

GBA Gesellschaft für Bioanalytik mbH · Flensburger Straße 15 · 25421 Pinneberg

Tallinn University of Technology  
Department of Marine Systems  
Akadeemia tee 15 a

ISO 14001  
ISO 45001  
zertifiziert



12618 Tallinn

### Test Report No.: 2021P508266 / 1

<b>Customer</b>	Tallinn University of Technology Department of Marine Systems
<b>Date of arrival</b>	11.03.2021
<b>Project</b>	no information
<b>Material</b>	Sediment
<b>Order</b>	Analyses by order of customer
<b>Packing material</b>	glass
<b>Amount of sample</b>	2x ca. 700 g
<b>GBA-No.</b>	21505327
<b>Taking of sample</b>	durch den Auftraggeber
<b>Transport of sample</b>	TNT
<b>Laboratory</b>	GBA Gesellschaft für Bioanalytik mbH
<b>Start / End of analysis</b>	11.03.2021 - 23.03.2021
<b>Sample storage</b>	If no other agreement was made solid samples are going to be stored for three months and water samples for two weeks after the report has been sent.

#### Remarks

Pinneberg, 23.03.2021



i.A. Jens Sörensen  
head of client services

The results are only based on the items tested. No responsibility is taken for the correctness of the sampling if the samples were not taken by the GBA or on their behalf. In this case, the results refer to the sample as received. The GBA test report may not be published without the express written consent of the GBA Group, nor may excerpts of it be reproduced without permission. GBA decision rules can be seen in the general terms and conditions.

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**Test Report No.: 2021P508266 / 1**
**no information**

<b>GBA-No.</b>		21505327
<b>Sample-No.</b>		001
<b>Material</b>		Sediment
<b>Sample identification</b>		<b>Station: 111</b>
<b>Amount of samples</b>		2x ca. 700 g
<b>Date of arrival</b>		11.03.2021
<b>Test results</b>	<b>Units</b>	
Dry weight	W.-%	50,3
TOC	W.-% DW	1,1
Digestion		
Arsenic (As)	mg/kg DW	14
Lead (Pb)	mg/kg DW	9,3
Cadmium (Cd)	mg/kg DW	0,32
Copper (Cu)	mg/kg DW	10
Nickel (Ni)	mg/kg DW	14
Mercury (Hg)	mg/kg DW	<0,10
Zinc (Zn)	mg/kg DW	55
Sum PAH (16)	mg/kg DW	0,289
Sum PAH (11)	mg/kg DW	0,289
Sum PAH (other 9)	mg/kg DW	0,124
Sum PAH (carcinogenic)	mg/kg DW	0,165
Sum PAH-L	mg/kg DW	<0,0225
Sum PAH-M	mg/kg DW	0,0910
Sum PAH-H	mg/kg DW	0,198
Naphthalene	mg/kg DW	<0,025
Acenaphthylene	mg/kg DW	<0,010
Acenaphthene	mg/kg DW	<0,010
Fluorene	mg/kg DW	<0,010
Phenanthrene	mg/kg DW	<0,035
Anthracene	mg/kg DW	<0,010
Fluoranthene	mg/kg DW	0,052
Pyrene	mg/kg DW	0,039
Benz(a)anthracene	mg/kg DW	0,019
Chrysene	mg/kg DW	0,025
Benzo(b)fluoranthene	mg/kg DW	0,042
Benzo(k)fluoranthene	mg/kg DW	0,014
Benzo(a)pyrene	mg/kg DW	0,024
Indeno(1,2,3-cd)pyrene	mg/kg DW	0,041
Dibenz(a,h)anthracene	mg/kg DW	<0,010
Benzo(g,h,i)perylene	mg/kg DW	0,033
Sum PCB	mg/kg DW	0,00149
PCB 28	mg/kg DW	<0,00010
PCB 52	mg/kg DW	<0,00010
PCB 101	mg/kg DW	0,00019
PCB 118	mg/kg DW	0,00031
PCB 153	mg/kg DW	0,00036
PCB 138	mg/kg DW	0,00037
PCB 180	mg/kg DW	0,00026

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<b>GBA-No.</b>		21505327
<b>Sample-No.</b>		001
<b>Material</b>		Sediment
<b>Sample identification</b>		<b>Station: 111</b>
<b>Amount of samples</b>		2x ca. 700 g
<b>Date of arrival</b>		11.03.2021
<b>Dry weight (freeze drying)</b>	W.-%	49,5
<b>Organotin compounds</b>		.
<b>Monobutyltin-cation</b>	µg/kg DW	<1,0
<b>Dibutyltin-cation</b>	µg/kg DW	<1,0
<b>Monophenyltin-cation</b>	µg/kg DW	<1,0
<b>Tributyltin-cation</b>	µg/kg DW	<1,0
<b>Monooctyltin-cation</b>	µg/kg DW	<1,0
<b>Tetrabutyltin-cation</b>	µg/kg DW	<1,0
<b>Diphenyltin-cation</b>	µg/kg DW	<1,0
<b>Diocetyl tin-cation</b>	µg/kg DW	<1,0
<b>Triphenyltin-cation</b>	µg/kg DW	<1,0
<b>Tricyclohexyltin-cation</b>	µg/kg DW	<1,0

DL = Detectionlimit MU = Measurement uncertainty n.a. = not evaluable n.b. = not definable n.n. = undetectable

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**Used methods**

Parameter	LOQ	Unit	MU %	Methods
Dry weight	0,40	W.-%	1	DIN ISO 11465: 1996-12 <sup>a</sup> 5
TOC	0,050	W.-% DW	9,6	DIN EN 15936: 2012-11 <sup>a</sup> 5
Digestion				DIN EN 13657: 2003-01 <sup>a</sup> 5
Arsenic (As)	1,0	mg/kg DW	13	DIN EN 16171: 2017-01 <sup>a</sup> 5
Lead (Pb)	1,0	mg/kg DW	14	DIN EN 16171: 2017-01 <sup>a</sup> 5
Cadmium (Cd)	0,10	mg/kg DW	13	DIN EN 16171: 2017-01 <sup>a</sup> 5
Copper (Cu)	1,0	mg/kg DW	15	DIN EN 16171: 2017-01 <sup>a</sup> 5
Nickel (Ni)	1,0	mg/kg DW	17	DIN EN 16171: 2017-01 <sup>a</sup> 5
Mercury (Hg)	0,10	mg/kg DW	19	DIN EN 16171: 2017-01 <sup>a</sup> 5
Zinc (Zn)	1,0	mg/kg DW	11	DIN EN 16171: 2017-01 <sup>a</sup> 5
Sum PAH (16)		mg/kg DW		calculated 5
Sum PAH (11)		mg/kg DW		calculated 5
Sum PAH (other 9)		mg/kg DW		calculated 5
Sum PAH (carcinogenic)		mg/kg DW		calculated 5
Sum PAH-L		mg/kg DW		calculated 5
Sum PAH-M		mg/kg DW		calculated 5
Sum PAH-H		mg/kg DW		calculated 5
Naphthalene	0,010	mg/kg DW	26	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Acenaphthylene	0,010	mg/kg DW	26	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Acenaphthene	0,010	mg/kg DW	26	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Fluorene	0,010	mg/kg DW	26	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Phenanthrene	0,010	mg/kg DW	26	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Anthracene	0,010	mg/kg DW	26	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Fluoranthene	0,010	mg/kg DW	26	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Pyrene	0,010	mg/kg DW	26	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Benz(a)anthracene	0,010	mg/kg DW	24	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Chrysene	0,010	mg/kg DW	26	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Benzo(b)fluoranthene	0,010	mg/kg DW	26	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Benzo(k)fluoranthene	0,010	mg/kg DW	23	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Benzo(a)pyrene	0,010	mg/kg DW	17	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Indeno(1,2,3-cd)pyrene	0,010	mg/kg DW	41	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Dibenz(a,h)anthracene	0,010	mg/kg DW	28	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Benzo(g,h,i)perylene	0,010	mg/kg DW	26	DIN ISO 18287: 2006-05 <sup>a</sup> 5
Sum PCB		mg/kg DW		calculated 5
PCB 28	0,00010	mg/kg DW	29	DIN ISO 10382: 2003-05 <sup>a</sup> 5
PCB 52	0,00010	mg/kg DW	33	DIN ISO 10382: 2003-05 <sup>a</sup> 5
PCB 101	0,00010	mg/kg DW	31	DIN ISO 10382: 2003-05 <sup>a</sup> 5
PCB 118	0,00010	mg/kg DW	19,8	DIN ISO 10382: 2003-05 <sup>a</sup> 5
PCB 153	0,00010	mg/kg DW	22	DIN ISO 10382: 2003-05 <sup>a</sup> 5
PCB 138	0,00010	mg/kg DW	22	DIN ISO 10382: 2003-05 <sup>a</sup> 5
PCB 180	0,00010	mg/kg DW	25	DIN ISO 10382: 2003-05 <sup>a</sup> 5

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Parameter	LOQ	Unit	MU %	Methods
Dry weight (freeze drying)	0,40	W.-%		DIN 38414-22: 2018-10 <sup>a</sup> 5
Organotin compounds				
Monobutyltin-cation	1,0	µg/kg DW	13	E DIN EN ISO 23161: 2017-11 <sup>a</sup> 5
Dibutyltin-cation	1,0	µg/kg DW	13	E DIN EN ISO 23161: 2017-11 <sup>a</sup> 5
Monophenyltin-cation	1,0	µg/kg DW	13	E DIN EN ISO 23161: 2017-11 <sup>a</sup> 5
Tributyltin-cation	1,0	µg/kg DW	13	E DIN EN ISO 23161: 2017-11 <sup>a</sup> 5
Monooctyltin-cation	1,0	µg/kg DW	13	E DIN EN ISO 23161: 2017-11 <sup>a</sup> 5
Tetrabutyltin-cation	1,0	µg/kg DW	13	E DIN EN ISO 23161: 2017-11 <sup>a</sup> 5
Diphenyltin-cation	1,0	µg/kg DW	13	E DIN EN ISO 23161: 2017-11 <sup>a</sup> 5
Diocetyl tin-cation	1,0	µg/kg DW	13	E DIN EN ISO 23161: 2017-11 <sup>a</sup> 5
Triphenyltin-cation	1,0	µg/kg DW	13	E DIN EN ISO 23161: 2017-11 <sup>a</sup> 5
Tricyclohexyltin-cation	1,0	µg/kg DW	13	E DIN EN ISO 23161: 2017-11 <sup>a</sup> 5

With <sup>a</sup> marked methods are accredited methods. Detection limits (DL) may vary depending on the matrix of the sample.

Untersuchungslabor: 5GBA Pinneberg