0.1 mm	0.1 - 2 mm	0.063 - 0.1 mm	0.063 - 0.1 mm	0.1 - 2 mm
		Description	PM024	-			Sandy Clay Loam	Clay indy Clay Loam	Clay	Silty Clay	Sandy Clay Loam	Sandy Clay Loam
		Inclusion 1)	PM024	-			Stones	Stones	Stones	Stones	Stones	Stones
		Inclusion 2)	PM024	-			None	None	None	None	Vegetation	None
		Moisture Content Ratio (% of as received sample)	PM024	%			13	15	13	14	17	15
Asbestos												
		Asbestos Quantification - Gravimetric - %	TM 304	%	<0.001	0.0454	-	-	-	-	<0.001	<0.001
		Asbestos Quantification - PCOM Evaluation - %	TM 304	%	<0.001	0.0011	-	-	-	-	<0.001	<0.001
		Additional Asbestos Components (Using TM048)	TM 304	-		0	-	-	-	-	None	None .oose fibres in soil).
		Analysts Comments	TM 304	-		0	-	-	-	-	N/C	N/C
		Asbestos Quantification - Total - %	TM 304	%	<0.001	0.0454	-	-	-	-	<0.001	<0.001
Carbon												
		Soil Organic Matter (SOM)	TM132	%	<0.35	3.14	1.95	-	-	3	-	-
Inorganics												
		pH	TM133	pH Units	<1	7.82	7.5	7.46	7.43	7.66	7.31	7.29
Metals - (Solids)												
		Arsenic	TM181	mg/kg	<0.6	20.1	12	12	14	19.8	16.6	18.9
		Cadmium	TM181	mg/kg	<0.02	0.185	<0.02	<0.02	0.0621	0.16	0.0717	0.153
		Chromium	TM181	mg/kg	<0.9	20.4	15.2	14.8	14.3	14.3	16.5	14.7
		Copper	TM181	mg/kg	<1.4	70.9	55.4	23.6	37.2	47.6	38	54.3
		Lead	TM181	mg/kg	<0.7	95.3	33.9	32.6	50	68.8	39.5	51.9
		Mercury	TM181	mg/kg	<0.14	27.71.57	<0.14	<0.14	0.405	0.438	0.285	0.428
		Nickel	TM181	mg/kg	<0.2	43.1	30.9	30.2	24.4	27.3	31.4	25.2
		Selenium	TM181	mg/kg	<1	1.09	<1	<1	<1	<1	<1	<1
		Vanadium	TM181	mg/kg	<0.2	23.9	17.4	14.6	13.5	19.3	20.5	15.5
		Zinc	TM181	mg/kg	<1.9	375	106	91.3	125	160	122	149

				Depth		0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
TPH Criteria Working (												
GRO Surrogate % recovery**	TM089	%			110	96	85	76	70	66	54	73
GRO TOT (Moisture Corrected)	TM089	µg/kg	<44		25200	3050	1610	6090	5100	5840	4410	6310
Methyl tertiary butyl ether (MTBE)	TM089	µg/kg	<5		5.75	<20	<20	<20	<20	<20	<50	<20
Benzene	TM089	µg/kg	<10	400	0	<40	<40	<40	<40	<40	<100	<40
Toluene	TM089	µg/kg	<2	52000	26	<8	<8	9.2	<8	<8	<20	<8
Ethylbenzene	TM089	µg/kg	<3	140000	16.2	<12	<12	<12	<12	<12	<30	<12
m,p-Xylene	TM089	µg/kg	<6	58000	0	<24	<24	<24	<24	<24	<60	<24
o-Xylene	TM089	µg/kg	<3	58000	85.8	<12	<12	49.5	<12	28.8	<30	48
sum of detected mpo xylene by GC	TM089	µg/kg	<9		85.8	<9	<9	49.5	<9	28.8	<9	48
sum of detected BTEX by GC	TM089	µg/kg	<24		102	<24	<24	58.7	<24	28.8	<24	48
Aliphatics >C5-C6	TM089	µg/kg	<10	112000	49	<40	<40	<40	<40	<40	<100	<40
Aliphatics >C6-C8	TM089	µg/kg	<10	sat	1440	162	94.8	167	146	215	302	324
Aliphatics >C8-C10	TM089	µg/kg	<10	42500	6230	312	198	856	676	733	647	1100
Aliphatics >C10-C12	TM089	µg/kg	<10	sat	8030	1390	696	2650	2280	2600	1780	2440
Aliphatics >C12-C16	TM173	µg/kg	<100	sat	133000	60700	29900	131000	60800	53200	45700	70200
Aliphatics >C16-C21	TM173	µg/kg	<100	sat	230000	124000	48700	218000	84300	76000	68400	100000
Aliphatics >C21-C35	TM173	µg/kg	<100	sat	243000	118000	52100	243000	83700	60800	56300	87200
Aliphatics >C35-C44	TM173	µg/kg	<100	sat	66300	16100	6690	31400	9000	6400	4370	9180
Total Aliphatics >C12-C44	TM173	µg/kg	<100	sat	622000	319000	137000	622000	238000	196000	175000	267000
Aromatics >EC5-EC7	TM089	µg/kg	<10	460	0	<40	<40	<40	<40	<40	<100	<40
Aromatics >EC7-EC8	TM089	µg/kg	<10	146000	0	<40	<40	<40	<40	<40	<100	<40
Aromatics >EC8-EC10	TM089	µg/kg	<10	71000	4150	213	132	620	461	517	432	783
Aromatics >EC10-EC12	TM089	µg/kg	<10	1390000	5350	926	464	1760	1520	1730	1190	1630
Aromatics >EC12-EC16	TM173	µg/kg	<100	sat	15900	6370	3600	6550	6060	6380	4750	13600
Aromatics >EC16-EC21	TM173	µg/kg	<100	sat	59100	39800	18900	38900	28900	28600	21500	50900
Aromatics >EC21-EC35	TM173	µg/kg	<100	sat	121000	90000	45200	118000	57900	45500	55200	91400
Aromatics >EC35-EC44	TM173	µg/kg	<100	sat	34100	23300	13000	34100	11900	11300	15300	18300
Aromatics >EC40-EC44	TM173	µg/kg	<100	sat	13900	8550	5380	13900	4450	4840	6720	6900
Total Aromatics >EC12-EC44	TM173	µg/kg	<100		212000	160000	80700	198000	105000	91800	96800	174000
Total Aliphatics & Aromatics >C5-C44	TM173	µg/kg	<100		826000	481000	220000	826000	348000	294000	276000	447000
Polyaromatic Hydrocar												
Naphthalene-d8 % recovery**	TM218	%			129	106	104	101	104	127	104	129
Acenaphthene-d10 % recovery**	TM218	%			131	104	103	99.6	103	126	103	131
Phenanthrene-d10 % recovery**	TM218	%			129	105	106	98.8	102	124	103	129
Chrysene-d12 % recovery**	TM218	%			119	105	94.4	90	93.2	113	95.1	119
Perylene-d12 % recovery**	TM218	%			126	102	97.6	97.3	101	122	103	126
Naphthalene	TM218	µg/kg	<9	2800	93.2	14.1	23	54.2	70.5	49.1	77	66.2
Acenaphthylene	TM218	µg/kg	<12	sat	26.2	<12	<12	<12	<12	<12	<12	<12
Acenaphthene	TM218	µg/kg	<8	sat	53.1	<8	<8	10.1	10.8	<8	9.75	10.9
Fluorene	TM218	µg/kg	<10	sat	97.5	15.5	26.9	40.3	46.9	55.7	45.9	70.6
Phenanthrene	TM218	µg/kg	<15	sat	586	57.9	101	157	173	172	161	264
Anthracene	TM218	µg/kg	<16	sat	140	26.6	<16	42.8	34.2	24.4	31.8	39.2
Fluoranthene	TM218	µg/kg	<17	sat	1040	21.6	29.7	116	103	67.2	97	107
Pyrene	TM218	µg/kg	<15	sat	1030	50.1	57	161	179	117	182	226
Benz(a)anthracene	TM218	µg/kg	<14	sat	754	<14	<14	66.2	63.7	39.2	68.6	76
Chrysene	TM218	µg/kg	<10	sat	771	<10	<10	82.3	62.7	47.9	81	120
Benzo(b)fluoranthene	TM218	µg/kg	<15	sat	1160	82.7	30.1	105	141	80	109	146

Depth						0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
Benzo(k)fluoranthene	TM218	µg/kg	<14	sat	482	19	<14	33.6	40.5	22.4	37.9	40.5
Benzo(a)pyrene	TM218	µg/kg	<15	sat	915	39.8	<15	70.6	94.2	47.9	83.8	79.7
Indeno(1,2,3-cd)pyrene	TM218	µg/kg	<18	sat	576	24	<18	35.8	46.6	22.7	40.9	41.2
Dibenzo(a,h)anthracene	TM218	µg/kg	<23	sat	259	<23	<23	<23	<23	<23	<23	<23
Benzo(g,h,i)perylene	TM218	µg/kg	<24	sat	656	32.3	<24	51.6	67.6	36.4	61.1	54.5
PAH, Total Detected USEPA 16	TM218	µg/kg	<118		6690	384	268	1030	1130	782	1090	1340

ALcontrol Laboratories

				Customer Sample ID	16	17	18	19	2	20	21	22
				Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
SDG(s):				AGS Id								
Customer:				Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Client Reference / Location:				Sampled Date	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014
Order no:				Sample Received Date	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014
				Final Instruction Date	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014
All results expressed on a dry weight basis				Report Completed Date	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015
				SDG	141124-12	141124-12	141124-12	141124-12	141124-12	141124-12	141124-12	141124-12
				Lab Sample Number	10434177	10434183	10434191	10434200	10434206	10434212	10434217	10434227
				Sample Temperature	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
Analysis	Test	Method	Units	LOD								
	Actinolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Amosite*	SUB (ASB)	-		Not Detected	Detected	Detected	Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Anthophyllite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Chrysotile*	SUB (ASB)	-		Detected	Detected	Detected	Not Detected	Not Detected	Not Detected	Detected	Detected
	Crocidolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Tremolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Non-Asbestos Fibres Detected	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Sample Description												
	Colour	PM024	-		Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
	Grain Size	PM024	-		0.063 - 0.1 mm	0.1 - 2 mm	0.1 - 2 mm	0.063 - 0.1 mm	0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm
	Description	PM024	-		Clay	Sandy Clay	Sandy Clay Loam	Clay	Sandy Clay Loam	Sandy Clay	Sandy Clay Loam	Sandy Clay Loam
	Inclusion 1)	PM024	-		Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
	Inclusion 2)	PM024	-		None	None	None	None	None	None	None	Vegetation
	Moisture Content Ratio (% of as received sample)	PM024	%		13	13	15	14	14	12	11	11
Asbestos												
	Asbestos Quantification - Gravimetric - %	TM 304	%	<0.001	<0.001	<0.001	0.014	<0.001	-	-	<0.001	0.0065
	Asbestos Quantification - PCOM Evaluation - %	TM 304	%	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.001
	Additional Asbestos Components (Using TM048)	TM 304	-		None	None	None	None	-	-	None	None
	Analysts Comments	TM 304	-		N/C	N/C	N/C	N/C	-	-	N/C	N/C
	Asbestos Quantification - Total - %	TM 304	%	<0.001	<0.001	<0.001	0.0145	<0.001	-	-	<0.001	0.0065
Carbon												
	Soil Organic Matter (SOM)	TM132	%	<0.35	-	-	-	-	-	2.53	-	-
Inorganics												
	pH	TM133	pH Units	<1	7.64	7.07	7.28	7.42	7.41	7.44	7.27	7.47
Metals - (Solids)												
	Arsenic	TM181	mg/kg	<0.6	17.1	15.3	20.1	15.1	11	17.7	10.6	13.6
	Cadmium	TM181	mg/kg	<0.02	0.0965	0.0294	0.077	0.185	<0.02	<0.02	<0.02	<0.02
	Chromium	TM181	mg/kg	<0.9	14.2	14.1	18.1	14.4	14.3	14.7	14.4	14.5
	Copper	TM181	mg/kg	<1.4	39	37.8	70.9	36.1	30.1	49.2	21.5	26.9
	Lead	TM181	mg/kg	<0.7	63.7	53.1	95.3	48.7	27.1	53.5	45.3	34.8
	Mercury	TM181	mg/kg	<0.14	0.535	0.472	0.428	0.372	<0.14	0.357	<0.14	<0.14
	Nickel	TM181	mg/kg	<0.2	26.7	25.8	28.8	27.4	29.4	27	29.9	29.4
	Selenium	TM181	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Vanadium	TM181	mg/kg	<0.2	18.5	14.6	23.9	15	16.3	14.4	16.3	17.7
	Zinc	TM181	mg/kg	<1.9	221	143	240	129	89.8	225	90.6	109

				Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
TPH Criteria Working (												
	GRO Surrogate % recovery**	TM089	%		64	76	109	59	75	77	52	61
	GRO TOT (Moisture Corrected)	TM089	µg/kg	<44	5630	8250	25200	5250	2420	16100	2800	4960
	Methyl tertiary butyl ether (MTBE)	TM089	µg/kg	<5	<20	<20	<20	<20	<20	<20	<20	<20
	Benzene	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40	<40
	Toluene	TM089	µg/kg	<2	<8	<8	<8	<8	<8	<8	<8	26
	Ethylbenzene	TM089	µg/kg	<3	<12	16.2	<12	<12	<12	<12	<12	<12
	m,p-Xylene	TM089	µg/kg	<6	<24	<24	<24	<24	<24	<24	<24	<24
	o-Xylene	TM089	µg/kg	<3	<12	85.8	<12	23.2	<12	<12	<12	30.5
	sum of detected mpo xylene by GC	TM089	µg/kg	<9	<9	85.8	<9	23.2	<9	<9	<9	<36
	sum of detected BTEX by GC	TM089	µg/kg	<24	<24	102	<24	<24	<24	<24	<24	<96
	Aliphatics >C5-C6	TM089	µg/kg	<10	<40	<40	<40	<40	<40	49	<40	<40
	Aliphatics >C6-C8	TM089	µg/kg	<10	158	290	1440	166	129	823	98.6	138
	Aliphatics >C8-C10	TM089	µg/kg	<10	787	1400	6230	610	233	3920	366	631
	Aliphatics >C10-C12	TM089	µg/kg	<10	2470	3290	8030	2400	1130	5190	1240	2220
	Aliphatics >C12-C16	TM173	µg/kg	<100	121000	48600	68200	40500	23100	77800	58500	50300
	Aliphatics >C16-C21	TM173	µg/kg	<100	158000	60900	92900	66900	33300	131000	88100	66000
	Aliphatics >C21-C35	TM173	µg/kg	<100	150000	59700	79000	69700	37300	126000	84100	62400
	Aliphatics >C35-C44	TM173	µg/kg	<100	15200	6840	2370	8610	3610	17700	17800	8150
	Total Aliphatics >C12-C44	TM173	µg/kg	<100	444000	176000	242000	186000	97300	352000	249000	187000
	Aromatics >EC5-EC7	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40	<40
	Aromatics >EC7-EC8	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40	<40
	Aromatics >EC8-EC10	TM089	µg/kg	<10	535	1040	4150	434	155	2620	252	450
	Aromatics >EC10-EC12	TM089	µg/kg	<10	1650	2190	5350	1600	752	3460	828	1480
	Aromatics >EC12-EC16	TM173	µg/kg	<100	15900	4150	4190	6340	1650	7500	1570	5260
	Aromatics >EC16-EC21	TM173	µg/kg	<100	59100	17100	22700	27300	9600	46100	10600	22400
	Aromatics >EC21-EC35	TM173	µg/kg	<100	98400	44900	53300	56000	23100	116000	30000	48900
	Aromatics >EC35-EC44	TM173	µg/kg	<100	22500	14500	15200	13100	4340	30900	11500	15700
	Aromatics >EC40-EC44	TM173	µg/kg	<100	8520	6070	6360	4890	1370	12000	4910	6020
	Total Aromatics >EC12-EC44	TM173	µg/kg	<100	196000	80600	95300	103000	38700	200000	53600	92300
	Total Aliphatics & Aromatics >C5-C44	TM173	µg/kg	<100	645000	265000	363000	294000	138000	569000	305000	284000
Polyaromatic Hydroca												
	Naphthalene-d8 % recovery**	TM218	%		103	100	116	103	106	104	106	101
	Acenaphthene-d10 % recovery**	TM218	%		103	99.3	115	104	104	104	106	102
	Phenanthrene-d10 % recovery**	TM218	%		104	98.8	114	104	102	103	105	102
	Chrysene-d12 % recovery**	TM218	%		96	91.2	103	97.4	104	95	105	103
	Perylene-d12 % recovery**	TM218	%		103	97.5	112	108	102	103	109	108
	Naphthalene	TM218	µg/kg	<9	76.4	93.2	87.9	77.2	23	81.5	17.5	<9
	Acenaphthylene	TM218	µg/kg	<12	14.8	<12	<12	22.3	<12	<12	<12	<12
	Acenaphthene	TM218	µg/kg	<8	<8	10.7	10.6	10.5	<8	11.9	<8	<8
	Fluorene	TM218	µg/kg	<10	55.2	55.7	58.5	65.1	30	49.1	<10	12.9
	Phenanthrene	TM218	µg/kg	<15	178	182	228	221	101	219	75.5	54.5
	Anthracene	TM218	µg/kg	<16	36.1	37.6	40.1	43.5	<16	36.7	<16	<16
	Fluoranthene	TM218	µg/kg	<17	89.2	99.2	114	106	76.7	99.5	32.9	53.2
	Pyrene	TM218	µg/kg	<15	174	184	191	210	94.3	197	66.9	69.3
	Benz(a)anthracene	TM218	µg/kg	<14	52.8	57.4	52	62.1	19.9	48.8	15.8	24
	Chrysene	TM218	µg/kg	<10	53.7	68.3	73.2	74.9	20.1	57.5	19	23.6
	Benzo(b)fluoranthene	TM218	µg/kg	<15	162	102	132	147	50.1	116	53.1	46.9

				Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
Benzo(k)fluoranthene	TM218	µg/kg	<14		45.7	31.4	38.7	43.8	20.5	34.8	17.5	18
Benzo(a)pyrene	TM218	µg/kg	<15		90.8	69	77.7	92.4	29.8	73.9	29.9	30.6
Indeno(1,2,3-cd)pyrene	TM218	µg/kg	<18		49.7	35.8	38.6	46	<18	34.3	20.9	21.9
Dibenzo(a,h)anthracene	TM218	µg/kg	<23		<23	<23	<23	<23	<23	<23	<23	<23
Benzo(g,h,i)perylene	TM218	µg/kg	<24		68.9	46.6	53.8	69.2	<24	51.2	33.5	30
PAH, Total Detected USEPA 16	TM218	µg/kg	<118		1150	1070	1200	1290	465	1110	382	385

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				Customer Sample ID	23	24	25	26	27	28	29	3
				Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
SDG(s):	141124-12	AGS Id										
Customer:	Atkins Global Ltd Llandarcy (7158)	Sample Type				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Client Reference / Location:	Coed Darcy	Sampled Date				20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014
Order no:	CD0999	Sample Received Date				24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014
				Final Instruction Date	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014
All results expressed on a dry weight basis				Report Completed Date	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015
				SDG	141124-12	141124-12	141124-12	141124-12	141124-12	141124-12	141124-12	141124-12
				Lab Sample Number	10434233	10434237	10434241	10434246	10434255	10434261	10434270	10434274
				Sample Temperature	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
Analysis	Test	Method	Units	LOD								
	Actinolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Amosite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Anthophyllite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Chrysotile*	SUB (ASB)	-		Not Detected	Detected	Detected	Detected	Detected	Detected	Not Detected	Detected
	Crocidolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Tremolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Non-Asbestos Fibres Detected	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Sample Description												
	Colour	PM024	-		Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
	Grain Size	PM024	-		0.063 - 0.1 mm	0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm	0.063 - 0.1 mm
	Description	PM024	-		Silty Clay Loam	Sandy Clay Loam	Sandy Silt Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay	Sandy Clay	Clay
	Inclusion 1)	PM024	-		Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
	Inclusion 2)	PM024	-		None	None	Vegetation	None	None	Vegetation	None	None
	Moisture Content Ratio (% of as received sample)	PM024	%		17	13	15	13	11	14	16	12
Asbestos												
	Asbestos Quantification - Gravimetric - %	TM 304	%	<0.001	-	<0.001	0.0011	0.0024	<0.001	<0.001	-	<0.001
	Asbestos Quantification - PCOM Evaluation - %	TM 304	%	<0.001	-	0.0011	<0.001	<0.001	<0.001	<0.001	-	<0.001
	Additional Asbestos Components (Using TM048)	TM 304	-		-	oose fibres in soil).	Loose fibres in soil).	None	None	None	-	None
	Analysts Comments	TM 304	-		-	N/C	N/C	N/C	N/C	N/C	-	N/C
	Asbestos Quantification - Total - %	TM 304	%	<0.001	-	0.0015	0.0011	0.0024	<0.001	<0.001	-	<0.001
Carbon												
	Soil Organic Matter (SOM)	TM132	%	<0.35	-	-	-	-	-	-	3.14	-
Inorganics												
	pH	TM133	pH Units	<1	7.2	7.12	7.34	7.24	7.39	7.42	7.16	7.24
Metals - (Solids)												
	Arsenic	TM181	mg/kg	<0.6	15.7	12	14.3	12.8	13.3	12.5	11.8	10.4
	Cadmium	TM181	mg/kg	<0.02	0.0678	0.0602	0.104	0.088	<0.02	0.0337	<0.02	<0.02
	Chromium	TM181	mg/kg	<0.9	14.3	13.7	13.8	14.5	17.2	13.7	15.7	15.2
	Copper	TM181	mg/kg	<1.4	35.2	26.2	35.2	28	25.3	28.9	23.4	20.8
	Lead	TM181	mg/kg	<0.7	48.4	31.2	40.5	35.4	73.7	39.6	21.9	26.9
	Mercury	TM181	mg/kg	<0.14	0.407	<0.14	1.57	0.32	0.393	0.364	0.149	<0.14
	Nickel	TM181	mg/kg	<0.2	28.5	29.4	25.9	29.4	30.4	28	40.3	31.7
	Selenium	TM181	mg/kg	<1	1.09	<1	1.04	<1	<1	<1	<1	<1
	Vanadium	TM181	mg/kg	<0.2	17.5	17.9	17.9	17.2	20.1	16	17.4	14.1
	Zinc	TM181	mg/kg	<1.9	137	121	115	108	113	165	93.4	88.5

				Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
TPH Criteria Working (												
	GRO Surrogate % recovery**	TM089	%		60	74	89	71	70	65	82	80
	GRO TOT (Moisture Corrected)	TM089	µg/kg	<44	2430	4400	7910	10200	7050	3200	3220	2920
	Methyl tertiary butyl ether (MTBE)	TM089	µg/kg	<5	<20	<20	<100	<20	<20	<20	<20	<20
	Benzene	TM089	µg/kg	<10	<40	<40	<200	<40	<40	<40	<40	<40
	Toluene	TM089	µg/kg	<2	<8	<8	<40	23	13.4	<8	<8	<8
	Ethylbenzene	TM089	µg/kg	<3	<12	<12	<60	<12	<12	<12	<12	<12
	m,p-Xylene	TM089	µg/kg	<6	<24	<24	<120	<24	<24	<24	<24	<24
	o-Xylene	TM089	µg/kg	<3	<12	<12	<60	78.2	50.4	15.2	<12	<12
	sum of detected mpo xylene by GC	TM089	µg/kg	<9	<9	<9	<9	78.2	50.4	15.2	<9	<9
	sum of detected BTEX by GC	TM089	µg/kg	<24	<24	<24	<24	101	<96	<24	<24	<24
	Aliphatics >C5-C6	TM089	µg/kg	<10	<40	<40	<200	44.9	<40	<40	<40	<40
	Aliphatics >C6-C8	TM089	µg/kg	<10	103	181	251	321	143	124	129	255
	Aliphatics >C8-C10	TM089	µg/kg	<10	317	683	887	1400	967	419	436	460
	Aliphatics >C10-C12	TM089	µg/kg	<10	1070	1840	3630	4420	3120	1400	1400	1110
	Aliphatics >C12-C16	TM173	µg/kg	<100	63300	40800	89600	50700	46700	37300	18100	20200
	Aliphatics >C16-C21	TM173	µg/kg	<100	108000	77900	167000	96800	69100	57400	35500	40900
	Aliphatics >C21-C35	TM173	µg/kg	<100	103000	83000	220000	88500	63900	58700	36700	37700
	Aliphatics >C35-C44	TM173	µg/kg	<100	16000	13700	66300	9960	7170	8580	4350	2530
	Total Aliphatics >C12-C44	TM173	µg/kg	<100	291000	215000	543000	246000	187000	162000	94600	101000
	Aromatics >EC5-EC7	TM089	µg/kg	<10	<40	<40	<200	<40	<40	<40	<40	<40
	Aromatics >EC7-EC8	TM089	µg/kg	<10	<40	<40	<200	<40	<40	<40	<40	<40
	Aromatics >EC8-EC10	TM089	µg/kg	<10	215	455	663	1020	694	295	293	306
	Aromatics >EC10-EC12	TM089	µg/kg	<10	713	1230	2420	2950	2080	934	935	740
	Aromatics >EC12-EC16	TM173	µg/kg	<100	3320	1560	2860	1760	4020	5750	614	1260
	Aromatics >EC16-EC21	TM173	µg/kg	<100	25800	11700	27300	13900	20700	26500	5200	8170
	Aromatics >EC21-EC35	TM173	µg/kg	<100	62400	36900	76000	40700	41200	58300	16900	27500
	Aromatics >EC35-EC44	TM173	µg/kg	<100	16100	10600	21800	12300	9740	20400	5580	9160
	Aromatics >EC40-EC44	TM173	µg/kg	<100	6350	3960	8400	4820	3750	9360	2340	4140
	Total Aromatics >EC12-EC44	TM173	µg/kg	<100	108000	60800	128000	68600	75600	111000	28300	46100
	Total Aliphatics & Aromatics >C5-C44	TM173	µg/kg	<100	401000	281000	679000	325000	270000	276000	126000	150000
Polyaromatic Hydrocarbons												
	Naphthalene-d8 % recovery**	TM218	%		107	105	88.9	104	106	106	105	105
	Acenaphthene-d10 % recovery**	TM218	%		108	105	88.6	104	106	107	105	106
	Phenanthrene-d10 % recovery**	TM218	%		108	105	87.6	105	106	108	105	105
	Chrysene-d12 % recovery**	TM218	%		108	107	89.2	104	108	109	103	105
	Perylene-d12 % recovery**	TM218	%		110	113	94.9	108	113	113	107	107
	Naphthalene	TM218	µg/kg	<9	22	18.8	32.1	15.3	34	36.7	<9	23.1
	Acenaphthylene	TM218	µg/kg	<12	<12	<12	26.2	<12	<12	<12	<12	<12
	Acenaphthene	TM218	µg/kg	<8	<8	<8	<8	<8	10.9	<8	<8	<8
	Fluorene	TM218	µg/kg	<10	22.5	38.7	30.6	20.4	44.2	39.7	<10	29.7
	Phenanthrene	TM218	µg/kg	<15	83.2	123	99.2	64.9	164	142	56.8	97.4
	Anthracene	TM218	µg/kg	<16	<16	63.3	34.9	<16	45.2	21.7	<16	<16
	Fluoranthene	TM218	µg/kg	<17	43.8	460	77.9	25.7	94.9	66.5	<17	<17
	Pyrene	TM218	µg/kg	<15	81.4	411	141	61.9	163	116	33.1	26.4
	Benz(a)anthracene	TM218	µg/kg	<14	20.5	754	55.6	<14	50.2	30.3	<14	<14
	Chrysene	TM218	µg/kg	<10	19	771	59.2	<10	70.1	27.1	<10	<10
	Benzo(b)fluoranthene	TM218	µg/kg	<15	59.2	1160	96.4	39.8	115	67.5	19.6	31.1

				Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
Benzo(k)fluoranthene	TM218	µg/kg	<14		17.7	482	38.3	<14	35.3	23.4	<14	<14
Benzo(a)pyrene	TM218	µg/kg	<15		31.4	915	71.8	22.9	64.1	49.9	<15	<15
Indeno(1,2,3-cd)pyrene	TM218	µg/kg	<18		<18	576	48.5	<18	45.6	27.9	<18	<18
Dibenzo(a,h)anthracene	TM218	µg/kg	<23		<23	259	<23	<23	<23	<23	<23	<23
Benzo(g,h,i)perylene	TM218	µg/kg	<24		<24	656	64.2	<24	62	38.9	<24	<24
PAH, Total Detected USEPA 16	TM218	µg/kg	<118		401	6690	876	251	998	687	<118	208

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				Customer Sample ID	30	31	32	33	34	35	36	37
				Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
SDG(s):				AGS Id								
Customer:				Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Client Reference / Location:				Sampled Date	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014
Order no:				Sample Received Date	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014
				Final Instruction Date	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014
All results expressed on a dry weight basis				Report Completed Date	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015
				SDG	141124-12	141124-12	141124-12	141124-12	141124-12	141124-12	141124-12	141124-12
				Lab Sample Number	10434280	10434284	10434288	10434293	10434298	10434304	10434309	10434313
				Sample Temperature	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
Analysis	Test	Method	Units	LOD								
	Actinolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Amosite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Anthophyllite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Chrysotile*	SUB (ASB)	-		Detected	Detected	Detected	Detected	Detected	Detected	Detected	Detected
	Crocidolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Tremolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Non-Asbestos Fibres Detected	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Sample Description												
	Colour	PM024	-		Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
	Grain Size	PM024	-		0.063 - 0.1 mm	0.063 - 0.1 mm	0.063 - 0.1 mm	0.063 - 0.1 mm	0.1 - 2 mm	0.1 - 2 mm	0.063 - 0.1 mm	0.1 - 2 mm
	Description	PM024	-		Silty Clay	Clay	Clay	Clay	Sandy Clay	Sandy Clay Loam	Clay	Sandy Clay
	Inclusion 1)	PM024	-		Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
	Inclusion 2)	PM024	-		None	None	None	None	Vegetation	Vegetation	None	Vegetation
	Moisture Content Ratio (% of as received sample)	PM024	%		14	13	12	15	14	12	13	15
Asbestos												
	Asbestos Quantification - Gravimetric - %	TM 304	%	<0.001	<0.001	0.0112	<0.001	<0.001	<0.001	0.0015	<0.001	0.0454
	Asbestos Quantification - PCOM Evaluation - %	TM 304	%	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Additional Asbestos Components (Using TM048)	TM 304	-		None	None	None	None	None	None	None	None
	Analysts Comments	TM 304	-		N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
	Asbestos Quantification - Total - %	TM 304	%	<0.001	<0.001	0.0117	<0.001	<0.001	<0.001	0.0015	<0.001	0.0454
Carbon												
	Soil Organic Matter (SOM)	TM132	%	<0.35	-	-	-	-	-	-	-	-
Inorganics												
	pH	TM133	pH Units	<1	7.82	7.59	7.08	7.31	7.37	7.71	7.16	7.31
Metals - (Solids)												
	Arsenic	TM181	mg/kg	<0.6	18.5	17.3	12.6	19.8	14.9	19.6	13.8	11.5
	Cadmium	TM181	mg/kg	<0.02	<0.02	<0.02	0.0223	<0.02	0.103	<0.02	<0.02	0.0651
	Chromium	TM181	mg/kg	<0.9	15.2	14.9	13.1	15.7	13.2	15.3	15.4	12.2
	Copper	TM181	mg/kg	<1.4	32.3	40.5	32.6	48.8	41	30.7	26.9	27.7
	Lead	TM181	mg/kg	<0.7	41.5	62.1	34.6	61.4	81.8	28.4	51.1	29
	Mercury	TM181	mg/kg	<0.14	0.538	0.697	0.246	0.979	0.303	0.311	0.223	<0.14
	Nickel	TM181	mg/kg	<0.2	30.6	26.5	26.5	28.3	24.8	26.3	28.7	22.4
	Selenium	TM181	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Vanadium	TM181	mg/kg	<0.2	20.2	16.8	15.6	16.9	12.4	13.5	16.3	11.5
	Zinc	TM181	mg/kg	<1.9	125	149	95.9	142	145	105	118	89.4

				Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
TPH Criteria Working (												
	GRO Surrogate % recovery**	TM089	%		81	72	100	102	66	85	110	58
	GRO TOT (Moisture Corrected)	TM089	µg/kg	<44	3880	3700	2800	1240	5040	8130	712	4750
	Methyl tertiary butyl ether (MTBE)	TM089	µg/kg	<5	<20	<20	<20	<5	<20	<20	5.75	<20
	Benzene	TM089	µg/kg	<10	<40	<40	<40	<10	<40	<40	<10	<40
	Toluene	TM089	µg/kg	<2	<8	13.8	<8	<2	<8	<8	<2	<8
	Ethylbenzene	TM089	µg/kg	<3	<12	<12	<12	<3	<12	<12	<3	<12
	m,p-Xylene	TM089	µg/kg	<6	<24	<24	<24	<6	<24	<24	<6	<24
	o-Xylene	TM089	µg/kg	<3	<12	17.3	<12	5.85	31.3	<12	<3	<12
	sum of detected mpo xylene by GC	TM089	µg/kg	<9	<9	<36	<9	<9	<36	<9	<9	<9
	sum of detected BTEX by GC	TM089	µg/kg	<24	<24	<96	<24	<24	<96	<24	<24	<24
	Aliphatics >C5-C6	TM089	µg/kg	<10	<40	<40	<40	10.5	<40	<40	<10	<40
	Aliphatics >C6-C8	TM089	µg/kg	<10	137	160	101	45.6	140	259	54.1	168
	Aliphatics >C8-C10	TM089	µg/kg	<10	599	411	357	151	619	1750	89.7	575
	Aliphatics >C10-C12	TM089	µg/kg	<10	1630	1670	1260	552	2290	2950	294	2150
	Aliphatics >C12-C16	TM173	µg/kg	<100	62500	111000	60800	85600	111000	73900	91300	23500
	Aliphatics >C16-C21	TM173	µg/kg	<100	99700	200000	112000	160000	202000	130000	177000	36600
	Aliphatics >C21-C35	TM173	µg/kg	<100	93100	206000	112000	152000	199000	143000	158000	39800
	Aliphatics >C35-C44	TM173	µg/kg	<100	10900	29800	14900	17200	30000	17500	15800	3330
	Total Aliphatics >C12-C44	TM173	µg/kg	<100	266000	547000	299000	415000	542000	364000	442000	103000
	Aromatics >EC5-EC7	TM089	µg/kg	<10	<40	<40	<40	<10	<40	<40	<10	<40
	Aromatics >EC7-EC8	TM089	µg/kg	<10	<40	<40	<40	<10	<40	<40	<10	<40
	Aromatics >EC8-EC10	TM089	µg/kg	<10	404	294	238	109	444	1170	62.1	389
	Aromatics >EC10-EC12	TM089	µg/kg	<10	1090	1120	837	369	1520	1970	196	1440
	Aromatics >EC12-EC16	TM173	µg/kg	<100	8800	4360	2040	6200	4140	8790	8120	2220
	Aromatics >EC16-EC21	TM173	µg/kg	<100	42000	30500	15600	40100	30700	49500	52800	12400
	Aromatics >EC21-EC35	TM173	µg/kg	<100	80800	87800	49700	92500	86800	111000	104000	25000
	Aromatics >EC35-EC44	TM173	µg/kg	<100	23100	20300	13600	21200	21800	24000	21000	3880
	Aromatics >EC40-EC44	TM173	µg/kg	<100	8980	5300	4940	7590	8050	8030	7450	1010
	Total Aromatics >EC12-EC44	TM173	µg/kg	<100	155000	143000	81000	160000	143000	193000	186000	43500
	Total Aliphatics & Aromatics >C5-C44	TM173	µg/kg	<100	425000	694000	383000	577000	691000	566000	630000	151000
Polyaromatic Hydroca												
	Naphthalene-d8 % recovery**	TM218	%		105	105	105	111	103	108	104	101
	Acenaphthene-d10 % recovery**	TM218	%		105	104	102	109	99.4	110	104	94.9
	Phenanthrene-d10 % recovery**	TM218	%		104	103	100	108	99.4	109	103	89.5
	Chrysene-d12 % recovery**	TM218	%		96.7	95.1	90.1	98	91.6	98.1	94.3	77.9
	Perylene-d12 % recovery**	TM218	%		105	102	98.4	107	100	110	101	81.7
	Naphthalene	TM218	µg/kg	<9	60	62.1	53.4	69.6	35.1	62.3	45.1	66.5
	Acenaphthylene	TM218	µg/kg	<12	19.7	<12	<12	<12	<12	14	<12	<12
	Acenaphthene	TM218	µg/kg	<8	53.1	10.1	<8	11.8	<8	10.4	<8	9.89
	Fluorene	TM218	µg/kg	<10	97.5	61.5	51.4	56.7	31.5	61.9	50	31.9
	Phenanthrene	TM218	µg/kg	<15	586	186	164	174	91.8	219	177	219
	Anthracene	TM218	µg/kg	<16	140	36.8	31.1	42.9	23.4	44.1	35.3	34.1
	Fluoranthene	TM218	µg/kg	<17	1040	82.7	55.6	90.9	43.1	134	81	162
	Pyrene	TM218	µg/kg	<15	1030	177	119	172	93.4	228	142	161
	Benz(a)anthracene	TM218	µg/kg	<14	537	59.5	36.5	61.8	<14	97.6	44.7	116
	Chrysene	TM218	µg/kg	<10	593	79.1	51.8	54.8	23.4	146	67.8	179
	Benzo(b)fluoranthene	TM218	µg/kg	<15	664	126	86.3	126	66.9	136	79	156

				Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
Benzo(k)fluoranthene	TM218	µg/kg	<14		338	32.6	20.3	37.3	16.5	48.1	22.3	60.1
Benzo(a)pyrene	TM218	µg/kg	<15		672	73.6	53.8	83.3	38.7	116	54.4	109
Indeno(1,2,3-cd)pyrene	TM218	µg/kg	<18		277	38.7	27.3	42.4	22	62.4	26.3	47.2
Dibenzo(a,h)anthracene	TM218	µg/kg	<23		91.1	<23	<23	<23	<23	<23	<23	<23
Benzo(g,h,i)perylene	TM218	µg/kg	<24		393	58.3	40.5	61.3	35.1	86.1	37.8	57.1
PAH, Total Detected USEPA 16	TM218	µg/kg	<118		6600	1080	791	1090	521	1470	862	1410

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				Customer Sample ID	38	39	4	40	5	6	7	8
				Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
SDG(s):	141124-12	AGS Id										
Customer:	Atkins Global Ltd Llandarcy (7158)	Sample Type				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Client Reference / Location:	Coed Darcy	Sampled Date				20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014	20/11/2014
Order no:	CD0999	Sample Received Date				24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014	24/11/2014
				Final Instruction Date	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014	16/12/2014
All results expressed on a dry weight basis				Report Completed Date	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015	05/02/2015
				SDG	141124-12	141124-12	141124-12	141124-12	141124-12	141124-12	141124-12	141124-12
				Lab Sample Number	10434318	10434322	10434329	10434337	10434343	10434348	10434353	10434358
				Sample Temperature	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
Analysis	Test	Method	Units	LOD								
	Actinolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Amosite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Anthophyllite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Chrysotile*	SUB (ASB)	-		Detected	Not Detected	Detected	Detected	Detected	Detected	Detected	Not Detected
	Crocidolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Tremolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Non-Asbestos Fibres Detected		SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Sample Description											
	Colour	PM024	-		Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
	Grain Size	PM024	-		0.063 - 0.1 mm	0.1 - 2 mm	0.063 - 0.1 mm	0.063 - 0.1 mm	0.063 - 0.1 mm	0.1 - 2 mm	0.1 - 2 mm	0.063 - 0.1 mm
	Description	PM024	-		Clay	Sandy Clay Loam	Clay	Clay	Silty Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Clay
	Inclusion 1)	PM024	-		Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones
	Inclusion 2)	PM024	-		None	Vegetation	Brick	None	None	None	None	None
	Moisture Content Ratio (% of as received sample)	PM024	%		16	14	12	15	8.5	12	16	12
Asbestos												
	Asbestos Quantification - Gravimetric - %	TM 304	%	<0.001	<0.001	-	<0.001	0.0012	<0.001	0.0011	<0.001	-
	Asbestos Quantification - PCOM Evaluation - %	TM 304	%	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	-
	Additional Asbestos Components (Using TM048)	TM 304	-		None	-	None	None	None	None	None	-
	Analysts Comments	TM 304	-		N/C	-	N/C	N/C	N/C	N/C	N/C	-
	Asbestos Quantification - Total - %	TM 304	%	<0.001	0.0012	-	<0.001	0.0015	<0.001	0.0012	<0.001	-
Carbon												
	Soil Organic Matter (SOM)	TM132	%	<0.35	-	-	-	-	-	-	-	-
Inorganics												
	pH	TM133	pH Units	<1	7.63	6.64	7.5	7.07	7.18	7.63	7.49	7.05
Metals - (Solids)												
	Arsenic	TM181	mg/kg	<0.6	20.1	14.8	14.9	16.3	10.9	12.9	12.9	13.1
	Cadmium	TM181	mg/kg	<0.02	0.0564	0.166	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Chromium	TM181	mg/kg	<0.9	15.1	12.8	15	15.3	13.4	15.3	20.4	16
	Copper	TM181	mg/kg	<1.4	43.3	34.8	25.3	36.6	20.8	22.6	50.1	27.9
	Lead	TM181	mg/kg	<0.7	59.2	48.4	35.5	46.7	27.2	42.7	31.5	33
	Mercury	TM181	mg/kg	<0.14	0.48	0.398	0.14	0.26	<0.14	<0.14	<0.14	<0.14
	Nickel	TM181	mg/kg	<0.2	26.5	22.6	31.7	31.2	28.7	30.5	43.1	33.3
	Selenium	TM181	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Vanadium	TM181	mg/kg	<0.2	16.9	13.2	14.5	16.9	13.2	17.1	19.3	15.1
	Zinc	TM181	mg/kg	<1.9	243	145	375	124	90.5	128	163	113

				Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
TPH Criteria Working (												
	GRO Surrogate % recovery**	TM089	%		64	79	77	82	79	108	101	64
	GRO TOT (Moisture Corrected)	TM089	µg/kg	<44	3450	7790	2170	4890	2000	12000	11200	1580
	Methyl tertiary butyl ether (MTBE)	TM089	µg/kg	<5	<20	<20	<20	<20	<20	<20	<20	<20
	Benzene	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40	<40
	Toluene	TM089	µg/kg	<2	9.52	21.1	<8	<8	<8	<8	<8	<8
	Ethylbenzene	TM089	µg/kg	<3	<12	<12	<12	<12	<12	<12	<12	<12
	m,p-Xylene	TM089	µg/kg	<6	<24	<24	<24	<24	<24	<24	<24	<24
	o-Xylene	TM089	µg/kg	<3	16.7	55	<12	<12	<12	<12	<12	<12
	sum of detected mpo xylene by GC	TM089	µg/kg	<9	<36	55	<9	<9	<9	<9	<9	<9
	sum of detected BTEX by GC	TM089	µg/kg	<24	<96	<96	<24	<24	<24	<24	<24	<24
	Aliphatics >C5-C6	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	48	<40
	Aliphatics >C6-C8	TM089	µg/kg	<10	156	176	150	125	126	532	529	104
	Aliphatics >C8-C10	TM089	µg/kg	<10	409	936	384	760	260	2080	2010	192
	Aliphatics >C10-C12	TM089	µg/kg	<10	1530	3560	811	2090	846	4760	4390	675
	Aliphatics >C12-C16	TM173	µg/kg	<100	133000	68100	40000	91300	57500	43900	9990	42300
	Aliphatics >C16-C21	TM173	µg/kg	<100	230000	135000	63000	167000	82600	96100	29700	80700
	Aliphatics >C21-C35	TM173	µg/kg	<100	212000	194000	66400	162000	70600	113000	34400	65400
	Aliphatics >C35-C44	TM173	µg/kg	<100	21400	19700	5900	21200	8710	19600	4870	5270
	Total Aliphatics >C12-C44	TM173	µg/kg	<100	597000	417000	175000	441000	219000	272000	79000	194000
	Aromatics >EC5-EC7	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40	<40
	Aromatics >EC7-EC8	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40	<40
	Aromatics >EC8-EC10	TM089	µg/kg	<10	293	690	257	512	176	1390	1340	128
	Aromatics >EC10-EC12	TM089	µg/kg	<10	1020	2370	540	1390	564	3180	2930	450
	Aromatics >EC12-EC16	TM173	µg/kg	<100	8980	2580	2390	2430	6290	1740	708	2740
	Aromatics >EC16-EC21	TM173	µg/kg	<100	54900	23000	15000	18600	32300	13000	3360	18200
	Aromatics >EC21-EC35	TM173	µg/kg	<100	121000	95900	45900	61100	63500	46100	11800	48600
	Aromatics >EC35-EC44	TM173	µg/kg	<100	27400	15200	14300	15900	17000	15100	4230	15100
	Aromatics >EC40-EC44	TM173	µg/kg	<100	9740	5140	6050	5710	6950	6110	1720	6430
	Total Aromatics >EC12-EC44	TM173	µg/kg	<100	212000	137000	77500	98000	119000	75900	20100	84600
	Total Aliphatics & Aromatics >C5-C44	TM173	µg/kg	<100	812000	562000	255000	544000	340000	360000	110000	280000
Polyaromatic Hydrocarbons												
	Naphthalene-d8 % recovery**	TM218	%		92.3	101	108	129	107	107	108	99.7
	Acenaphthene-d10 % recovery**	TM218	%		91.9	99.1	107	130	105	103	105	99.2
	Phenanthrene-d10 % recovery**	TM218	%		90.2	97.1	106	128	104	102	103	101
	Chrysene-d12 % recovery**	TM218	%		87.8	93.6	109	118	108	103	102	91
	Perylene-d12 % recovery**	TM218	%		91.7	96.8	108	125	109	102	98	88.5
	Naphthalene	TM218	µg/kg	<9	38.9	22.5	18.3	81.7	16.2	15.9	61.5	16.4
	Acenaphthylene	TM218	µg/kg	<12	<12	<12	<12	<12	<12	<12	<12	<12
	Acenaphthene	TM218	µg/kg	<8	<8	<8	<8	15.5	<8	<8	<8	<8
	Fluorene	TM218	µg/kg	<10	44.1	26.8	22.5	61.5	22.4	19.2	65.5	19.6
	Phenanthrene	TM218	µg/kg	<15	104	82.8	102	208	97	82.6	214	76.6
	Anthracene	TM218	µg/kg	<16	21.2	<16	<16	42	<16	<16	<16	<16
	Fluoranthene	TM218	µg/kg	<17	49.5	41	28.4	100	48.8	<17	49.8	21.4
	Pyrene	TM218	µg/kg	<15	97.9	93.4	59.1	241	104	48.5	65.9	42.2
	Benz(a)anthracene	TM218	µg/kg	<14	29.2	18.1	<14	65.1	22.9	<14	58.2	<14
	Chrysene	TM218	µg/kg	<10	30.9	20.4	14.6	66.8	25.6	<10	127	<10
	Benzo(b)fluoranthene	TM218	µg/kg	<15	55.2	58.1	45.4	146	68	27.6	153	22.9

			Depth	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
Benzo(k)fluoranthene	TM218	µg/kg	<14	19.2	19	<14	48.4	<14	<14	43.4	<14
Benzo(a)pyrene	TM218	µg/kg	<15	35.4	33.8	22.3	96.1	36.1	<15	72.7	<15
Indeno(1,2,3-cd)pyrene	TM218	µg/kg	<18	<18	24.7	<18	50	21.6	<18	48.4	<18
Dibenzo(a,h)anthracene	TM218	µg/kg	<23	<23	<23	<23	<23	<23	<23	<23	<23
Benzo(g,h,i)perylene	TM218	µg/kg	<24	<24	33.9	<24	69.7	31.9	<24	64.4	<24
PAH, Total Detected USEPA 16	TM218	µg/kg	<118	525	475	313	1290	494	194	1020	199

ALcontrol Laboratories

		Customer Sample ID		9
		Depth		0.00-0.00
SDG(s):	141124-12	AGS Id		
Customer:	Atkins Global Ltd Llandarcy (7158)	Sample Type		SOLID
Client Reference / Location:	Coed Darcy	Sampled Date		20/11/2014
Order no:	CD0999	Sample Received Date		24/11/2014
		Final Instruction Date		16/12/2014
All results expressed on a dry weight basis		Report Completed Date		05/02/2015
		SDG		141124-12
		Lab Sample Number		10434363
		Sample Temperature		8.8

Analysis	Test	Method	Units	LOD
	Actinolite*	SUB (ASB)	-	Not Detected
	Amosite*	SUB (ASB)	-	Not Detected
	Anthophyllite*	SUB (ASB)	-	Not Detected
	Chrysotile*	SUB (ASB)	-	Detected
	Crocidolite*	SUB (ASB)	-	Not Detected
	Tremolite*	SUB (ASB)	-	Not Detected
	Non-Asbestos Fibres Detected	SUB (ASB)	-	Not Detected

Sample Description				
	Colour	PM024	-	Dark Brown
	Grain Size	PM024	-	0.1 - 2 mm
	Description	PM024	-	Sandy Clay Loam
	Inclusion 1)	PM024	-	Stones
	Inclusion 2)	PM024	-	None
	Moisture Content Ratio (% of as received sample)	PM024	%	11

Asbestos				
	Asbestos Quantification - Gravimetric - %	TM 304	%	<0.001
	Asbestos Quantification - PCOM Evaluation - %	TM 304	%	<0.001
	Additional Asbestos Components (Using TM048)	TM 304	-	None
	Analysts Comments	TM 304	-	N/C
	Asbestos Quantification - Total - %	TM 304	%	<0.001

Carbon				
	Soil Organic Matter (SOM)	TM132	%	<0.35

Inorganics				
	pH	TM133	pH Units	<1

Metals - (Solids)				
	Arsenic	TM181	mg/kg	<0.6
	Cadmium	TM181	mg/kg	<0.02
	Chromium	TM181	mg/kg	<0.9
	Copper	TM181	mg/kg	<1.4
	Lead	TM181	mg/kg	<0.7
	Mercury	TM181	mg/kg	<0.14
	Nickel	TM181	mg/kg	<0.2
	Selenium	TM181	mg/kg	<1
	Vanadium	TM181	mg/kg	<0.2
	Zinc	TM181	mg/kg	<1.9

				Depth	0.00-0.00
TPH Criteria Working (					
	GRO Surrogate % recovery**	TM089	%		81
	GRO TOT (Moisture Corrected)	TM089	µg/kg	<44	2220
	Methyl tertiary butyl ether (MTBE)	TM089	µg/kg	<5	<20
	Benzene	TM089	µg/kg	<10	<40
	Toluene	TM089	µg/kg	<2	<8
	Ethylbenzene	TM089	µg/kg	<3	<12
	m,p-Xylene	TM089	µg/kg	<6	<24
	o-Xylene	TM089	µg/kg	<3	<12
	sum of detected mpo xylene by GC	TM089	µg/kg	<9	<9
	sum of detected BTEX by GC	TM089	µg/kg	<24	<24
	Aliphatics >C5-C6	TM089	µg/kg	<10	<40
	Aliphatics >C6-C8	TM089	µg/kg	<10	153
	Aliphatics >C8-C10	TM089	µg/kg	<10	321
	Aliphatics >C10-C12	TM089	µg/kg	<10	898
	Aliphatics >C12-C16	TM173	µg/kg	<100	36100
	Aliphatics >C16-C21	TM173	µg/kg	<100	78100
	Aliphatics >C21-C35	TM173	µg/kg	<100	82900
	Aliphatics >C35-C44	TM173	µg/kg	<100	15100
	Total Aliphatics >C12-C44	TM173	µg/kg	<100	212000
	Aromatics >EC5-EC7	TM089	µg/kg	<10	<40
	Aromatics >EC7-EC8	TM089	µg/kg	<10	<40
	Aromatics >EC8-EC10	TM089	µg/kg	<10	214
	Aromatics >EC10-EC12	TM089	µg/kg	<10	599
	Aromatics >EC12-EC16	TM173	µg/kg	<100	719
	Aromatics >EC16-EC21	TM173	µg/kg	<100	7430
	Aromatics >EC21-EC35	TM173	µg/kg	<100	30000
	Aromatics >EC35-EC44	TM173	µg/kg	<100	10700
	Aromatics >EC40-EC44	TM173	µg/kg	<100	4540
	Total Aromatics >EC12-EC44	TM173	µg/kg	<100	48900
	Total Aliphatics & Aromatics >C5-C44	TM173	µg/kg	<100	263000
Polyaromatic Hydrocarbons					
	Naphthalene-d8 % recovery**	TM218	%		106
	Acenaphthene-d10 % recovery**	TM218	%		104
	Phenanthrene-d10 % recovery**	TM218	%		103
	Chrysene-d12 % recovery**	TM218	%		103
	Perylene-d12 % recovery**	TM218	%		99.9
	Naphthalene	TM218	µg/kg	<9	<9
	Acenaphthylene	TM218	µg/kg	<12	<12
	Acenaphthene	TM218	µg/kg	<8	<8
	Fluorene	TM218	µg/kg	<10	<10
	Phenanthrene	TM218	µg/kg	<15	55.7
	Anthracene	TM218	µg/kg	<16	<16
	Fluoranthene	TM218	µg/kg	<17	24.5
	Pyrene	TM218	µg/kg	<15	41.9
	Benz(a)anthracene	TM218	µg/kg	<14	<14
	Chrysene	TM218	µg/kg	<10	<10
	Benzo(b)fluoranthene	TM218	µg/kg	<15	39.3

			Depth	0.00-0.00
Benzo(k)fluoranthene	TM218	µg/kg	<14	<14
Benzo(a)pyrene	TM218	µg/kg	<15	17.1
Indeno(1,2,3-cd)pyrene	TM218	µg/kg	<18	<18
Dibenzo(a,h)anthracene	TM218	µg/kg	<23	<23
Benzo(g,h,i)perylene	TM218	µg/kg	<24	<24
PAH, Total Detected USEPA 16	TM218	µg/kg	<118	178

Appendix B – Coed Darcy Risk Based Screening Levels for deep >1m Residential

Lowest of the Remedial Target Criterion/Risk Based Screening Level for Parks land use, Deep Soil (>1m)

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Benzo(a)pyrene	>sat	>sat
Benzene	48	48
Toluene	>sat	>sat
Ethylbenzene	>sat	>sat
Xylene	478	1330
TPH aromatic C7-C8	>sat	>sat
TPH aromatic C8-C10	>sat	>sat
TPH aromatic C10-C12	>sat	>sat
TPH aromatic C12-C16	>sat	>sat
TPH aliphatic C6-C8	>sat	>sat
TPH aliphatic C8-C10	>sat	>sat
TPH aliphatic C10-C12	>sat	>sat
TPH aliphatic C12-C16	>sat	>sat
TPH aromatic C16-C21	>sat	>sat
TPH aromatic C21-C35	>sat	>sat
TPH aliphatic C16-C21	>sat	>sat
TPH aliphatic C21-C35	>sat	>sat
Total TPH (Phase 1)	>sat	>sat
Total TPH (Process Area)	>sat	>sat
Total TPH (North Tank Farm)	>sat	>sat
Total TPH (South Tank Farm)	>sat	>sat
1,2-Dichloroethane	6	6
1,1,1-Trichloroethane	>sat	>sat
Tetrachloroethene	1780	1780
Trichloroethene	269	269
Vinyl chloride	8.21	11.4
Dichloromethane	6220	6220
Cis-1,2-Dichloroethene	881	881
Trans-1,2 Dichloroethene	881	881
Acenaphthene	>sat	>sat
Anthracene	>sat	>sat
Benzo(a)anthracene	>sat	>sat
Benzo(b)fluoranthene	>sat	>sat
Benzo(g,h,i)perylene	>sat	>sat
Benzo(k)fluoranthene	>sat	>sat
Chrysene	>sat	>sat
Dibenz(ah)anthracene	>sat	>sat
Fluoranthene	>sat	>sat
Fluorene	>sat	>sat
Indeno(1,2,3-cd)pyrene	>sat	>sat
Pyrene	>sat	>sat
Phenol	>sat	>sat
Mercury (methyl)	>sat	>sat
Mercury (elemental)	>sat	>sat
Naphthalene	>sat	>sat
TPH aromatic C5-C7	432	928
TPH aliphatic C5-C6	>sat	>sat
1,1,1,2-Tetrachloroethane	>sat	>sat
1,1,2,2-Tetrachloroethane	>sat	>sat
Carbon tetrachloride	301	778
Chlorobenzene	>sat	>sat

Notes

- Where the lower of the vapour or aqueous saturation limits has been exceeded by the RTC calculated, the hazard quotient is considered to be less than 1 and as such >sat has been presented
- Xylene - Users must consider total exposure from all xylene isomers and not consider them in isolation. It should be noted that the value presented is the lowest of the aqueous or vapour saturation limits. The lowest saturation limit of the three isomers has been presented.
- TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered and therefore no value has been presented here
- 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
- Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
- Asbestos has not been considered here as it is being considered in a separate report
- Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
- TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Arsenic	64 a	64 a
Chromium	78 a	78 a
Cadmium	2.6	2.6
Mercury (inorganic)	1 b	1 b
Nickel	75 b	75 b
Selenium	3 b	3 b
Lead	337 a	337 a
Vanadium	351	351
Copper	143 a	143 a
Zinc	478 a	478 a
Benzo(a)pyrene	0.9	0.9
Benzene	13	13
Toluene	8110	8110
Ethylbenzene	4740	4740
Xylene	7940	7940
TPH aromatic C7-C8	21300	21300
TPH aromatic C8-C10	2230	2310
TPH aromatic C10-C12	2300	2340
TPH aromatic C12-C16	2330	2350
TPH aliphatic C6-C8	294000 *	294000 *
TPH aliphatic C8-C10	5740 *	5740 *
TPH aliphatic C10-C12	5700	5830
TPH aliphatic C12-C16	5800	5860
TPH aromatic C16-C21	1450	1450
TPH aromatic C21-C35	1450	1450
TPH aliphatic C16-C35	159000	159000
TPH aliphatic C21-C35	159000	159000
Total TPH (Phase 1)	9060	9060
Total TPH (Process Area)	10800	10800
Total TPH (North Tank Farm)	9420	9420
Total TPH (South Tank Farm)	6350	6350
1,2-Dichloroethane	4.5	4.5
1,1,1-Trichloroethane	27900	27900
Tetrachloroethene	641	641
Trichloroethene	193	193
Vinyl chloride	0.7	0.7
Dichloromethane	241	241
Cis-1,2-Dichloroethene	392	468
Trans-1,2 Dichloroethene	632	632
Acenaphthene	5340	5350
Anthracene	26800	26800
Benzo(a)anthracene	20.8	21.1
Benzo(b)fluoranthene	21.3	21.3
Benzo(g,h,i)perylene	218	218
Benzo(k)fluoranthene	215	215
Chrysene	2090	2090
Dibenz(ah)anthracene	2.16	2.16
Fluoranthene	3570	3570
Fluorene	3570	3570
Indeno(1,2,3-cd)pyrene	21.2	21.2
Pyrene	2680	2680
Phenol	859	859
Mercury (methyl)	19.4	19.4
Mercury (elemental)	4.3	12.9
Naphthalene	955	1340
TPH aromatic C5-C7	26.2	27.5
TPH aliphatic C5-C6	294000	294000
1,1,1,2-Tetrachloroethane	498	533
1,1,2,2-Tetrachloroethane	516	539
Carbon tetrachloride	111	128
Chlorobenzene	170	170

Notes
1. It is assumed that no visible free product is present within the top 1.0m of soil
2. Metal RTC derived considering Soil Codes and background data
a – based on background soil concentration
b – based on Soil Code
3. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
4. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
* 5. The RTC for TPH aliphatic C5-C6, TPH aliphatic C6-C8 and TPH aliphatic C8-C10 are based on a value produced from following the approach outlined in SR4 for substances at saturation
6. TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered
7. 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
8. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
9. Asbestos has not been considered here as it is being considered in a separate report
10. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
11. Elemental mercury is based on the inhalation pathway only and the saturation limit has been presented
12. TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Benzo(a)pyrene	>sat	>sat
Benzene	0.4	0.4
Toluene	52	52
Ethylbenzene	140	140
Xylene	58	58
TPH aromatic C7-C8	146	146
TPH aromatic C8-C10	71	209
TPH aromatic C10-C12	1390	1390
TPH aromatic C12-C16	>sat	>sat
TPH aliphatic C6-C8	>sat	>sat
TPH aliphatic C8-C10	42.5	125
TPH aliphatic C10-C12	>sat	>sat
TPH aliphatic C12-C16	>sat	>sat
TPH aliphatic C16-C21	>sat	>sat
TPH aliphatic C21-C35	>sat	>sat
TPH aromatic C16-C21	>sat	>sat
TPH aromatic C21-C35	>sat	>sat
Total TPH (Phase 1)	9180	9180
Total TPH (Process Area)	4100	4100
Total TPH (North Tank Farm)	3800	3800
Total TPH (South Tank Farm)	2790	2790
1,2-Dichloroethane	0.0111	0.0176
1,1,1-Trichloroethane	10.8	25.9
Tetrachloroethene	2.3	6.12
Trichloroethene	0.188	0.463
Vinyl chloride	0.00093	0.00129
Dichloromethane	4.19	6.04
Cis-1,2-Dichloroethene	0.206	0.392
Trans-1,2 Dichloroethene	0.332	0.689
Acenaphthene	>sat	>sat
Anthracene	>sat	>sat
Benzo(a)anthracene	>sat	>sat
Benzo(b)fluoranthene	>sat	>sat
Benzo(g,h,i)perylene	>sat	>sat
Benzo(k)fluoranthene	>sat	>sat
Chrysene	>sat	>sat
Dibenz(ah)anthracene	>sat	>sat
Fluoranthene	>sat	>sat
Fluorene	>sat	>sat
Indeno(1,2,3-cd)pyrene	>sat	>sat
Pyrene	>sat	>sat
Phenol	1030	2340
Mercury (methyl)	27.7	62.5
Mercury (elemental)	0.291	0.87
Naphthalene	2.8	8.02
TPH aromatic C5-C7	0.46	0.987
TPH aliphatic C5-C6	112	246
1,1,1,2-Tetrachloroethane	1.84	5.09
1,1,2,2-Tetrachloroethane	4.71	11.3
Carbon tetrachloride	0.0309	0.0801
Chlorobenzene	17.9	47.9

Notes

- Where the lower of the vapour or aqueous saturation limits have been exceeded by the RTC calculated, the hazard quotient is considered to be less than 1 and as such >sat has been presented
- Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
- TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered and therefore no RTC value has been presented here
- 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
- Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
- TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- Asbestos has not been considered here as it is being considered in a separate report
- Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
- TPH aromatic C5-C7 is considered to comprise benzene only

Lowest of the Remedial Target Criterion/Risk Based Screening Level for Residential with the Consumption of Produce land use, Shallow Soil.

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Arsenic	64 a	64 a
Chromium	78 a	78 a
Cadmium	2.6	2.6
Mercury (inorganic)	1 b	1 b
Nickel	50	50
Selenium	3 b	3 b
Lead	337 a	337 a
Vanadium	113	115
Copper	143 a	143 a
Zinc	478 a	478 a
Benzo(a)pyrene	0.9	0.9
Benzene	0.0493	0.12
Toluene	36	36
Ethylbenzene	38.2	41
Xylene	17.2	32
TPH aromatic C7-C8	86.9	125
TPH aromatic C8-C10	14.8	94
TPH aromatic C10-C12	57.3	118
TPH aromatic C12-C16	131	131
TPH aliphatic C6-C8	69.8	8340
TPH aliphatic C8-C10	9.76	87.1
TPH aliphatic C10-C12	1780 *	3200
TPH aliphatic C12-C16	4510	4510
TPH aromatic C16-C21	82	82
TPH aromatic C21-C35	888	1130
TPH aliphatic C16-C21	94200	94200
TPH aliphatic C21-C35	94800	94800
Total TPH (Phase 1)	1720	1720
Total TPH (Process Area)	2600	2600
Total TPH (North Tank Farm)	1100	1100
Total TPH (South Tank Farm)	1020	1020
1,2-Dichloroethane	0.0019	0.0102
1,1,1-Trichloroethane	2.23	17.3
Tetrachloroethene	0.455	3.62
Trichloroethene	0.0382	0.304
Vinyl chloride	0.000202	0.00082
Dichloromethane	0.458	1.56
Cis-1,2-Dichloroethene	0.0393	0.255
Trans-1,2-Dichloroethene	0.0671	0.464
Acenaphthene	588 *	1380
Anthracene	8270	14800
Benzo(a)anthracene	7.56	16.5
Benzo(b)fluoranthene	20	23.9
Benzo(g,h,i)perylene	235	248
Benzo(k)fluoranthene	216	243
Chrysene	1500	2220
Dibenz(ah)anthracene	1.97	2.39
Fluoranthene	822	1630
Fluorene	615	1390
Indeno(1,2,3-cd)pyrene	19.2	23.6
Pyrene	563	1150
Phenol	162	349
Mercury (methyl)	6.28	11.3
Mercury (elemental)	0.0607	0.583
Naphthalene	0.585	5.05
TPH aromatic C5-C7	0.0493	0.192
TPH aliphatic C5-C6	30.1	172
1,1,1,2-Tetrachloroethane	0.353	2.78
1,1,2,2-Tetrachloroethane	0.695	3.63
Carbon tetrachloride	0.00656	0.0541
Chlorobenzene	1.06	3.38

Notes

1. It is assumed that no visible free product is present within the top 1.0m of soil
2. Metal RTC derived considering Soil Codes and background data
- a – based on background soil concentration
- b – based on Soil Code
3. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
4. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- * 5. The RTC for TPH aliphatic C10-C12 and acenaphthene is based on a value produced from following the approach outlined in SR4 for substances at saturation
6. 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
7. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
8. Asbestos has not been considered here as it is being considered in a separate report
9. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
10. Phenol is derived by comparing the oral exposure to the oral HCV and the dermal and inhalation exposure to the inhalation HCV
11. Elemental mercury is based on inhalation pathways only
12. TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC/RBSL mg/L
Benzo(a)pyrene	>sat
Benzene	0.0888
Toluene	47
Ethylbenzene	13.4
Xylene	4.1
TPH aromatic C7-C8	20
TPH aromatic C8-C10	0.985
TPH aromatic C10-C12	3.87
TPH aromatic C12-C16	>sat
TPH aromatic C16-C21	>sat
TPH aromatic C21-C35	>sat
TPH aliphatic C6-C8	1.4
TPH aliphatic C8-C10	0.0296
TPH aliphatic C10-C12	0.0228
TPH aliphatic C12-C16	>sat
TPH aliphatic C16-C21	>sat
TPH aliphatic C21-C35	>sat
1,2-Dichloroethane	0.0373
1,1,1-Trichloroethane	13.1
Tetrachloroethene	1.66
Trichloroethene	0.222
Vinyl chloride	0.00248
Dichloromethane	13
Cis-1,2 Dichloroethene	0.547
Trans-1,2 Dichloroethene	0.675
Acenaphthene	>sat
Anthracene	>sat
Benzo(a)anthracene	>sat
Benzo(b)fluoranthene	>sat
Benzo(k)fluoranthene	>sat
Chrysene	>sat
Dibenz(ah)anthracene	>sat
Fluoranthene	>sat
Fluorene	>sat
Indeno(1,2,3-cd)pyrene	>sat
Pyrene	>sat
Phenol	1700
Mercury (methyl)	45.5
Mercury (elemental)	0.00463
Naphthalene	0.952
TPH aromatic C5-C7	0.0888
TPH aliphatic C5-C6	1.93
1,1,1,2-Tetrachloroethane	1.05
1,1,2,2-Tetrachloroethane	6.89
Carbon Tetrachloride	0.0229
Chlorobenzene (mono)	13.7

Notes
1. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
2. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
3. Where indoor and outdoor values were presented by RBCA, these have been integrated in line with SNIFFER (2003). Where both indoor and outdoor values derived by RBCA were greater than the saturation limit, >sat has been presented. Where indoor values were presented by RBCA, and the outdoor values were >sat, only the indoor values have been presented. Therefore >sat indicates that the theoretical RTC is greater than solubility limit.
4. TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered
7. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
8. TPH aromatic C5-C7 is considered to comprise benzene only by Atkins

Technical Note SP119

Subject: Coed Darcy Stockpile 119 Validation

Reference: 5041216

Revision: 001

Author: Daniel Hopkins

Checker: Matt Timmins

Issued to: -

Reviewer:

Date: 10th March 2015

Authoriser:

Introduction

Atkins Ltd has been instructed by St Modwen Developments to control the management and testing of stockpiled material for reuse within the Coed Darcy development. This technical note provides information on stockpile 119 and its suitability for reuse within the site.

The Outline Planning Permission (Ref. 1) grants the redevelopment of the Former Llandarcy oil refinery as a mixed use development, comprising a range of residential, commercial and retail properties, community areas and public open space.

Stockpile Chemical Testing

A total of 40 No. samples were taken by Atkins Ltd and Environmental Scientifics Group Ltd (ESG) and scheduled for laboratory analysis by Alcontrol. The samples were tested for the following determinands (Table 1.) with full results in Appendix A.

Table 1. Soils – List of Determinands

Arsenic (total)	Cadmium (total)	Chromium (total)
Chromium (hexavalent)	Copper (total)	Lead (total)
Mercury (total)	Nickel (total)	Selenium (total)
Zinc (total)	pH	Total Organic Carbon
BTEX	Total Petroleum Hydrocarbons -CWG	USEPA 16 Polycyclic Aromatic Hydrocarbons
Asbestos (Quantification)		

The samples were screened against deep (>1m) residential Coed Darcy Risk Based Screening Levels (RBSL) and Remediation Target Criteria (RTCs).

Asbestos was detected in 10 No. samples; however subsequent quantification demonstrated the concentrations were below the Risk Based Screening Levels (RBSL) for soils to be placed >1m below finished floor level.

References

1. *Neath Port Talbot County Council Approval of Outline Planning Permission. Reference Number P2005/0393 March 2005*

Appendices

Appendix A - Screening sheet of samples

Appendix B – Coed Darcy Risk Based Screening Levels for deep >1m Residential

Appendix A – Screening sheet

ALcontrol Laboratories

				Customer Sample ID		SP119-01	SP119-02	SP119-03	SP119-04	SP119-05	SP119-06
				Depth		-	-	-	-	-	-
SDG(s):				AGS Id							
Customer:				Sample Type		SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Client Reference / Location:				Sampled Date							
Order no:				Sample Received Date		28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014
				Final Instruction Date		18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014
All results expressed on a dry weight basis				Report Completed Date		06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015
				SDG		141128-121	141128-121	141128-121	141128-121	141128-121	141128-121
				Lab Sample Number		10467029	10467030	10467033	10467034	10467035	10467037
				Sample Temperature		9.2	9.2	9.2	9.2	9.2	9.2
Analysis	Test	Method	Units	LOD	1% RBSL >1m RESI	MAX					
	Actinolite*	SUB (ASB)	-				Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Amosite*	SUB (ASB)	-				Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Anthophyllite*	SUB (ASB)	-				Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Chrysotile*	SUB (ASB)	-				Detected	Detected	Detected	Not Detected	Not Detected
	Crocidolite*	SUB (ASB)	-				Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Tremolite*	SUB (ASB)	-				Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Non-Asbestos Fibres Detected	SUB (ASB)	-				Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Sample Description											
	Colour	PM024	-				Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
	Grain Size	PM024	-				0.063 - 0.1 mm	0.1 - 2 mm	0.063 - 0.1 mm	0.063 - 0.1 mm	0.1 - 2 mm
	Description	PM024	-				Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam
	Inclusion 1)	PM024	-				Stones	Stones	Stones	Stones	Stones
	Inclusion 2)	PM024	-				N/A	Vegetation	N/A	N/A	Vegetation
	Moisture Content Ratio (% of as received sample)	PM024	%				12	12	12	14	13
Asbestos											
	Asbestos Quantification - Gravimetric - %	TM 304	%	<0.001	0.0038		<0.001	0.0016	<0.001	-	-
	Asbestos Quantification - PCOM Evaluation - %	TM 304	%	<0.001	0.0021		<0.001	0.0021	<0.001	-	-
	Additional Asbestos Components (Using TM048)	TM 304	-		0		None	None	None	-	-
	Analysts Comments	TM 304	-		0		N/C 3 PCM analysis		N/C	-	-
	Asbestos Quantification - Total - %	TM 304	%	<0.001	0.0039		<0.001	0.0037	<0.001	-	-
Carbon											
	Soil Organic Matter (SOM)	TM132	%	<0.35			3.86	-	-	-	-
Inorganics											
	pH	TM133	pH Units	<1			7.99	7.06	7.78	7.74	6.78
Metals - (Solids)											
	Arsenic	TM181	mg/kg	<0.6	31.7		21	18.7	24.1	16.9	24.8
	Cadmium	TM181	mg/kg	<0.02	0.539		0.383	0.305	0.429	0.193	0.26
	Chromium	TM181	mg/kg	<0.9	18.2		16	14.1	13.2	12.9	15.6
	Copper	TM181	mg/kg	<1.4	77.1		34.3	33.8	39.2	27.5	39
	Lead	TM181	mg/kg	<0.7	166		59.3	36.3	43.6	27.7	62.5
	Mercury	TM181	mg/kg	<0.14	27.7	0.319	<0.14	<0.14	<0.14	<0.14	<0.14
	Nickel	TM181	mg/kg	<0.2	37.5		30.5	31.3	30.7	26.8	30.4
	Selenium	TM181	mg/kg	<1	1.33		<1	<1	<1	<1	<1
	Vanadium	TM181	mg/kg	<0.2	24.4		19.1	18.2	19	15.4	18.5
	Zinc	TM181	mg/kg	<1.9	309		144	115	126	93.7	127

Customer Sample ID					SP119-01	SP119-02	SP119-03	SP119-04	SP119-05	SP119-06
TPH Criteria Working Group (TPH CWG)										
GRO Surrogate % recovery**	TM089	%		107	85	94	89	94	74	107
GRO TOT (Moisture Corrected)	TM089	µg/kg	<44	1050	<176	<176	<176	<176	1050	<176
Methyl tertiary butyl ether (MTBE)	TM089	µg/kg	<5	0	<20	<20	<20	<20	<20	<20
Benzene	TM089	µg/kg	<10	4000	0	<40	<40	<40	<40	<40
Toluene	TM089	µg/kg	<2	52000	0	<8	<8	<8	<8	<8
Ethylbenzene	TM089	µg/kg	<3	140000	0	<12	<12	<12	<12	<12
m,p-Xylene	TM089	µg/kg	<6	58000	0	<24	<24	<24	<24	<24
o-Xylene	TM089	µg/kg	<3	58000	0	<12	<12	<12	<12	<12
sum of detected mpo xylene by GC	TM089	µg/kg	<9	0	<9	<9	<9	<9	<9	<9
sum of detected BTEX by GC	TM089	µg/kg	<24	0	<24	<24	<24	<24	<24	<24
Aliphatics >C5-C6	TM089	µg/kg	<10	112000	0	<40	<40	<40	<40	<40
Aliphatics >C6-C8	TM089	µg/kg	<10	sat	186	<40	<40	<40	186	<40
Aliphatics >C8-C10	TM089	µg/kg	<10	42500	161	<40	51.3	<40	161	<40
Aliphatics >C10-C12	TM089	µg/kg	<10	sat	312	<40	47.9	<40	312	<40
Aliphatics >C12-C16	TM173	µg/kg	<100	sat	8080	4900	4180	4770	1650	2600
Aliphatics >C16-C21	TM173	µg/kg	<100	sat	17400	4380	11600	9690	3740	9800
Aliphatics >C21-C35	TM173	µg/kg	<100	sat	73400	4750	19600	17500	12200	11700
Aliphatics >C35-C44	TM173	µg/kg	<100	sat	19600	4880	10400	8410	4450	4870
Total Aliphatics >C12-C44	TM173	µg/kg	<100	sat	90600	18900	45800	40400	22100	29000
Aromatics >EC5-EC7	TM089	µg/kg	<10	460	0	<40	<40	<40	<40	<40
Aromatics >EC7-EC8	TM089	µg/kg	<10	146000	0	<40	<40	<40	<40	<40
Aromatics >EC8-EC10	TM089	µg/kg	<10	71000	138	<40	<40	<40	138	<40
Aromatics >EC10-EC12	TM089	µg/kg	<10	1390000	208	<40	<40	<40	208	<40
Aromatics >EC12-EC16	TM173	µg/kg	<100	sat	923	<100	611	897	597	597
Aromatics >EC16-EC21	TM173	µg/kg	<100	sat	5350	958	4050	3520	2830	1530
Aromatics >EC21-EC35	TM173	µg/kg	<100	sat	38100	6880	18000	16900	16500	11300
Aromatics >EC35-EC44	TM173	µg/kg	<100	sat	20300	4030	8810	8890	9600	7220
Aromatics >EC40-EC44	TM173	µg/kg	<100	sat	7880	1480	3420	3670	3960	2810
Total Aromatics >EC12-EC44	TM173	µg/kg	<100	64600	11900	31500	30200	29600	20600	30200
Total Aliphatics & Aromatics >C5-C44	TM173	µg/kg	<100	132000	30800	77500	70600	51700	50700	88400
Polyaromatic Hydrocar										
Naphthalene-d8 % recovery**	TM218	%		107	102	99.6	99.9	100	102	101
Acenaphthene-d10 % recovery**	TM218	%		101	99.7	97.6	97.6	98.2	98.3	98.4
Phenanthrene-d10 % recovery**	TM218	%		104	99.5	99.8	97.6	96.6	99.2	96.3
Chrysene-d12 % recovery**	TM218	%		110	97.2	95.6	95.2	101	108	99.6
Perylene-d12 % recovery**	TM218	%		111	97.9	98.3	94.6	109	109	106
Naphthalene	TM218	µg/kg	<9	2800	167	95.1	167	71.7	45.6	79.2
Acenaphthylene	TM218	µg/kg	<12	sat	39	<12	<12	<12	<12	<12
Acenaphthene	TM218	µg/kg	<8	sat	398	<8	<8	<8	<8	31.8
Fluorene	TM218	µg/kg	<10	sat	427	<10	<10	<10	<10	36.8
Phenanthrene	TM218	µg/kg	<15	sat	4500	447	751	382	255	410
Anthracene	TM218	µg/kg	<16	sat	1110	19.3	<16	<16	19.6	<16
Fluoranthene	TM218	µg/kg	<17	sat	7720	227	212	98.8	143	108
Pyrene	TM218	µg/kg	<15	sat	5200	173	156	77.7	102	77.4
Benz(a)anthracene	TM218	µg/kg	<14	sat	5200	151	99.8	<14	72.4	64.7
Chrysene	TM218	µg/kg	<10	sat	4670	275	382	182	139	205
Benzo(b)fluoranthene	TM218	µg/kg	<15	sat	5800	341	354	185	167	153

Customer Sample ID						SP119-01	SP119-02	SP119-03	SP119-04	SP119-05	SP119-06
Benzo(k)fluoranthene	TM218	µg/kg	<14	sat	2100	100	63.5	36.2	42.4	41	86.8
Benzo(a)pyrene	TM218	µg/kg	<15	sat	3460	151	93.9	52.5	71.1	57.2	151
Indeno(1,2,3-cd)pyrene	TM218	µg/kg	<18	sat	1900	107	86.2	42.9	44.2	49.4	104
Dibenzo(a,h)anthracene	TM218	µg/kg	<23	sat	878	49.8	54.2	<23	<23	30.3	49.4
Benzo(g,h,i)perylene	TM218	µg/kg	<24		1880	129	108	50.7	52.7	76.1	114
PAH, Total Detected USEPA 16	TM218	µg/kg	<118		45400	2270	2530	1180	1150	1350	2440

ALcontrol Laboratories

				Customer Sample ID	SP119-07	SP119-08	SP119-09	SP119-10	SP119-11	SP119-12	SP119-13
				Depth	-	-	-	-	-	-	-
SDG(s):	141128-121			AGS Id							
Customer:	Atkins Global Ltd Llandarcy (7158)			Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Client Reference / Location:	Coed Darcy Urban Village			Sampled Date							
Order no:	CD0992			Sample Received Date	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014
				Final Instruction Date	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014
All results expressed on a dry weight basis				Report Completed Date	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015
				SDG	141128-121	141128-121	141128-121	141128-121	141128-121	141128-121	141128-121
				Lab Sample Number	10467038	10467039	10467040	10467041	10467042	10467043	10467044
				Sample Temperature	9.2	9.2	9.2	9.2	9.2	9.2	9.2
Analysis	Test	Method	Units	LOD							
	Actinolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Amosite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Anthophyllite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Chrysotile*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Crocidolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Tremolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Non-Asbestos Fibres Detected	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Sample Description											
	Colour	PM024	-		Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
	Grain Size	PM024	-		0.1 - 2 mm	0.1 - 2 mm	2 - 10 mm	0.1 - 2 mm	0.063 - 0.1 mm	0.1 - 2 mm	0.063 - 0.1 mm
	Description	PM024	-		Sandy Loam	Sandy Clay Loam	Stone/Soil	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam
	Inclusion 1)	PM024	-		Stones	Stones	Stones	Stones	Stones	Stones	Stones
	Inclusion 2)	PM024	-		Vegetation	None	N/A	N/A	Vegetation	None	N/A
	Moisture Content Ratio (% of as received sample)	PM024	%		9.4	13	11	12	13	14	12
Asbestos											
	Asbestos Quantification - Gravimetric - %	TM 304	%	<0.001	-	-	-	-	-	-	-
	Asbestos Quantification - PCOM Evaluation - %	TM 304	%	<0.001	-	-	-	-	-	-	-
	Additional Asbestos Components (Using TM048)	TM 304	-		-	-	-	-	-	-	-
	Analysts Comments	TM 304	-		-	-	-	-	-	-	-
	Asbestos Quantification - Total - %	TM 304	%	<0.001	-	-	-	-	-	-	-
Carbon											
	Soil Organic Matter (SOM)	TM132	%	<0.35	-	-	-	-	3.81	-	-
Inorganics											
	pH	TM133	pH Units	<1	7.98	7.99	7.33	7	7.05	6.76	6.91
Metals - (Solids)											
	Arsenic	TM181	mg/kg	<0.6	17.4	20.3	17.4	19.4	19.2	25.3	19.4
	Cadmium	TM181	mg/kg	<0.02	0.0212	0.256	0.193	0.0494	<0.02	0.294	0.137
	Chromium	TM181	mg/kg	<0.9	15.6	15.7	14.8	16	14.6	15.8	15.3
	Copper	TM181	mg/kg	<1.4	32.1	40.9	28.5	31.7	31.3	41.6	34.9
	Lead	TM181	mg/kg	<0.7	27.6	47.1	38.2	34.5	55.4	47.5	36.7
	Mercury	TM181	mg/kg	<0.14	<0.14	0.263	<0.14	<0.14	<0.14	<0.14	<0.14
	Nickel	TM181	mg/kg	<0.2	30.8	28.6	32.3	34.2	33	37	33.4
	Selenium	TM181	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
	Vanadium	TM181	mg/kg	<0.2	20.6	17.8	15.9	18.2	17.4	21.4	17.6
	Zinc	TM181	mg/kg	<1.9	102	126	136	119	119	135	120

Customer Sample ID				SP119-07	SP119-08	SP119-09	SP119-10	SP119-11	SP119-12	SP119-13
TPH Criteria Working Group (TPH CWG)										
GRO Surrogate % recovery**	TM089	%		97	85	92	71	91	94	76
GRO TOT (Moisture Corrected)	TM089	µg/kg	<44	<176	<176	<176	<176	263	<176	<176
Methyl tertiary butyl ether (MTBE)	TM089	µg/kg	<5	<20	<20	<20	<20	<20	<20	<20
Benzene	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Toluene	TM089	µg/kg	<2	<8	<8	<8	<8	<8	<8	<8
Ethylbenzene	TM089	µg/kg	<3	<12	<12	<12	<12	<12	<12	<12
m,p-Xylene	TM089	µg/kg	<6	<24	<24	<24	<24	<24	<24	<24
o-Xylene	TM089	µg/kg	<3	<12	<12	<12	<12	<12	<12	<12
sum of detected mpo xylene by GC	TM089	µg/kg	<9	<9	<9	<9	<9	<9	<9	<36
sum of detected BTEX by GC	TM089	µg/kg	<24	<24	<24	<24	<24	<24	<24	<96
Aliphatics >C5-C6	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aliphatics >C6-C8	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aliphatics >C8-C10	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aliphatics >C10-C12	TM089	µg/kg	<10	<40	<40	<40	<40	101	<40	<40
Aliphatics >C12-C16	TM173	µg/kg	<100	2010	<100	4110	3370	4130	<100	8080
Aliphatics >C16-C21	TM173	µg/kg	<100	5070	<100	12300	7250	7210	3170	17400
Aliphatics >C21-C35	TM173	µg/kg	<100	6130	<100	26800	10200	6810	38900	13300
Aliphatics >C35-C44	TM173	µg/kg	<100	1790	<100	10800	<100	4140	7170	5270
Total Aliphatics >C12-C44	TM173	µg/kg	<100	15000	<100	54000	20800	22300	49200	44000
Aromatics >EC5-EC7	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aromatics >EC7-EC8	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aromatics >EC8-EC10	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aromatics >EC10-EC12	TM089	µg/kg	<10	<40	<40	<40	<40	67.9	<40	<40
Aromatics >EC12-EC16	TM173	µg/kg	<100	<100	<100	661	<100	411	638	597
Aromatics >EC16-EC21	TM173	µg/kg	<100	839	1890	3380	<100	1100	711	2600
Aromatics >EC21-EC35	TM173	µg/kg	<100	6010	18200	21600	6780	7000	14800	13200
Aromatics >EC35-EC44	TM173	µg/kg	<100	3590	12000	12500	1390	4210	5290	6520
Aromatics >EC40-EC44	TM173	µg/kg	<100	1450	5450	4860	<100	1660	1260	2370
Total Aromatics >EC12-EC44	TM173	µg/kg	<100	10400	32100	38100	8170	12700	21400	22900
Total Aliphatics & Aromatics >C5-C44	TM173	µg/kg	<100	25400	32100	92100	29100	35300	70600	67000
Polyaromatic Hydrocar										
Naphthalene-d8 % recovery**	TM218	%		101	104	99	98.4	100	102	98.9
Acenaphthene-d10 % recovery**	TM218	%		98.1	101	97.8	97.6	97.2	99.9	97
Phenanthrene-d10 % recovery**	TM218	%		95.4	99	99.1	97.1	94.3	100	93.2
Chrysene-d12 % recovery**	TM218	%		97.6	102	84.2	105	97.4	87.7	94
Perylene-d12 % recovery**	TM218	%		103	109	84.5	105	98.6	88.9	97.5
Naphthalene	TM218	µg/kg	<9	45.4	76.1	68.8	64.1	75.5	46.9	45.5
Acenaphthylene	TM218	µg/kg	<12	<12	<12	<12	<12	<12	<12	<12
Acenaphthene	TM218	µg/kg	<8	<8	<8	<8	<8	<8	<8	<8
Fluorene	TM218	µg/kg	<10	<10	<10	<10	<10	<10	17.9	<10
Phenanthrene	TM218	µg/kg	<15	242	377	306	408	377	345	202
Anthracene	TM218	µg/kg	<16	21.1	<16	<16	<16	39.1	35.2	<16
Fluoranthene	TM218	µg/kg	<17	168	147	112	152	276	297	59.3
Pyrene	TM218	µg/kg	<15	144	116	89.3	130	195	227	48.4
Benz(a)anthracene	TM218	µg/kg	<14	99.5	88.6	69.9	78.6	141	174	28
Chrysene	TM218	µg/kg	<10	181	224	161	184	235	277	103
Benzo(b)fluoranthene	TM218	µg/kg	<15	212	186	187	213	223	300	94.1

			Customer Sample ID	SP119-07	SP119-08	SP119-09	SP119-10	SP119-11	SP119-12	SP119-13
Benzo(k)fluoranthene	TM218	µg/kg	<14	72.7	51.7	44.3	53.6	70.3	85.3	23.8
Benzo(a)pyrene	TM218	µg/kg	<15	97.9	96.4	63.3	70	101	130	24.6
Indeno(1,2,3-cd)pyrene	TM218	µg/kg	<18	69	68.1	53.5	46.8	74.1	87.3	26.8
Dibenzo(a,h)anthracene	TM218	µg/kg	<23	30.5	32.3	28.6	29.2	35.1	42	<23
Benzo(g,h,i)perylene	TM218	µg/kg	<24	83.1	81.9	67.8	61.1	86.9	99.7	33.3
PAH, Total Detected USEPA 16	TM218	µg/kg	<118	1470	1540	1250	1490	1930	2170	689

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				Customer Sample ID	SP119-14	SP119-15	SP119-16	SP119-17	SP119-18	SP119-19	SP119-20
				Depth	-	-	-	-	-	-	-
SDG(s):	141128-121			AGS Id							
Customer:	Atkins Global Ltd Llandarcy (7158)			Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Client Reference / Location:	Coed Darcy Urban Village			Sampled Date							
Order no:	CD0992			Sample Received Date	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014
				Final Instruction Date	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014
All results expressed on a dry weight basis				Report Completed Date	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015
				SDG	141128-121	141128-121	141128-121	141128-121	141128-121	141128-121	141128-121
				Lab Sample Number	10467045	10467046	10467047	10467048	10467049	10467051	10467052
				Sample Temperature	9.2	9.2	9.2	9.2	9.2	9.2	9.2
Analysis	Test	Method	Units	LOD							
	Actinolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Amosite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Anthophyllite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Chrysotile*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Detected	Detected
	Crocidolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Tremolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Non-Asbestos Fibres Detected	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Sample Description											
	Colour	PM024	-		Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
	Grain Size	PM024	-		0.063 - 0.1 mm	0.063 - 0.1 mm	0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm
	Description	PM024	-		Sandy Clay Loam	Sandy Clay Loam	Clay Loam	Sandy Clay Loam	Sandy Loam	Sandy Clay Loam	Sandy Clay Loam
	Inclusion 1)	PM024	-		Stones	Stones	Stones	Stones	Stones	Stones	Stones
	Inclusion 2)	PM024	-		N/A	N/A	N/A	Vegetation Concrete/Aggregate	Vegetation	Vegetation	Vegetation
	Moisture Content Ratio (% of as received sample)	PM024	%		14	14	12	13	13	11	15
Asbestos											
	Asbestos Quantification - Gravimetric - %	TM 304	%	<0.001	-	-	-	-	-	<0.001	<0.001
	Asbestos Quantification - PCOM Evaluation - %	TM 304	%	<0.001	-	-	-	-	-	<0.001	<0.001
	Additional Asbestos Components (Using TM048)	TM 304	-		-	-	-	-	-	None	None
	Analysts Comments	TM 304	-		-	-	-	-	-	N/C	N/C
	Asbestos Quantification - Total - %	TM 304	%	<0.001	-	-	-	-	-	<0.001	<0.001
Carbon											
	Soil Organic Matter (SOM)	TM132	%	<0.35	-	-	-	-	-	-	3.79
Inorganics											
	pH	TM133	pH Units	<1	7.15	7.9	7.5	7.43	8.28	6.83	7.25
Metals - (Solids)											
	Arsenic	TM181	mg/kg	<0.6	31.7	21.9	18.6	18.6	21.3	27	31.4
	Cadmium	TM181	mg/kg	<0.02	0.157	0.0728	0.134	0.233	0.398	0.446	0.534
	Chromium	TM181	mg/kg	<0.9	14.6	14.8	16.4	14.9	14.7	15.4	18.2
	Copper	TM181	mg/kg	<1.4	41.5	38.9	35.8	31.6	39.1	46.3	59.7
	Lead	TM181	mg/kg	<0.7	48	42.1	34.2	35.8	45.7	62	86.4
	Mercury	TM181	mg/kg	<0.14	<0.14	0.145	<0.14	<0.14	<0.14	<0.14	<0.14
	Nickel	TM181	mg/kg	<0.2	31.4	32.2	32.6	29.6	28.6	30	31.1
	Selenium	TM181	mg/kg	<1	1.33	<1	<1	<1	<1	<1	<1
	Vanadium	TM181	mg/kg	<0.2	18.9	17.3	16.3	19.1	18.3	21.6	23.2
	Zinc	TM181	mg/kg	<1.9	127	146	135	110	129	143	139

Customer Sample ID				SP119-14	SP119-15	SP119-16	SP119-17	SP119-18	SP119-19	SP119-20
TPH Criteria Working Group (TPH CWG)										
GRO Surrogate % recovery**	TM089	%		94	91	96	98	83	86	94
GRO TOT (Moisture Corrected)	TM089	µg/kg	<44	<176	<176	<176	<176	<176	<176	<176
Methyl tertiary butyl ether (MTBE)	TM089	µg/kg	<5	<20	<20	<20	<20	<20	<20	<20
Benzene	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Toluene	TM089	µg/kg	<2	<8	<8	<8	<8	<8	<8	<8
Ethylbenzene	TM089	µg/kg	<3	<12	<12	<12	<12	<12	<12	<12
m,p-Xylene	TM089	µg/kg	<6	<24	<24	<24	<24	<24	<24	<24
o-Xylene	TM089	µg/kg	<3	<12	<12	<12	<12	<12	<12	<12
sum of detected mpo xylene by GC	TM089	µg/kg	<9	<9	<9	<9	<9	<9	<9	<9
sum of detected BTEX by GC	TM089	µg/kg	<24	<24	<24	<24	<24	<24	<24	<24
Aliphatics >C5-C6	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aliphatics >C6-C8	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aliphatics >C8-C10	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aliphatics >C10-C12	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aliphatics >C12-C16	TM173	µg/kg	<100	4440	2750	2090	5640	<100	780	739
Aliphatics >C16-C21	TM173	µg/kg	<100	14600	8970	4980	12500	<100	2110	1460
Aliphatics >C21-C35	TM173	µg/kg	<100	33800	26800	11900	30500	15700	13600	9630
Aliphatics >C35-C44	TM173	µg/kg	<100	14200	13000	5940	9710	<100	4270	2860
Total Aliphatics >C12-C44	TM173	µg/kg	<100	67100	51600	24900	58300	15700	20700	14700
Aromatics >EC5-EC7	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aromatics >EC7-EC8	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aromatics >EC8-EC10	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aromatics >EC10-EC12	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aromatics >EC12-EC16	TM173	µg/kg	<100	923	815	<100	270	<100	721	<100
Aromatics >EC16-EC21	TM173	µg/kg	<100	5270	5350	792	1110	2090	3630	1920
Aromatics >EC21-EC35	TM173	µg/kg	<100	38100	26200	8730	15800	27900	19400	16000
Aromatics >EC35-EC44	TM173	µg/kg	<100	20300	13900	5410	7850	15900	9530	4630
Aromatics >EC40-EC44	TM173	µg/kg	<100	7880	5380	1930	2540	6220	3870	1380
Total Aromatics >EC12-EC44	TM173	µg/kg	<100	64600	46200	14900	25000	45900	33300	22600
Total Aliphatics & Aromatics >C5-C44	TM173	µg/kg	<100	132000	97800	39900	83300	61600	54000	37300
Polyaromatic Hydrocar										
Naphthalene-d8 % recovery**	TM218	%		101	100	102	101	98.2	100	103
Acenaphthene-d10 % recovery**	TM218	%		97.7	97.2	98	98.1	96.1	97.4	100
Phenanthrene-d10 % recovery**	TM218	%		98	95.9	98.7	98.8	96.4	97.3	100
Chrysene-d12 % recovery**	TM218	%		110	97.4	110	85.4	94.3	99.3	98
Perylene-d12 % recovery**	TM218	%		108	102	108	87.3	94.7	99.2	95.4
Naphthalene	TM218	µg/kg	<9	89.6	66.2	51.9	59.5	79.5	71.7	49.7
Acenaphthylene	TM218	µg/kg	<12	<12	<12	<12	<12	<12	<12	<12
Acenaphthene	TM218	µg/kg	<8	<8	<8	<8	<8	<8	11.3	33.9
Fluorene	TM218	µg/kg	<10	<10	<10	<10	<10	<10	<10	27.5
Phenanthrene	TM218	µg/kg	<15	486	314	234	277	371	422	406
Anthracene	TM218	µg/kg	<16	<16	<16	<16	<16	<16	24.9	56.2
Fluoranthene	TM218	µg/kg	<17	142	159	104	140	145	214	528
Pyrene	TM218	µg/kg	<15	116	128	80.2	110	105	159	389
Benz(a)anthracene	TM218	µg/kg	<14	88.7	98.9	88	89.4	97.8	151	334
Chrysene	TM218	µg/kg	<10	250	220	136	172	213	282	409
Benzo(b)fluoranthene	TM218	µg/kg	<15	251	247	179	183	232	299	577

			Customer Sample ID	SP119-14	SP119-15	SP119-16	SP119-17	SP119-18	SP119-19	SP119-20
Benzo(k)fluoranthene	TM218	µg/kg	<14	49.4	72.9	39.7	51	59.5	76.3	166
Benzo(a)pyrene	TM218	µg/kg	<15	76.2	102	78.3	73.2	89.5	115	291
Indeno(1,2,3-cd)pyrene	TM218	µg/kg	<18	56.5	79.2	49.1	57.4	67.4	79.7	186
Dibenzo(a,h)anthracene	TM218	µg/kg	<23	39.1	36.4	29.1	<23	34.6	48.5	79.6
Benzo(g,h,i)perylene	TM218	µg/kg	<24	69.5	96.6	60.5	70.2	81.8	92.8	217
PAH, Total Detected USEPA 16	TM218	µg/kg	<118	1710	1620	1130	1280	1580	2050	3750

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				Customer Sample ID	SP119-21	SP119-22	SP119-23	SP119-24	SP119-25	SP119-26	SP119-27
				Depth	-	-	-	-	-	-	-
SDG(s):	141128-121			AGS Id							
Customer:	Atkins Global Ltd Llandarcy (7158)			Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Client Reference / Location:	Coed Darcy Urban Village			Sampled Date							
Order no:	CD0992			Sample Received Date	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014
				Final Instruction Date	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014
All results expressed on a dry weight basis				Report Completed Date	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015
				SDG	141128-121	141128-121	141128-121	141128-121	141128-121	141128-121	141128-121
				Lab Sample Number	10467053	10467054	10467055	10467056	10467057	10467059	10467060
				Sample Temperature	9.2	9.2	9.2	9.2	9.2	9.2	9.2
Analysis	Test	Method	Units	LOD							
	Actinolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Amosite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Anthophyllite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Chrysotile*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Detected	Detected
	Crocidolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Tremolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Non-Asbestos Fibres Detected	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Sample Description											
	Colour	PM024	-		Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
	Grain Size	PM024	-		0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm	0.063 - 0.1 mm	0.1 - 2 mm	0.063 - 0.1 mm
	Description	PM024	-		Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam
	Inclusion 1)	PM024	-		Stones	Stones	Stones	Stones	Stones	Stones	Stones
	Inclusion 2)	PM024	-		Vegetation	Vegetation	None	None	Vegetation	None	N/A
	Moisture Content Ratio (% of as received sample)	PM024	%		15	14	10	13	16	14	11
Asbestos											
	Asbestos Quantification - Gravimetric - %	TM 304	%	<0.001	-	-	-	-	-	<0.001	0.0038
	Asbestos Quantification - PCOM Evaluation - %	TM 304	%	<0.001	-	-	-	-	-	<0.001	<0.001
	Additional Asbestos Components (Using TM048)	TM 304	-		-	-	-	-	-	None	None
	Analysts Comments	TM 304	-		-	-	-	-	-	N/C	N/C
	Asbestos Quantification - Total - %	TM 304	%	<0.001	-	-	-	-	-	<0.001	0.0039
Carbon											
	Soil Organic Matter (SOM)	TM132	%	<0.35	-	-	-	-	-	-	-
Inorganics											
	pH	TM133	pH Units	<1	7.2	6.73	7.25	7.18	7.05	7.83	6.95
Metals - (Solids)											
	Arsenic	TM181	mg/kg	<0.6	28.2	27.5	21.7	21.6	24.4	26.8	19.4
	Cadmium	TM181	mg/kg	<0.02	0.154	0.154	0.226	0.175	0.234	0.432	0.21
	Chromium	TM181	mg/kg	<0.9	15.6	15.8	15.1	13.8	15.1	16.7	15.4
	Copper	TM181	mg/kg	<1.4	46.4	46.6	29.5	36.5	46.6	45.1	30.3
	Lead	TM181	mg/kg	<0.7	72.3	75.9	32.1	53.8	58.9	55.7	36.4
	Mercury	TM181	mg/kg	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
	Nickel	TM181	mg/kg	<0.2	27.7	31.4	33.8	28	26.6	35.1	32.4
	Selenium	TM181	mg/kg	<1	1.17	1.11	<1	<1	1.15	<1	<1
	Vanadium	TM181	mg/kg	<0.2	16.7	17.3	17.2	18.9	18.1	22.3	18.5
	Zinc	TM181	mg/kg	<1.9	126	130	98.8	110	113	135	98

Customer Sample ID				SP119-21	SP119-22	SP119-23	SP119-24	SP119-25	SP119-26	SP119-27
TPH Criteria Working Group (TPH CWG)										
GRO Surrogate % recovery**	TM089	%		88	82	83	99	99	97	89
GRO TOT (Moisture Corrected)	TM089	µg/kg	<44	<176	<176	337	<176	<176	<176	<176
Methyl tertiary butyl ether (MTBE)	TM089	µg/kg	<5	<20	<20	<20	<20	<20	<20	<20
Benzene	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Toluene	TM089	µg/kg	<2	<8	<8	<8	<8	<8	<8	<8
Ethylbenzene	TM089	µg/kg	<3	<12	<12	<12	<12	<12	<12	<12
m,p-Xylene	TM089	µg/kg	<6	<24	<24	<24	<24	<24	<24	<24
o-Xylene	TM089	µg/kg	<3	<12	<12	<12	<12	<12	<12	<12
sum of detected mpo xylene by GC	TM089	µg/kg	<9	<9	<9	<9	<36	<9	<9	<9
sum of detected BTEX by GC	TM089	µg/kg	<24	<24	<24	<24	<96	<24	<24	<24
Aliphatics >C5-C6	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aliphatics >C6-C8	TM089	µg/kg	<10	<40	<40	58.2	<40	<40	<40	<40
Aliphatics >C8-C10	TM089	µg/kg	<10	<40	<40	54.9	49	<40	<40	<40
Aliphatics >C10-C12	TM089	µg/kg	<10	<40	<40	93	41	<40	<40	<40
Aliphatics >C12-C16	TM173	µg/kg	<100	1120	1590	2500	3360	791	940	1570
Aliphatics >C16-C21	TM173	µg/kg	<100	2890	2360	4160	3300	1300	2990	3570
Aliphatics >C21-C35	TM173	µg/kg	<100	11500	13500	24100	13600	10700	17600	49900
Aliphatics >C35-C44	TM173	µg/kg	<100	4140	3310	8010	4460	3610	6390	11000
Total Aliphatics >C12-C44	TM173	µg/kg	<100	19600	20800	38800	24800	16400	27900	66100
Aromatics >EC5-EC7	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aromatics >EC7-EC8	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aromatics >EC8-EC10	TM089	µg/kg	<10	<40	<40	53.8	<40	<40	<40	<40
Aromatics >EC10-EC12	TM089	µg/kg	<10	<40	<40	61.6	<40	<40	<40	<40
Aromatics >EC12-EC16	TM173	µg/kg	<100	<100	<100	<100	<100	496	<100	516
Aromatics >EC16-EC21	TM173	µg/kg	<100	2120	2720	1120	<100	2480	897	2160
Aromatics >EC21-EC35	TM173	µg/kg	<100	14700	17700	11500	1480	17200	14600	12500
Aromatics >EC35-EC44	TM173	µg/kg	<100	2780	2700	3220	971	8800	6650	6110
Aromatics >EC40-EC44	TM173	µg/kg	<100	<100	<100	<100	<100	3140	2210	2400
Total Aromatics >EC12-EC44	TM173	µg/kg	<100	19600	23100	15800	2450	28900	22200	21300
Total Aliphatics & Aromatics >C5-C44	TM173	µg/kg	<100	39300	44000	54900	27400	45400	50100	87500
Polyaromatic Hydrocar										
Naphthalene-d8 % recovery**	TM218	%		100	102	102	99.8	102	98.9	101
Acenaphthene-d10 % recovery**	TM218	%		96.6	100	99.7	96.4	99.1	95.4	98.9
Phenanthrene-d10 % recovery**	TM218	%		95.2	96.7	100	94.1	100	97.9	99
Chrysene-d12 % recovery**	TM218	%		100	99	86.6	94.7	87.8	96.1	98.6
Perylene-d12 % recovery**	TM218	%		103	102	87.8	96.9	89.8	96.2	99.3
Naphthalene	TM218	µg/kg	<9	76.5	56.5	49.9	30.1	53.8	62.3	73
Acenaphthylene	TM218	µg/kg	<12	28.5	<12	<12	<12	<12	<12	<12
Acenaphthene	TM218	µg/kg	<8	205	51.7	<8	<8	57.3	13.1	19.6
Fluorene	TM218	µg/kg	<10	241	48.3	<10	<10	44.5	13.6	20.3
Phenanthrene	TM218	µg/kg	<15	2740	521	269	183	475	390	415
Anthracene	TM218	µg/kg	<16	581	80.1	<16	<16	69.1	24.2	34.2
Fluoranthene	TM218	µg/kg	<17	4030	675	86.4	51.6	554	218	312
Pyrene	TM218	µg/kg	<15	2730	525	63.2	37.3	397	160	229
Benz(a)anthracene	TM218	µg/kg	<14	2530	369	48	26.8	310	143	188
Chrysene	TM218	µg/kg	<10	2490	579	136	92.6	421	284	310
Benzo(b)fluoranthene	TM218	µg/kg	<15	2880	668	116	78.6	566	316	368

			Customer Sample ID	SP119-21	SP119-22	SP119-23	SP119-24	SP119-25	SP119-26	SP119-27
Benzo(k)fluoranthene	TM218	µg/kg	<14	1150	232	31	19.8	179	79.1	96.5
Benzo(a)pyrene	TM218	µg/kg	<15	1820	345	34.4	20.6	288	126	163
Indeno(1,2,3-cd)pyrene	TM218	µg/kg	<18	1100	244	29	25.1	205	92	101
Dibenzo(a,h)anthracene	TM218	µg/kg	<23	478	100	<23	<23	85.6	46.4	47.2
Benzo(g,h,i)perylene	TM218	µg/kg	<24	1100	266	35.6	29	245	113	114
PAH, Total Detected USEPA 16	TM218	µg/kg	<118	24200	4760	899	594	3950	2080	2490

ALcontrol Laboratories

				Customer Sample ID	SP119-28	SP119-29	SP119-30	SP119-31	SP119-32	SP119-33	SP119-34
				Depth	-	-	-	-	-	-	-
SDG(s):	141128-121			AGS Id							
Customer:	Atkins Global Ltd Llandarcy (7158)			Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Client Reference / Location:	Coed Darcy Urban Village			Sampled Date							
Order no:	CD0992			Sample Received Date	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014
				Final Instruction Date	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014
All results expressed on a dry weight basis				Report Completed Date	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015
				SDG	141128-121	141128-121	141128-121	141128-121	141128-121	141128-121	141128-121
				Lab Sample Number	10467061	10467062	10467063	10467064	10467065	10467066	10467067
				Sample Temperature	9.2	9.2	9.2	9.2	9.2	9.2	9.2
Analysis	Test	Method	Units	LOD							
	Actinolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Amosite*	SUB (ASB)	-		Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Anthophyllite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Chrysotile*	SUB (ASB)	-		Detected	Detected	Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Crocidolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Tremolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Non-Asbestos Fibres Detected	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Sample Description											
	Colour	PM024	-		Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
	Grain Size	PM024	-		0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm	0.063 - 0.1 mm	0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm
	Description	PM024	-		Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Loam	Sandy Loam
	Inclusion 1)	PM024	-		Stones	Stones	Stones	Stones	Stones	Stones	Stones
	Inclusion 2)	PM024	-		None	None	None	Vegetation	None	Vegetation	Vegetation
	Moisture Content Ratio (% of as received sample)	PM024	%		10	13	16	16	15	12	13
Asbestos											
	Asbestos Quantification - Gravimetric - %	TM 304	%	<0.001	<0.001	<0.001	<0.001	-	-	-	-
	Asbestos Quantification - PCOM Evaluation - %	TM 304	%	<0.001	<0.001	<0.001	<0.001	-	-	-	-
	Additional Asbestos Components (Using TM048)	TM 304	-		None	None	None	-	-	-	-
	Analysts Comments	TM 304	-		N/C	N/C	N/C	-	-	-	-
	Asbestos Quantification - Total - %	TM 304	%	<0.001	<0.001	<0.001	<0.001	-	-	-	-
Carbon											
	Soil Organic Matter (SOM)	TM132	%	<0.35	-	3.1	-	-	-	-	-
Inorganics											
	pH	TM133	pH Units	<1	6.8	6.98	7.23	7.05	8	7.07	7.13
Metals - (Solids)											
	Arsenic	TM181	mg/kg	<0.6	26	21.4	27.1	26.8	25.5	20.5	29.9
	Cadmium	TM181	mg/kg	<0.02	0.338	0.137	0.435	0.194	0.539	0.174	0.418
	Chromium	TM181	mg/kg	<0.9	16.1	16.1	16.3	16.3	16.2	15.1	17.3
	Copper	TM181	mg/kg	<1.4	42.7	77.1	47.2	48.4	52.6	35.2	50
	Lead	TM181	mg/kg	<0.7	46.3	37	47.2	64.6	56.3	50.4	59.3
	Mercury	TM181	mg/kg	<0.14	<0.14	<0.14	<0.14	<0.14	0.158	<0.14	<0.14
	Nickel	TM181	mg/kg	<0.2	32.6	34	31.8	29.1	32	28.3	30.3
	Selenium	TM181	mg/kg	<1	<1	<1	<1	1.02	<1	<1	<1
	Vanadium	TM181	mg/kg	<0.2	20.6	19.1	21.9	19.6	21.4	18.7	22.3
	Zinc	TM181	mg/kg	<1.9	126	112	138	121	162	114	129

Customer Sample ID				SP119-28	SP119-29	SP119-30	SP119-31	SP119-32	SP119-33	SP119-34
TPH Criteria Working Group (TPH CWG)										
GRO Surrogate % recovery**	TM089	%		89	91	88	99	93	91	81
GRO TOT (Moisture Corrected)	TM089	µg/kg	<44	<176	<176	<176	<176	<176	<176	<176
Methyl tertiary butyl ether (MTBE)	TM089	µg/kg	<5	<20	<20	<20	<20	<20	<20	<20
Benzene	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Toluene	TM089	µg/kg	<2	<8	<8	<8	<8	<8	<8	<8
Ethylbenzene	TM089	µg/kg	<3	<12	<12	<12	<12	<12	<12	<12
m,p-Xylene	TM089	µg/kg	<6	<24	<24	<24	<24	<24	<24	<24
o-Xylene	TM089	µg/kg	<3	<12	<12	<12	<12	<12	<12	<12
sum of detected mpo xylene by GC	TM089	µg/kg	<9	<9	<9	<9	<9	<9	<9	<9
sum of detected BTEX by GC	TM089	µg/kg	<24	<24	<24	<24	<24	<24	<24	<24
Aliphatics >C5-C6	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aliphatics >C6-C8	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aliphatics >C8-C10	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aliphatics >C10-C12	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aliphatics >C12-C16	TM173	µg/kg	<100	759	<100	3890	992	5470	3680	229
Aliphatics >C16-C21	TM173	µg/kg	<100	4180	3700	12200	1430	10500	5890	3360
Aliphatics >C21-C35	TM173	µg/kg	<100	73400	23600	36100	6100	26800	23900	19800
Aliphatics >C35-C44	TM173	µg/kg	<100	12300	6850	19600	2930	8650	7000	4580
Total Aliphatics >C12-C44	TM173	µg/kg	<100	90600	34200	71700	11400	51400	40500	27900
Aromatics >EC5-EC7	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aromatics >EC7-EC8	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aromatics >EC8-EC10	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aromatics >EC10-EC12	TM089	µg/kg	<10	<40	<40	<40	<40	<40	<40	<40
Aromatics >EC12-EC16	TM173	µg/kg	<100	<100	<100	209	399	<100	584	<100
Aromatics >EC16-EC21	TM173	µg/kg	<100	1260	1390	2220	2030	394	3010	2170
Aromatics >EC21-EC35	TM173	µg/kg	<100	19200	8760	19500	14800	10200	21400	16800
Aromatics >EC35-EC44	TM173	µg/kg	<100	5390	2310	10200	6810	2940	7120	4990
Aromatics >EC40-EC44	TM173	µg/kg	<100	1630	<100	3550	2440	<100	1890	1140
Total Aromatics >EC12-EC44	TM173	µg/kg	<100	25800	12500	32200	24100	13500	32200	23900
Total Aliphatics & Aromatics >C5-C44	TM173	µg/kg	<100	116000	46700	104000	35600	64900	72800	52000
Polyaromatic Hydrocar										
Naphthalene-d8 % recovery**	TM218	%		107	106	101	100	101	88.8	98.7
Acenaphthene-d10 % recovery**	TM218	%		99.3	100	100	96.7	98.7	86.4	95.3
Phenanthrene-d10 % recovery**	TM218	%		104	104	99.8	95	99.4	86.8	92.8
Chrysene-d12 % recovery**	TM218	%		106	100	97.9	99.4	86	74.2	96.6
Perylene-d12 % recovery**	TM218	%		110	111	98.5	101	88.1	73.7	97.6
Naphthalene	TM218	µg/kg	<9	92.9	97.3	77.8	64.3	54.8	43.9	44.4
Acenaphthylene	TM218	µg/kg	<12	<12	<12	<12	15.4	<12	<12	<12
Acenaphthene	TM218	µg/kg	<8	26.8	<8	<8	63.5	<8	27.9	21.2
Fluorene	TM218	µg/kg	<10	27.6	12.6	<10	63.6	<10	25.4	25.6
Phenanthrene	TM218	µg/kg	<15	623	611	441	724	259	357	346
Anthracene	TM218	µg/kg	<16	37.7	18.7	33.3	128	<16	45.3	47.7
Fluoranthene	TM218	µg/kg	<17	425	203	340	981	174	417	399
Pyrene	TM218	µg/kg	<15	326	143	251	749	128	304	296
Benz(a)anthracene	TM218	µg/kg	<14	293	117	212	585	111	241	250
Chrysene	TM218	µg/kg	<10	458	342	339	729	174	347	359
Benzo(b)fluoranthene	TM218	µg/kg	<15	590	325	391	782	231	475	415

			Customer Sample ID	SP119-28	SP119-29	SP119-30	SP119-31	SP119-32	SP119-33	SP119-34
Benzo(k)fluoranthene	TM218	µg/kg	<14	150	58.6	107	303	69.6	165	140
Benzo(a)pyrene	TM218	µg/kg	<15	266	106	183	479	97.6	212	220
Indeno(1,2,3-cd)pyrene	TM218	µg/kg	<18	158	79.5	118	293	74.1	152	154
Dibenzo(a,h)anthracene	TM218	µg/kg	<23	77.7	48.7	53.6	126	32	63.6	64
Benzo(g,h,i)perylene	TM218	µg/kg	<24	193	90.7	137	325	91.5	181	170
PAH, Total Detected USEPA 16	TM218	µg/kg	<118	3740	2250	2680	6410	1500	3060	2950

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				Customer Sample ID	SP119-35	SP119-36	SP119-37	SP119-38	SP119-39	SP119-40
				Depth	-	-	-	-	-	-
SDG(s):				AGS Id						
Customer:				Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Client Reference / Location:				Sampled Date						
Order no:				Sample Received Date	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014	28/11/2014
				Final Instruction Date	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014	18/12/2014
				Report Completed Date	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015	06/02/2015
				SDG	141128-121	141128-121	141128-121	141128-121	141128-121	141128-121
				Lab Sample Number	10467068	10467070	10467071	10467072	10467073	10467074
				Sample Temperature	9.2	9.2	9.2	9.2	9.2	9.2
Analysis	Test	Method	Units	LOD						
	Actinolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Amosite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Anthophyllite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Chrysotile*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Crocidolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Tremolite*	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Non-Asbestos Fibres Detected	SUB (ASB)	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Sample Description										
	Colour	PM024	-		Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown
	Grain Size	PM024	-		0.1 - 2 mm	0.063 - 0.1 mm	0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm	0.1 - 2 mm
	Description	PM024	-		Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam
	Inclusion 1)	PM024	-		Stones	Stones	Stones	Stones	Stones	Stones
	Inclusion 2)	PM024	-		Vegetation	Vegetation	None	Vegetation	None	None
	Moisture Content Ratio (% of as received sample)	PM024	%		15	15	11	16	16	13
Asbestos										
	Asbestos Quantification - Gravimetric - %	TM 304	%	<0.001	-	-	-	-	-	-
	Asbestos Quantification - PCOM Evaluation - %	TM 304	%	<0.001	-	-	-	-	-	-
	Additional Asbestos Components (Using TM048)	TM 304	-		-	-	-	-	-	-
	Analysts Comments	TM 304	-		-	-	-	-	-	-
	Asbestos Quantification - Total - %	TM 304	%	<0.001	-	-	-	-	-	-
Carbon										
	Soil Organic Matter (SOM)	TM132	%	<0.35	-	-	-	3.76	-	-
Inorganics										
	pH	TM133	pH Units	<1	7.25	7.19	7.94	7.49	8.19	6.98
Metals - (Solids)										
	Arsenic	TM181	mg/kg	<0.6	26.7	22.9	20.7	25.5	30.3	29.8
	Cadmium	TM181	mg/kg	<0.02	0.393	0.164	0.404	0.0738	0.15	0.503
	Chromium	TM181	mg/kg	<0.9	16.4	15	17.5	15.1	15.2	16.4
	Copper	TM181	mg/kg	<1.4	49.1	41.1	38	44	45.6	52.6
	Lead	TM181	mg/kg	<0.7	58.4	53.1	57.2	166	71.9	61.7
	Mercury	TM181	mg/kg	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.319
	Nickel	TM181	mg/kg	<0.2	31.2	26	37.2	28.2	37.5	34.3
	Selenium	TM181	mg/kg	<1	<1	<1	<1	<1	1.05	<1
	Vanadium	TM181	mg/kg	<0.2	23.9	20.4	20.5	16.2	16.2	24.4
	Zinc	TM181	mg/kg	<1.9	154	115	138	120	137	169

TPH Criteria Working Group (TPH CWG)				Customer Sample ID	SP119-35	SP119-36	SP119-37	SP119-38	SP119-39	SP119-40
GRO Surrogate % recovery**	TM089	%			93	93	89	98	96	91
GRO TOT (Moisture Corrected)	TM089	µg/kg	<44		297	<176	<176	<176	<176	<176
Methyl tertiary butyl ether (MTBE)	TM089	µg/kg	<5		<20	<20	<20	<20	<20	<20
Benzene	TM089	µg/kg	<10		<40	<40	<40	<40	<40	<40
Toluene	TM089	µg/kg	<2		<8	<8	<8	<8	<8	<8
Ethylbenzene	TM089	µg/kg	<3		<12	<12	<12	<12	<12	<12
m,p-Xylene	TM089	µg/kg	<6		<24	<24	<24	<24	<24	<24
o-Xylene	TM089	µg/kg	<3		<12	<12	<12	<12	<12	<12
sum of detected mpo xylene by GC	TM089	µg/kg	<9		<36	<9	<9	<9	<9	<9
sum of detected BTEX by GC	TM089	µg/kg	<24		<96	<24	<24	<24	<24	<24
Aliphatics >C5-C6	TM089	µg/kg	<10		<40	<40	<40	<40	<40	<40
Aliphatics >C6-C8	TM089	µg/kg	<10		<40	<40	<40	<40	<40	<40
Aliphatics >C8-C10	TM089	µg/kg	<10		53.8	<40	<40	<40	<40	<40
Aliphatics >C10-C12	TM089	µg/kg	<10		92.4	<40	<40	<40	<40	<40
Aliphatics >C12-C16	TM173	µg/kg	<100		870	1980	3180	1950	3670	3320
Aliphatics >C16-C21	TM173	µg/kg	<100		2760	5610	6540	4650	7480	3960
Aliphatics >C21-C35	TM173	µg/kg	<100		15100	21700	19600	25300	18900	16800
Aliphatics >C35-C44	TM173	µg/kg	<100		4120	8300	8770	6220	7670	1870
Total Aliphatics >C12-C44	TM173	µg/kg	<100		22800	37600	38100	38100	37700	26000
Aromatics >EC5-EC7	TM089	µg/kg	<10		<40	<40	<40	<40	<40	<40
Aromatics >EC7-EC8	TM089	µg/kg	<10		<40	<40	<40	<40	<40	<40
Aromatics >EC8-EC10	TM089	µg/kg	<10		49.1	<40	<40	<40	<40	<40
Aromatics >EC10-EC12	TM089	µg/kg	<10		62	<40	<40	<40	<40	<40
Aromatics >EC12-EC16	TM173	µg/kg	<100		<100	858	<100	<100	<100	<100
Aromatics >EC16-EC21	TM173	µg/kg	<100		2290	5270	1140	1520	1800	<100
Aromatics >EC21-EC35	TM173	µg/kg	<100		18000	30200	13000	13000	12400	1350
Aromatics >EC35-EC44	TM173	µg/kg	<100		2750	13500	5520	3740	2460	799
Aromatics >EC40-EC44	TM173	µg/kg	<100		<100	5360	1720	835	<100	<100
Total Aromatics >EC12-EC44	TM173	µg/kg	<100		23000	49800	19700	18300	16600	2150
Total Aliphatics & Aromatics >C5-C44	TM173	µg/kg	<100		46100	87500	57800	56500	54400	28200
Polyaromatic Hydrocar										
Naphthalene-d8 % recovery**	TM218	%			98.7	98.6	100	100	101	100
Acenaphthene-d10 % recovery**	TM218	%			95.8	95.2	98.1	97.5	98.4	97.8
Phenanthrene-d10 % recovery**	TM218	%			94.1	92.8	99.2	94.3	95.9	98.3
Chrysene-d12 % recovery**	TM218	%			101	96.3	84.2	96.9	97.3	85.9
Perylene-d12 % recovery**	TM218	%			104	99	85.2	98.9	100	87.3
Naphthalene	TM218	µg/kg	<9		100	50.3	63.4	50.3	70.1	68.9
Acenaphthylene	TM218	µg/kg	<12		39	16	<12	<12	<12	<12
Acenaphthene	TM218	µg/kg	<8		398	166	<8	28.5	<8	<8
Fluorene	TM218	µg/kg	<10		427	127	<10	29.6	<10	<10
Phenanthrene	TM218	µg/kg	<15		4500	1240	280	372	303	351
Anthracene	TM218	µg/kg	<16		1110	308	<16	54.1	<16	<16
Fluoranthene	TM218	µg/kg	<17		7720	1890	110	468	125	129
Pyrene	TM218	µg/kg	<15		5200	1430	84.3	343	106	95.4
Benz(a)anthracene	TM218	µg/kg	<14		5200	939	61.8	219	78.4	69.2
Chrysene	TM218	µg/kg	<10		4670	992	135	391	180	186
Benzo(b)fluoranthene	TM218	µg/kg	<15		5800	1140	154	488	158	176

			Customer Sample ID	SP119-35	SP119-36	SP119-37	SP119-38	SP119-39	SP119-40
Benzo(k)fluoranthene	TM218	µg/kg	<14	2100	481	41.7	151	50	38.5
Benzo(a)pyrene	TM218	µg/kg	<15	3460	801	53.5	229	63.8	56.3
Indeno(1,2,3-cd)pyrene	TM218	µg/kg	<18	1900	487	44.3	161	51.9	44.5
Dibenzo(a,h)anthracene	TM218	µg/kg	<23	878	177	<23	67.9	<23	<23
Benzo(g,h,i)perylene	TM218	µg/kg	<24	1880	536	56.1	190	63.9	53.9
PAH, Total Detected USEPA 16	TM218	µg/kg	<118	45400	10800	1080	3240	1250	1270

ALcontrol Laboratories

		Customer Sample ID		
		Depth		
SDG(s):	141128-121	AGS Id		
Customer:	Atkins Global Ltd Llandarcy (7158)	Sample Type		
Client Reference / Location:	Coed Darcy Urban Village	Sampled Date		
Order no:	CD0992	Sample Received Date		
		Final Instruction Date		
All results expressed on a dry weight basis		Report Completed Date		
		SDG		
		Lab Sample Number		
		Sample Temperature		

Analysis	Test	Method	Units	LOD
	Actinolite*	SUB (ASB)	-	
	Amosite*	SUB (ASB)	-	
	Anthophyllite*	SUB (ASB)	-	
	Chrysotile*	SUB (ASB)	-	
	Crocidolite*	SUB (ASB)	-	
	Tremolite*	SUB (ASB)	-	
	Non-Asbestos Fibres Detected	SUB (ASB)	-	

Sample Description

	Colour	PM024	-	
	Grain Size	PM024	-	
	Description	PM024	-	
	Inclusion 1)	PM024	-	
	Inclusion 2)	PM024	-	
	Moisture Content Ratio (% of as received sample)	PM024	%	

Asbestos

	Asbestos Quantification - Gravimetric - %	TM 304	%	<0.001
	Asbestos Quantification - PCOM Evaluation - %	TM 304	%	<0.001
	Additional Asbestos Components (Using TM048)	TM 304	-	
	Analysts Comments	TM 304	-	
	Asbestos Quantification - Total - %	TM 304	%	<0.001

Carbon

	Soil Organic Matter (SOM)	TM132	%	<0.35
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Inorganics

	pH	TM133	pH Units	<1
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Metals - (Solids)

	Arsenic	TM181	mg/kg	<0.6
	Cadmium	TM181	mg/kg	<0.02
	Chromium	TM181	mg/kg	<0.9
	Copper	TM181	mg/kg	<1.4
	Lead	TM181	mg/kg	<0.7
	Mercury	TM181	mg/kg	<0.14
	Nickel	TM181	mg/kg	<0.2
	Selenium	TM181	mg/kg	<1
	Vanadium	TM181	mg/kg	<0.2
	Zinc	TM181	mg/kg	<1.9

Customer Sample ID

TPH Criteria Working Group (TPH CWG)

GRO Surrogate % recovery**	TM089	%	
GRO TOT (Moisture Corrected)	TM089	µg/kg	<44
Methyl tertiary butyl ether (MTBE)	TM089	µg/kg	<5
Benzene	TM089	µg/kg	<10
Toluene	TM089	µg/kg	<2
Ethylbenzene	TM089	µg/kg	<3
m,p-Xylene	TM089	µg/kg	<6
o-Xylene	TM089	µg/kg	<3
sum of detected mpo xylene by GC	TM089	µg/kg	<9
sum of detected BTEX by GC	TM089	µg/kg	<24
Aliphatics >C5-C6	TM089	µg/kg	<10
Aliphatics >C6-C8	TM089	µg/kg	<10
Aliphatics >C8-C10	TM089	µg/kg	<10
Aliphatics >C10-C12	TM089	µg/kg	<10
Aliphatics >C12-C16	TM173	µg/kg	<100
Aliphatics >C16-C21	TM173	µg/kg	<100
Aliphatics >C21-C35	TM173	µg/kg	<100
Aliphatics >C35-C44	TM173	µg/kg	<100
Total Aliphatics >C12-C44	TM173	µg/kg	<100
Aromatics >EC5-EC7	TM089	µg/kg	<10
Aromatics >EC7-EC8	TM089	µg/kg	<10
Aromatics >EC8-EC10	TM089	µg/kg	<10
Aromatics >EC10-EC12	TM089	µg/kg	<10
Aromatics >EC12-EC16	TM173	µg/kg	<100
Aromatics >EC16-EC21	TM173	µg/kg	<100
Aromatics >EC21-EC35	TM173	µg/kg	<100
Aromatics >EC35-EC44	TM173	µg/kg	<100
Aromatics >EC40-EC44	TM173	µg/kg	<100
Total Aromatics >EC12-EC44	TM173	µg/kg	<100
Total Aliphatics & Aromatics >C5-C44	TM173	µg/kg	<100

Polyaromatic Hydrocar

Naphthalene-d8 % recovery**	TM218	%	
Acenaphthene-d10 % recovery**	TM218	%	
Phenanthrene-d10 % recovery**	TM218	%	
Chrysene-d12 % recovery**	TM218	%	
Perylene-d12 % recovery**	TM218	%	
Naphthalene	TM218	µg/kg	<9
Acenaphthylene	TM218	µg/kg	<12
Acenaphthene	TM218	µg/kg	<8
Fluorene	TM218	µg/kg	<10
Phenanthrene	TM218	µg/kg	<15
Anthracene	TM218	µg/kg	<16
Fluoranthene	TM218	µg/kg	<17
Pyrene	TM218	µg/kg	<15
Benz(a)anthracene	TM218	µg/kg	<14
Chrysene	TM218	µg/kg	<10
Benzo(b)fluoranthene	TM218	µg/kg	<15

Customer Sample ID			
Benzo(k)fluoranthene	TM218	µg/kg	<14
Benzo(a)pyrene	TM218	µg/kg	<15
Indeno(1,2,3-cd)pyrene	TM218	µg/kg	<18
Dibenzo(a,h)anthracene	TM218	µg/kg	<23
Benzo(g,h,i)perylene	TM218	µg/kg	<24
PAH, Total Detected USEPA 16	TM218	µg/kg	<118

Appendix B – Risk Based Screening Levels

Lowest of the Remedial Target Criterion/Risk Based Screening Level for Parks land use, Deep Soil (>1m)

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Benzo(a)pyrene	>sat	>sat
Benzene	48	48
Toluene	>sat	>sat
Ethylbenzene	>sat	>sat
Xylene	478	1330
TPH aromatic C7-C8	>sat	>sat
TPH aromatic C8-C10	>sat	>sat
TPH aromatic C10-C12	>sat	>sat
TPH aromatic C12-C16	>sat	>sat
TPH aliphatic C6-C8	>sat	>sat
TPH aliphatic C8-C10	>sat	>sat
TPH aliphatic C10-C12	>sat	>sat
TPH aliphatic C12-C16	>sat	>sat
TPH aromatic C16-C21	>sat	>sat
TPH aromatic C21-C35	>sat	>sat
TPH aliphatic C16-C21	>sat	>sat
TPH aliphatic C21-C35	>sat	>sat
Total TPH (Phase 1)	>sat	>sat
Total TPH (Process Area)	>sat	>sat
Total TPH (North Tank Farm)	>sat	>sat
Total TPH (South Tank Farm)	>sat	>sat
1,2-Dichloroethane	6	6
1,1,1-Trichloroethane	>sat	>sat
Tetrachloroethene	1780	1780
Trichloroethene	269	269
Vinyl chloride	8.21	11.4
Dichloromethane	6220	6220
Cis-1,2-Dichloroethene	881	881
Trans-1,2 Dichloroethene	881	881
Acenaphthene	>sat	>sat
Anthracene	>sat	>sat
Benzo(a)anthracene	>sat	>sat
Benzo(b)fluoranthene	>sat	>sat
Benzo(g,h,i)perylene	>sat	>sat
Benzo(k)fluoranthene	>sat	>sat
Chrysene	>sat	>sat
Dibenz(ah)anthracene	>sat	>sat
Fluoranthene	>sat	>sat
Fluorene	>sat	>sat
Indeno(1,2,3-cd)pyrene	>sat	>sat
Pyrene	>sat	>sat
Phenol	>sat	>sat
Mercury (methyl)	>sat	>sat
Mercury (elemental)	>sat	>sat
Naphthalene	>sat	>sat
TPH aromatic C5-C7	432	928
TPH aliphatic C5-C6	>sat	>sat
1,1,1,2-Tetrachloroethane	>sat	>sat
1,1,2,2-Tetrachloroethane	>sat	>sat
Carbon tetrachloride	301	778
Chlorobenzene	>sat	>sat

Notes
1. Where the lower of the vapour or aqueous saturation limits has been exceeded by the RTC calculated, the hazard quotient is considered to be less than 1 and as such >sat has been presented
2. Xylene - Users must consider total exposure from all xylene isomers and not consider them in isolation. It should be noted that the value presented is the lowest of the aqueous or vapour saturation limits. The lowest saturation limit of the three isomers has been presented.
3. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
4. TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered and therefore no value has been presented here
5. 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
6. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
7. Asbestos has not been considered here as it is being considered in a separate report
8. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
9. TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Arsenic	64 a	64 a
Chromium	78 a	78 a
Cadmium	2.6	2.6
Mercury (inorganic)	1 b	1 b
Nickel	75 b	75 b
Selenium	3 b	3 b
Lead	337 a	337 a
Vanadium	351	351
Copper	143 a	143 a
Zinc	478 a	478 a
Benzo(a)pyrene	0.9	0.9
Benzene	13	13
Toluene	8110	8110
Ethylbenzene	4740	4740
Xylene	7940	7940
TPH aromatic C7-C8	21300	21300
TPH aromatic C8-C10	2230	2310
TPH aromatic C10-C12	2300	2340
TPH aromatic C12-C16	2330	2350
TPH aliphatic C6-C8	294000 *	294000 *
TPH aliphatic C8-C10	5740 *	5740 *
TPH aliphatic C10-C12	5700	5830
TPH aliphatic C12-C16	5800	5860
TPH aromatic C16-C21	1450	1450
TPH aromatic C21-C35	1450	1450
TPH aliphatic C16-C35	159000	159000
TPH aliphatic C21-C35	159000	159000
Total TPH (Phase 1)	9060	9060
Total TPH (Process Area)	10800	10800
Total TPH (North Tank Farm)	9420	9420
Total TPH (South Tank Farm)	6350	6350
1,2-Dichloroethane	4.5	4.5
1,1,1-Trichloroethane	27900	27900
Tetrachloroethene	641	641
Trichloroethene	193	193
Vinyl chloride	0.7	0.7
Dichloromethane	241	241
Cis-1,2-Dichloroethene	392	468
Trans-1,2 Dichloroethene	632	632
Acenaphthene	5340	5350
Anthracene	26800	26800
Benzo(a)anthracene	20.8	21.1
Benzo(b)fluoranthene	21.3	21.3
Benzo(g,h,i)perylene	218	218
Benzo(k)fluoranthene	215	215
Chrysene	2090	2090
Dibenz(ah)anthracene	2.16	2.16
Fluoranthene	3570	3570
Fluorene	3570	3570
Indeno(1,2,3-cd)pyrene	21.2	21.2
Pyrene	2680	2680
Phenol	859	859
Mercury (methyl)	19.4	19.4
Mercury (elemental)	4.3	12.9
Naphthalene	955	1340
TPH aromatic C5-C7	26.2	27.5
TPH aliphatic C5-C6	294000	294000
1,1,1,2-Tetrachloroethane	498	533
1,1,2,2-Tetrachloroethane	516	539
Carbon tetrachloride	111	128
Chlorobenzene	170	170

Notes
1. It is assumed that no visible free product is present within the top 1.0m of soil
2. Metal RTC derived considering Soil Codes and background data
a – based on background soil concentration
b – based on Soil Code
3. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
4. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
* 5. The RTC for TPH aliphatic C5-C6, TPH aliphatic C6-C8 and TPH aliphatic C8-C10 are based on a value produced from following the approach outlined in SR4 for substances at saturation
6. TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered
7. 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
8. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
9. Asbestos has not been considered here as it is being considered in a separate report
10. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
11. Elemental mercury is based on the inhalation pathway only and the saturation limit has been presented
12. TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Benzo(a)pyrene	>sat	>sat
Benzene	0.4	0.4
Toluene	52	52
Ethylbenzene	140	140
Xylene	58	58
TPH aromatic C7-C8	146	146
TPH aromatic C8-C10	71	209
TPH aromatic C10-C12	1390	1390
TPH aromatic C12-C16	>sat	>sat
TPH aliphatic C6-C8	>sat	>sat
TPH aliphatic C8-C10	42.5	125
TPH aliphatic C10-C12	>sat	>sat
TPH aliphatic C12-C16	>sat	>sat
TPH aliphatic C16-C21	>sat	>sat
TPH aliphatic C21-C35	>sat	>sat
TPH aromatic C16-C21	>sat	>sat
TPH aromatic C21-C35	>sat	>sat
Total TPH (Phase 1)	9180	9180
Total TPH (Process Area)	4100	4100
Total TPH (North Tank Farm)	3800	3800
Total TPH (South Tank Farm)	2790	2790
1,2-Dichloroethane	0.0111	0.0176
1,1,1-Trichloroethane	10.8	25.9
Tetrachloroethene	2.3	6.12
Trichloroethene	0.188	0.463
Vinyl chloride	0.00093	0.00129
Dichloromethane	4.19	6.04
Cis-1,2-Dichloroethene	0.206	0.392
Trans-1,2 Dichloroethene	0.332	0.689
Acenaphthene	>sat	>sat
Anthracene	>sat	>sat
Benzo(a)anthracene	>sat	>sat
Benzo(b)fluoranthene	>sat	>sat
Benzo(g,h,i)perylene	>sat	>sat
Benzo(k)fluoranthene	>sat	>sat
Chrysene	>sat	>sat
Dibenz(ah)anthracene	>sat	>sat
Fluoranthene	>sat	>sat
Fluorene	>sat	>sat
Indeno(1,2,3-cd)pyrene	>sat	>sat
Pyrene	>sat	>sat
Phenol	1030	2340
Mercury (methyl)	27.7	62.5
Mercury (elemental)	0.291	0.87
Naphthalene	2.8	8.02
TPH aromatic C5-C7	0.46	0.987
TPH aliphatic C5-C6	112	246
1,1,1,2-Tetrachloroethane	1.84	5.09
1,1,2,2-Tetrachloroethane	4.71	11.3
Carbon tetrachloride	0.0309	0.0801
Chlorobenzene	17.9	47.9

Notes

- Where the lower of the vapour or aqueous saturation limits have been exceeded by the RTC calculated, the hazard quotient is considered to be less than 1 and as such >sat has been presented
- Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
- TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered and therefore no RTC value has been presented here
- 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
- Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
- TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- Asbestos has not been considered here as it is being considered in a separate report
- Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
- TPH aromatic C5-C7 is considered to comprise benzene only

Lowest of the Remedial Target Criterion/Risk Based Screening Level for Residential with the Consumption of Produce land use, Shallow Soil.

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Arsenic	64 a	64 a
Chromium	78 a	78 a
Cadmium	2.6	2.6
Mercury (inorganic)	1 b	1 b
Nickel	50	50
Selenium	3 b	3 b
Lead	337 a	337 a
Vanadium	113	115
Copper	143 a	143 a
Zinc	478 a	478 a
Benzo(a)pyrene	0.9	0.9
Benzene	0.0493	0.12
Toluene	36	36
Ethylbenzene	38.2	41
Xylene	17.2	32
TPH aromatic C7-C8	86.9	125
TPH aromatic C8-C10	14.8	94
TPH aromatic C10-C12	57.3	118
TPH aromatic C12-C16	131	131
TPH aliphatic C6-C8	69.8	8340
TPH aliphatic C8-C10	9.76	87.1
TPH aliphatic C10-C12	1780 *	3200
TPH aliphatic C12-C16	4510	4510
TPH aromatic C16-C21	82	82
TPH aromatic C21-C35	888	1130
TPH aliphatic C16-C21	94200	94200
TPH aliphatic C21-C35	94800	94800
Total TPH (Phase 1)	1720	1720
Total TPH (Process Area)	2600	2600
Total TPH (North Tank Farm)	1100	1100
Total TPH (South Tank Farm)	1020	1020
1,2-Dichloroethane	0.0019	0.0102
1,1,1-Trichloroethane	2.23	17.3
Tetrachloroethene	0.455	3.62
Trichloroethene	0.0382	0.304
Vinyl chloride	0.000202	0.00082
Dichloromethane	0.458	1.56
Cis-1,2-Dichloroethene	0.0393	0.255
Trans-1,2-Dichloroethene	0.0671	0.464
Acenaphthene	588 *	1380
Anthracene	8270	14800
Benzo(a)anthracene	7.56	16.5
Benzo(b)fluoranthene	20	23.9
Benzo(g,h,i)perylene	235	248
Benzo(k)fluoranthene	216	243
Chrysene	1500	2220
Dibenz(ah)anthracene	1.97	2.39
Fluoranthene	822	1630
Fluorene	615	1390
Indeno(1,2,3-cd)pyrene	19.2	23.6
Pyrene	563	1150
Phenol	162	349
Mercury (methyl)	6.28	11.3
Mercury (elemental)	0.0607	0.583
Naphthalene	0.585	5.05
TPH aromatic C5-C7	0.0493	0.192
TPH aliphatic C5-C6	30.1	172
1,1,1,2-Tetrachloroethane	0.353	2.78
1,1,2,2-Tetrachloroethane	0.695	3.63
Carbon tetrachloride	0.00656	0.0541
Chlorobenzene	1.06	3.38

Notes

1. It is assumed that no visible free product is present within the top 1.0m of soil
2. Metal RTC derived considering Soil Codes and background data
- a – based on background soil concentration
- b – based on Soil Code
3. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
4. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- * 5. The RTC for TPH aliphatic C10-C12 and acenaphthene is based on a value produced from following the approach outlined in SR4 for substances at saturation
6. 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
7. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
8. Asbestos has not been considered here as it is being considered in a separate report
9. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
10. Phenol is derived by comparing the oral exposure to the oral HCV and the dermal and inhalation exposure to the inhalation HCV
11. Elemental mercury is based on inhalation pathways only
12. TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC/RBSL mg/L
Benzo(a)pyrene	>sat
Benzene	0.0888
Toluene	47
Ethylbenzene	13.4
Xylene	4.1
TPH aromatic C7-C8	20
TPH aromatic C8-C10	0.985
TPH aromatic C10-C12	3.87
TPH aromatic C12-C16	>sat
TPH aromatic C16-C21	>sat
TPH aromatic C21-C35	>sat
TPH aliphatic C6-C8	1.4
TPH aliphatic C8-C10	0.0296
TPH aliphatic C10-C12	0.0228
TPH aliphatic C12-C16	>sat
TPH aliphatic C16-C21	>sat
TPH aliphatic C21-C35	>sat
1,2-Dichloroethane	0.0373
1,1,1-Trichloroethane	13.1
Tetrachloroethene	1.66
Trichloroethene	0.222
Vinyl chloride	0.00248
Dichloromethane	13
Cis-1,2 Dichloroethene	0.547
Trans-1,2 Dichloroethene	0.675
Acenaphthene	>sat
Anthracene	>sat
Benzo(a)anthracene	>sat
Benzo(b)fluoranthene	>sat
Benzo(k)fluoranthene	>sat
Chrysene	>sat
Dibenz(ah)anthracene	>sat
Fluoranthene	>sat
Fluorene	>sat
Indeno(1,2,3-cd)pyrene	>sat
Pyrene	>sat
Phenol	1700
Mercury (methyl)	45.5
Mercury (elemental)	0.00463
Naphthalene	0.952
TPH aromatic C5-C7	0.0888
TPH aliphatic C5-C6	1.93
1,1,1,2-Tetrachloroethane	1.05
1,1,2,2-Tetrachloroethane	6.89
Carbon Tetrachloride	0.0229
Chlorobenzene (mono)	13.7

Notes
1. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
2. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
3. Where indoor and outdoor values were presented by RBCA, these have been integrated in line with SNIFFER (2003). Where both indoor and outdoor values derived by RBCA were greater than the saturation limit, >sat has been presented. Where indoor values were presented by RBCA, and the outdoor values were >sat, only the indoor values have been presented. Therefore >sat indicates that the theoretical RTC is greater than solubility limit.
4. TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered
7. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
8. TPH aromatic C5-C7 is considered to comprise benzene only by Atkins

Technical Note SP126

Subject:	Coed Darcy	
Reference:	5041216	Revision: 001
Author:	Daniel Hopkins	Checker: Matt Timmins
Issued to:	-	Reviewer:
Date:	10 th March 2015	Authoriser:

Introduction

Atkins Ltd has been instructed by St Modwen Developments to control the management and testing of stockpiled material for reuse within the Coed Darcy development. This technical note provides information on stockpile 126 and its suitability for reuse within the site.

The Outline Planning Permission (Ref. 1) grants the redevelopment of the Former Llandarcy oil refinery as a mixed use development, comprising a range of residential, commercial and retail properties, community areas and public open space.

Stockpile Chemical Testing

A total of 40 No. samples were taken by Atkins Ltd and Environmental Scientifics Group Ltd (ESG) and scheduled for laboratory analysis by Chemtest. The samples were tested for the following determinands (Table 1.) with full results in Appendix A.

Table 1. Soils – List of Determinands

Arsenic (total)	Cadmium (total)	Chromium (total)
Chromium (hexavalent)	Copper (total)	Lead (total)
Mercury (total)	Nickel (total)	Selenium (total)
Zinc (total)	pH	
BTEX	Total Petroleum Hydrocarbons -CWG	USEPA 16 Polycyclic Aromatic Hydrocarbons
Asbestos (Quantification)		

The samples were screened against deep (>1m) residential Coed Darcy Risk Based Screening Levels (RBSL) and Remediation Target Criteria (RTCs). No asbestos was detected in any of the samples.

References

1. Neath Port Talbot County Council Approval of Outline Planning Permission. Reference Number P2005/0393 March 2005

Appendices

Appendix A - Screening sheet of samples

Appendix B – Coed Darcy Risk Based Screening Levels for deep >1m Residential

Appendix A – Screening sheet

Client: Enverity	Chemtest Job No.:						14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006
Quotation No.: Q14-02412	Chemtest Sample ID.:						77906	77907	77908	77909	77910	77911	77912	77913	77914	77915	77916	77917	77918
Order No.:	Client Sample Ref.:						Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126
	Client Sample ID.:						1	2	3	4	5	6	7	8	9	10	11	12	13
	Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):																		
	Bottom Depth(m):																		
	Date Sampled:						03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14
Determinand	Accred.	SOP	Units	LOD	RBSL >1m Resi	MAX													
ACM Type	U	2192					-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001			No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.02		12.0	5.90	12.00	9.90	6.60	8.90	5.20	12.00	5.40	3.90	5.40	5.20	6.10	5.10
pH	U	2010			0	9.6	8.30	9.60	8.20	7.30	5.80	7.60	7.70	7.70	7.60	7.70	7.30	7.40	7.70
Arsenic	U	2450	mg/kg	1		69.0	18.00	35.00	21.00	10.00	8.60	15.00	69.00	10.00	7.40	8.10	6.10	8.50	8.60
Cadmium	U	2450	mg/kg	0.1		0.7	0.43	0.56	0.48	0.29	0.32	0.45	0.48	0.20	0.24	0.15	0.23	0.27	0.21
Chromium	U	2450	mg/kg	1		69.0	20.00	69.00	25.00	21.00	18.00	20.00	18.00	27.00	23.00	22.00	21.00	23.00	22.00
Copper	U	2450	mg/kg	0.5		500.0	35.00	70.00	54.00	22.00	21.00	33.00	54.00	34.00	25.00	23.00	19.00	21.00	23.00
Mercury	U	2450	mg/kg	0.1		5.4	0.65	1.50	1.40	0.24	0.17	0.30	0.28	0.26	0.23	0.14	0.25	0.23	0.21
Nickel	U	2450	mg/kg	0.5		61.0	31.00	38.00	42.00	36.00	30.00	37.00	27.00	57.00	54.00	49.00	53.00	61.00	51.00
Lead	U	2450	mg/kg	0.5		240.0	70.00	150.00	120.00	27.00	20.00	180.00	55.00	23.00	20.00	19.00	16.00	18.00	20.00
Selenium	U	2450	mg/kg	0.2		0.2	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Vanadium	U	2450	mg/kg	5		45.0	22.00	44.00	24.00	22.00	20.00	22.00	23.00	25.00	22.00	21.00	17.00	22.00	19.00
Zinc	U	2450	mg/kg	0.5		420.0	150.00	260.00	210.00	100.00	100.00	200.00	92.00	140.00	81.00	62.00	74.00	94.00	73.00
Organic Matter	U	2625	%	0.4		5.5	2.20	5.50	4.00	1.90	2.20	2.40	3.30	1.40	1.50	1.40	1.70	1.90	2.20
Aliphatic TPH >C5-C6	N	2675	mg/kg	0.1	112	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Aliphatic TPH >C6-C8	N	2675	mg/kg	0.1	sat	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Aliphatic TPH >C8-C10	U	2675	mg/kg	0.1	42.5	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Aliphatic TPH >C10-C12	U	2675	mg/kg	1	sat	1.7	1.40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.70	1.00
Aliphatic TPH >C12-C16	U	2675	mg/kg	1	sat	180.0	130.00	3.20	3.80	1.00	130.00	1.00	1.00	1.00	1.00	1.00	1.00	180.00	160.00
Aliphatic TPH >C16-C21	U	2675	mg/kg	1	sat	430.0	430.00	7.70	5.00	1.00	390.00	1.00	1.00	1.00	1.00	1.00	1.00	110.00	110.00
Aliphatic TPH >C21-C35	U	2675	mg/kg	1	sat	270.0	270.00	2.70	1.60	1.00	34.00	1.00	1.00	1.00	1.00	1.00	1.00	3.20	13.00
Aliphatic TPH >C35-C44	U	2675	mg/kg	1	sat	2.0	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total Aliphatic Hydrocarbons	U	2675	mg/kg	5		840.0	840.00	14.00	10.00	5.00	550.00	5.00	5.00	5.00	5.00	5.00	5.00	300.00	280.00
Aromatic TPH >C5-C7	N	2675	mg/kg	0.1	0.46	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Aromatic TPH >C7-C8	N	2675	mg/kg	0.1	146	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Aromatic TPH >C8-C10	U	2675	mg/kg	0.1	71	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Aromatic TPH >C10-C12	N	2675	mg/kg	1	1390	1.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Aromatic TPH >C12-C16	U	2675	mg/kg	1	sat	39.0	8.00	1.00	1.00	1.00	18.00	1.00	1.00	1.00	1.00	1.00	1.00	39.00	38.00
Aromatic TPH >C16-C21	U	2675	mg/kg	1	sat	110.0	17.00	1.00	1.00	1.00	110.00	1.00	1.00	1.00	1.00	1.00	1.00	45.00	50.00
Aromatic TPH >C21-C35	N	2675	mg/kg	1	sat	23.0	11.00	1.00	1.00	1.00	23.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Aromatic TPH >C35-C44	N	2675	mg/kg	1	sat	1.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total Aromatic Hydrocarbons	U	2675	mg/kg	5		150.0	36.00	5.00	5.00	5.00	150.00	5.00	5.00	5.00	5.00	5.00	5.00	85.00	88.00
Total Petroleum Hydrocarbons	U	2675	mg/kg	10		870.0	870.00	14.00	10.00	10.00	710.00	10.00	10.00	10.00	10.00	10.00	10.00	380.00	370.00
Naphthalene	U	2700	mg/kg	0.1	2.8	0.3	0.10	0.25	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Acenaphthylene	U	2700	mg/kg	0.1		0.5	0.16	0.54	0.37	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Acenaphthene	U	2700	mg/kg	0.1	sat	0.4	0.13	0.26	0.16	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Fluorene	U	2700	mg/kg	0.1	sat	0.8	0.26	0.75	0.33	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Phenanthrene	U	2700	mg/kg	0.1		5.1	0.67	5.10	3.20	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Anthracene	U	2700	mg/kg	0.1	sat	1.4	0.34	1.40	0.75	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Fluoranthene	U	2700	mg/kg	0.1	sat	9.2	0.86	9.20	4.20	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Pyrene	U	2700	mg/kg	0.1	sat	6.5	1.70	6.50	3.50	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Benzo[a]anthracene	U	2700	mg/kg	0.1	sat	5.3	0.70	5.30	2.00	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Chrysene	U	2700	mg/kg	0.1	sat	8.1	0.73	8.10	3.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.1	sat	6.3	0.10	6.30	2.40	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.1	sat	2.2	0.10	2.20	1.60	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Benzo[a]pyrene	U	2700	mg/kg	0.1	sat	2.6	0.10	2.60	1.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.1	sat	1.2	0.10	1.20	0.88	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.1	sat	0.8	0.10	0.42	0.42	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.1	sat	2.2	0.10	2.20	0.96	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Total Of 16 PAH's	U	2700	mg/kg	2		52.0	5.60	52.00	25.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Moisture	N	2030	%	0.02		7.1	6.30	5.30	6.30	4.80	5.30	6.10	5.60	5.30	7.10	6.10			
Benzene	U	2760	µg/kg	1	400	1.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Toluene	U	2760	µg/kg	1	52000	1.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Ethylbenzene	U	2760	µg/kg	1	140000	1.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
m & p-Xylene	U	2760	µg/kg	1	58000	1.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
o-Xylene	U	2760	µg/kg	1	58000	1.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			

14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006
77919	77920	77921	77922	77923	77924	77925	77926	77927	77928	77929	77930	77931	77932	77933	77934	77935	77936	77937
Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126
14	15	16	17	18	19	20	21	22	23	24	25	27	28	29	30	31	32	33
SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14	03-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
9.40	5.50	4.50	5.90	5.60	5.10	6.30	6.40	7.20	8.10	7.20	8.10	7.00	6.40	6.10	8.10	5.80	8.10	5.10
8.10	7.60	7.70	7.40	7.80	7.50	7.70	7.80	8.10	8.80	8.80	8.20	7.90	7.80	7.60	7.40	7.40	6.40	7.10
25.00	10.00	9.90	12.00	11.00	9.30	11.00	15.00	16.00	24.00	31.00	66.00	19.00	11.00	9.30	13.00	13.00	14.00	8.20
0.50	0.29	0.28	0.32	0.31	0.24	0.27	0.40	0.42	0.47	0.74	0.71	0.41	0.35	0.31	0.38	0.39	0.34	0.26
20.00	17.00	21.00	20.00	19.00	17.00	17.00	19.00	19.00	17.00	20.00	32.00	19.00	19.00	17.00	18.00	18.00	19.00	21.00
58.00	23.00	26.00	32.00	23.00	19.00	25.00	36.00	37.00	54.00	94.00	500.00	45.00	30.00	34.00	31.00	25.00	51.00	20.00
5.40	0.26	0.20	0.20	0.17	0.16	0.18	0.18	0.19	0.21	1.10	0.47	0.19	0.16	0.15	0.16	0.11	0.20	0.16
33.00	33.00	37.00	37.00	35.00	36.00	33.00	34.00	35.00	26.00	29.00	48.00	35.00	40.00	31.00	30.00	38.00	39.00	38.00
120.00	35.00	33.00	30.00	33.00	22.00	38.00	45.00	48.00	64.00	170.00	240.00	52.00	35.00	38.00	69.00	32.00	24.00	21.00
0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
21.00	17.00	17.00	19.00	18.00	15.00	15.00	17.00	17.00	19.00	21.00	45.00	18.00	16.00	14.00	16.00	16.00	19.00	17.00
220.00	97.00	110.00	110.00	100.00	74.00	100.00	110.00	120.00	120.00	420.00	300.00	120.00	130.00	98.00	110.00	93.00	100.00	86.00
3.40	2.10	1.90	2.90	2.20	2.60	2.10	2.60	2.60	2.40	2.90	4.10	2.60	2.40	1.60	2.10	3.10	2.60	1.50
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.50	1.10	1.50	1.00	1.50	1.00	8.50	1.00	1.00	1.00	1.00	29.00	1.00	1.00	3.80	1.10	1.60	1.50	1.00
6.00	6.30	6.20	3.10	4.20	1.00	30.00	1.00	1.00	1.00	37.00	1.00	2.10	12.00	3.40	3.90	3.20	1.00	1.00
29.00	5.50	4.20	16.00	13.00	1.00	22.00	1.00	21.00	1.00	21.00	1.00	11.00	34.00	81.00	1.00	1.00	29.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.00
37.00	13.00	12.00	19.00	19.00	5.00	60.00	5.00	21.00	5.00	86.00	5.00	13.00	50.00	86.00	5.40	5.00	30.00	5.00
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.10	1.00	1.00	1.00	1.00	1.00	4.70	1.00	1.00	1.00	13.00	1.00	1.00	2.90	1.00	1.00	1.00	1.00	1.00
2.10	1.00	1.20	1.10	1.10	1.00	4.10	1.00	1.00	1.00	8.30	1.00	1.20	2.30	1.30	1.10	1.30	1.00	1.00
9.80	1.40	2.60	5.70	4.70	1.00	6.90	1.00	3.90	1.00	12.00	1.00	3.20	6.20	14.00	1.00	1.00	7.80	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13.00	5.00	5.00	6.80	5.80	5.00	16.00	5.00	5.00	5.00	33.00	5.00	5.00	11.00	15.00	5.00	5.00	7.80	5.00
50.00	14.00	16.00	26.00	25.00	10.00	76.00	10.00	25.00	10.00	120.00	10.00	18.00	61.00	100.00	10.00	10.00	38.00	10.00
0.21	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.28	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.23	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.31	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.17	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.42	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.13	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.65	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.46	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.85	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.25	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.46	0.10	0.10	0.10	0.10	0.10	0.10	0.39	0.10	0.25	1.10	0.27	0.24	0.10	0.10	0.19	0.10	0.10	0.10
0.47	0.10	0.10	0.10	0.10	0.10	0.10	0.33	0.10	0.22	1.60	0.25	0.25	0.10	0.10	0.20	0.10	0.10	0.10
0.19	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.85	0.14	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.84	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	1.40	0.54	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.55	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	1.30	0.24	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.68	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.47	0.39	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.41	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.68	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.75	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.73	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.47	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.82	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.70	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	1.30	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
6.70	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	13.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

14-16006	14-16006	14-16006	14-16006	14-16006	14-16006	14-16006
77938	77939	77940	77941	77942	77943	77944
Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126	Stockpile 126
34	35	36	37	38	39	40
SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
04-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14	04-Dec-14
-	-	-	-	-	-	-
No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
7.20	6.00	7.90	9.00	8.60	6.50	6.90
7.50	7.50	8.10	8.30	8.40	8.10	7.70
14.00	13.00	20.00	28.00	34.00	23.00	14.00
0.39	0.33	0.39	0.48	0.46	0.51	0.36
20.00	21.00	18.00	14.00	11.00	15.00	21.00
31.00	28.00	41.00	54.00	35.00	50.00	33.00
0.18	0.21	0.19	0.18	0.21	0.17	0.17
36.00	47.00	31.00	20.00	14.00	21.00	36.00
43.00	47.00	59.00	95.00	63.00	61.00	50.00
0.20	0.20	0.20	0.20	0.20	0.20	0.20
19.00	18.00	18.00	17.00	13.00	18.00	19.00
110.00	110.00	140.00	150.00	71.00	130.00	120.00
2.40	3.80	2.10	2.60	3.30	2.10	2.80
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
1.00	1.00	1.00	1.00	1.00	1.00	1.00
3.30	1.00	1.00	1.00	1.00	1.00	4.00
8.80	1.00	1.00	1.00	2.80	1.90	14.00
12.00	1.00	1.00	1.00	180.00	100.00	18.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00
25.00	5.00	5.00	5.00	190.00	100.00	35.00
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
1.00	1.00	1.00	1.00	1.00	1.00	1.00
2.90	1.00	1.00	1.00	1.00	1.60	3.20
2.30	1.00	1.70	1.80	2.20	13.00	3.20
4.60	1.00	1.20	1.00	15.00	1.00	8.30
1.00	1.00	1.00	1.00	1.00	1.00	1.00
9.80	5.00	5.00	5.00	17.00	14.00	15.00
34.00	10.00	10.00	10.00	200.00	120.00	50.00
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.12	0.11	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.12	0.18	0.10	0.22	0.27	0.25	0.16
0.12	0.17	0.10	0.22	0.23	0.26	0.13
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10	0.10	0.10
2.00	2.00	2.00	2.00	2.00	2.00	2.00

Appendix B – Coed Darcy Risk Based Screening Levels for deep >1m Residential

Lowest of the Remedial Target Criterion/Risk Based Screening Level for Parks land use, Deep Soil (>1m)

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Benzo(a)pyrene	>sat	>sat
Benzene	48	48
Toluene	>sat	>sat
Ethylbenzene	>sat	>sat
Xylene	478	1330
TPH aromatic C7-C8	>sat	>sat
TPH aromatic C8-C10	>sat	>sat
TPH aromatic C10-C12	>sat	>sat
TPH aromatic C12-C16	>sat	>sat
TPH aliphatic C6-C8	>sat	>sat
TPH aliphatic C8-C10	>sat	>sat
TPH aliphatic C10-C12	>sat	>sat
TPH aliphatic C12-C16	>sat	>sat
TPH aromatic C16-C21	>sat	>sat
TPH aromatic C21-C35	>sat	>sat
TPH aliphatic C16-C21	>sat	>sat
TPH aliphatic C21-C35	>sat	>sat
Total TPH (Phase 1)	>sat	>sat
Total TPH (Process Area)	>sat	>sat
Total TPH (North Tank Farm)	>sat	>sat
Total TPH (South Tank Farm)	>sat	>sat
1,2-Dichloroethane	6	6
1,1,1-Trichloroethane	>sat	>sat
Tetrachloroethene	1780	1780
Trichloroethene	269	269
Vinyl chloride	8.21	11.4
Dichloromethane	6220	6220
Cis-1,2-Dichloroethene	881	881
Trans-1,2 Dichloroethene	881	881
Acenaphthene	>sat	>sat
Anthracene	>sat	>sat
Benzo(a)anthracene	>sat	>sat
Benzo(b)fluoranthene	>sat	>sat
Benzo(g,h,i)perylene	>sat	>sat
Benzo(k)fluoranthene	>sat	>sat
Chrysene	>sat	>sat
Dibenz(ah)anthracene	>sat	>sat
Fluoranthene	>sat	>sat
Fluorene	>sat	>sat
Indeno(1,2,3-cd)pyrene	>sat	>sat
Pyrene	>sat	>sat
Phenol	>sat	>sat
Mercury (methyl)	>sat	>sat
Mercury (elemental)	>sat	>sat
Naphthalene	>sat	>sat
TPH aromatic C5-C7	432	928
TPH aliphatic C5-C6	>sat	>sat
1,1,1,2-Tetrachloroethane	>sat	>sat
1,1,2,2-Tetrachloroethane	>sat	>sat
Carbon tetrachloride	301	778
Chlorobenzene	>sat	>sat

Notes

- Where the lower of the vapour or aqueous saturation limits has been exceeded by the RTC calculated, the hazard quotient is considered to be less than 1 and as such >sat has been presented
- Xylene - Users must consider total exposure from all xylene isomers and not consider them in isolation. It should be noted that the value presented is the lowest of the aqueous or vapour saturation limits. The lowest saturation limit of the three isomers has been presented.
- TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered and therefore no value has been presented here
- 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
- Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
- Asbestos has not been considered here as it is being considered in a separate report
- Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
- TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Arsenic	64 a	64 a
Chromium	78 a	78 a
Cadmium	2.6	2.6
Mercury (inorganic)	1 b	1 b
Nickel	75 b	75 b
Selenium	3 b	3 b
Lead	337 a	337 a
Vanadium	351	351
Copper	143 a	143 a
Zinc	478 a	478 a
Benzo(a)pyrene	0.9	0.9
Benzene	13	13
Toluene	8110	8110
Ethylbenzene	4740	4740
Xylene	7940	7940
TPH aromatic C7-C8	21300	21300
TPH aromatic C8-C10	2230	2310
TPH aromatic C10-C12	2300	2340
TPH aromatic C12-C16	2330	2350
TPH aliphatic C6-C8	294000 *	294000 *
TPH aliphatic C8-C10	5740 *	5740 *
TPH aliphatic C10-C12	5700	5830
TPH aliphatic C12-C16	5800	5860
TPH aromatic C16-C21	1450	1450
TPH aromatic C21-C35	1450	1450
TPH aliphatic C16-C35	159000	159000
TPH aliphatic C21-C35	159000	159000
Total TPH (Phase 1)	9060	9060
Total TPH (Process Area)	10800	10800
Total TPH (North Tank Farm)	9420	9420
Total TPH (South Tank Farm)	6350	6350
1,2-Dichloroethane	4.5	4.5
1,1,1-Trichloroethane	27900	27900
Tetrachloroethene	641	641
Trichloroethene	193	193
Vinyl chloride	0.7	0.7
Dichloromethane	241	241
Cis-1,2-Dichloroethene	392	468
Trans-1,2 Dichloroethene	632	632
Acenaphthene	5340	5350
Anthracene	26800	26800
Benzo(a)anthracene	20.8	21.1
Benzo(b)fluoranthene	21.3	21.3
Benzo(g,h,i)perylene	218	218
Benzo(k)fluoranthene	215	215
Chrysene	2090	2090
Dibenz(ah)anthracene	2.16	2.16
Fluoranthene	3570	3570
Fluorene	3570	3570
Indeno(1,2,3-cd)pyrene	21.2	21.2
Pyrene	2680	2680
Phenol	859	859
Mercury (methyl)	19.4	19.4
Mercury (elemental)	4.3	12.9
Naphthalene	955	1340
TPH aromatic C5-C7	26.2	27.5
TPH aliphatic C5-C6	294000	294000
1,1,1,2-Tetrachloroethane	498	533
1,1,2,2-Tetrachloroethane	516	539
Carbon tetrachloride	111	128
Chlorobenzene	170	170

Notes
1. It is assumed that no visible free product is present within the top 1.0m of soil
2. Metal RTC derived considering Soil Codes and background data
a – based on background soil concentration
b – based on Soil Code
3. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
4. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
* 5. The RTC for TPH aliphatic C5-C6, TPH aliphatic C6-C8 and TPH aliphatic C8-C10 are based on a value produced from following the approach outlined in SR4 for substances at saturation
6. TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered
7. 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
8. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
9. Asbestos has not been considered here as it is being considered in a separate report
10. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
11. Elemental mercury is based on the inhalation pathway only and the saturation limit has been presented
12. TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Benzo(a)pyrene	>sat	>sat
Benzene	0.4	0.4
Toluene	52	52
Ethylbenzene	140	140
Xylene	58	58
TPH aromatic C7-C8	146	146
TPH aromatic C8-C10	71	209
TPH aromatic C10-C12	1390	1390
TPH aromatic C12-C16	>sat	>sat
TPH aliphatic C6-C8	>sat	>sat
TPH aliphatic C8-C10	42.5	125
TPH aliphatic C10-C12	>sat	>sat
TPH aliphatic C12-C16	>sat	>sat
TPH aliphatic C16-C21	>sat	>sat
TPH aliphatic C21-C35	>sat	>sat
TPH aromatic C16-C21	>sat	>sat
TPH aromatic C21-C35	>sat	>sat
Total TPH (Phase 1)	9180	9180
Total TPH (Process Area)	4100	4100
Total TPH (North Tank Farm)	3800	3800
Total TPH (South Tank Farm)	2790	2790
1,2-Dichloroethane	0.0111	0.0176
1,1,1-Trichloroethane	10.8	25.9
Tetrachloroethene	2.3	6.12
Trichloroethene	0.188	0.463
Vinyl chloride	0.00093	0.00129
Dichloromethane	4.19	6.04
Cis-1,2-Dichloroethene	0.206	0.392
Trans-1,2 Dichloroethene	0.332	0.689
Acenaphthene	>sat	>sat
Anthracene	>sat	>sat
Benzo(a)anthracene	>sat	>sat
Benzo(b)fluoranthene	>sat	>sat
Benzo(g,h,i)perylene	>sat	>sat
Benzo(k)fluoranthene	>sat	>sat
Chrysene	>sat	>sat
Dibenz(ah)anthracene	>sat	>sat
Fluoranthene	>sat	>sat
Fluorene	>sat	>sat
Indeno(1,2,3-cd)pyrene	>sat	>sat
Pyrene	>sat	>sat
Phenol	1030	2340
Mercury (methyl)	27.7	62.5
Mercury (elemental)	0.291	0.87
Naphthalene	2.8	8.02
TPH aromatic C5-C7	0.46	0.987
TPH aliphatic C5-C6	112	246
1,1,1,2-Tetrachloroethane	1.84	5.09
1,1,2,2-Tetrachloroethane	4.71	11.3
Carbon tetrachloride	0.0309	0.0801
Chlorobenzene	17.9	47.9

Notes

- Where the lower of the vapour or aqueous saturation limits have been exceeded by the RTC calculated, the hazard quotient is considered to be less than 1 and as such >sat has been presented
- Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
- TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered and therefore no RTC value has been presented here
- 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
- Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
- TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- Asbestos has not been considered here as it is being considered in a separate report
- Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
- TPH aromatic C5-C7 is considered to comprise benzene only

Lowest of the Remedial Target Criterion/Risk Based Screening Level for Residential with the Consumption of Produce land use, Shallow Soil.

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Arsenic	64 a	64 a
Chromium	78 a	78 a
Cadmium	2.6	2.6
Mercury (inorganic)	1 b	1 b
Nickel	50	50
Selenium	3 b	3 b
Lead	337 a	337 a
Vanadium	113	115
Copper	143 a	143 a
Zinc	478 a	478 a
Benzo(a)pyrene	0.9	0.9
Benzene	0.0493	0.12
Toluene	36	36
Ethylbenzene	38.2	41
Xylene	17.2	32
TPH aromatic C7-C8	86.9	125
TPH aromatic C8-C10	14.8	94
TPH aromatic C10-C12	57.3	118
TPH aromatic C12-C16	131	131
TPH aliphatic C6-C8	69.8	8340
TPH aliphatic C8-C10	9.76	87.1
TPH aliphatic C10-C12	1780 *	3200
TPH aliphatic C12-C16	4510	4510
TPH aromatic C16-C21	82	82
TPH aromatic C21-C35	888	1130
TPH aliphatic C16-C21	94200	94200
TPH aliphatic C21-C35	94800	94800
Total TPH (Phase 1)	1720	1720
Total TPH (Process Area)	2600	2600
Total TPH (North Tank Farm)	1100	1100
Total TPH (South Tank Farm)	1020	1020
1,2-Dichloroethane	0.0019	0.0102
1,1,1-Trichloroethane	2.23	17.3
Tetrachloroethene	0.455	3.62
Trichloroethene	0.0382	0.304
Vinyl chloride	0.000202	0.00082
Dichloromethane	0.458	1.56
Cis-1,2-Dichloroethene	0.0393	0.255
Trans-1,2-Dichloroethene	0.0671	0.464
Acenaphthene	588 *	1380
Anthracene	8270	14800
Benzo(a)anthracene	7.56	16.5
Benzo(b)fluoranthene	20	23.9
Benzo(g,h,i)perylene	235	248
Benzo(k)fluoranthene	216	243
Chrysene	1500	2220
Dibenz(ah)anthracene	1.97	2.39
Fluoranthene	822	1630
Fluorene	615	1390
Indeno(1,2,3-cd)pyrene	19.2	23.6
Pyrene	563	1150
Phenol	162	349
Mercury (methyl)	6.28	11.3
Mercury (elemental)	0.0607	0.583
Naphthalene	0.585	5.05
TPH aromatic C5-C7	0.0493	0.192
TPH aliphatic C5-C6	30.1	172
1,1,1,2-Tetrachloroethane	0.353	2.78
1,1,2,2-Tetrachloroethane	0.695	3.63
Carbon tetrachloride	0.00656	0.0541
Chlorobenzene	1.06	3.38

Notes

1. It is assumed that no visible free product is present within the top 1.0m of soil
2. Metal RTC derived considering Soil Codes and background data
- a – based on background soil concentration
- b – based on Soil Code
3. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
4. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- * 5. The RTC for TPH aliphatic C10-C12 and acenaphthene is based on a value produced from following the approach outlined in SR4 for substances at saturation
6. 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
7. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
8. Asbestos has not been considered here as it is being considered in a separate report
9. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
10. Phenol is derived by comparing the oral exposure to the oral HCV and the dermal and inhalation exposure to the inhalation HCV
11. Elemental mercury is based on inhalation pathways only
12. TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC/RBSL mg/L
Benzo(a)pyrene	>sat
Benzene	0.0888
Toluene	47
Ethylbenzene	13.4
Xylene	4.1
TPH aromatic C7-C8	20
TPH aromatic C8-C10	0.985
TPH aromatic C10-C12	3.87
TPH aromatic C12-C16	>sat
TPH aromatic C16-C21	>sat
TPH aromatic C21-C35	>sat
TPH aliphatic C6-C8	1.4
TPH aliphatic C8-C10	0.0296
TPH aliphatic C10-C12	0.0228
TPH aliphatic C12-C16	>sat
TPH aliphatic C16-C21	>sat
TPH aliphatic C21-C35	>sat
1,2-Dichloroethane	0.0373
1,1,1-Trichloroethane	13.1
Tetrachloroethene	1.66
Trichloroethene	0.222
Vinyl chloride	0.00248
Dichloromethane	13
Cis-1,2 Dichloroethene	0.547
Trans-1,2 Dichloroethene	0.675
Acenaphthene	>sat
Anthracene	>sat
Benzo(a)anthracene	>sat
Benzo(b)fluoranthene	>sat
Benzo(k)fluoranthene	>sat
Chrysene	>sat
Dibenz(ah)anthracene	>sat
Fluoranthene	>sat
Fluorene	>sat
Indeno(1,2,3-cd)pyrene	>sat
Pyrene	>sat
Phenol	1700
Mercury (methyl)	45.5
Mercury (elemental)	0.00463
Naphthalene	0.952
TPH aromatic C5-C7	0.0888
TPH aliphatic C5-C6	1.93
1,1,1,2-Tetrachloroethane	1.05
1,1,2,2-Tetrachloroethane	6.89
Carbon Tetrachloride	0.0229
Chlorobenzene (mono)	13.7

Notes
1. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
2. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
3. Where indoor and outdoor values were presented by RBCA, these have been integrated in line with SNIFFER (2003). Where both indoor and outdoor values derived by RBCA were greater than the saturation limit, >sat has been presented. Where indoor values were presented by RBCA, and the outdoor values were >sat, only the indoor values have been presented. Therefore >sat indicates that the theoretical RTC is greater than solubility limit.
4. TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered
7. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
8. TPH aromatic C5-C7 is considered to comprise benzene only by Atkins

Technical Note SP127

Subject: Coed Darcy Stockpile127 Visual Olfactory Validation

Reference: 5041216

Revision: 001

Author: Daniel Hopkins

Checker: MP

Issued to: -

Reviewer: MP

Date: 28th October 2015

Authoriser: MP

Introduction

Atkins Ltd has been instructed by St Modwen Developments to control the management and validation of stockpiled material for reuse within the Coed Darcy development. This technical note provides information on stockpile 127 and its suitability for reuse within the site.

The Outline Planning Permission (Ref. 1) grants the redevelopment of the Former Llandarcy oil refinery as a mixed use development, comprising a range of residential, commercial and retail properties, community areas and public open space.

Stockpile Visual and Olfactory Validation

The stockpile was checked for any material during and after initial placement that was higher than a '2' on the visual and olfactory scale, in line with the Scale of Aesthetic Criteria defined in the S106. No exceedances were identified during uplift and placement.

References

1. *Neath Port Talbot County Council Approval of Outline Planning Permission. Reference Number P2005/0393 March 2005*

Technical Note SP129

Subject: Coed Darcy Stockpile 129 Validation

Reference: 5041216

Revision: 001

Author: Daniel Hopkins

Checker: Matt Timmins

Issued to: -

Reviewer:

Date: 16th March 2015

Authoriser:

Introduction

Atkins Ltd has been instructed by St Modwen Developments to control the management and testing of stockpiled material for reuse within the Coed Darcy development. This technical note provides information on stockpile 129 and its suitability for reuse within the site.

The Outline Planning Permission (Ref. 1) grants the redevelopment of the Former Llandarcy oil refinery as a mixed use development, comprising a range of residential, commercial and retail properties, community areas and public open space.

Stockpile Chemical Testing

A total of 10 No. samples were taken by Atkins Ltd and Environmental Scientifics Group Ltd (ESG) and scheduled for laboratory analysis by Chemtest. The samples were tested for the following determinands (Table 1.) with full results in Appendix A.

Table 1. Soils – List of Determinands

Arsenic (total)	Cadmium (total)	Chromium (total)
Chromium (hexavalent)	Copper (total)	Lead (total)
Mercury (total)	Nickel (total)	Selenium (total)
Zinc (total)	pH	Total Organic Carbon
BTEX	Total Petroleum Hydrocarbons -CWG	USEPA 16 Polycyclic Aromatic Hydrocarbons
Asbestos (Quantification)		

The samples were screened against deep (>1m) residential Coed Darcy Risk Based Screening Levels (RBSL) and Remediation Target Criteria (RTCs).

Asbestos was detected in 1 No. samples; however subsequent quantification demonstrated the concentrations were below the Risk Based Screening Levels for soils to be placed >1m below finished floor level.

Deviating samples

The following samples were classed as deviating by the laboratory;

- SP129-2 – Due to sample not being supplied in an appropriate container
- SP129-10 – Due to sample not being supplied in an appropriate container

References

1. Neath Port Talbot County Council Approval of Outline Planning Permission. Reference Number P2005/0393 March 2005

Appendices

Appendix A - Screening sheet of samples

Appendix B – Coed Darcy Risk Based Screening Levels for deep >1m Residential

Appendix A – Screening sheet

Client: Enverity	Chemtest Job No.:							15-02687	15-02687	15-02687	15-02687	15-02687	15-02687	15-02687	15-02687	15-02687	15-02687
Quotation No.:	Chemtest Sample ID.:							99818	99819	99820	99821	99822	99823	99824	99825	99826	99827
Order No.:	Client Sample Ref.:																
	Client Sample ID.:							SP129 - 1	SP129 - 2	SP129 - 3	SP129 - 4	SP129 - 5	SP129 - 6	SP129 - 7	SP129 - 8	SP129 - 9	SP129 - 10
	Sample Type:							SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):																
	Bottom Depth(m):																
	Date Sampled:							09-Feb-15	09-Feb-15	09-Feb-15	09-Feb-15	09-Feb-15	09-Feb-15	09-Feb-15	09-Feb-15	09-Feb-15	09-Feb-15
Determinand	Accred.	SOP	Units	LOD	1% >1m RESI RBSL	MAX											
ACM Type	U	2192					-	-	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001			No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry	U	2192	%	0.001		0.00	-	-	-	-	-	-	-	-	-	-	-
Total Asbestos	N	2192	%	0.001	0.02	0.00	-	-	-	-	-	-	-	-	-	-	-
pH	U	2010				8.80	8.8	8.5	8.1	8.4	8.2	8.1	8	8.5	8.3	8.4	8.4
Arsenic	U	2450	mg/kg	1		30.00	26	23	22	30	25	21	23	18	22	22	22
Cadmium	U	2450	mg/kg	0.1		0.92	0.73	0.76	0.71	0.92	0.73	0.57	0.79	0.59	0.61	0.53	0.53
Chromium	U	2450	mg/kg	1		34.00	25	33	25	34	33	24	34	27	26	27	27
Copper	U	2450	mg/kg	0.5		110.00	90	97	94	110	83	71	100	58	70	52	52
Mercury	U	2450	mg/kg	0.1	27.7	0.38	0.18	0.2	0.2	0.23	0.18	0.2	0.38	0.17	0.17	0.22	0.22
Nickel	U	2450	mg/kg	0.5		58.00	39	42	42	58	56	36	45	45	41	40	40
Lead	U	2450	mg/kg	0.5		380.00	380	310	220	310	230	120	94	130	230	130	130
Selenium	U	2450	mg/kg	0.2		0.58	0.41	0.58	0.21	0.45	0.2	0.3	0.43	0.36	0.46	0.38	0.38
Vanadium	U	2450	mg/kg	5		33.00	24	26	23	33	30	23	27	26	24	27	27
Zinc	U	2450	mg/kg	0.5		610.00	520	500	490	610	420	290	300	320	470	320	320
Organic Matter	U	2625	%	0.4		2.90	2.8	2.2	1.7	2.9	1.9	1.9	2.2	1.7	2.9	2.9	2.9
Aliphatic TPH >C5-C6	N	2675	mg/kg	0.1	112.0	0.10	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aliphatic TPH >C6-C8	N	2675	mg/kg	0.1	sat	0.10	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aliphatic TPH >C8-C10	U	2675	mg/kg	0.1	42.5	0.10	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aliphatic TPH >C10-C12	U	2675	mg/kg	1	sat	1.00	1	1	1	1	1	1	1	1	1	1	1
Aliphatic TPH >C12-C16	U	2675	mg/kg	1	sat	7.20	1	1	7.2	1	1	1	1	1	1	1	1
Aliphatic TPH >C16-C21	U	2675	mg/kg	1	sat	8.50	1	1	8.5	1	1	1	1	1	1	1	1
Aliphatic TPH >C21-C35	U	2675	mg/kg	1	sat	7.50	1	1	7.5	1	1	1	1	1	1	1	1
Aliphatic TPH >C35-C44	U	2675	mg/kg	1	sat	1.00	1	1	1	1	1	1	1	1	1	1	1
Total Aliphatic Hydrocarbons	U	2675	mg/kg	5		23.00	5	5	23	5	5	5	5	5	5	5	5
Aromatic TPH >C5-C7	N	2675	mg/kg	0.1	0.5	0.10	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aromatic TPH >C7-C8	N	2675	mg/kg	0.1	146	0.10	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aromatic TPH >C8-C10	U	2675	mg/kg	0.1	71	0.10	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aromatic TPH >C10-C12	N	2675	mg/kg	1	1390	1.00	1	1	1	1	1	1	1	1	1	1	1
Aromatic TPH >C12-C16	U	2675	mg/kg	1	sat	1.00	1	1	1	1	1	1	1	1	1	1	1
Aromatic TPH >C16-C21	U	2675	mg/kg	1	sat	4.30	1	2.6	4	3.7	1	1	1	1	4.3	1	1
Aromatic TPH >C21-C35	N	2675	mg/kg	1	sat	9.60	1	2.7	1	1.1	1	1	1	1	9.6	1	1
Aromatic TPH >C35-C44	N	2675	mg/kg	1	sat	1.00	1	1	1	1	1	1	1	1	1	1	1
Total Aromatic Hydrocarbons	U	2675	mg/kg	5	3800	14.00	5	5.4	5	5	5	5	5	5	14	5	5
Total Petroleum Hydrocarbons	U	2675	mg/kg	10	3800	27.00	10	10	27	10	10	10	10	10	14	10	10
Naphthalene	U	2700	mg/kg	0.1	2.8	1.10	0.15	0.1	1.1	0.1	0.1	0.1	0.1	0.1	0.14	0.1	0.1
Acenaphthylene	U	2700	mg/kg	0.1		0.41	0.24	0.1	0.41	0.1	0.1	0.1	0.1	0.1	0.11	0.1	0.1
Acenaphthene	U	2700	mg/kg	0.1		0.45	0.1	0.1	0.45	0.1	0.1	0.1	0.1	0.1	0.37	0.1	0.1
Fluorene	U	2700	mg/kg	0.1		0.21	0.11	0.1	0.13	0.1	0.1	0.1	0.1	0.1	0.21	0.1	0.1
Phenanthrene	U	2700	mg/kg	0.1		1.10	0.5	0.1	0.22	0.78	0.1	0.1	0.1	0.1	1.1	0.1	0.1
Anthracene	U	2700	mg/kg	0.1	sat	0.28	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.28	0.1	0.1
Fluoranthene	U	2700	mg/kg	0.1		2.20	0.77	0.7	0.38	0.73	0.28	0.41	0.21	0.35	2.2	0.37	0.37
Pyrene	U	2700	mg/kg	0.1		1.70	0.62	0.42	0.27	0.55	0.13	0.19	0.18	0.25	1.7	0.32	0.32
Benzo[a]anthracene	U	2700	mg/kg	0.1	sat	1.00	0.35	0.16	0.1	0.4	0.1	0.1	0.1	0.27	1	0.11	0.11
Chrysene	U	2700	mg/kg	0.1		1.10	0.8	0.29	0.1	0.52	0.1	0.1	0.1	0.33	1.1	0.18	0.18
Benzo[b]fluoranthene	U	2700	mg/kg	0.1	sat	0.97	0.35	0.62	0.1	0.4	0.1	0.1	0.1	0.36	0.97	0.1	0.1
Benzo[k]fluoranthene	U	2700	mg/kg	0.1		0.31	0.22	0.23	0.1	0.12	0.1	0.1	0.1	0.11	0.31	0.1	0.1
Benzo[a]pyrene	U	2700	mg/kg	0.1	sat	0.83	0.33	0.38	0.1	0.63	0.1	0.1	0.1	0.28	0.83	0.1	0.1
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.1		0.63	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.63	0.1	0.1
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.1		0.10	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo[g,h,i]perylene	U	2700	mg/kg	0.1		0.21	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.21	0.1	0.1
Total Of 16 PAH's	U	2700	mg/kg	2		11.00	4.5	2.8	3	4.1	2	2	2	2	11	2	2
Benzene	U	2760	µg/kg	1	400	1.00	1	1	1	1	1	1	1	1	1	1	1
Toluene	U	2760	µg/kg	1	52000	1.00	1	1	1	1	1	1	1	1	1	1	1
Ethylbenzene	U	2760	µg/kg	1	140000	1.00	1	1	1	1	1	1	1	1	1	1	1
m & p-Xylene	U	2760	µg/kg	1	58000	1.00	1	1	1	1	1	1	1	1	1	1	1
o-Xylene	U	2760	µg/kg	1	58000	1.00	1	1	1	1	1	1	1	1	1	1	1

Appendix B – Coed Darcy Risk Based Screening Levels for deep >1m Residential

Lowest of the Remedial Target Criterion/Risk Based Screening Level for Parks land use, Deep Soil (>1m)

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Benzo(a)pyrene	>sat	>sat
Benzene	48	48
Toluene	>sat	>sat
Ethylbenzene	>sat	>sat
Xylene	478	1330
TPH aromatic C7-C8	>sat	>sat
TPH aromatic C8-C10	>sat	>sat
TPH aromatic C10-C12	>sat	>sat
TPH aromatic C12-C16	>sat	>sat
TPH aliphatic C6-C8	>sat	>sat
TPH aliphatic C8-C10	>sat	>sat
TPH aliphatic C10-C12	>sat	>sat
TPH aliphatic C12-C16	>sat	>sat
TPH aromatic C16-C21	>sat	>sat
TPH aromatic C21-C35	>sat	>sat
TPH aliphatic C16-C21	>sat	>sat
TPH aliphatic C21-C35	>sat	>sat
Total TPH (Phase 1)	>sat	>sat
Total TPH (Process Area)	>sat	>sat
Total TPH (North Tank Farm)	>sat	>sat
Total TPH (South Tank Farm)	>sat	>sat
1,2-Dichloroethane	6	6
1,1,1-Trichloroethane	>sat	>sat
Tetrachloroethene	1780	1780
Trichloroethene	269	269
Vinyl chloride	8.21	11.4
Dichloromethane	6220	6220
Cis-1,2-Dichloroethene	881	881
Trans-1,2 Dichloroethene	881	881
Acenaphthene	>sat	>sat
Anthracene	>sat	>sat
Benzo(a)anthracene	>sat	>sat
Benzo(b)fluoranthene	>sat	>sat
Benzo(g,h,i)perylene	>sat	>sat
Benzo(k)fluoranthene	>sat	>sat
Chrysene	>sat	>sat
Dibenz(ah)anthracene	>sat	>sat
Fluoranthene	>sat	>sat
Fluorene	>sat	>sat
Indeno(1,2,3-cd)pyrene	>sat	>sat
Pyrene	>sat	>sat
Phenol	>sat	>sat
Mercury (methyl)	>sat	>sat
Mercury (elemental)	>sat	>sat
Naphthalene	>sat	>sat
TPH aromatic C5-C7	432	928
TPH aliphatic C5-C6	>sat	>sat
1,1,1,2-Tetrachloroethane	>sat	>sat
1,1,2,2-Tetrachloroethane	>sat	>sat
Carbon tetrachloride	301	778
Chlorobenzene	>sat	>sat

Notes
1. Where the lower of the vapour or aqueous saturation limits has been exceeded by the RTC calculated, the hazard quotient is considered to be less than 1 and as such >sat has been presented
2. Xylene - Users must consider total exposure from all xylene isomers and not consider them in isolation. It should be noted that the value presented is the lowest of the aqueous or vapour saturation limits. The lowest saturation limit of the three isomers has been presented.
3. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
4. TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered and therefore no value has been presented here
5. 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
6. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
7. Asbestos has not been considered here as it is being considered in a separate report
8. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
9. TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Arsenic	64 a	64 a
Chromium	78 a	78 a
Cadmium	2.6	2.6
Mercury (inorganic)	1 b	1 b
Nickel	75 b	75 b
Selenium	3 b	3 b
Lead	337 a	337 a
Vanadium	351	351
Copper	143 a	143 a
Zinc	478 a	478 a
Benzo(a)pyrene	0.9	0.9
Benzene	13	13
Toluene	8110	8110
Ethylbenzene	4740	4740
Xylene	7940	7940
TPH aromatic C7-C8	21300	21300
TPH aromatic C8-C10	2230	2310
TPH aromatic C10-C12	2300	2340
TPH aromatic C12-C16	2330	2350
TPH aliphatic C6-C8	294000 *	294000 *
TPH aliphatic C8-C10	5740 *	5740 *
TPH aliphatic C10-C12	5700	5830
TPH aliphatic C12-C16	5800	5860
TPH aromatic C16-C21	1450	1450
TPH aromatic C21-C35	1450	1450
TPH aliphatic C16-C35	159000	159000
TPH aliphatic C21-C35	159000	159000
Total TPH (Phase 1)	9060	9060
Total TPH (Process Area)	10800	10800
Total TPH (North Tank Farm)	9420	9420
Total TPH (South Tank Farm)	6350	6350
1,2-Dichloroethane	4.5	4.5
1,1,1-Trichloroethane	27900	27900
Tetrachloroethene	641	641
Trichloroethene	193	193
Vinyl chloride	0.7	0.7
Dichloromethane	241	241
Cis-1,2-Dichloroethene	392	468
Trans-1,2 Dichloroethene	632	632
Acenaphthene	5340	5350
Anthracene	26800	26800
Benzo(a)anthracene	20.8	21.1
Benzo(b)fluoranthene	21.3	21.3
Benzo(g,h,i)perylene	218	218
Benzo(k)fluoranthene	215	215
Chrysene	2090	2090
Dibenz(ah)anthracene	2.16	2.16
Fluoranthene	3570	3570
Fluorene	3570	3570
Indeno(1,2,3-cd)pyrene	21.2	21.2
Pyrene	2680	2680
Phenol	859	859
Mercury (methyl)	19.4	19.4
Mercury (elemental)	4.3	12.9
Naphthalene	955	1340
TPH aromatic C5-C7	26.2	27.5
TPH aliphatic C5-C6	294000	294000
1,1,1,2-Tetrachloroethane	498	533
1,1,2,2-Tetrachloroethane	516	539
Carbon tetrachloride	111	128
Chlorobenzene	170	170

Notes
1. It is assumed that no visible free product is present within the top 1.0m of soil
2. Metal RTC derived considering Soil Codes and background data
a – based on background soil concentration
b – based on Soil Code
3. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
4. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
* 5. The RTC for TPH aliphatic C5-C6, TPH aliphatic C6-C8 and TPH aliphatic C8-C10 are based on a value produced from following the approach outlined in SR4 for substances at saturation
6. TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered
7. 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
8. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
9. Asbestos has not been considered here as it is being considered in a separate report
10. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
11. Elemental mercury is based on the inhalation pathway only and the saturation limit has been presented
12. TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Benzo(a)pyrene	>sat	>sat
Benzene	0.4	0.4
Toluene	52	52
Ethylbenzene	140	140
Xylene	58	58
TPH aromatic C7-C8	146	146
TPH aromatic C8-C10	71	209
TPH aromatic C10-C12	1390	1390
TPH aromatic C12-C16	>sat	>sat
TPH aliphatic C6-C8	>sat	>sat
TPH aliphatic C8-C10	42.5	125
TPH aliphatic C10-C12	>sat	>sat
TPH aliphatic C12-C16	>sat	>sat
TPH aliphatic C16-C21	>sat	>sat
TPH aliphatic C21-C35	>sat	>sat
TPH aromatic C16-C21	>sat	>sat
TPH aromatic C21-C35	>sat	>sat
Total TPH (Phase 1)	9180	9180
Total TPH (Process Area)	4100	4100
Total TPH (North Tank Farm)	3800	3800
Total TPH (South Tank Farm)	2790	2790
1,2-Dichloroethane	0.0111	0.0176
1,1,1-Trichloroethane	10.8	25.9
Tetrachloroethene	2.3	6.12
Trichloroethene	0.188	0.463
Vinyl chloride	0.00093	0.00129
Dichloromethane	4.19	6.04
Cis-1,2-Dichloroethene	0.206	0.392
Trans-1,2 Dichloroethene	0.332	0.689
Acenaphthene	>sat	>sat
Anthracene	>sat	>sat
Benzo(a)anthracene	>sat	>sat
Benzo(b)fluoranthene	>sat	>sat
Benzo(g,h,i)perylene	>sat	>sat
Benzo(k)fluoranthene	>sat	>sat
Chrysene	>sat	>sat
Dibenz(ah)anthracene	>sat	>sat
Fluoranthene	>sat	>sat
Fluorene	>sat	>sat
Indeno(1,2,3-cd)pyrene	>sat	>sat
Pyrene	>sat	>sat
Phenol	1030	2340
Mercury (methyl)	27.7	62.5
Mercury (elemental)	0.291	0.87
Naphthalene	2.8	8.02
TPH aromatic C5-C7	0.46	0.987
TPH aliphatic C5-C6	112	246
1,1,1,2-Tetrachloroethane	1.84	5.09
1,1,2,2-Tetrachloroethane	4.71	11.3
Carbon tetrachloride	0.0309	0.0801
Chlorobenzene	17.9	47.9

Notes

- Where the lower of the vapour or aqueous saturation limits have been exceeded by the RTC calculated, the hazard quotient is considered to be less than 1 and as such >sat has been presented
- Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
- TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered and therefore no RTC value has been presented here
- 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
- Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
- TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- Asbestos has not been considered here as it is being considered in a separate report
- Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
- TPH aromatic C5-C7 is considered to comprise benzene only

Lowest of the Remedial Target Criterion/Risk Based Screening Level for Residential with the Consumption of Produce land use, Shallow Soil.

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Arsenic	64 a	64 a
Chromium	78 a	78 a
Cadmium	2.6	2.6
Mercury (inorganic)	1 b	1 b
Nickel	50	50
Selenium	3 b	3 b
Lead	337 a	337 a
Vanadium	113	115
Copper	143 a	143 a
Zinc	478 a	478 a
Benzo(a)pyrene	0.9	0.9
Benzene	0.0493	0.12
Toluene	36	36
Ethylbenzene	38.2	41
Xylene	17.2	32
TPH aromatic C7-C8	86.9	125
TPH aromatic C8-C10	14.8	94
TPH aromatic C10-C12	57.3	118
TPH aromatic C12-C16	131	131
TPH aliphatic C6-C8	69.8	8340
TPH aliphatic C8-C10	9.76	87.1
TPH aliphatic C10-C12	1780 *	3200
TPH aliphatic C12-C16	4510	4510
TPH aromatic C16-C21	82	82
TPH aromatic C21-C35	888	1130
TPH aliphatic C16-C21	94200	94200
TPH aliphatic C21-C35	94800	94800
Total TPH (Phase 1)	1720	1720
Total TPH (Process Area)	2600	2600
Total TPH (North Tank Farm)	1100	1100
Total TPH (South Tank Farm)	1020	1020
1,2-Dichloroethane	0.0019	0.0102
1,1,1-Trichloroethane	2.23	17.3
Tetrachloroethene	0.455	3.62
Trichloroethene	0.0382	0.304
Vinyl chloride	0.000202	0.00082
Dichloromethane	0.458	1.56
Cis-1,2-Dichloroethene	0.0393	0.255
Trans-1,2-Dichloroethene	0.0671	0.464
Acenaphthene	588 *	1380
Anthracene	8270	14800
Benzo(a)anthracene	7.56	16.5
Benzo(b)fluoranthene	20	23.9
Benzo(g,h,i)perylene	235	248
Benzo(k)fluoranthene	216	243
Chrysene	1500	2220
Dibenz(ah)anthracene	1.97	2.39
Fluoranthene	822	1630
Fluorene	615	1390
Indeno(1,2,3-cd)pyrene	19.2	23.6
Pyrene	563	1150
Phenol	162	349
Mercury (methyl)	6.28	11.3
Mercury (elemental)	0.0607	0.583
Naphthalene	0.585	5.05
TPH aromatic C5-C7	0.0493	0.192
TPH aliphatic C5-C6	30.1	172
1,1,1,2-Tetrachloroethane	0.353	2.78
1,1,2,2-Tetrachloroethane	0.695	3.63
Carbon tetrachloride	0.00656	0.0541
Chlorobenzene	1.06	3.38

Notes

1. It is assumed that no visible free product is present within the top 1.0m of soil
2. Metal RTC derived considering Soil Codes and background data
- a – based on background soil concentration
- b – based on Soil Code
3. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
4. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- * 5. The RTC for TPH aliphatic C10-C12 and acenaphthene is based on a value produced from following the approach outlined in SR4 for substances at saturation
6. 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
7. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
8. Asbestos has not been considered here as it is being considered in a separate report
9. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
10. Phenol is derived by comparing the oral exposure to the oral HCV and the dermal and inhalation exposure to the inhalation HCV
11. Elemental mercury is based on inhalation pathways only
12. TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC/RBSL mg/L
Benzo(a)pyrene	>sat
Benzene	0.0888
Toluene	47
Ethylbenzene	13.4
Xylene	4.1
TPH aromatic C7-C8	20
TPH aromatic C8-C10	0.985
TPH aromatic C10-C12	3.87
TPH aromatic C12-C16	>sat
TPH aromatic C16-C21	>sat
TPH aromatic C21-C35	>sat
TPH aliphatic C6-C8	1.4
TPH aliphatic C8-C10	0.0296
TPH aliphatic C10-C12	0.0228
TPH aliphatic C12-C16	>sat
TPH aliphatic C16-C21	>sat
TPH aliphatic C21-C35	>sat
1,2-Dichloroethane	0.0373
1,1,1-Trichloroethane	13.1
Tetrachloroethene	1.66
Trichloroethene	0.222
Vinyl chloride	0.00248
Dichloromethane	13
Cis-1,2 Dichloroethene	0.547
Trans-1,2 Dichloroethene	0.675
Acenaphthene	>sat
Anthracene	>sat
Benzo(a)anthracene	>sat
Benzo(b)fluoranthene	>sat
Benzo(k)fluoranthene	>sat
Chrysene	>sat
Dibenz(ah)anthracene	>sat
Fluoranthene	>sat
Fluorene	>sat
Indeno(1,2,3-cd)pyrene	>sat
Pyrene	>sat
Phenol	1700
Mercury (methyl)	45.5
Mercury (elemental)	0.00463
Naphthalene	0.952
TPH aromatic C5-C7	0.0888
TPH aliphatic C5-C6	1.93
1,1,1,2-Tetrachloroethane	1.05
1,1,2,2-Tetrachloroethane	6.89
Carbon Tetrachloride	0.0229
Chlorobenzene (mono)	13.7

Notes
1. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
2. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
3. Where indoor and outdoor values were presented by RBCA, these have been integrated in line with SNIFFER (2003). Where both indoor and outdoor values derived by RBCA were greater than the saturation limit, >sat has been presented. Where indoor values were presented by RBCA, and the outdoor values were >sat, only the indoor values have been presented. Therefore >sat indicates that the theoretical RTC is greater than solubility limit.
4. TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered
7. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
8. TPH aromatic C5-C7 is considered to comprise benzene only by Atkins

Technical Note SP130

Subject: Coed Darcy Stockpile 130 Validation

Reference: 5041216

Revision: 001

Author: Daniel Hopkins

Checker: MT

Issued to: -

Reviewer: MP

Date: 24th June 2015

Authoriser: -

Introduction

Atkins Ltd has been instructed by St Modwen Developments to control the management and testing of stockpiled material for reuse within the Coed Darcy development. This technical note provides information on stockpile 130 and its suitability for reuse within the site.

The Outline Planning Permission (Ref. 1) grants the redevelopment of the Former Llandarcy oil refinery as a mixed use development, comprising a range of residential, commercial and retail properties, community areas and public open space.

Stockpile Chemical Testing

A total of 28 No. samples were taken by Atkins Ltd and Enverity and scheduled for laboratory analysis by Chemtest. The samples were tested for the following determinands (Table 1.) with full results in Appendix A.

Table 1. Soils – List of Determinands

Arsenic (total)	Cadmium (total)	Chromium (total)
Chromium (hexavalent)	Copper (total)	Lead (total)
Mercury (total)	Nickel (total)	Selenium (total)
Zinc (total)	pH	Total Organic Carbon
BTEX	Total Petroleum Hydrocarbons -CWG	USEPA 16 Polycyclic Aromatic Hydrocarbons
Asbestos (Quantification)		

The results of the chemical testing were screened against Coed Darcy Risk Based Screening Levels (RBSLs) and RTCs for a residential end use (>1m below finished floor level) (Appendix B). No laboratory analytical data were identified above the RBSL.

References

1. *Neath Port Talbot County Council Approval of Outline Planning Permission. Reference Number P2005/0393 March 2005*

Appendices

Appendix A - Screening sheet of samples

Appendix B – Coed Darcy Risk Based Screening Levels for deep >1m Residential

Appendix A – Screened Laboratory Analytical Data

Client: Enverity	Chemtest Job No.:						15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815
Quotation No.:	Chemtest Sample ID.:						110138	110139	110140	110141	110142	110143	110144	110145	110146	110147	110148	110149	110150	110151
Order No.:	Client Sample Ref.:																			
	Client Sample ID.:						SP130-1	SP130-2	SP130-3	SP130-4	SP130-5	SP130-6	SP130-7	SP130-8	SP130-9	SP130-10	SP130-11	SP130-12	SP130-13	SP130-14
	Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):																			
	Bottom Depth(m):																			
	Date Sampled:				RESI >1m RBSL															
							27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15
Determinand	Accred.	SOP	Units	LOD		MAX														
ACM Type	U	2192					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001			No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry	U	2192	%	0.001			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Asbestos	N	2192	%	0.001			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moisture	N	2030	%	0.02			11.0	7.70	7.40	8.30	8.40	11.00	7.50	10.00	8.50	8.20	9.80	7.20	8.60	7.00
pH	U	2010					10.3	9.20	9.40	8.90	9.00	10.00	9.00	10.10	9.90	10.30	9.30	10.10	9.00	10.10
Arsenic	U	2450	mg/kg	1			29.0	4.00	11.00	4.80	8.00	8.40	4.40	11.00	7.70	2.90	1.40	12.00	4.20	3.50
Cadmium	U	2450	mg/kg	0.1			0.8	0.42	0.52	0.59	0.54	0.56	0.44	0.77	0.44	0.50	0.71	0.49	0.43	0.37
Chromium	U	2450	mg/kg	1			110.0	42.00	63.00	37.00	61.00	66.00	51.00	51.00	50.00	38.00	31.00	110.00	51.00	42.00
Copper	U	2450	mg/kg	0.5			130.0	40.00	58.00	38.00	46.00	52.00	36.00	50.00	43.00	30.00	30.00	39.00	41.00	46.00
Mercury	U	2450	mg/kg	0.1		27.7	0.4	0.19	0.30	0.17	0.24	0.28	0.16	0.22	0.23	0.18	0.15	0.24	0.23	0.21
Nickel	U	2450	mg/kg	0.5			67.0	44.00	60.00	45.00	59.00	38.00	45.00	37.00	46.00	44.00	26.00	45.00	39.00	37.00
Lead	U	2450	mg/kg	0.5			110.0	59.00	82.00	59.00	61.00	86.00	73.00	86.00	67.00	60.00	64.00	73.00	67.00	55.00
Selenium	U	2450	mg/kg	0.2			0.4	< 0.20	< 0.20	< 0.20	0.35	< 0.20	< 0.20	< 0.20	0.22	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Vanadium	U	2450	mg/kg	5			140.0	49.00	61.00	35.00	61.00	94.00	48.00	55.00	62.00	38.00	26.00	140.00	66.00	46.00
Zinc	U	2450	mg/kg	0.5			300.0	160.00	280.00	270.00	150.00	160.00	110.00	270.00	140.00	120.00	110.00	130.00	170.00	100.00

Results Summary - Soil

Project: SP130 Coed Darcy

Client: Enverity	Chemtest Job No.:				15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	15-04815	
Quotation No.:	Chemtest Sample ID.:				110152	110153	110154	110155	110156	110157	110158	110159	110160	110161	110162	110163	110164	110165
Order No.:	Client Sample Ref.:																	
	Client Sample ID.:				SP130-15	SP130-16	SP130-17	SP130-18	SP130-19	SP130-20	SP130-21	SP130-22	SP130-23	SP130-24	SP130-25	SP130-26	SP130-27	SP130-28
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):																	
	Bottom Depth(m):																	
	Date Sampled:				27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15	27-Feb-15
Determinand	Accred.	SOP	Units	LOD														
ACM Type	U	2192			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry	U	2192	%	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Asbestos	N	2192	%	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moisture	N	2030	%	0.02	7.70	9.70	8.40	8.20	7.70	7.00	7.40	6.90	8.10	9.50	8.90	9.00	10.00	8.10
pH	U	2010			9.60	9.10	9.00	8.90	9.50	9.10	9.80	8.90	9.70	9.10	8.90	9.30	8.90	9.10
Arsenic	U	2450	mg/kg	1	14.00	7.20	3.00	13.00	18.00	4.70	9.70	12.00	7.00	27.00	19.00	13.00	21.00	29.00
Cadmium	U	2450	mg/kg	0.1	0.64	0.53	0.43	0.66	0.63	0.46	0.59	0.47	0.47	0.70	0.42	0.39	0.54	0.50
Chromium	U	2450	mg/kg	1	57.00	60.00	34.00	65.00	63.00	44.00	54.00	41.00	49.00	75.00	37.00	78.00	51.00	38.00
Copper	U	2450	mg/kg	0.5	55.00	41.00	38.00	52.00	84.00	39.00	45.00	32.00	34.00	52.00	33.00	28.00	47.00	130.00
Mercury	U	2450	mg/kg	0.1	0.20	0.19	0.19	0.32	0.43	0.20	0.31	0.21	0.27	0.35	0.23	0.15	0.31	0.19
Nickel	U	2450	mg/kg	0.5	57.00	43.00	39.00	56.00	67.00	45.00	49.00	53.00	35.00	64.00	40.00	30.00	48.00	44.00
Lead	U	2450	mg/kg	0.5	95.00	91.00	61.00	88.00	110.00	76.00	81.00	66.00	67.00	87.00	61.00	51.00	80.00	69.00
Selenium	U	2450	mg/kg	0.2	0.20	0.21	0.24	0.27	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	0.23	0.24	< 0.20	0.26	< 0.20
Vanadium	U	2450	mg/kg	5	60.00	94.00	29.00	83.00	82.00	40.00	52.00	45.00	68.00	100.00	40.00	38.00	61.00	38.00
Zinc	U	2450	mg/kg	0.5	150.00	180.00	140.00	170.00	300.00	150.00	190.00	120.00	120.00	210.00	130.00	100.00	180.00	180.00
Organic Matter	U	2625	%	0.4		2.80							2.90					
Aliphatic TPH >C5-C6	N	2675	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Aliphatic TPH >C6-C8	N	2675	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Aliphatic TPH >C8-C10	U	2675	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Aliphatic TPH >C10-C12	U	2675	mg/kg	1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Aliphatic TPH >C12-C16	U	2675	mg/kg	1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00	1.00	1.00	1.00	1.00	1.00	1.00
Aliphatic TPH >C16-C21	U	2675	mg/kg	1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	41.00	1.00	1.00	12.00	1.00	1.00	1.00
Aliphatic TPH >C21-C35	U	2675	mg/kg	1	1.00	1.00	31.00	33.00	1.00	1.00	30.00	11.00	1.00	1.00	200.00	1.00	1.00	1.00
Aliphatic TPH >C35-C44	U	2675	mg/kg	1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.10	1.00	1.00	1.00
Total Aliphatic Hydrocarbons	U	2675	mg/kg	5	5.00	5.00	31.00	33.00	5.00	5.00	30.00	64.00	5.00	5.00	210.00	5.00	5.00	5.00
Aromatic TPH >C5-C7	N	2675	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Aromatic TPH >C7-C8	N	2675	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Aromatic TPH >C8-C10	U	2675	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Aromatic TPH >C10-C12	N	2675	mg/kg	1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.30	1.00	1.00	29.00	1.00	1.00	1.00
Aromatic TPH >C12-C16	U	2675	mg/kg	1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.80	1.00	1.00	210.00	1.00	1.00	1.00
Aromatic TPH >C16-C21	U	2675	mg/kg	1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.00	1.00	9.00	1.00	1.00	1.00
Aromatic TPH >C21-C35	N	2675	mg/kg	1	1.00	1.00	7.20	4.90	1.00	1.00	4.70	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Aromatic TPH >C35-C44	N	2675	mg/kg	1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total Aromatic Hydrocarbons	U	2675	mg/kg	5	5.00	5.00	7.20	5.00	5.00	5.00	10.00	5.00	5.00	5.00	250.00	5.00	5.00	5.00
Total Petroleum Hydrocarbons	U	2675	mg/kg	10	10.00	10.00	38.00	38.00	10.00	10.00	35.00	74.00	10.00	10.00	470.00	10.00	10.00	10.00
Naphthalene	U	2700	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Acenaphthylene	U	2700	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Acenaphthene	U	2700	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Fluorene	U	2700	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.13	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Phenanthrene	U	2700	mg/kg	0.1	0.20	0.20	0.24	0.22	0.17	0.19	1.00	0.19	0.37	0.36	0.10	0.10	0.10	0.10
Anthracene	U	2700	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.34	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Fluoranthene	U	2700	mg/kg	0.1	0.25	0.27	0.15	0.18	0.11	0.20	2.70	0.24	0.46	0.23	0.44	0.28	0.53	0.30
Pyrene	U	2700	mg/kg	0.1	0.28	0.23	0.19	0.16	0.14	0.19	2.30	0.23	0.48	0.24	0.40	0.17	0.47	0.24
Benzo[a]anthracene	U	2700	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	1.50	0.10	0.16	0.10	0.31	0.10	0.28	0.10
Chrysene	U	2700	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	1.60	0.10	0.21	0.10	0.45	0.10	0.85	0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.1	0.10	0.10	0.10	0.10	0.10	0.10	2.00	0.10	0.10	0.10	0.50	0.10	0.36	0.10
Benzo[k]fluoranthene	U	2700																

Project: SP130 Coed Darcy

Client: Enverity	Chemtest Job No.:			
Quotation No.:	Chemtest Sample ID.:			
Order No.:	Client Sample Ref.:			
	Client Sample ID.:			
	Sample Type:			
	Top Depth (m):			
	Bottom Depth(m):			
	Date Sampled:			
Determinand	Accred.	SOP	Units	LOD
ACM Type	U	2192		
Asbestos Identification	U	2192	%	0.001
Asbestos by Gravimetry	U	2192	%	0.001
Total Asbestos	N	2192	%	0.001
Moisture	N	2030	%	0.02
pH	U	2010		
Arsenic	U	2450	mg/kg	1
Cadmium	U	2450	mg/kg	0.1
Chromium	U	2450	mg/kg	1
Copper	U	2450	mg/kg	0.5
Mercury	U	2450	mg/kg	0.1
Nickel	U	2450	mg/kg	0.5
Lead	U	2450	mg/kg	0.5
Selenium	U	2450	mg/kg	0.2
Vanadium	U	2450	mg/kg	5
Zinc	U	2450	mg/kg	0.5
Organic Matter	U	2625	%	0.4
Aliphatic TPH >C5-C6	N	2675	mg/kg	0.1
Aliphatic TPH >C6-C8	N	2675	mg/kg	0.1
Aliphatic TPH >C8-C10	U	2675	mg/kg	0.1
Aliphatic TPH >C10-C12	U	2675	mg/kg	1
Aliphatic TPH >C12-C16	U	2675	mg/kg	1
Aliphatic TPH >C16-C21	U	2675	mg/kg	1
Aliphatic TPH >C21-C35	U	2675	mg/kg	1
Aliphatic TPH >C35-C44	U	2675	mg/kg	1
Total Aliphatic Hydrocarbons	U	2675	mg/kg	5
Aromatic TPH >C5-C7	N	2675	mg/kg	0.1
Aromatic TPH >C7-C8	N	2675	mg/kg	0.1
Aromatic TPH >C8-C10	U	2675	mg/kg	0.1
Aromatic TPH >C10-C12	N	2675	mg/kg	1
Aromatic TPH >C12-C16	U	2675	mg/kg	1
Aromatic TPH >C16-C21	U	2675	mg/kg	1
Aromatic TPH >C21-C35	N	2675	mg/kg	1
Aromatic TPH >C35-C44	N	2675	mg/kg	1
Total Aromatic Hydrocarbons	U	2675	mg/kg	5
Total Petroleum Hydrocarbons	U	2675	mg/kg	10
Naphthalene	U	2700	mg/kg	0.1
Acenaphthylene	U	2700	mg/kg	0.1
Acenaphthene	U	2700	mg/kg	0.1
Fluorene	U	2700	mg/kg	0.1
Phenanthrene	U	2700	mg/kg	0.1
Anthracene	U	2700	mg/kg	0.1
Fluoranthene	U	2700	mg/kg	0.1
Pyrene	U	2700	mg/kg	0.1
Benzo[a]anthracene	U	2700	mg/kg	0.1
Chrysene	U	2700	mg/kg	0.1
Benzo[b]fluoranthene	U	2700	mg/kg	0.1
Benzo[k]fluoranthene	U	2700	mg/kg	0.1
Benzo[a]pyrene	U	2700	mg/kg	0.1
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.1
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.1
Benzo[g,h,i]perylene	U	2700	mg/kg	0.1
Total Of 16 PAH's	U	2700	mg/kg	2
Benzene	U	2760	µg/kg	1
Toluene	U	2760	µg/kg	1
Ethylbenzene	U	2760	µg/kg	1
m & p-Xylene	U	2760	µg/kg	1
o-Xylene	U	2760	µg/kg	1

Results Summary - Soil

Appendix B – RBSLs

Lowest of the Remedial Target Criterion/Risk Based Screening Level for Parks land use, Deep Soil (>1m)

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Benzo(a)pyrene	>sat	>sat
Benzene	48	48
Toluene	>sat	>sat
Ethylbenzene	>sat	>sat
Xylene	478	1330
TPH aromatic C7-C8	>sat	>sat
TPH aromatic C8-C10	>sat	>sat
TPH aromatic C10-C12	>sat	>sat
TPH aromatic C12-C16	>sat	>sat
TPH aliphatic C6-C8	>sat	>sat
TPH aliphatic C8-C10	>sat	>sat
TPH aliphatic C10-C12	>sat	>sat
TPH aliphatic C12-C16	>sat	>sat
TPH aromatic C16-C21	>sat	>sat
TPH aromatic C21-C35	>sat	>sat
TPH aliphatic C16-C21	>sat	>sat
TPH aliphatic C21-C35	>sat	>sat
Total TPH (Phase 1)	>sat	>sat
Total TPH (Process Area)	>sat	>sat
Total TPH (North Tank Farm)	>sat	>sat
Total TPH (South Tank Farm)	>sat	>sat
1,2-Dichloroethane	6	6
1,1,1-Trichloroethane	>sat	>sat
Tetrachloroethene	1780	1780
Trichloroethene	269	269
Vinyl chloride	8.21	11.4
Dichloromethane	6220	6220
Cis-1,2-Dichloroethene	881	881
Trans-1,2 Dichloroethene	881	881
Acenaphthene	>sat	>sat
Anthracene	>sat	>sat
Benzo(a)anthracene	>sat	>sat
Benzo(b)fluoranthene	>sat	>sat
Benzo(g,h,i)perylene	>sat	>sat
Benzo(k)fluoranthene	>sat	>sat
Chrysene	>sat	>sat
Dibenz(ah)anthracene	>sat	>sat
Fluoranthene	>sat	>sat
Fluorene	>sat	>sat
Indeno(1,2,3-cd)pyrene	>sat	>sat
Pyrene	>sat	>sat
Phenol	>sat	>sat
Mercury (methyl)	>sat	>sat
Mercury (elemental)	>sat	>sat
Naphthalene	>sat	>sat
TPH aromatic C5-C7	432	928
TPH aliphatic C5-C6	>sat	>sat
1,1,1,2-Tetrachloroethane	>sat	>sat
1,1,2,2-Tetrachloroethane	>sat	>sat
Carbon tetrachloride	301	778
Chlorobenzene	>sat	>sat

Notes

- Where the lower of the vapour or aqueous saturation limits has been exceeded by the RTC calculated, the hazard quotient is considered to be less than 1 and as such >sat has been presented
- Xylene - Users must consider total exposure from all xylene isomers and not consider them in isolation. It should be noted that the value presented is the lowest of the aqueous or vapour saturation limits. The lowest saturation limit of the three isomers has been presented.
- TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered and therefore no value has been presented here
- 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
- Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
- Asbestos has not been considered here as it is being considered in a separate report
- Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
- TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Arsenic	64 a	64 a
Chromium	78 a	78 a
Cadmium	2.6	2.6
Mercury (inorganic)	1 b	1 b
Nickel	75 b	75 b
Selenium	3 b	3 b
Lead	337 a	337 a
Vanadium	351	351
Copper	143 a	143 a
Zinc	478 a	478 a
Benzo(a)pyrene	0.9	0.9
Benzene	13	13
Toluene	8110	8110
Ethylbenzene	4740	4740
Xylene	7940	7940
TPH aromatic C7-C8	21300	21300
TPH aromatic C8-C10	2230	2310
TPH aromatic C10-C12	2300	2340
TPH aromatic C12-C16	2330	2350
TPH aliphatic C6-C8	294000 *	294000 *
TPH aliphatic C8-C10	5740 *	5740 *
TPH aliphatic C10-C12	5700	5830
TPH aliphatic C12-C16	5800	5860
TPH aromatic C16-C21	1450	1450
TPH aromatic C21-C35	1450	1450
TPH aliphatic C16-C35	159000	159000
TPH aliphatic C21-C35	159000	159000
Total TPH (Phase 1)	9060	9060
Total TPH (Process Area)	10800	10800
Total TPH (North Tank Farm)	9420	9420
Total TPH (South Tank Farm)	6350	6350
1,2-Dichloroethane	4.5	4.5
1,1,1-Trichloroethane	27900	27900
Tetrachloroethene	641	641
Trichloroethene	193	193
Vinyl chloride	0.7	0.7
Dichloromethane	241	241
Cis-1,2-Dichloroethene	392	468
Trans-1,2 Dichloroethene	632	632
Acenaphthene	5340	5350
Anthracene	26800	26800
Benzo(a)anthracene	20.8	21.1
Benzo(b)fluoranthene	21.3	21.3
Benzo(g,h,i)perylene	218	218
Benzo(k)fluoranthene	215	215
Chrysene	2090	2090
Dibenz(ah)anthracene	2.16	2.16
Fluoranthene	3570	3570
Fluorene	3570	3570
Indeno(1,2,3-cd)pyrene	21.2	21.2
Pyrene	2680	2680
Phenol	859	859
Mercury (methyl)	19.4	19.4
Mercury (elemental)	4.3	12.9
Naphthalene	955	1340
TPH aromatic C5-C7	26.2	27.5
TPH aliphatic C5-C6	294000	294000
1,1,1,2-Tetrachloroethane	498	533
1,1,2,2-Tetrachloroethane	516	539
Carbon tetrachloride	111	128
Chlorobenzene	170	170

Notes
1. It is assumed that no visible free product is present within the top 1.0m of soil
2. Metal RTC derived considering Soil Codes and background data
a – based on background soil concentration
b – based on Soil Code
3. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
4. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
* 5. The RTC for TPH aliphatic C5-C6, TPH aliphatic C6-C8 and TPH aliphatic C8-C10 are based on a value produced from following the approach outlined in SR4 for substances at saturation
6. TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered
7. 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
8. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
9. Asbestos has not been considered here as it is being considered in a separate report
10. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
11. Elemental mercury is based on the inhalation pathway only and the saturation limit has been presented
12. TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Benzo(a)pyrene	>sat	>sat
Benzene	0.4	0.4
Toluene	52	52
Ethylbenzene	140	140
Xylene	58	58
TPH aromatic C7-C8	146	146
TPH aromatic C8-C10	71	209
TPH aromatic C10-C12	1390	1390
TPH aromatic C12-C16	>sat	>sat
TPH aliphatic C6-C8	>sat	>sat
TPH aliphatic C8-C10	42.5	125
TPH aliphatic C10-C12	>sat	>sat
TPH aliphatic C12-C16	>sat	>sat
TPH aliphatic C16-C21	>sat	>sat
TPH aliphatic C21-C35	>sat	>sat
TPH aromatic C16-C21	>sat	>sat
TPH aromatic C21-C35	>sat	>sat
Total TPH (Phase 1)	9180	9180
Total TPH (Process Area)	4100	4100
Total TPH (North Tank Farm)	3800	3800
Total TPH (South Tank Farm)	2790	2790
1,2-Dichloroethane	0.0111	0.0176
1,1,1-Trichloroethane	10.8	25.9
Tetrachloroethene	2.3	6.12
Trichloroethene	0.188	0.463
Vinyl chloride	0.00093	0.00129
Dichloromethane	4.19	6.04
Cis-1,2-Dichloroethene	0.206	0.392
Trans-1,2 Dichloroethene	0.332	0.689
Acenaphthene	>sat	>sat
Anthracene	>sat	>sat
Benzo(a)anthracene	>sat	>sat
Benzo(b)fluoranthene	>sat	>sat
Benzo(g,h,i)perylene	>sat	>sat
Benzo(k)fluoranthene	>sat	>sat
Chrysene	>sat	>sat
Dibenz(ah)anthracene	>sat	>sat
Fluoranthene	>sat	>sat
Fluorene	>sat	>sat
Indeno(1,2,3-cd)pyrene	>sat	>sat
Pyrene	>sat	>sat
Phenol	1030	2340
Mercury (methyl)	27.7	62.5
Mercury (elemental)	0.291	0.87
Naphthalene	2.8	8.02
TPH aromatic C5-C7	0.46	0.987
TPH aliphatic C5-C6	112	246
1,1,1,2-Tetrachloroethane	1.84	5.09
1,1,2,2-Tetrachloroethane	4.71	11.3
Carbon tetrachloride	0.0309	0.0801
Chlorobenzene	17.9	47.9

Notes

- Where the lower of the vapour or aqueous saturation limits have been exceeded by the RTC calculated, the hazard quotient is considered to be less than 1 and as such >sat has been presented
- Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
- TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered and therefore no RTC value has been presented here
- 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
- Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
- TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- Asbestos has not been considered here as it is being considered in a separate report
- Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
- TPH aromatic C5-C7 is considered to comprise benzene only

Lowest of the Remedial Target Criterion/Risk Based Screening Level for Residential with the Consumption of Produce land use, Shallow Soil.

Contaminant	Minimum of RTC (1%) / RBSL mg/kg	Minimum of RTC (3%) / RBSL mg/kg
Arsenic	64 a	64 a
Chromium	78 a	78 a
Cadmium	2.6	2.6
Mercury (inorganic)	1 b	1 b
Nickel	50	50
Selenium	3 b	3 b
Lead	337 a	337 a
Vanadium	113	115
Copper	143 a	143 a
Zinc	478 a	478 a
Benzo(a)pyrene	0.9	0.9
Benzene	0.0493	0.12
Toluene	36	36
Ethylbenzene	38.2	41
Xylene	17.2	32
TPH aromatic C7-C8	86.9	125
TPH aromatic C8-C10	14.8	94
TPH aromatic C10-C12	57.3	118
TPH aromatic C12-C16	131	131
TPH aliphatic C6-C8	69.8	8340
TPH aliphatic C8-C10	9.76	87.1
TPH aliphatic C10-C12	1780 *	3200
TPH aliphatic C12-C16	4510	4510
TPH aromatic C16-C21	82	82
TPH aromatic C21-C35	888	1130
TPH aliphatic C16-C21	94200	94200
TPH aliphatic C21-C35	94800	94800
Total TPH (Phase 1)	1720	1720
Total TPH (Process Area)	2600	2600
Total TPH (North Tank Farm)	1100	1100
Total TPH (South Tank Farm)	1020	1020
1,2-Dichloroethane	0.0019	0.0102
1,1,1-Trichloroethane	2.23	17.3
Tetrachloroethene	0.455	3.62
Trichloroethene	0.0382	0.304
Vinyl chloride	0.000202	0.00082
Dichloromethane	0.458	1.56
Cis-1,2-Dichloroethene	0.0393	0.255
Trans-1,2-Dichloroethene	0.0671	0.464
Acenaphthene	588 *	1380
Anthracene	8270	14800
Benzo(a)anthracene	7.56	16.5
Benzo(b)fluoranthene	20	23.9
Benzo(g,h,i)perylene	235	248
Benzo(k)fluoranthene	216	243
Chrysene	1500	2220
Dibenz(ah)anthracene	1.97	2.39
Fluoranthene	822	1630
Fluorene	615	1390
Indeno(1,2,3-cd)pyrene	19.2	23.6
Pyrene	563	1150
Phenol	162	349
Mercury (methyl)	6.28	11.3
Mercury (elemental)	0.0607	0.583
Naphthalene	0.585	5.05
TPH aromatic C5-C7	0.0493	0.192
TPH aliphatic C5-C6	30.1	172
1,1,1,2-Tetrachloroethane	0.353	2.78
1,1,2,2-Tetrachloroethane	0.695	3.63
Carbon tetrachloride	0.00656	0.0541
Chlorobenzene	1.06	3.38

Notes

1. It is assumed that no visible free product is present within the top 1.0m of soil
2. Metal RTC derived considering Soil Codes and background data
- a – based on background soil concentration
- b – based on Soil Code
3. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
4. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
- * 5. The RTC for TPH aliphatic C10-C12 and acenaphthene is based on a value produced from following the approach outlined in SR4 for substances at saturation
6. 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.
7. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
8. Asbestos has not been considered here as it is being considered in a separate report
9. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
10. Phenol is derived by comparing the oral exposure to the oral HCV and the dermal and inhalation exposure to the inhalation HCV
11. Elemental mercury is based on inhalation pathways only
12. TPH aromatic C5-C7 is considered to comprise benzene only

Contaminant	Minimum of RTC/RBSL mg/L
Benzo(a)pyrene	>sat
Benzene	0.0888
Toluene	47
Ethylbenzene	13.4
Xylene	4.1
TPH aromatic C7-C8	20
TPH aromatic C8-C10	0.985
TPH aromatic C10-C12	3.87
TPH aromatic C12-C16	>sat
TPH aromatic C16-C21	>sat
TPH aromatic C21-C35	>sat
TPH aliphatic C6-C8	1.4
TPH aliphatic C8-C10	0.0296
TPH aliphatic C10-C12	0.0228
TPH aliphatic C12-C16	>sat
TPH aliphatic C16-C21	>sat
TPH aliphatic C21-C35	>sat
1,2-Dichloroethane	0.0373
1,1,1-Trichloroethane	13.1
Tetrachloroethene	1.66
Trichloroethene	0.222
Vinyl chloride	0.00248
Dichloromethane	13
Cis-1,2 Dichloroethene	0.547
Trans-1,2 Dichloroethene	0.675
Acenaphthene	>sat
Anthracene	>sat
Benzo(a)anthracene	>sat
Benzo(b)fluoranthene	>sat
Benzo(k)fluoranthene	>sat
Chrysene	>sat
Dibenz(ah)anthracene	>sat
Fluoranthene	>sat
Fluorene	>sat
Indeno(1,2,3-cd)pyrene	>sat
Pyrene	>sat
Phenol	1700
Mercury (methyl)	45.5
Mercury (elemental)	0.00463
Naphthalene	0.952
TPH aromatic C5-C7	0.0888
TPH aliphatic C5-C6	1.93
1,1,1,2-Tetrachloroethane	1.05
1,1,2,2-Tetrachloroethane	6.89
Carbon Tetrachloride	0.0229
Chlorobenzene (mono)	13.7

Notes
1. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation
2. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins
3. Where indoor and outdoor values were presented by RBCA, these have been integrated in line with SNIFFER (2003). Where both indoor and outdoor values derived by RBCA were greater than the saturation limit, >sat has been presented. Where indoor values were presented by RBCA, and the outdoor values were >sat, only the indoor values have been presented. Therefore >sat indicates that the theoretical RTC is greater than solubility limit.
4. TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered
7. Additivity for TPHs and PAHs to be undertaken in line with guidance in Atkins report 5041216-REM-RPT-00216
8. TPH aromatic C5-C7 is considered to comprise benzene only by Atkins

Appendix E. Photo Sheet



Photograph 1 – Showing the sandstone bedrock after the surface scrape.



Photograph 2 - Showing the bedrock and slight sheen on surface water.



Photograph 3 – Showing some of the impacted Made Ground above the bedrock.



Photograph 4 – Showing the variable depth to natural bedrock.



Photograph 5 – Showing the minor stained natural bedrock.



Photograph 6 – Showing the stained Made Ground above the natural bedrock which was removed during the initial work before the validated back fill.



Photograph 7 – Showing the base of excavation on the bedrock on the left and backfilled material on the right.



Photograph 8 – Showing depth to the bedrock with VO scores of less than 2 and clean fill material.



Photograph 9 – Showing the base of excavation IP4080, note the shallow depth to bedrock.



Photograph 10 – Showing IP4080 excavation, note shallow depth to bedrock.



Photograph 11 – Showing the Northern area of MP32 excavated to bedrock



Photograph 12 – Showing the Northern area of MP32 excavated to bedrock with manmade drainage channels



Photograph 13 – Showing the central area, note the material being rolled in to the divots and channels to produce a level surface.



Photograph 14 – Showing the central area, note the material being rolled in to produce a level surface.