

## Certificate of Analysis

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



### Test Report ID MAR02139

Issue Version: 1

Customer: Irish Hydrodata, Ballygarvan, Co. Cork

Customer Reference: Port of Cork - Marine Institute Analysis

Date Sampled: 28-29-Nov-23

Date Samples Received: 30-Nov-23

Test Report Date: 05-Jan-24

Condition of samples: Ambient      Satisfactory

Opinions and Interpretations expressed herein are outside the scope of our UKAS accreditation  
The results reported relate only to the sample tested  
The results apply to the sample as received

*JM Colbourne*

Authorised by: Jane Colbourne

Position: Customer Service Specialist



1252

# Certificate of Analysis

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



Test Report ID            MAR02139  
Issue Version             1  
Customer Reference       Port of Cork - Marine Institute Analysis

		Method No	SUB_02*
Client Reference:	SOCOTEC Ref:	Matrix	Visual Description
CH1	MAR02139.001	Sediment	Dark grey organic silty CLAY
CH2	MAR02139.002	Sediment	Dark grey organic silty CLAY
CH3	MAR02139.003	Sediment	Dark grey organic silty CLAY
CH4	MAR02139.004	Sediment	Dark grey organic silty CLAY
CH5	MAR02139.005	Sediment	Grey silty CLAY
CH6	MAR02139.006	Sediment	Grey clayey SILT
CH7	MAR02139.007	Sediment	Grey clayey SILT
CH8	MAR02139.008	Sediment	Dark grey organic clayey SILT
CH9	MAR02139.009	Sediment	Grey silty CLAY
CH10	MAR02139.010	Sediment	Grey clayey SILT
CH11	MAR02139.011	Sediment	Grey silty CLAY
CH12	MAR02139.012	Sediment	Grey silty CLAY
CH13	MAR02139.013	Sediment	Grey silty CLAY
CH14	MAR02139.014	Sediment	Dark grey organic clayey SILT
CH15	MAR02139.015	Sediment	Grey clayey SILT
CH16	MAR02139.016	Sediment	Dark grey organic clayey SILT
CH17	MAR02139.017	Sediment	Greyish brown clayey SILT
CH18	MAR02139.018	Sediment	Grey clayey SILT
CH19	MAR02139.019	Sediment	Dark grey organic SILT
CH20	MAR02139.020	Sediment	Grey silty CLAY
CH21	MAR02139.021	Sediment	Brown slightly gravelly SAND
CH22	MAR02139.022	Sediment	Grey slightly gravelly SAND
CH23	MAR02139.023	Sediment	Grey gravelly SAND
CH24	MAR02139.024	Sediment	Grey silty CLAY
CH25	MAR02139.025	Sediment	Brown SAND

\* See Report Notes

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Test Report ID      MAR02139  
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		Units	%	%	%	%	%	Mg/m3
		Method No	ASC/SOP/303	ASC/SOP/303	SUB_01*	SUB_01*	SUB_01*	SUB_02*
		Limit of Detection	0.2	0.2	N/A	N/A	N/A	N/A
		Accreditation	UKAS	UKAS	N	N	N	N
Client Reference:	SOCOTEC Ref:	Matrix	Total Moisture @ 120°C	Total Solids	Gravel (>2mm)	Sand (63-2000 µm)	Silt (<63 µm)	Particle Density
CH1	MAR02139.001	Sediment	73.0	27.0	0.00	45.59	54.41	2.41
CH2	MAR02139.002	Sediment	78.9	21.1	5.08	47.87	47.05	2.53
CH3	MAR02139.003	Sediment	73.6	26.4	33.24	31.73	35.04	2.58
CH4	MAR02139.004	Sediment	69.2	30.8	0.00	13.05	86.95	2.64
CH5	MAR02139.005	Sediment	56.1	43.9	0.00	15.45	84.55	2.66
CH6	MAR02139.006	Sediment	68.3	31.7	0.00	14.03	85.97	2.62
CH7	MAR02139.007	Sediment	58.6	41.4	0.00	19.63	80.37	2.58
CH8	MAR02139.008	Sediment	55.8	44.2	0.00	31.39	68.61	2.66
CH9	MAR02139.009	Sediment	49.8	50.2	0.00	48.67	51.33	2.71
CH10	MAR02139.010	Sediment	57.2	42.8	36.13	22.72	41.15	2.68
CH11	MAR02139.011	Sediment	43.7	56.3	0.00	55.13	44.87	2.67
CH12	MAR02139.012	Sediment	35.7	64.3	4.58	57.42	38.00	2.67
CH13	MAR02139.013	Sediment	71.0	29.0	0.00	29.71	70.29	2.63
CH14	MAR02139.014	Sediment	63.8	36.2	0.00	22.85	77.15	2.67
CH15	MAR02139.015	Sediment	66.0	34.0	0.00	16.60	83.40	2.68
CH16	MAR02139.016	Sediment	60.0	40.0	0.00	22.91	77.09	2.61
CH17	MAR02139.017	Sediment	55.8	44.2	0.00	33.30	66.70	2.70
CH18	MAR02139.018	Sediment	53.0	47.0	5.23	34.94	59.83	2.68
CH19	MAR02139.019	Sediment	44.6	55.4	20.73	43.29	35.98	2.62
CH20	MAR02139.020	Sediment	40.1	59.9	0.00	49.26	50.74	2.68
CH21	MAR02139.021	Sediment	34.9	65.1	16.16	64.65	19.19	2.67
CH22	MAR02139.022	Sediment	45.8	54.2	0.00	57.06	42.94	2.71
CH23	MAR02139.023	Sediment	44.3	55.7	30.80	39.22	29.99	2.69
CH24	MAR02139.024	Sediment	39.3	60.7	0.00	39.71	60.29	2.68
CH25	MAR02139.025	Sediment	48.3	51.7	0.00	97.65	2.35	2.73
Reference Material (% Recovery)			NA	NA	NA	NA	NA	N/A
QC Blank			NA	NA	NA	NA	NA	N/A

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Test Report ID MAR02139  
Issue Version 1  
Customer Reference Port of Cork - Marine Institute Analysis

		Units	% m/m	%m/m
		Method No	WSLM59*	ANC*
		Limit of Detection	0.02	0.12
		Accreditation	UKAS	No
Client Reference:	SOCOTEC Ref:	Matrix	TOC	Carbonate Equivalent (%CO3)
CH1	MAR02139.001	Sediment	7.65	3.6
CH2	MAR02139.002	Sediment	6.47	4.6
CH3	MAR02139.003	Sediment	5.33	1.7
CH4	MAR02139.004	Sediment	3.61	9.12
CH5	MAR02139.005	Sediment	2.85	9.6
CH6	MAR02139.006	Sediment	2.15	12.0
CH7	MAR02139.007	Sediment	2.01	12.5
CH8	MAR02139.008	Sediment	2.10	12.7
CH9	MAR02139.009	Sediment	1.46	12.7
CH10	MAR02139.010	Sediment	3.16	13.4
CH11	MAR02139.011	Sediment	0.97	13.0
CH12	MAR02139.012	Sediment	0.91	13.9
CH13	MAR02139.013	Sediment	1.57	13.2
CH14	MAR02139.014	Sediment	2.30	10.6
CH15	MAR02139.015	Sediment	2.12	11.0
CH16	MAR02139.016	Sediment	2.05	12.0
CH17	MAR02139.017	Sediment	1.70	11.5
CH18	MAR02139.018	Sediment	1.76	19.9
CH19	MAR02139.019	Sediment	1.82	22.6
CH20	MAR02139.020	Sediment	1.26	12.0
CH21	MAR02139.021	Sediment	0.63	18.5
CH22	MAR02139.022	Sediment	1.17	13.9
CH23	MAR02139.023	Sediment	1.10	34.1
CH24	MAR02139.024	Sediment	1.31	17.8
CH25	MAR02139.025	Sediment	0.32	18.5
Reference Material (% Recovery)			101	98
QC Blank			<0.02	<0.12

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Issue Version        1  
Customer Reference   Port of Cork - Marine Institute 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	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*
		Limit of Detection	0.14	0.03	1	0.7	0.6	0.01	0.4
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	Arsenic as As	Cadmium as Cd	Chromium as Cr	Copper as Cu	Lead as Pb	Mercury as Hg	Nickel as Ni
CH1	MAR02139.001	Sediment	11.6	0.58	58.7	51.1	53.4	0.22	29.0
CH2	MAR02139.002	Sediment	13.1	0.50	57	53.1	63.4	0.15	28.1
CH3	MAR02139.003	Sediment	16.0	0.49	72.6	41.1	45.2	0.12	33.2
CH4	MAR02139.004	Sediment	15.3	0.40	69.4	30.0	41.3	0.09	29.2
CH5	MAR02139.005	Sediment	15.6	0.33	70.3	25.8	35.2	0.07	29.8
CH6	MAR02139.006	Sediment	13.5	0.24	62.6	20.1	29.6	0.04	26.7
CH7	MAR02139.007	Sediment	13.5	0.25	52.1	18.5	24.1	0.05	23.4
CH8	MAR02139.008	Sediment	14.6	0.28	60.8	21.3	30.4	0.06	25.5
CH9	MAR02139.009	Sediment	11.7	0.19	43.6	13.7	20.6	0.03	19.0
CH10	MAR02139.010	Sediment	12.4	0.20	53.5	36.8	23.3	0.03	22.0
CH11	MAR02139.011	Sediment	8.9	0.14	34.7	8.9	14.3	<0.01	15.1
CH12	MAR02139.012	Sediment	7.8	0.21	39.9	12.5	21.9	0.03	15.1
CH13	MAR02139.013	Sediment	10.8	0.18	60.8	15.0	25.5	0.03	21.6
CH14	MAR02139.014	Sediment	9.6	0.22	60.7	17.3	26.6	0.05	21.6
CH15	MAR02139.015	Sediment	12.0	0.24	63.0	17.5	27.2	0.02	23.1
CH16	MAR02139.016	Sediment	12.5	0.28	68.9	18.9	29.8	0.02	25.3
CH17	MAR02139.017	Sediment	10.5	0.22	54.5	12.6	20.8	<0.01	20.6
CH18	MAR02139.018	Sediment	10.2	0.14	42.1	15.1	26.2	<0.01	18.4
CH19	MAR02139.019	Sediment	10.2	0.21	37.7	37.9	52.3	0.09	18.0
CH20	MAR02139.020	Sediment	9.4	0.22	39.2	11.8	17.5	<0.01	17.7
CH21	MAR02139.021	Sediment	10.4	0.13	28.7	22.3	13.3	<0.01	15.4
CH22	MAR02139.022	Sediment	9.7	0.21	33.9	9.6	15.7	<0.01	15.4
CH23	MAR02139.023	Sediment	8.7	0.09	20.6	8.6	17.6	<0.01	9.7
CH24	MAR02139.024	Sediment	11.2	0.16	42.8	11.6	19.8	<0.01	19.0
CH25	MAR02139.025	Sediment	11.5	0.05	23.4	3.9	8.2	<0.01	9.6
CRM(1)	MAR02139.026	Sediment	22.0	0.24	81.4	35.8	19.2	0.03	37.4
Certified Reference Material 2702 (Measured Value)			41.52	0.885	277.9	98.0	103.1	0.465	62.21
Certified Reference Material 2702 (Certified Value)			45.3	0.817	352	117.7	132.8	0.447	75.4
Certified Reference Material 2702 (% Recovery)			90	77	83	81	85	95	95
QC Blank			<0.14	<0.03	<1	<0.7	<0.6	<0.01	<0.4

\* See Report Notes

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Test Report ID MAR02139  
Issue Version 1  
Customer Reference Port of Cork - Marine Institute Analysis

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPOES-MWSED*	ICPOES-MWSED*
		Limit of Detection	3.5	1750	2
		Accreditation	UKAS	UKAS	N
Client Reference:	SOCOTEC Ref:	Matrix	Zinc as Zn	Aluminium as Al	Lithium as Li
CH1	MAR02139.001	Sediment	211	51600	51.6
CH2	MAR02139.002	Sediment	212	46500	46.2
CH3	MAR02139.003	Sediment	186	64300	69.1
CH4	MAR02139.004	Sediment	171	58200	68.9
CH5	MAR02139.005	Sediment	135	60300	72.1
CH6	MAR02139.006	Sediment	122	53700	64.7
CH7	MAR02139.007	Sediment	110	42900	51.4
CH8	MAR02139.008	Sediment	126	51000	61.9
CH9	MAR02139.009	Sediment	77.0	39700	47.7
CH10	MAR02139.010	Sediment	104	44500	55.4
CH11	MAR02139.011	Sediment	71.8	32100	39.0
CH12	MAR02139.012	Sediment	167	31700	39.6
CH13	MAR02139.013	Sediment	83.3	49500	60.6
CH14	MAR02139.014	Sediment	93.7	48600	59.3
CH15	MAR02139.015	Sediment	93.4	49500	60.5
CH16	MAR02139.016	Sediment	101	54100	66.4
CH17	MAR02139.017	Sediment	88.7	43400	52.1
CH18	MAR02139.018	Sediment	74.1	36900	46.5
CH19	MAR02139.019	Sediment	100	31400	39.7
CH20	MAR02139.020	Sediment	68.8	37700	43.5
CH21	MAR02139.021	Sediment	59.0	27200	34.4
CH22	MAR02139.022	Sediment	72.3	30900	37.9
CH23	MAR02139.023	Sediment	36.8	16300	23.3
CH24	MAR02139.024	Sediment	64.4	39200	48.4
CH25	MAR02139.025	Sediment	32.2	17400	24.7
CRM(1)	MAR02139.026	Sediment	130	70700	78.9
Certified Reference Material 2702 (Measured Value)			439.8	82765	85.72
Certified Reference Material 2702 (Certified Value)			485.3	84000	78.2
Certified Reference Material 2702 (% Recovery)			84	92	99
QC Blank			<3.5	<1750	<2

\* See Report Notes

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Test Report ID MAR02139  
Issue Version 1  
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		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	Dibutyltin (DBT)	Tributyltin (TBT)
CH1	MAR02139.001	Sediment	<5	<5
CH2	MAR02139.002	Sediment	<5	<5
CH3	MAR02139.003	Sediment	<5	<5
CH7	MAR02139.007	Sediment	<5	<5
CH8	MAR02139.008	Sediment	<5	<5
CH9	MAR02139.009	Sediment	<5	<5
CH11	MAR02139.011	Sediment	<5	<5
CH12	MAR02139.012	Sediment	<5	<5
CH14	MAR02139.014	Sediment	<5	<5
CH15	MAR02139.015	Sediment	<5	<5
CH16	MAR02139.016	Sediment	<5	<5
CH18	MAR02139.018	Sediment	<5	<5
CH19	MAR02139.019	Sediment	<5	11.0
CH20	MAR02139.020	Sediment	<5	<5
CH21	MAR02139.021	Sediment	<5	<5
CH23	MAR02139.023	Sediment	<5	<5
CH24	MAR02139.024	Sediment	<5	<5
CRM(3)	MAR02139.028	Sediment	293	231
Certified Reference Material BCR-646 (Measured Value)			648	337
Certified Reference Material BCR-646 (Certified Value)			770	480
Certified Reference Material BCR-646 (% Recovery)			84	70
QC Blank			<1	<1

MAR02139

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		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	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	ACENAPTH	ACENAPHY	ANTHRACN	BAA	BAP	BBF
CH1	MAR02139.001	Sediment	20.5	<5	58.0	95.7	137	128
CH2	MAR02139.002	Sediment	<5	<5	41.6	137	163	176
CH3	MAR02139.003	Sediment	<5	<5	29.2	108	139	128
CH7	MAR02139.007	Sediment	<5	<5	34.4	122	123	142
CH8	MAR02139.008	Sediment	<5	<5	<5	36.6	50.4	73.5
Certified Reference Material Nist 1941b (Measured Value)			35.2	58.0	123	222	218	371
Certified Reference Material Nist 1941b (Certified Value)			38.4	53.3	184	335	358	453
Certified Reference Material Nist 1941b (% Recovery)			92	109	67	66	61	82
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries

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

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

\* See Report Notes

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		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	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	BENZGHIP	BKF*	CHRYSENE*	DBENZAH	FLUORANT	FLUORENE
CH1	MAR02139.001	Sediment	119	120	131	21.2	241	30.1
CH2	MAR02139.002	Sediment	140	156	164	27.4	309	32.1
CH3	MAR02139.003	Sediment	132	130	132	25.3	235	25.8
CH7	MAR02139.007	Sediment	88.2	126	132	24.2	209	14.9
CH8	MAR02139.008	Sediment	53.9	61.2	48.3	<5	76.8	12.9
Certified Reference Material Nist 1941b (Measured Value)			239	362	341	61.3	526	47.9
Certified Reference Material Nist 1941b (Certified Value)			307	225	399	53.0	651	85.0
Certified Reference Material Nist 1941b (% Recovery)			78	161	86	116	81	56
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries

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		Units	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/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	SOCOTEC Ref:	Matrix	INDPYR	NAPTH	PHENANT	PYRENE	THC
CH1	MAR02139.001	Sediment	112	49.7	114	243	888000
CH2	MAR02139.002	Sediment	139	38.7	140	300	799000
CH3	MAR02139.003	Sediment	136	42.2	106	218	668000
CH7	MAR02139.007	Sediment	108	27.4	65.7	163	207000
CH8	MAR02139.008	Sediment	62.5	24.0	38.1	72.8	220000
Certified Reference Material Nist 1941b (Measured Value)			244	525	316	400	1407
Certified Reference Material Nist 1941b (Certified Value)			341	848	406	581	1400
Certified Reference Material Nist 1941b (% Recovery)			72	62	78	69	101
QC Blank			<1	<1	<1	<1	<100

For full analyte name see method summaries

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Issue Version             1  
Customer Reference       Port of Cork - Marine Institute 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	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	ACENAPTH	ACENAPHY	ANTHRACN	BAA	BAP	BBF
CH9	MAR02139.009	Sediment	<5	<5	15.3	43.4	52.5	60.2
CH11	MAR02139.011	Sediment	<5	<5	<5	22.9	27.6	31.4
CH12	MAR02139.012	Sediment	<5	<5	<5	<5	<5	11.3
CH14	MAR02139.014	Sediment	<5	<5	<5	26.4	36.3	48.5
CH15	MAR02139.015	Sediment	<5	<5	<5	25.6	32.2	53.8
CH16	MAR02139.016	Sediment	<5	<5	23.2	72.3	75.9	86.5
CH18	MAR02139.018	Sediment	<5	<5	<5	19.1	23.3	36.4
CH19	MAR02139.019	Sediment	17.1	12.1	262	212	239	197
CH20	MAR02139.020	Sediment	153	<5	119	249	269	234
CH21	MAR02139.021	Sediment	<5	<5	<5	<5	<5	10.0
CH23	MAR02139.023	Sediment	<5	<5	<5	19.7	21.6	30.8
CH24	MAR02139.024	Sediment	<5	<5	14.6	41.1	41.3	52.0
CRM(2)	MAR02139.027	Sediment	9.67	7.06	14.7	53.0	70.6	110
CRM(4)	MAR02139.029	Sediment	26.9	54.7	121	225	224	371
Certified Reference Material Nist 1941b (Measured Value)			38.6	61.8	129	228	220	368
Certified Reference Material Nist 1941b (Certified Value)			38.4	53.3	184	335	358	453
Certified Reference Material Nist 1941b (% Recovery)			100	116	70	68	61	81
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries  
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 \* See Report Notes

# Certificate of Analysis

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



Test Report ID MAR02139  
Issue Version 1  
Customer Reference Port of Cork - Marine Institute 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	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	BENZGHIP	BKF*	CHRYSENE*	DBENZAH	FLUORANT	FLUORENE
CH9	MAR02139.009	Sediment	46.5	59.2	51.4	<5	91.6	<5
CH11	MAR02139.011	Sediment	24.5	30.3	29.1	<5	47.9	<5
CH12	MAR02139.012	Sediment	8.44	10.9	<5	<5	10.2	<5
CH14	MAR02139.014	Sediment	41.2	46.7	34.2	<5	50.3	<5
CH15	MAR02139.015	Sediment	43.2	57.4	35.2	<5	53.9	<5
CH16	MAR02139.016	Sediment	63.6	92.9	77.1	13.6	122	12.7
CH18	MAR02139.018	Sediment	28.0	36.4	25.5	<5	39.6	<5
CH19	MAR02139.019	Sediment	146	202	238	27.5	417	24.3
CH20	MAR02139.020	Sediment	179	228	305	33.6	754	102
CH21	MAR02139.021	Sediment	<5	7.79	<5	<5	8.24	<5
CH23	MAR02139.023	Sediment	22.0	26.2	22.5	<5	49.1	<5
CH24	MAR02139.024	Sediment	33.3	52.7	43.6	<5	87.8	<5
CRM(2)	MAR02139.027	Sediment	112	94.7	72.8	16.9	111	12.0
CRM(4)	MAR02139.029	Sediment	207	347	335	49.4	523	48.1
Certified Reference Material Nist 1941b (Measured Value)			224	352	349	55.8	563	45.9
Certified Reference Material Nist 1941b (Certified Value)			307	225	399	53.0	651	85.0
Certified Reference Material Nist 1941b (% Recovery)			73	156	87	105	86	54
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries

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\* See Report Notes

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# Certificate of Analysis



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Test Report ID MAR02139  
Issue Version 1  
Customer Reference Port of Cork - Marine Institute Analysis

		Units	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/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	SOCOTEC Ref:	Matrix	INDPYR	NAPTH	PHENANT	PYRENE	THC
CH9	MAR02139.009	Sediment	52.6	15.5	29.2	81.7	88500
CH11	MAR02139.011	Sediment	24.3	<5	21.4	49.2	55300
CH12	MAR02139.012	Sediment	10.4	<5	7.99	10.6	29400
CH14	MAR02139.014	Sediment	50.2	22.3	29.6	44.7	127000
CH15	MAR02139.015	Sediment	51.8	21.9	31.3	46.6	160000
CH16	MAR02139.016	Sediment	73.4	21.2	83.2	101	139000
CH18	MAR02139.018	Sediment	34.3	16.2	25.4	36.6	68800
CH19	MAR02139.019	Sediment	153	50.6	131	413	89400
CH20	MAR02139.020	Sediment	170	24.0	659	625	60100
CH21	MAR02139.021	Sediment	8.56	<5	<5	8.79	18200
CH23	MAR02139.023	Sediment	25.5	12.7	21.0	41.6	38200
CH24	MAR02139.024	Sediment	40.1	16.8	38.6	68.1	60100
CRM(2)	MAR02139.027	Sediment	110	36.7	71.2	105	NA
CRM(4)	MAR02139.029	Sediment	241	494	306	416	NA
Certified Reference Material Nist 1941b (Measured Value)			253	535	337	431	1496
Certified Reference Material Nist 1941b (Certified Value)			341	848	406	581	1400
Certified Reference Material Nist 1941b (% Recovery)			74	63	83	74	107
QC Blank			<1	<1	<1	<1	<100

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 \* See Report Notes

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		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)	µg/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	0.08	0.08	0.08	0.08	0.08	0.08	0.08
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	PCB28	PCB52	PCB101	PCB118	PCB138	PCB153	PCB180
CH1	MAR02139.001	Sediment	0.49	0.61	0.62	0.74	0.79	1.07	0.69
CH2	MAR02139.002	Sediment	0.23	0.27	0.32	0.39	0.40	0.57	0.37
CH3	MAR02139.003	Sediment	0.20	0.16	0.22	0.22	0.30	0.40	0.26
CH7	MAR02139.007	Sediment	0.16	0.13	0.21	0.25	0.28	0.45	0.22
Certified Reference Material Nist 1941b (Measured Value)			3.38	5.33	4.84	3.90	3.24	5.08	3.20
Certified Reference Material Nist 1941b (Certified Value)			4.52	5.24	5.11	4.23	3.60	5.47	3.24
Certified Reference Material Nist 1941b (% Recovery)			75	102	95	92	90	93	99
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

For full analyte name see method summaries

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		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)	µg/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	0.08	0.08	0.08	0.08	0.08	0.08	0.08
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	PCB28	PCB52	PCB101	PCB118	PCB138	PCB153	PCB180
CH8	MAR02139.008	Sediment	0.72	0.78	0.43	0.45	0.26	0.37	0.14
CH9	MAR02139.009	Sediment	0.18	0.13	0.12	0.22	0.13	0.17	0.08
CH11	MAR02139.011	Sediment	0.10	0.10	0.14	0.15	0.27	0.16	<0.08
CH12	MAR02139.012	Sediment	0.11	0.09	0.13	0.13	0.20	0.17	0.10
CH14	MAR02139.014	Sediment	0.22	0.14	0.15	0.13	0.29	0.23	<0.08
CH15	MAR02139.015	Sediment	0.15	0.13	0.18	0.31	0.18	0.27	0.15
CH16	MAR02139.016	Sediment	0.19	0.12	0.16	0.25	0.14	0.18	<0.08
CH18	MAR02139.018	Sediment	0.10	0.12	0.74	0.38	1.21	1.44	0.92
CH19	MAR02139.019	Sediment	0.11	0.24	0.83	0.49	0.51	0.98	0.17
CH20	MAR02139.020	Sediment	<0.08	<0.08	<0.08	<0.08	0.09	<0.08	<0.08
CH21	MAR02139.021	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
CH23	MAR02139.023	Sediment	<0.08	<0.08	<0.08	0.09	<0.08	<0.08	<0.08
CH24	MAR02139.024	Sediment	<0.08	<0.08	<0.08	0.11	0.08	0.13	<0.08
CRM(2)	MAR02139.027	Sediment	0.37	0.56	0.49	0.52	0.53	0.70	0.24
CRM(4)	MAR02139.029	Sediment	3.64	5.44	5.35	5.22	3.59	5.41	3.07
Certified Reference Material Nist 1941b (Measured Value)			3.57	5.37	5.01	4.12	3.12	5.10	3.52
Certified Reference Material Nist 1941b (Certified Value)			4.52	5.24	5.11	4.23	3.60	5.47	3.24
Certified Reference Material Nist 1941b (% Recovery)			79	102	98	97	87	93	109
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

For full analyte name see method summaries  
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		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)	µg/Kg (Dry Weight)	µg/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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	N*	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	AHCH	BHCH	GHCH	DIELDRIN	HCb	DDE	DDT	DDD
CH1	MAR02139.001	Sediment	<0.1	<0.1	0.22	1.95	0.16	1.65	0.16	3.38
CH2	MAR02139.002	Sediment	<0.1	<0.1	0.13	0.96	0.16	1.08	0.11	1.98
CH3	MAR02139.003	Sediment	<0.1	<0.1	0.19	0.57	<0.1	0.42	0.15	0.42
CH7	MAR02139.007	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	0.18	<0.1	0.11
Certified Reference Material Nist 1941b (Measured Value)			42.0	41.0	48.6	43.1	6.65	3.42	0.49	3.60
Certified Reference Material Nist 1941b (Certified Value)			40.0	40.0	40.0	40.0	5.83	3.22	0.70	4.66
Certified Reference Material Nist 1941b (% Recovery)			105~	102~	121~	108~	114	106	70	77
QC Blank			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

For full analyte name see method summaries

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\* See Report Notes

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		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)	µg/Kg (Dry Weight)	µg/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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	N*	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	AHCH	BHCH	GHCH	DIELDRIN	HCB	DDE	DDT	DDD
CH8	MAR02139.008	Sediment	<0.1	<0.1	<0.1	0.12	<0.1	0.24	0.14	0.15
CH9	MAR02139.009	Sediment	<0.1	<0.1	0.14	<0.1	0.13	0.14	0.12	0.16
CH11	MAR02139.011	Sediment	<0.1	<0.1	0.10	0.18	<0.1	<0.1	0.14	0.28
CH12	MAR02139.012	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	0.10	<0.1	0.12
CH14	MAR02139.014	Sediment	<0.1	<0.1	0.21	<0.1	<0.1	0.19	0.35	<0.1
CH15	MAR02139.015	Sediment	<0.1	<0.1	0.12	0.16	<0.1	0.18	0.21	0.11
CH16	MAR02139.016	Sediment	<0.1	<0.1	0.17	0.14	<0.1	0.16	1.05	0.20
CH18	MAR02139.018	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.42	0.26
CH19	MAR02139.019	Sediment	<0.1	<0.1	0.13	0.53	0.12	0.15	<0.1	0.20
CH20	MAR02139.020	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	<0.1	0.38
CH21	MAR02139.021	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
CH23	MAR02139.023	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
CH24	MAR02139.024	Sediment	<0.1	<0.1	0.10	<0.1	<0.1	<0.1	0.17	<0.1
CRM(2)	MAR02139.027	Sediment	<0.1	<0.1	0.28	0.38	0.13	0.99	0.49	1.14
CRM(4)	MAR02139.029	Sediment	<0.1	<0.1	<0.1	<0.1	8.97	3.23	0.52	3.51
Certified Reference Material Nist 1941b (Measured Value)			41.4	47.6	49.1	44.7	6.76	2.95	0.69	2.97
Certified Reference Material Nist 1941b (Certified Value)			40.0	40.0	40.0	40.0	5.83	3.22	0.70	4.66
Certified Reference Material Nist 1941b (% Recovery)			103~	119~	123~	112~	116	92	98	64
QC Blank			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

For full analyte name see method summaries

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Test Report ID MAR02139

Issue Version 1

Customer Reference Port of Cork - Marine Institute Analysis

## REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
WSLM59*	MAR02139.001-029	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ANC*	MAR02139.001-029	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPMS-MWSED*	MAR02139.001-029	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPOES-MWSED*	MAR02139.001-029	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
SUB_01*	MAR02139.001-029	Analysis was conducted by an approved subcontracted laboratory.
SUB_02*	MAR02139.001-029	Analysis was conducted by an approved subcontracted laboratory.
ASC/SOP/301	MAR02139.001-003, .007-009, .011-012, .014-016, .018-021, .023-024	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	MAR02139.001-003, .007-009, .011-012, .014-016, .018-021, .023-024, .027, .029	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. The remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected. However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (DDT). These circumstances should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR02139.001-003, .007-009, .011-012, .014-016, .018, .020-021, .023-024	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/303/304	MAR02139.001-003, .007-009, .011-012, .014-016, .018-021, .023-024, .027, .029	Benzo[k]fluoranthene is known to coelute with Benzo[j]fluoranthene and these peaks can not be resolved. It is believed Benzo[j]fluoranthene is present in these samples therefore it is suggested that the Benzo[k]fluoranthene results should be taken as a Benzo[k]fluoranthene (inc. Benzo[j]fluoranthene). Benzo[j]fluoranthene is not UKAS accredited. This should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR02139.001-003, .007-009, .011-012, .014-016, .018-021, .023-024, .027, .029	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene). This should be taken into consideration when utilising the data.

## 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	Sample Contaminated through Damaged Packaging	N/A	N/A
D3	Sample Contaminated through Sampling	N/A	N/A
D4	Inappropriate Container/Packaging	N/A	N/A
D5	Damaged in Transit	N/A	N/A
D6	Insufficient Quantity of Sample	N/A	N/A
D7	Inappropriate Headspace	N/A	N/A
D8	Retained at Incorrect Temperature	N/A	N/A
D9	Lack of Date & Time of Sampling	N/A	N/A
D10	Insufficient Sample Details	N/A	N/A
D11	Sample integrity compromised or not suitable for analysis	N/A	N/A

MAR02139

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Method	Sample and Fraction Size	Method Summary
Total Solids	Wet Sediment	Calculation (100%-Moisture Content).Moisture content determined by drying a portion of the sample at 120°C to constant weight.
Particle Size Analysis	Wet Sediment	Wet and dry sieving followed by laser diffraction analysis.
Total Organic Carbon (TOC)	Air dried and seived to <2mm	Carbonate removal and sulphurous acid/combustion at 1600°C/NDIR.
Carbonate	Air dried and seived to <2mm	Quantitative digestion with Hydrochloric Acid back titration with 1M Sodium Hydroxide to pH 7
Metals	Air dried and seived to <2mm	Microwave assisted HF/Boric 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	Solvent extraction and clean up followed by GC-FID analysis.
Polychlorinated Biphenyls (PCBs)	Air dried and seived to <2mm	Solvent extraction and clean up followed by GC-MS-MS analysis.
Organochlorine Pesticides (OCPs)	Air dried and seived 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	DBENZA	Dibenzo[ah]anthracene	GHCH	gamma-Hexachlorocyclohexane
BAP	Benzo[a]pyrene	FLUORANT	Fluoranthene	DIELDRIN	Dieldrin
BBF	Benzo[b]fluoranthene	FLUORENE	Fluorene	HC	Hexachlorobenzene
BEP	Benzo[e]pyrene	INDPYR	Indeno[1,2,3-cd]pyrene	DDD	p,p'-Dichlorodiphenyldichloroethane
BENZGHIP	Benzo[ghi]perylene	NAPTH	Naphthalene	DDE	p,p'-Dichlorodiphenyldichloroethylene
BKF	Benzo[k]fluoranthene	PERYLENE	Perylene	DDT	p,p'-Dichlorodiphenyltrichloroethane
C1N	C1-naphthalenes	PHENANT	Phenanthrene		
C1PHEN	C1-phenanthrene	PYRENE	Pyrene		

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