



Report to: Able UK Ltd

**Able Marine Energy Park:
Sediment Sampling 2020.**

Date: April 2021

Report ref: P11195-AMEP-ME-TR-000142-01

Report Name: Able Marine Energy Park: Sediment Sampling 2020.

Client Name: Able UK Ltd

Date: April 2021

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Report Title: Able Marine Energy Park: Sediment Sampling 2020.

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1. Introduction

Able UK Ltd. has been granted a Development Consent Order (DCO) to construct the Able Marine Energy Park (AMEP) near Immingham on the southern bank of the Humber Estuary. The AMEP Sampling Plan (v3) includes a series of proposals to inform the update of the dredging and disposal strategy baseline in relation to dredging works which are planned to be undertaken as part of the AMEP construction. This included sediment sampling and analysis at six locations in the Humber Estuary and draft proposals for sediment sampling to update the existing baseline were submitted to the Marine Management Organisation (MMO) for approval. In 2017 MMO provided confirmation of revised requirements for sampling and analysis (Letter dated 30 May 2017, Ref: SAM/2017/00027) which recommended increasing the number of samples to 11 including three samples from Cherry Cobb Sands on the north bank of the Humber. These samples were collected in 2017 and subsequently processed by CEFAS and PMSL. In 2020, MMO requested that the 2017 sampling regime be repeated (letter dated 10th September 2020 Ref: SAM/2020/00052) with the same suite of determinands to be analysed along with the addition of PCBs and organotins. The positions of the proposed sample locations were provided by CEFAS/MMO and Precision Marine Survey Ltd were commissioned to undertake collection of the sediment samples and arrange subsequent analysis with an MMO approved laboratory (SOCOTEC Ltd).

2. Methods

2.1 Sample Collection

As outlined above a total of 11 sample sites were surveyed at pre-defined locations provided by CEFAS. This included eight sample sites in the vicinity of the AMEP construction/dredging footprint off North Killingholme (Sites B, G, J, M, Q, R, T and W) and three intertidal samples in the vicinity of the breach location at Cherry Cobb Sands on the north bank of the Humber (sites CCS X, CCS Y and CCS Z). The sampling stations at North Killingholme were sampled remotely using a stainless steel 0.1m² day grab from the PMSL survey vessel 'Precision 1' which was deployed from Hull Marina on the 12th December 2020 whilst the intertidal samples at Cherry Cobb Sands were sampled on foot on the 15th December 2020.

Methodologies for grab sampling followed standard methodologies e.g. Marine Monitoring Handbook procedural guideline 3-9 (Davies *et al*, 2001) and other best practice guidelines (Ware & Kenny, 2011; Worsfold & Hall, 2010). Collection of contaminant sub-samples followed guidance outlined in MMO letter Ref: SAM/2020/00052. At each pre-determined station position the vessel was taken out of gear and the 0.1m² Day grab was lowered by winch into the water. The winch was then used to lower the grab to the seabed at a rate of approximately 1 m/s and the winch slowed as the length of warp indicated it was approaching the seabed. Once the grab had landed, as evident by the slackening of the winch wire, the winch was stopped and the position of the grab was taken from the GPS along with time and water depth and recorded on the grab logsheet. The winch was then used to raise the grab off the seabed and docked into the retrieval frame on board the survey vessel and slowly brought aboard and lowered onto a metal frame with a sample box placed beneath.

With the grab resting on the frame, the grab was inspected to assess whether it had deployed correctly and to ensure that adequate material was retained for sub-sampling. Grabs with inadequate sample volumes or those with material such as stones caught in the jaws of the grab (or where the grab jaws had not fully closed) were discarded. When samples were within the prescribed limits, each grab sample was photographed and surface sub-samples from the upper layer of in-situ sediment collected using a non-metallic / stainless steel scoop as per MMO guidance.

Sub-samples collected for PSA were placed in an appropriately labelled plastic container whilst sub-samples for contaminant analysis were placed in labelled, contaminant free, glass jars (filled approximately $\frac{3}{4}$ full) provided by SOCOTEC as per MMO/CEFAS guidance. No pooling of samples from separate grabs was undertaken and each PSA/contaminant sub-sample collected at a survey site was taken from a single discrete grab sample. Sampling from Cherry Cobb Sands undertaken on foot followed a similar procedure with sediment sub-samples taken directly from the intertidal sediment surface. All sampling equipment (grab/scoops) were carefully washed and dried between samples and the sediment samples were placed in the refrigerated cool boxes for transit to PMSL premises and then transported whereupon they were immediately frozen prior to transport to SOCOTEC Ltd premises for analysis.

A full survey log was maintained throughout the survey detailing time of sampling, GPS position, number of attempts required, station number, water depth, physical characteristics of the sample and presence of any other relevant features. Survey positions and other sampling details are provided in Table 1 and the spatial distribution of sample locations is shown in Figure 1. All samples were collected during survey were within 10m of the target position.

Table 1. Sampling positions and survey log.

Sample ID	Lat (WGS84)	Long (WGS84)	Date/Time	Recorded Water Depth (m)	Water Depth (m CD)	Attempts	Sediment Notes
Site B	53.656688	-0.212977	12/12/2020 10:52	10.41	8.606	2	(Gravelly) Muddy Sand
Site G	53.658597	-0.224615	12/12/2020 11:53	4.10	1.197	1	Gravelly Mud with shell debris
Site J	53.655285	-0.217165	12/12/2020 11:28	8.61	6.208	5	Gravelly Mud with some stones
Site M	53.652893	-0.211033	12/12/2020 10:17	10.74	9.341	2	Muddy sand
Site Q	53.649503	-0.212520	12/12/2020 12:21	3.18	-0.218	1	Mud/Clay
Site R	53.655522	-0.221008	12/12/2020 13:28	4.98	-0.019	13	Gravelly Mud with shell debris
Site T	53.654632	-0.223865	12/12/2020 15:32	1.20	-5.599	1	Mud/Clay
Site W	53.650522	-0.217458	12/12/2020 14:43	1.66	-4.642	1	Mud/Clay
CCS X	53.658598	-0.145794	15/12/2020 13:00	N/A	N/A	1	Mud & organic/plant debris
CCS Y	53.658315	-0.144559	15/12/2020 14:23	N/A	N/A	1	Mud & organic/plant debris
CCS Z	53.657397	-0.144084	15/12/2020 13:39	N/A	N/A	1	Mud & organic/plant debris

2.2 Laboratory Analysis

2.2.1 Sample Analysis

The samples jars containing sediments for contaminant analysis and PSA were transported in a refrigerated cool box to the SOCOTEC laboratory laboratory by PMSL staff on the 16th December. The following analysis was undertaken by SOCOTEC or their MMO approved sub-contractor:

- Trace metals;
- Organotins;
- Total Hydrocarbons (THC);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Polychlorinated Biphenyls (PCBs);
- Organochlorine Pesticides (OCs); and
- Particle Size Analysis (PSA)#

Analysed by Ocean Ecology

All analytical procedures followed MMO approved dredge material SOPs. The results of the analysis provided within the SOCOTEC Certificate of Analysis appended in Appendix 1.

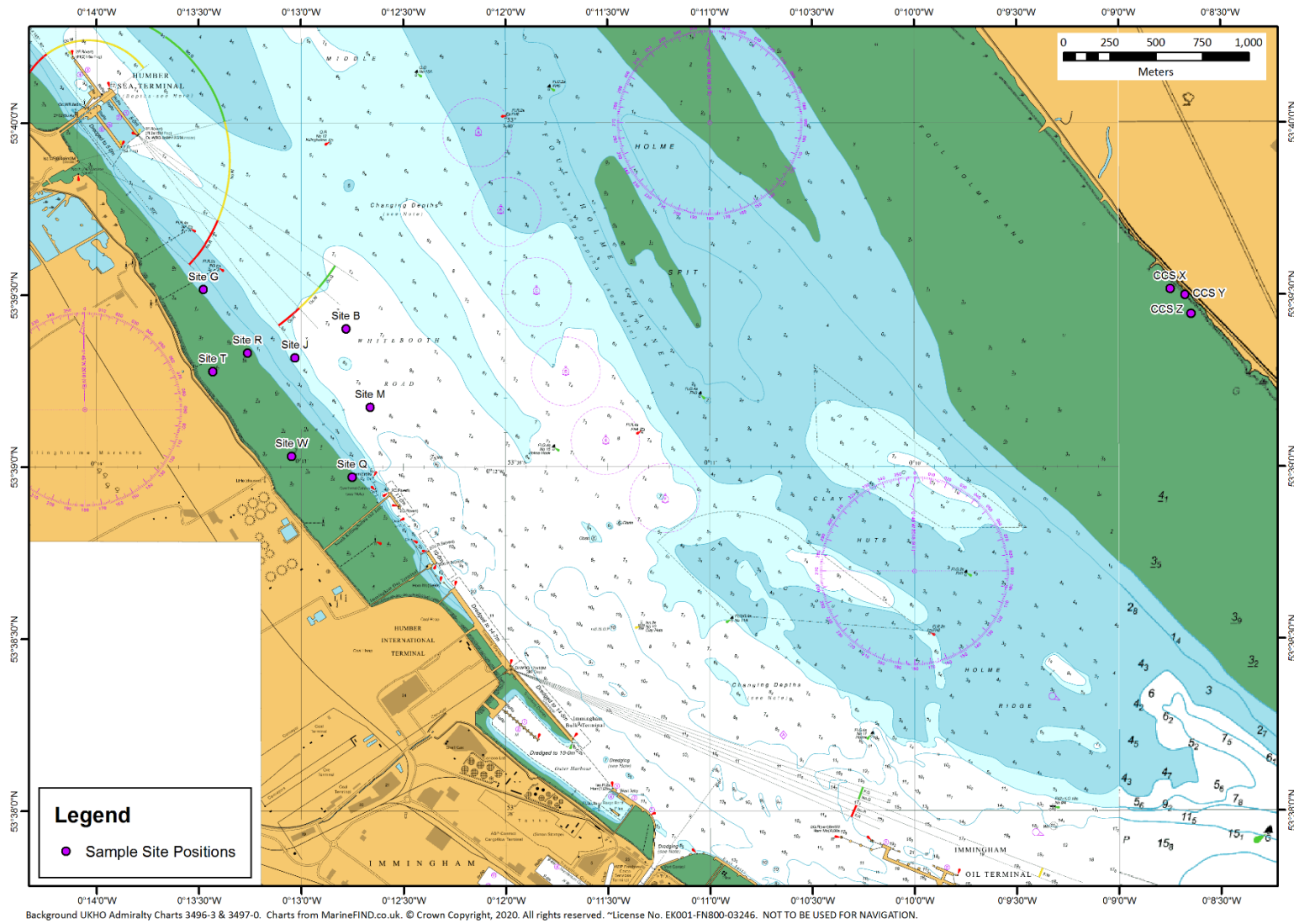


Figure 1. Location of survey samples

3. References

Davies, J., Baxter, J., Bradley, M., Connor, D., Khan, J., Murray, E., Sanderson, W., Turnbull, C. & Vincent, M., (2001), *Marine Monitoring Handbook*, 405 pp, ISBN 1 85716 550 0.

Mason, C. 2016. NMBAQC's Best Practice Guidance: Particle Size Analysis (PSA) for Supporting Biological Analysis (version 18_01_2016). NE Atlantic Marine Biological AQC Coordinating Committee.

Ware, S.J. & Kenny, A.J. 2011. *Guidelines for the Conduct of Benthic Studies at Marine Aggregate Extraction Sites (2nd Edition)*. Marine Aggregate Levy Sustainability Fund, 80 pp.

Worsfold, T & Hall, D. 2010. *Guidelines for processing marine macrobenthic invertebrate samples: A Processing Requirements Protocol*. NMBAQC.

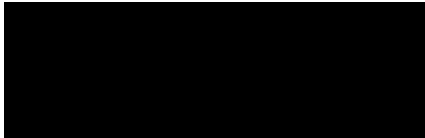
Appendix 1. SOCOTEC Certificate of Analysis

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00881
Issue Version	1
Customer	Precision Marine Survey Limited, Church Farm, Main Road, Thorngumbald, East Yorkshire, HU12 9NE
Customer Reference	MMO Marine Sediment Analysis
Date Sampled	12 & 15-Dec-20
Date Received	16-Dec-20
Date Reported	21-Jan-21
Condition of samples	Cold Satisfactory



Authorised by: Marya Hubbard

Position: Laboratory Manager

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)
		Method No	*SUB_01	*SUB_01	*SUB_01	*SUB_01	*SUB_01
		Accreditation	MMO	MMO	MMO	MMO	MMO
			45mm	31.5mm	22.4mm	16mm	11.2mm
Client Reference:	SOCOTEC Ref:	Matrix	-5.5	-5.0	-4.5	-4.0	-3.5
Site B	MAR00881.001	Sediment	0.00	0.00	0.00	0.00	0.00
Site G	MAR00881.002	Sediment	0.00	0.00	0.00	3.91	5.64
Site J	MAR00881.003	Sediment	0.00	0.00	4.79	5.15	0.00
Site M	MAR00881.004	Sediment	0.00	0.00	0.00	0.00	0.00
Site Q	MAR00881.005	Sediment	0.00	0.00	0.00	0.00	0.00
Site R	MAR00881.006	Sediment	0.00	5.60	0.00	13.10	7.12
Site T	MAR00881.007	Sediment	0.00	0.00	0.00	0.00	0.00
Site W	MAR00881.008	Sediment	0.00	0.00	0.00	0.00	0.00
CCS X	MAR00881.009	Sediment	0.00	0.00	0.00	0.00	0.00
CCS Y	MAR00881.010	Sediment	0.00	0.00	0.00	0.01	0.01
CCS Z	MAR00881.011	Sediment	0.00	0.00	0.00	0.00	0.00

* See Report Notes

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)
		Method No	*SUB_01	*SUB_01	*SUB_01	*SUB_01	*SUB_01	*SUB_01
		Accreditation	MMO	MMO	MMO	MMO	MMO	MMO
			8mm	5.6mm	4mm	2.8mm	2mm	1.4mm
Client Reference:	SOCOTEC Ref:	Matrix	-3.0	-2.5	-2.0	-1.5	-1.0	-0.5
Site B	MAR00881.001	Sediment	0.07	0.02	0.18	0.26	0.26	0.37
Site G	MAR00881.002	Sediment	3.25	2.89	1.28	0.77	0.43	0.33
Site J	MAR00881.003	Sediment	0.00	0.00	0.00	0.04	0.04	0.06
Site M	MAR00881.004	Sediment	0.00	0.00	0.00	0.00	0.00	0.03
Site Q	MAR00881.005	Sediment	0.00	0.00	0.00	0.00	0.00	0.00
Site R	MAR00881.006	Sediment	3.74	2.30	1.00	0.63	0.41	0.38
Site T	MAR00881.007	Sediment	0.00	0.00	0.00	0.00	0.00	0.00
Site W	MAR00881.008	Sediment	0.00	0.00	0.00	0.00	0.00	0.00
CCS X	MAR00881.009	Sediment	0.00	0.00	0.01	0.04	0.05	0.05
CCS Y	MAR00881.010	Sediment	0.02	0.11	0.14	0.15	0.19	0.18
CCS Z	MAR00881.011	Sediment	0.00	0.00	0.01	0.01	0.02	0.03

* See Report Notes

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)
		Method No	*SUB_01	*SUB_01	*SUB_01	*SUB_01	*SUB_01	*SUB_01
		Accreditation	MMO	MMO	MMO	MMO	MMO	MMO
			1mm	707µm	500µm	353.6µm	250µm	176.8µm
Client Reference:	SOCOTEC Ref:	Matrix	0.0	0.5	1.0	1.5	2.0	2.5
Site B	MAR00881.001	Sediment	0.55	1.41	5.09	26.14	38.54	15.63
Site G	MAR00881.002	Sediment	0.24	0.00	0.00	0.00	0.00	0.07
Site J	MAR00881.003	Sediment	0.04	0.00	0.00	0.01	0.70	1.57
Site M	MAR00881.004	Sediment	0.74	0.47	0.04	9.39	35.38	16.11
Site Q	MAR00881.005	Sediment	0.00	0.00	0.00	0.00	0.00	0.09
Site R	MAR00881.006	Sediment	0.32	0.00	0.00	0.00	0.00	0.08
Site T	MAR00881.007	Sediment	0.00	0.00	0.00	0.00	0.00	0.91
Site W	MAR00881.008	Sediment	0.00	0.00	0.00	0.00	0.00	0.58
CCS X	MAR00881.009	Sediment	0.03	0.00	0.00	0.00	0.00	0.12
CCS Y	MAR00881.010	Sediment	0.17	0.00	0.00	0.00	0.00	0.04
CCS Z	MAR00881.011	Sediment	0.02	0.00	0.00	0.00	0.00	0.11

* See Report Notes

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)
		Method No	*SUB_01	*SUB_01	*SUB_01	*SUB_01	*SUB_01	*SUB_01
		Accreditation	MMO	MMO	MMO	MMO	MMO	MMO
			125µm	88.39µm	63µm	44.2µm	31.3µm	22.1µm
Client Reference:	SOCOTEC Ref:	Matrix	3.0	3.5	4.0	4.5	5.0	5.5
Site B	MAR00881.001	Sediment	3.30	0.99	0.10	0.57	0.52	0.64
Site G	MAR00881.002	Sediment	2.41	1.76	0.67	5.07	6.18	6.75
Site J	MAR00881.003	Sediment	2.97	7.49	4.64	6.02	6.41	6.53
Site M	MAR00881.004	Sediment	1.49	2.32	0.93	1.42	2.52	2.77
Site Q	MAR00881.005	Sediment	3.56	2.80	1.78	8.78	9.39	9.55
Site R	MAR00881.006	Sediment	2.26	1.10	0.40	3.77	4.83	5.16
Site T	MAR00881.007	Sediment	4.12	0.77	5.43	13.88	14.64	12.35
Site W	MAR00881.008	Sediment	4.03	1.89	7.88	14.49	13.30	11.17
CCS X	MAR00881.009	Sediment	2.23	0.99	0.65	8.08	13.04	11.82
CCS Y	MAR00881.010	Sediment	2.53	2.75	0.10	0.98	6.76	9.29
CCS Z	MAR00881.011	Sediment	3.76	2.17	1.39	10.85	14.11	11.29

* See Report Notes

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)
		Method No	*SUB_01	*SUB_01	*SUB_01	*SUB_01	*SUB_01	*SUB_01
		Accreditation	MMO	MMO	MMO	MMO	MMO	MMO
			15.6µm	11µm	7.8µm	5.5µm	3.9µm	2.75µm
Client Reference:	SOCOTEC Ref:	Matrix	6.0	6.5	7.0	7.5	8.0	8.5
Site B	MAR00881.001	Sediment	0.55	0.77	0.87	0.82	0.64	0.41
Site G	MAR00881.002	Sediment	7.40	8.13	8.88	8.66	6.93	4.63
Site J	MAR00881.003	Sediment	6.07	6.63	7.67	7.66	6.33	4.48
Site M	MAR00881.004	Sediment	2.57	3.07	3.48	3.57	3.12	2.34
Site Q	MAR00881.005	Sediment	8.49	7.45	7.72	7.99	7.04	5.24
Site R	MAR00881.006	Sediment	5.62	6.06	6.91	7.06	5.87	4.02
Site T	MAR00881.007	Sediment	8.15	6.30	5.76	5.43	4.64	3.58
Site W	MAR00881.008	Sediment	7.53	5.77	5.39	5.22	4.55	3.56
CCS X	MAR00881.009	Sediment	8.75	7.45	7.09	6.86	6.09	4.88
CCS Y	MAR00881.010	Sediment	8.62	9.53	9.88	9.69	8.38	6.37
CCS Z	MAR00881.011	Sediment	7.77	6.95	6.29	5.94	5.42	4.52

* See Report Notes

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)
		Method No	*SUB_01	*SUB_01	*SUB_01	*SUB_01	*SUB_01
		Accreditation	MMO	MMO	MMO	MMO	MMO
			1.95µm	1.38µm	0.98µm	0.69µm	0.49µm
Client Reference:	SOCOTEC Ref:	Matrix	9.0	9.5	10.0	10.5	11.0
Site B	MAR00881.001	Sediment	0.25	0.22	0.22	0.19	0.15
Site G	MAR00881.002	Sediment	2.80	1.98	1.75	1.63	1.49
Site J	MAR00881.003	Sediment	3.03	2.36	2.03	1.75	1.50
Site M	MAR00881.004	Sediment	1.63	1.27	1.11	0.99	0.86
Site Q	MAR00881.005	Sediment	3.69	3.02	2.75	2.49	2.20
Site R	MAR00881.006	Sediment	2.49	1.80	1.58	1.46	1.32
Site T	MAR00881.007	Sediment	2.62	2.11	1.88	1.71	1.51
Site W	MAR00881.008	Sediment	2.68	2.24	2.03	1.83	1.59
CCS X	MAR00881.009	Sediment	3.82	3.33	3.04	2.70	2.35
CCS Y	MAR00881.010	Sediment	4.59	3.69	3.22	2.85	2.53
CCS Z	MAR00881.011	Sediment	3.58	3.04	2.69	2.36	2.04

* See Report Notes

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)
		Method No	*SUB_01	*SUB_01	*SUB_01	*SUB_01	*SUB_01
		Accreditation	MMO	MMO	MMO	MMO	MMO
			0.34µm	0.24µm	0.17µm	0.12µm	0.09µm
Client Reference:	SOCOTEC Ref:	Matrix	11.5	12.0	12.5	13.0	13.5
Site B	MAR00881.001	Sediment	0.10	0.07	0.04	0.03	0.02
Site G	MAR00881.002	Sediment	1.28	1.04	0.76	0.54	0.33
Site J	MAR00881.003	Sediment	1.26	1.02	0.75	0.54	0.33
Site M	MAR00881.004	Sediment	0.73	0.59	0.44	0.32	0.20
Site Q	MAR00881.005	Sediment	1.88	1.52	1.11	0.78	0.47
Site R	MAR00881.006	Sediment	1.14	0.92	0.67	0.48	0.29
Site T	MAR00881.007	Sediment	1.29	1.05	0.78	0.57	0.35
Site W	MAR00881.008	Sediment	1.34	1.07	0.79	0.57	0.35
CCS X	MAR00881.009	Sediment	2.01	1.64	1.22	0.88	0.54
CCS Y	MAR00881.010	Sediment	2.20	1.82	1.36	0.98	0.60
CCS Z	MAR00881.011	Sediment	1.73	1.41	1.06	0.77	0.48

* See Report Notes

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	% (at 0.5phi intervals)	% (at 0.5phi intervals)	% (at 0.5phi intervals)
		Method No	*SUB_01	*SUB_01	*SUB_01
		Accreditation	MMO	MMO	MMO
			0.06µm	0.04µm	<0.04µm
Client Reference:	SOCOTEC Ref:	Matrix	14.0	14.5	>14.5
Site B	MAR00881.001	Sediment	0.01	0.00	0.00
Site G	MAR00881.002	Sediment	0.13	0.02	0.00
Site J	MAR00881.003	Sediment	0.13	0.02	0.00
Site M	MAR00881.004	Sediment	0.08	0.01	0.00
Site Q	MAR00881.005	Sediment	0.18	0.02	0.00
Site R	MAR00881.006	Sediment	0.11	0.01	0.00
Site T	MAR00881.007	Sediment	0.14	0.02	0.00
Site W	MAR00881.008	Sediment	0.14	0.02	0.00
CCS X	MAR00881.009	Sediment	0.21	0.02	0.00
CCS Y	MAR00881.010	Sediment	0.24	0.03	0.00
CCS Z	MAR00881.011	Sediment	0.19	0.02	0.00

* See Report Notes

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	mg/Kg (Dry Weight)							
		Method No	SOCOTEC Env Chem*							
		Limit of Detection	0.5	0.04	0.5	0.5	0.01	0.5	0.5	2
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Mercury (Hg)	Nickel (Ni)	Lead (Pb)	Zinc (Zn)
Site B	MAR00881.001	Sediment	16.8	0.37	47.0	31.6	0.18	34.4	64.0	159
Site G	MAR00881.002	Sediment	15.4	0.31	42.0	27.8	0.16	30.4	56.4	137
Site J	MAR00881.003	Sediment	30.6	0.16	8.7	9.5	0.05	11.6	27.8	63.5
Site M	MAR00881.004	Sediment	18.5	0.43	49.7	34.0	0.22	34.2	69.2	167
Site Q	MAR00881.005	Sediment	18.7	0.37	49.4	33.3	0.18	38.3	67.7	174
Site R	MAR00881.006	Sediment	16.4	0.46	45.9	36.2	0.24	32.2	61.6	163
Site T	MAR00881.007	Sediment	27.5	0.22	18.5	15.0	0.11	16.8	41.6	88.6
Site W	MAR00881.008	Sediment	15.3	0.34	41.8	28.0	0.16	31.7	52.2	129
CCS X	MAR00881.009	Sediment	18.5	0.33	54.2	33.0	0.19	39.5	72.6	176
CCS Y	MAR00881.010	Sediment	15.0	0.32	44.5	28.8	0.18	33.2	52.9	137
CCS Z	MAR00881.011	Sediment	15.0	0.40	43.4	32.7	0.20	29.7	55.1	152
Certified Reference Material SETOC 774 (% Recovery)			91	106	97	98	91	99	96	99
QC Blank			<0.5	<0.04	<0.5	<0.5	<0.01	<0.5	<0.5	<2

* See Report Notes

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	mg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	0.001	0.001
		Accreditation	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	Dibutyltin (DBT)	Tributyltin (TBT)
Site B	MAR00881.001	Sediment	<0.005	<0.005
Site G	MAR00881.002	Sediment	<0.005	<0.005
Certified Reference Material BCR-646 (% Recovery)			96	75
QC Blank			<0.001	<0.001

* See report notes

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	mg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	0.001	0.001
		Accreditation	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	Dibutyltin (DBT)	Tributyltin (TBT)
Site J	MAR00881.003	Sediment	<0.005	<0.005
Site M	MAR00881.004	Sediment	<0.005	<0.005
Site Q	MAR00881.005	Sediment	<0.005	<0.005
Site R	MAR00881.006	Sediment	<0.005	<0.005
Site T	MAR00881.007	Sediment	<0.005	<0.005
Site W	MAR00881.008	Sediment	<0.005	<0.005
CCS X	MAR00881.009	Sediment	<0.005	<0.005
CCS Y	MAR00881.010	Sediment	<0.005	<0.005
CCS Z	MAR00881.011	Sediment	<0.005	<0.005
Certified Reference Material BCR-646 (% Recovery)			82	71
QC Blank			<0.001	<0.001

* See report notes

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	ACENAPTH	ACENAPHY	ANTHRACN	BAA	BAP	BBF
Site B	MAR00881.001	Sediment	226	368	344	1230	1180	775
Site G	MAR00881.002	Sediment	48.5	43.3	122	261	341	309
Site J	MAR00881.003	Sediment	39.0	28.1	91.4	167	238	234
Site M	MAR00881.004	Sediment	11.7	5.13	28.0	47.0	52.7	47.2
Site Q	MAR00881.005	Sediment	79.3	41.9	157	316	416	362
Site R	MAR00881.006	Sediment	46.2	32.6	102	194	266	258
Site T	MAR00881.007	Sediment	74.9	41.5	165	331	425	371
Site W	MAR00881.008	Sediment	87.4	42.5	202	418	535	406
CCS X	MAR00881.009	Sediment	40.0	34.9	96.0	197	257	248
CCS Y	MAR00881.010	Sediment	39.6	28.1	87.2	212	282	273
Certified Reference Material CRM QPH098MS (% Recovery)			100	105	112	62	72	70
QC Blank			<1	<1	<1	<1	<1	<1

~ Indicates result is for an In-house Reference Material as
 no Certified Reference Materials are available.
 For full analyte name see method summaries

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	MMO	MMO	MMO
Client Reference:	SOCOTEC Ref:	Matrix	BENZGHIP	BEP	BKF	C1N	C1PHEN	C2N
Site B	MAR00881.001	Sediment	452	696	539	466	360	453
Site G	MAR00881.002	Sediment	289	311	169	624	438	477
Site J	MAR00881.003	Sediment	235	240	107	566	365	428
Site M	MAR00881.004	Sediment	49.5	58.2	20.4	173	196	159
Site Q	MAR00881.005	Sediment	355	381	177	1030	655	801
Site R	MAR00881.006	Sediment	272	275	106	663	430	509
Site T	MAR00881.007	Sediment	337	374	179	962	625	733
Site W	MAR00881.008	Sediment	370	418	209	860	543	653
CCS X	MAR00881.009	Sediment	244	252	118	677	433	514
CCS Y	MAR00881.010	Sediment	273	286	141	604	399	471
Certified Reference Material CRM QPH098MS (% Recovery)			76	72	95	107	83	111
QC Blank			<1	<1	<1	<1	<1	<1

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Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	MMO	MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	C3N~	CHRYSENE	DBENZAH	FLUORANT	FLUORENE	INDPYR
Site B	MAR00881.001	Sediment	268	1100	114	808	153	509
Site G	MAR00881.002	Sediment	387	244	51.5	504	71.0	243
Site J	MAR00881.003	Sediment	388	181	40.7	351	60.5	190
Site M	MAR00881.004	Sediment	168	56.6	8.41	108	17.6	34.9
Site Q	MAR00881.005	Sediment	693	335	62.6	666	118	307
Site R	MAR00881.006	Sediment	405	221	45.6	388	68.1	221
Site T	MAR00881.007	Sediment	633	363	60.6	668	114	302
Site W	MAR00881.008	Sediment	549	428	72.8	766	123	363
CCS X	MAR00881.009	Sediment	431	198	41.5	373	67.2	193
CCS Y	MAR00881.010	Sediment	33.8	239	47.6	415	61.0	232
Certified Reference Material CRM QPH098MS (% Recovery)			89	83	94	84	94	62
QC Blank			<1	<1	<1	<1	<1	<1

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 no Certified Reference Materials are available.
 For full analyte name see method summaries

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	mg/Kg
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/305
		Limit of Detection	1	1	1	1	1
		Accreditation	UKAS/MMO	MMO	UKAS/MMO	UKAS/MMO	MMO
Client Reference:	SOCOTEC Ref:	Matrix	NAPTH	PERYLENE	PHENANT	PYRENE	THC
Site B	MAR00881.001	Sediment	233	298	196	858	21.1
Site G	MAR00881.002	Sediment	218	135	425	504	113
Site J	MAR00881.003	Sediment	197	108	342	365	91.5
Site M	MAR00881.004	Sediment	59.7	29.1	157	133	92.2
Site Q	MAR00881.005	Sediment	356	164	616	666	47.4
Site R	MAR00881.006	Sediment	232	131	385	405	60.9
Site T	MAR00881.007	Sediment	355	185	626	668	32.6
Site W	MAR00881.008	Sediment	342	198	617	742	76.0
CCS X	MAR00881.009	Sediment	235	111	384	378	12.0
CCS Y	MAR00881.010	Sediment	213	122	369	413	37.8
Certified Reference Material CRM QPH098MS (% Recovery)			88	81	96	86	88~
QC Blank			<1	<1	<1	<1	<1

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 no Certified Reference Materials are available.
 For full analyte name see method summaries

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
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 Customer Reference MMO Marine Sediment Analysis

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	ACENAPTH	ACENAPHY	ANTHRACN	BAA	BAP	BBF
CCS Z	MAR00881.011	Sediment	43.0	24.5	92.0	189	253	242
Certified Reference Material CRM QPH098MS (% Recovery)			91	115	100	64	68	66
QC Blank			<1	<1	<1	<1	<1	<1

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 no Certified Reference Materials are available.
 For full analyte name see method summaries

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	MMO	MMO	MMO
Client Reference:	SOCOTEC Ref:	Matrix	BENZGHIP	BEP	BKF	C1N	C1PHEN	C2N
CCS Z	MAR00881.011	Sediment	237	247	119	679	438	536
Certified Reference Material CRM QPH098MS (% Recovery)			70	67	87	107	81	103
QC Blank			<1	<1	<1	<1	<1	<1

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 no Certified Reference Materials are available.
 For full analyte name see method summaries

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	MMO	MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	C3N~	CHRYSENE	DBENZAH	FLUORANT	FLUORENE	INDPYR
CCS Z	MAR00881.011	Sediment	444	229	37.7	389	67.7	187
Certified Reference Material CRM QPH098MS (% Recovery)			90	80	84	81	101	51
QC Blank			<1	<1	<1	<1	<1	<1

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Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	mg/Kg
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/305
		Limit of Detection	1	1	1	1	1
		Accreditation	UKAS/MMO	MMO	UKAS/MMO	UKAS/MMO	MMO
Client Reference:	SOCOTEC Ref:	Matrix	NAPTH	PERYLENE	PHENANT	PYRENE	THC
CCS Z	MAR00881.011	Sediment	248	107	404	391	79.6
Certified Reference Material CRM QPH098MS (% Recovery)			97	70	91	84	89~
QC Blank			<1	<1	<1	<1	<1

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 no Certified Reference Materials are available.
 For full analyte name see method summaries

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	PCB 101	PCB 105	PCB 110	PCB 118	PCB 128	PCB 138	PCB 141	PCB 149
Site B	MAR00881.001	Sediment	0.00013	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
Site G	MAR00881.002	Sediment	0.00064	0.00019	0.00087	0.00031	0.00012	0.00105	0.00022	0.00067
Site J	MAR00881.003	Sediment	0.00054	0.00019	0.00068	0.00043	0.00013	0.00086	0.00010	0.00051
Site M	MAR00881.004	Sediment	0.02085	0.00819	0.02113	0.02450	0.01305	0.05398	0.00963	0.03129
Site Q	MAR00881.005	Sediment	0.00075	0.00024	0.00090	0.00050	0.00021	0.00127	<0.00008	0.00073
Site R	MAR00881.006	Sediment	0.00069	0.00021	0.00072	0.00053	0.00008	0.00106	0.00016	0.00052
Certified Reference Material CRM QOR136 (% Recovery)			103	101	115~	98	108~	102	111~	115~
QC Blank			<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008

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Certificate of Analysis



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Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	PCB 151	PCB 153	PCB 156	PCB 158	PCB 170	PCB 18	PCB 180
Site B	MAR00881.001	Sediment	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	0.00025	<0.00008
Site G	MAR00881.002	Sediment	0.00021	0.00096	<0.00008	0.00011	0.00019	0.00043	0.00057
Site J	MAR00881.003	Sediment	0.00014	0.00084	<0.00008	<0.00008	0.00011	0.00035	0.00056
Site M	MAR00881.004	Sediment	0.00940	0.05890	0.00656	0.00211	0.02792	0.00025	0.06172
Site Q	MAR00881.005	Sediment	0.00028	0.00108	<0.00008	0.00010	0.00021	0.00076	0.00070
Site R	MAR00881.006	Sediment	0.00016	0.00082	<0.00008	0.00015	0.00021	0.00039	0.00056
Certified Reference Material CRM QOR136 (% Recovery)			121~	94	96	111~	102~	114~	90
QC Blank			<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008

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Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	PCB 183	PCB 187	PCB 194	PCB 28	PCB 31	PCB 44	PCB 47
Site B	MAR00881.001	Sediment	<0.00008	<0.00008	<0.00008	0.00015	0.00024	0.00020	<0.00008
Site G	MAR00881.002	Sediment	0.00014	0.00036	0.00015	0.00063	0.00084	0.00057	0.00019
Site J	MAR00881.003	Sediment	0.00011	0.00029	0.00011	0.00053	0.00076	0.00054	0.00018
Site M	MAR00881.004	Sediment	0.01069	0.03748	0.04183	0.00027	0.00032	0.00154	0.00068
Site Q	MAR00881.005	Sediment	0.00017	0.00047	0.00014	0.00081	0.00129	0.00064	0.00042
Site R	MAR00881.006	Sediment	0.00014	0.00031	0.00010	0.00058	0.00071	0.00049	0.00274
Certified Reference Material CRM QOR136 (% Recovery)			96~	101~	94~	86	116	116~	111~
QC Blank			<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008

~ Indicates result is for an In-house Reference Material as
 no Certified Reference Materials are available.

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	PCB 49	PCB 52	PCB 66
Site B	MAR00881.001	Sediment	0.00015	0.00024	<0.00008
Site G	MAR00881.002	Sediment	0.00042	0.00073	0.00071
Site J	MAR00881.003	Sediment	0.00040	0.00069	0.00071
Site M	MAR00881.004	Sediment	0.00180	0.00512	0.00374
Site Q	MAR00881.005	Sediment	0.00059	0.00104	0.00089
Site R	MAR00881.006	Sediment	0.00049	0.00074	0.00078
Certified Reference Material CRM QOR136 (% Recovery)			110~	106	128~
QC Blank			<0.00008	<0.00008	<0.00008

~ Indicates result is for an In-house Reference Material as
 no Certified Reference Materials are available.

Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	PCB 101	PCB 105	PCB 110	PCB 118	PCB 128	PCB 138	PCB 141	PCB 149
Site T	MAR00881.007	Sediment	0.00077	0.00020	0.00090	0.00054	0.00018	0.00081	0.00012	0.00070
Site W	MAR00881.008	Sediment	0.00069	0.00019	0.00079	0.00039	0.00016	0.00085	<0.00008	0.00055
CCS X	MAR00881.009	Sediment	0.00058	0.00019	0.00067	0.00041	0.00009	0.00082	<0.00008	0.00054
CCS Y	MAR00881.010	Sediment	0.00064	0.00017	0.00074	0.00056	0.00015	0.00098	0.00020	0.00066
CCS Z	MAR00881.011	Sediment	0.00058	0.00014	0.00060	0.00040	0.00011	0.00053	0.00009	0.00050
Certified Reference Material CRM QOR136 (% Recovery)			93	89	105~	94	109~	102	106~	105~
QC Blank			<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008

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		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	PCB 151	PCB 153	PCB 156	PCB 158	PCB 170	PCB 18	PCB 180
Site T	MAR00881.007	Sediment	0.00015	0.00095	0.00009	0.00015	0.00025	0.00061	0.00054
Site W	MAR00881.008	Sediment	0.00017	0.00094	<0.00008	<0.00008	0.00013	0.00065	0.00047
CCS X	MAR00881.009	Sediment	0.00015	0.00066	<0.00008	0.00009	0.00016	0.00099	0.00048
CCS Y	MAR00881.010	Sediment	0.00018	0.00099	<0.00008	<0.00008	0.00021	0.00052	0.00068
CCS Z	MAR00881.011	Sediment	0.00012	0.00068	<0.00008	<0.00008	0.00013	0.00071	0.00044
Certified Reference Material CRM QOR136 (% Recovery)			99~	110	87	106~	107~	105~	69
QC Blank			<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008

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 Customer Reference MMO Marine Sediment Analysis

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	PCB 183	PCB 187	PCB 194	PCB 28	PCB 31	PCB 44	PCB 47
Site T	MAR00881.007	Sediment	0.00012	0.00033	0.00015	0.00076	0.00199	0.00062	0.00019
Site W	MAR00881.008	Sediment	0.00010	0.00034	0.00011	0.00077	0.00108	0.00058	0.00019
CCS X	MAR00881.009	Sediment	0.00011	0.00025	0.00009	0.00080	0.00144	0.00064	0.00022
CCS Y	MAR00881.010	Sediment	0.00019	0.00047	0.00016	0.00067	0.00094	0.00046	0.00017
CCS Z	MAR00881.011	Sediment	<0.00008	0.00028	<0.00008	0.00069	0.00099	0.00054	0.00018
Certified Reference Material CRM QOR136 (% Recovery)			100~	108~	108~	79	102	106~	103~
QC Blank			<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008

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Test Report ID MAR00881
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 Customer Reference MMO Marine Sediment Analysis

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.00008	0.00008	0.00008
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO
Client Reference:	SOCOTEC Ref:	Matrix	PCB 49	PCB 52	PCB 66
Site T	MAR00881.007	Sediment	0.00055	0.00088	0.00076
Site W	MAR00881.008	Sediment	0.00051	0.00087	0.00068
CCS X	MAR00881.009	Sediment	0.00061	0.00096	0.00070
CCS Y	MAR00881.010	Sediment	0.00041	0.00073	0.00066
CCS Z	MAR00881.011	Sediment	0.00049	0.00085	0.00068
Certified Reference Material CRM QOR136 (% Recovery)			105~	111	127~
QC Blank			<0.00008	<0.00008	<0.00008

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are available.

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Test Report ID MAR00881
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		Units	mg/Kg (Dry Weight)							
		Method No	ASC/SOP/302							
		Limit of Detection	0.0001							
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	MMO
Client Reference:	SOCOTEC Ref:	Matrix	AHCH	BHCH	GHCH	DIELDRIN	HCB	PPTDE	PPDDE	PPDDT
Site B	MAR00881.001	Sediment	<0.0001	<0.0001	<0.0001	0.0001	0.0002	0.0009	0.0002	<0.0001
Site G	MAR00881.002	Sediment	<0.0001	0.0001	<0.0001	0.0009	0.0005	0.0068	0.0014	0.0035
Site J	MAR00881.003	Sediment	<0.0001	<0.0001	<0.0001	0.0003	0.0006	0.0055	0.0011	0.0034
Site M	MAR00881.004	Sediment	<0.0001	<0.0001	<0.0001	0.0003	0.0002	0.0018	0.0003	0.0002
Site Q	MAR00881.005	Sediment	<0.0001	<0.0001	<0.0001	0.0008	0.0008	0.0079	0.0015	0.0021
Site R	MAR00881.006	Sediment	<0.0001	0.0002	<0.0001	0.0008	0.0006	0.0066	0.0014	0.0016
Certified Reference Material CRM QOR136 (% Recovery)			94~	110~	115~	106~	116	60	91	67~
QC Blank			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

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 no Certified Reference Materials are available.
 For full analyte name see method summaries

Certificate of Analysis



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Test Report ID MAR00881
 Issue Version 1
 Customer Reference MMO Marine Sediment Analysis

		Units	mg/Kg (Dry Weight)							
		Method No	ASC/SOP/302							
		Limit of Detection	0.0001							
		Accreditation	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	UKAS/MMO	MMO
Client Reference:	SOCOTEC Ref:	Matrix	AHCH	BHCH	GHCH	DIELDRIN	HCB	PPTDE	PPDDE	PPDDT
Site T	MAR00881.007	Sediment	<0.0001	0.0001	<0.0001	0.0010	0.0007	0.0074	0.0015	0.0016
Site W	MAR00881.008	Sediment	<0.0001	<0.0001	<0.0001	0.0008	0.0006	0.0067	0.0011	0.0037
CCS X	MAR00881.009	Sediment	<0.0001	<0.0001	0.0001	0.0005	0.0006	0.0050	0.0013	0.0016
CCS Y	MAR00881.010	Sediment	<0.0001	<0.0001	<0.0001	0.0008	0.0007	0.0060	0.0012	0.0052
CCS Z	MAR00881.011	Sediment	<0.0001	<0.0001	<0.0001	0.0005	0.0006	0.0047	0.0010	<0.0001
Certified Reference Material CRM QOR136 (% Recovery)			110~	95~	132~	117~	111~	77	94	57
QC Blank			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are available.
 For full analyte name see method summaries

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Test Report ID MAR00881

Issue Version 1

Customer Reference MMO Marine Sediment Analysis

REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
*SUB_01	MAR00881.001-011	Analysis was conducted by an approved subcontracted laboratory.
SOCOTEC Env Chem*	MAR00881.001-011	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ASC/SOP/301	MAR00881.001-011	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted, but in doing so, the detection limit for this test has been elevated.
ASC/SOP/302	MAR00881.001-011	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with DDT falling outside acceptable limits. DDT is a known problem compound that can breakdown into DDD and DDE. These circumstances should be taken into consideration when utilising the data and in line with our QMS policy we have removed accreditation, where applicable.
ASC/SOP/303/304	MAR00881.001-011	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved in the PAHSED UKAS accredited method. Chrysene and Triphenylene are resolved for MMO but this is currently not UKAS accredited therefore Chrysene is reported without this accreditation.

DEVIATING SAMPLE STATEMENT

Deviation Code	Deviation Definition	Sample ID	Deviation Details. The following information should be taken into consideration when using the data contained within this report
D1	Holding Time Exceeded	N/A	N/A
D2	Handling Time Exceeded	N/A	N/A
D3	Sample Contaminated through Damaged Packaging	N/A	N/A
D4	Sample Contaminated through Sampling	N/A	N/A
D5	Inappropriate Container/Packaging	N/A	N/A
D6	Damaged in Transit	N/A	N/A
D7	Insufficient Quantity of Sample	N/A	N/A
D8	Inappropriate Headspace	N/A	N/A
D9	Retained at Incorrect Temperature	N/A	N/A
D10	Lack of Date & Time of Sampling	N/A	N/A
D11	Insufficient Sample Details	N/A	N/A
D12	Sample integrity compromised or not suitable for analysis	N/A	N/A

Certificate of Analysis



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Method	Sample and Fraction Size	Method Summary
Particle Size Analysis	Wet Sediment	Wet and dry sieving followed by laser diffraction analysis.
Metals	Air dried	Aqua-regia extraction followed by ICP analysis.
Organotins	Wet Sediment	Solvent extraction and derivatisation followed by GC-MS analysis.
Polyaromatic Hydrocarbons (PAH)	Wet Sediment	Solvent extraction and clean up followed by GC-MS analysis.
Total Hydrocarbon Content (THC)	Wet Sediment	Ultra-violet fluorescence spectroscopy
Polychlorinated Biphenyls (PCBs)	Air dried and sieved to <2mm	Solvent extraction and clean up followed by GC-MS-MS analysis.
Organochlorine Pesticides (OCPs)	Air dried and sieved to <2mm	Solvent extraction and clean up followed by GC-MS-MS analysis.

Analyte Definitions					
Analyte Abbreviation	Full Analyte name	Analyte Abbreviation	Full Analyte name	Analyte Abbreviation	Full Analyte name
ACENAPTH	Acenaphthene	C2N	C2-naphthalenes	THC	Total Hydrocarbon Content
ACENAPHY	Acenaphthylene	C3N	C3-naphthalenes	AHCH	alpha-Hexachlorocyclohexane
ANTHRACN	Anthracene	CHRYSENE	Chrysene	BHCH	beta-Hexachlorocyclohexane
BAA	Benzo[a]anthracene	DBENZAH	Dibenzo[ah]anthracene	GHCH	gamma-Hexachlorocyclohexane
BAP	Benzo[a]pyrene	FLUORANT	Fluoranthene	DIELDRIN	Dieldrin
BBF	Benzo[b]fluoranthene	FLUORENE	Fluorene	HCB	Hexachlorobenzene
BEP	Benzo[e]pyrene	INDPYR	Indeno[1,2,3-cd]pyrene	PPDDE	p,p'-Dichlorodiphenyldichloroethylene
BENZGHIP	Benzo[ghi]perylene	NAPTH	Naphthalene	PPDDT	p,p'-Dichlorodiphenyltrichloroethane
BKF	Benzo[k]fluoranthene	PERYLENE	Perylene	PPTDE	p,p'-Dichlorodiphenyldichloroethane
C1N	C1-naphthalenes	PHENANT	Phenanthrene		
C1PHEN	C1-phenanthrene	PYRENE	Pyrene		