

1                                    **Supporting Information for:**

2

3                    **Effect-based characterization of mixtures of**

4                    **environmental pollutants in diverse**

5                    **sediments**

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28 **Table S1.** Overview of the sampling stations investigated in this study. A corresponding map is given in the main manuscript  
 29 as *Figure 1*.

Sampling area	Sample name	Sampling location	Sampling date	$f_{oc}$ [kg <sub>oc</sub> /kg <sub>sed</sub> ]	Characteristics
Australia	AUS_Gladstone Harbour	S23°49.1668' E151°14.28248'	06/2013	0.017	Harbour, estuarine, coal loading dock, van Veen grab sampler, <i>ref.</i> <sup>1</sup>
Australia	AUS_Calliope River	S23°50.0708' E151°13.22'	06/2013	0.0074	Estuary, general industry, van Veen grab sampler, <i>ref.</i> <sup>1</sup>
Australia	AUS_Brisbane River	S27°31.264' E152°59.40279'	06/2013	0.018	Urban estuary, stainless steel shovel, <i>ref.</i> <sup>1</sup>
Australia	AUS_Daintree River	S16°15.036' E145°18.2412'	08/2013	0.027	Freshwater, remote agricultural, van Veen grab sampler, <i>ref.</i> <sup>1</sup>
European Arctic, Svalbard	ARK_Svalbard_HS	N76°58,51' E15°43,61'	09/2015	0.034	Marine, expedition of the German research vessel Heincke, HE451, close to Svalbard, 2.5 km from the coast, 221 m depth, Ussel box corer, 0-5 cm
European Arctic, Svalbard	ARK_Svalbard_RF2	N80°30,21' E22°0,85'	09/2015	0.025	Marine, HE451, close to Svalbard, 13 km from the coast, 210 m depth, Ussel box corer, 0-5 cm
European Arctic, Svalbard	ARK_Svalbard_HL1	N80°0,56' E17°12,98'	09/2015	0.021	Marine, HE451, close to Svalbard, 15 km from the coast, 359 m depth, Ussel box corer, 0-5 cm
European Arctic, Svalbard	ARK_Svalbard_HL2	N79°25,11' E20°7,83'	09/2015	0.035	Marine, HE451, close to Svalbard, 4.5 km from the coast, 161 m depth, Ussel box corer, 0-5 cm
European Arctic, Svalbard	ARK_Svalbard_KF4	N78°58,33' E8°42,47'	09/2015	0.044	Marine, HE451, close to Svalbard, 40 km from the coast, 231 m depth, Ussel box corer, 0-5 cm
European Arctic, Svalbard	ARK_Svalbard_WLH	N78°55,87' E12°2,47'	09/2015	0.033	Marine, HE451, close to Svalbard, 2.0 km from the coast, 229 m depth, Ussel box corer, 0-5 cm
European Arctic	ARK_N4	N79°44,26' E4°25,96'	07/2016	0.034	Marine, expedition of the German icebreaker Polarstern PS99.2, ARK-XXX/1.2, open deep sea between Svalbard and Greenland, 125 km from the coast, 2620 m depth, multicorer, 0-5 cm

Sampling area	Sample name	Sampling location	Sampling date	$f_{oc}$ [kg <sub>oc</sub> /kg <sub>sed</sub> ]	Characteristics
European Arctic	pooled sample ARK_EG1+2	N78°59,47'- N78°56,03' W5°27,05'-W4°38,59'	07/2016	0.011	Marine, ARK-XXX/1.2, open deep sea between Svalbard and Greenland, 340-350 km from the coast, 981-1551 m depth, multicorer, 0-5 cm
European Arctic	ARK_EG3	N78°51,31' W3°57,33'	07/2016	0.011	Marine, ARK-XXX/1.2, open deep sea between Svalbard and Greenland, 320 km from the coast, 1982 m depth, multicorer, 0-5 cm
Germany	DE_Marina	N49°14,25'E6°59,49'	06/2015	0.050	Freshwater, River Saar, harbor, stream Brebach joins, close to a sewage treatment plant, van Veen grab sampler, 0-20 cm
Germany	DE_Saarbrücken	N49°14,25' E6°59,49'	06/2015	0.029	Freshwater, River Saar, barrage, van Veen grab sampler, 0-20 cm
Germany	DE_Völklingen	N49°15,20'E6°51,32'	06/2015	0.072	Freshwater, River Saar, harbor, stream Rossel joins, van Veen grab sampler, 0-20 cm
Germany	DE_Lisdorf	N49°17,56'E6°45,24'	06/2015	0.043	Freshwater, River Saar, barrage, van Veen grab sampler, 0-20 cm
Germany	DE_Dillingen	N48°34,45'E10°29,38'	06/2015	0.034	Freshwater, River Saar, harbor, stream Prims joins, van Veen grab sampler, 0-20 cm
Germany	DE_Rehlingen	N49°21,49'E6°41,32'	06/2015	0.069	Freshwater, River Saar, barrage, van Veen grab sampler, 0-20 cm
Germany	DE_Mettlach	N49°29,44'E6°35,0'	06/2015	0.073	Freshwater, River Saar, barrage in Saar loop, van Veen grab sampler, 0-20 cm
Germany	DE_Schoden	N49°38,14'E6°34,46'	06/2015	0.048	Freshwater, River Saar, barrage, van Veen grab sampler, 0-20 cm
Germany	DE_Konzerbrück	N49°41,42' 6°33,57'	06/2015	0.052	Freshwater, River Saar, mouth into River Mosel, van Veen grab sampler, 0-20 cm
Germany	DE_Trier	N49°44,59' 6°38,14'	06/2015	0.050	Freshwater, River Mosel, van Veen grab sampler, 0-20 cm
Sweden	SE_Klara Sjö	N59°20,11' E18°02,21'	08/2016	0.017	Freshwater, PAH contamination originating from former gas works and creosote production, Stockholm, former remediation activity, gravity corer, 0-5 cm
Sweden	SE_Alöfjärden	N58°40,45' E17°8,28'	09/2016	0.069	Brackish water, contaminated Baltic Sea bay next to an active steelworks site, approx. 100 km south of Stockholm, gravity corer, 0-5 cm
Sweden	SE_Nordmalingsfjärden	N63°30,11' E19°31,65'	09/2016	0.036	Brackish water, Rundvik industrial area, long tradition of wood-related industry near Umeå, gravity corer, 0-5 cm
Sweden	SE_Oxundasjön	N59°33,13' E17°52,26'	09/2016	0.076	Freshwater, Upplands Väsby, site contaminated with PCBs (unknown origin), gravity corer, 0-5 cm

32 **Table S2.** Overview of the applied bioassays, the positive reference compounds and their EC values.

Endpoint	Assay name	Method reference	Positive reference compound	EC value	Positive reference compound EC value $\pm$ SE
Activation of arylhydrocarbon receptor	AhR CALUX	2	2,3,7,8-tetrachloro dibenzo dioxin (TCDD)	EC <sub>10</sub>	$(1.68 \pm 0.02) 10^{-4}$ $\mu\text{g}_{\text{TCDD}}/\text{L}_{\text{bioassay}}$
Oxidative stress response	AREc32	3, 4	<i>tert</i> -butylhydroquinone (tBHQ)	EC <sub>IR1.5</sub>	$0.353 \pm 0.004$ $\text{mg}_{\text{tBHQ}}/\text{L}_{\text{bioassay}}$
Binding to peroxisome proliferator activated receptor gamma (PPAR $\gamma$ )	PPAR $\gamma$ -bla	5	rosiglitazone	EC <sub>10</sub>	$0.267 \pm 0.019$ $\mu\text{g}_{\text{Rosiglitazone}}/\text{L}_{\text{bioassay}}$
Activation of estrogen receptor (ER)	ER $\alpha$ GeneBLAzer	6	17 $\beta$ -estradiol	EC <sub>10</sub>	$2.41 \pm 0.13$ $\text{ng}_{\text{Estradiol}}/\text{L}_{\text{bioassay}}$
Activation of androgen receptor (AR)	AR GeneBLAzer	6	metribolone (R1881)	EC <sub>10</sub>	$(2.18 \pm 0.09) 10^{-2}$ $\mu\text{g}_{\text{R1881}}/\text{L}_{\text{bioassay}}$
Activation of glucocorticoid receptor (GR)	GR GeneBLAzer	6	dexamethasone	EC <sub>10</sub>	$0.112 \pm 0.002$ $\mu\text{g}_{\text{Dexamethasone}}/\text{L}_{\text{bioassay}}$
Activation of progesterone receptor (PR)	PR GeneBLAzer	6	promegestone	EC <sub>10</sub>	$(6.90 \pm 0.18) 10^{-3}$ $\mu\text{g}_{\text{Progesterone}}/\text{L}_{\text{bioassay}}$

33 EC effect concentration

34 IR induction ratio

35

36 **Table S3.** Blank-corrected toxic units (TUs) for sediment processed using passive equilibrium sampling (PES) for the active  
 37 bioassays [ $L_{\text{bioassay}}/\text{kg}_{\text{silicone}}$ ] and their associated standard errors (SE).

Sample name	TU <sub>AhR</sub>	SE TU <sub>AhR</sub>	TU <sub>AREc32</sub>	SE TU <sub>AREc32</sub>	TU <sub>PPARy</sub>	SE TU <sub>PPARy</sub>	TU <sub>ERα</sub>	SE TU <sub>ERα</sub>
SE_Älöfjärden	3.50E+05	1.21E+07	1.02E+03	2.86E+04	4.44E+02	9.39E+03	3.36E+01	2.31E+01
SE_Oxundasjön	4.97E+04	4.64E+05	2.04E+02	4.37E+03	n.a.	n.a.	n.a.	n.a.
SE_Nordmalingsfjärden	4.47E+03	4.40E+04	7.04E+01	1.30E+03	1.06E+02	9.66E+02	n.a.	n.a.
SE_Klara Sjö	5.33E+05	8.56E+06	4.08E+02	6.33E+03	1.07E+03	2.21E+04	n.a.	n.a.
ARK_N4	2.96E+03	5.13E+04	1.01E+02	2.20E+03	3.70E+01	4.06E+02	n.a.	n.a.
ARK_EG1+2	2.61E+03	5.61E+04	3.99E+01	9.87E+02	5.09E+01	4.50E+02	n.a.	n.a.
ARK_EG3	1.87E+03	3.26E+04	4.75E+01	1.15E+03	2.79E+01	1.46E+02	n.a.	n.a.
ARK_Svalbard-HS	2.36E+03	4.18E+04	1.30E+02	2.18E+03	2.43E+02	3.90E+03	7.32E+01	8.20E+01
ARK_Svalbard-RF2	2.29E+03	2.72E+04	1.10E+02	2.67E+03	1.62E+02	3.33E+03	4.03E+01	2.96E+01
ARK_Svalbard-HL1	2.35E+03	3.98E+04	2.10E+02	4.22E+03	1.49E+02	2.35E+03	3.37E+01	2.39E+01
ARK_Svalbard-HL2	5.22E+03	1.19E+05	1.92E+02	2.74E+03	2.37E+02	3.98E+03	1.12E+02	6.72E+01
ARK_Svalbard-KF4	6.10E+03	2.03E+05	1.09E+02	2.04E+03	1.13E+02	1.62E+03	3.28E+01	1.74E+01
ARK_Svalbard-WLH	2.37E+03	3.23E+04	2.24E+02	3.25E+03	3.40E+02	5.92E+03	6.59E+01	3.34E+01
AUS_Gladstone Harbour	n.a.	n.a.	1.55E+02	4.23E+03	1.09E+02	1.17E+03	n.a.	n.a.
AUS_Calliope River	1.32E+03	1.51E+04	6.30E+01	1.83E+03	7.93E+01	8.21E+02	n.a.	n.a.
AUS_Brisbane River	3.24E+04	3.96E+05	2.65E+02	3.21E+03	n.a.	n.a.	n.a.	n.a.
AUS_Daintree River	n.a.	n.a.	5.38E+01	6.83E+02	7.55E+01	8.02E+02	n.a.	n.a.
DE_Marina	2.29E+04	3.08E+05	5.45E+02	3.52E+03	2.17E+02	4.43E+03	n.a.	n.a.
DE_Saarbrücken	3.18E+03	4.59E+04	1.75E+02	2.29E+03	1.61E+02	3.13E+03	n.a.	n.a.
DE_Völklingen	3.29E+03	2.83E+04	n.a.	n.a.	1.11E+03	1.79E+04	n.a.	n.a.
DE_Lisdorf	3.77E+03	4.84E+04	7.29E+02	4.97E+03	4.91E+02	5.83E+03	n.a.	n.a.
DE_Dillingen	1.40E+04	8.54E+04	1.73E+02	2.09E+03	2.44E+02	4.70E+03	n.a.	n.a.
DE_Rehlingen	5.05E+04	1.05E+06	3.29E+02	4.29E+03	1.18E+02	2.34E+03	BLANK>50 %	BLANK>50 %
DE_Mettlach	2.41E+03	3.68E+04	n.a.	n.a.	9.23E+02	1.04E+04	n.a.	n.a.
DE_Schoden	1.51E+04	3.01E+05	9.48E+01	9.42E+02	2.47E+02	5.70E+03	n.a.	n.a.
DE_Konzerbrück	5.18E+03	6.76E+04	3.22E+02	3.82E+03	1.38E+02	3.06E+03	n.a.	n.a.
DE_Trier	1.95E+04	1.97E+05	n.a.	n.a.	8.24E+02	1.37E+04	n.a.	n.a.

38 n.a. not analyzed

39 BLANK>50 % If the TU of the weighted blank was larger than 50 % of the TU of the sample, this sample was excluded from further data analysis.

40 **Table S4.** Blank-corrected toxic units (TUs) for sediment processed using accelerated solvent extraction (ASE) for the active  
 41 bioassays [ $L_{\text{bioassay}}/\text{kg}_{\text{sediment}}$ ] and their associated standard errors (SE).

Sample name	TU <sub>AhR</sub>	SE TU <sub>AhR</sub>	TU <sub>AREc32</sub>	SE TU <sub>AREc32</sub>	TU <sub>PPAR<math>\gamma</math></sub>	SE TU <sub>PPAR<math>\gamma</math></sub>	TU <sub>ER<math>\alpha</math></sub>	SE TU <sub>ER<math>\alpha</math></sub>
SE_Älöfjärden (1)	1.09E+05	1.38E+06	4.89E+02	9.17E+03	1.70E+01	3.30E+02	n.a.	n.a.
SE_Älöfjärden (2)	4.48E+04	4.07E+05	1.80E+02	2.28E+03	1.21E+01	1.62E+02	n.a.	n.a.
SE_Älöfjärden (3)	1.41E+05	3.89E+06	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
SE_Oxundasjön (1)	7.52E+02	1.60E+04	6.49E+01	1.20E+03	6.57E+01	1.33E+03	n.a.	n.a.
SE_Oxundasjön (2)	2.95E+03	2.70E+04	2.84E+01	4.98E+02	5.85E+01	1.48E+03	n.a.	n.a.
SE_Oxundasjön (3)	4.92E+03	1.19E+05	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
SE_Nordmalingsfjärden (1)	n.a.	n.a.	2.23E+01	4.02E+02	1.03E+01	8.07E+01	n.a.	n.a.
SE_Nordmalingsfjärden (2)	n.a.	n.a.	1.01E+01	1.30E+02	1.16E+01	1.26E+02	n.a.	n.a.
SE_Nordmalingsfjärden (3)	4.95E+02	5.18E+03	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
SE_Klara Sjö (1)	1.01E+05	1.20E+06	3.36E+02	4.03E+03	1.25E+02	2.29E+03	n.a.	n.a.
SE_Klara Sjö (2)	4.63E+05	5.57E+06	1.27E+03	2.69E+04	1.87E+02	3.95E+03	2.79E+00	1.92E+00
SE_Klara Sjö (3)	7.45E+03	2.91E+04	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ARK_N4 (1)	3.85E+03	1.41E+05	2.99E+01	5.76E+02	n.a.	n.a.	n.a.	n.a.
ARK_N4 (2)	9.55E+02	6.70E+03	1.39E+02	3.48E+03	8.74E+00	7.58E+01	BLANK>50 %	BLANK>50 %
ARK_N4 (3)	1.20E+03	3.09E+04	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ARK_EG 1+2 (1)	n.a.	n.a.	1.02E+01	5.52E+01	n.a.	n.a.	n.a.	n.a.
ARK_EG 1+2 (2)	n.a.	n.a.	4.62E+01	6.47E+02	n.a.	n.a.	n.a.	n.a.
ARK_EG 1+2 (3)	5.23E+02	5.64E+03	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ARK_EG 3 (1)	n.a.	n.a.	5.94E+01	1.31E+03	n.a.	n.a.	1.08E+02	4.09E+01
ARK_EG 3 (2)	n.a.	n.a.	4.60E+01	7.23E+02	n.a.	n.a.	n.a.	n.a.
ARK_EG 3 (3)	BLANK>50 %	BLANK>50 %	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ARK_Svalbard-HS (1)	n.a.	n.a.	9.86E+02	1.66E+04	3.26E+01	6.38E+02	1.24E+01	8.33E+00
ARK_Svalbard-HS (2)	n.a.	n.a.	1.55E+02	2.22E+03	8.69E+00	8.82E+01	2.73E+00	2.60E+00
ARK_Svalbard-HS (3)	1.12E+04	8.66E+04	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ARK_Svalbard-RF2 (1)	n.a.	n.a.	1.19E+02	1.62E+03	1.97E+01	3.16E+02	BLANK>50 %	BLANK>50 %
ARK_Svalbard-RF2 (2)	n.a.	n.a.	9.10E+01	2.43E+03	2.00E+01	3.42E+02	n.a.	n.a.
ARK_Svalbard-RF2 (3)	2.40E+03	2.95E+04	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ARK_Svalbard-HL1 (1)	n.a.	n.a.	8.87E+01	2.05E+03	1.72E+01	2.97E+02	n.a.	n.a.
ARK_Svalbard-HL1 (2)	n.a.	n.a.	2.91E+01	4.45E+02	3.62E+01	4.82E+02	4.47E+00	5.65E+00
ARK_Svalbard-HL1 (3)	2.05E+03	2.38E+04	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ARK_Svalbard-HL2 (1)	n.a.	n.a.	9.00E+01	1.76E+03	1.60E+01	2.18E+02	1.19E+01	8.95E+00
ARK_Svalbard-HL2 (2)	n.a.	n.a.	3.05E+01	2.31E+02	1.26E+01	1.69E+02	1.20E+01	9.64E+00
ARK_Svalbard-HL2 (3)	1.35E+03	8.21E+03	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

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Sample name	TU <sub>AhR</sub>	SE TU <sub>AhR</sub>	TU <sub>AREc32</sub>	SE TU <sub>AREc32</sub>	TU <sub>PPARy</sub>	SE TU <sub>PPARy</sub>	TU <sub>ERα</sub>	SE TU <sub>ERα</sub>
ARK_Svalbard-KF4 (1)	n.a.	n.a.	1.04E+02	1.63E+03	1.28E+01	1.44E+02	n.a.	n.a.
ARK_Svalbard-KF4 (2)	n.a.	n.a.	8.02E+01	1.28E+03	2.89E+01	4.65E+02	1.15E+01	8.75E+00
ARK_Svalbard-KF4 (3)	5.74E+03	5.24E+04	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ARK_Svalbard-WLH (1)	4.05E+02	2.63E+03	3.07E+01	4.80E+02	8.85E+00	1.11E+02	n.a.	n.a.
ARK_Svalbard-WLH (2)	3.27E+02	5.18E+03	3.83E+01	6.00E+02	n.a.	n.a.	n.a.	n.a.
ARK_Svalbard-WLH (3)	8.88E+03	1.09E+05	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
AUS_Gladstone Harbor (1)	n.a.	n.a.	1.25E+01	2.67E+02	7.11E+00	6.59E+01	n.a.	n.a.
AUS_Gladstone Harbor (2)	1.11E+03	5.10E+03	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
AUS_Calliope River (1)	2.26E+02	2.75E+03	1.27E+01	2.60E+02	6.16E+00	4.34E+01	n.a.	n.a.
AUS_Calliope River (2)	3.18E+02	2.23E+03	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
AUS_Brisbane River (1)	1.91E+03	1.91E+04	3.23E+01	1.15E+03	n.a.	n.a.	n.a.	n.a.
AUS_Brisbane River (2)	4.14E+03	3.02E+04	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
AUS_Daintree River (1)	n.a.	n.a.	8.46E+00	2.48E+02	1.87E+01	2.36E+02	n.a.	n.a.
AUS_Daintree River (2)	1.25E+02	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
DE_Marina (1)	n.a.	n.a.	1.40E+02	2.93E+03	5.78E+01	6.48E+02	n.a.	n.a.
DE_Marina (2)	1.23E+04	2.24E+05	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
DE_Saarbrücken (1)	n.a.	n.a.	3.96E+02	6.32E+03	4.79E+01	6.78E+02	3.53E+00	4.26E+00
DE_Saarbrücken (2)	7.62E+04	8.16E+05	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
DE_Völklingen (1)	n.a.	n.a.	3.01E+02	3.95E+03	6.84E+01	9.83E+02	7.96E+00	7.65E+00
DE_Völklingen (2)	1.99E+04	4.93E+05	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
DE_Lisdorf (1)	6.72E+03	8.96E+04	7.96E+02	1.25E+04	4.54E+01	8.00E+02	4.47E+00	7.30E+00
DE_Lisdorf (2)	2.28E+04	5.81E+05	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
DE_Dillingen (1)	n.a.	n.a.	2.51E+02	5.37E+03	1.24E+01	1.35E+02	n.a.	n.a.
DE_Dillingen (2)	3.00E+03	2.28E+04	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
DE_Rehlingen (1)	4.53E+04	4.67E+05	4.54E+02	9.49E+03	6.74E+01	9.97E+02	3.06E+00	5.39E+00
DE_Rehlingen (2)	1.35E+03	9.26E+03	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
DE_Mettlach (1)	8.11E+03	1.16E+05	2.22E+02	3.11E+03	1.10E+02	1.49E+03	1.03E+01	9.25E+00
DE_Mettlach (2)	9.01E+03	4.87E+04	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
DE_Schoden (1)	n.a.	n.a.	9.58E+01	1.93E+03	3.22E+01	5.22E+02	n.a.	n.a.
DE_Schoden (2)	6.88E+03	5.79E+04	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
DE_Konzerbrück (1)	n.a.	n.a.	7.22E+01	1.24E+03	2.97E+01	3.44E+02	3.86E+00	5.93E+00
DE_Konzerbrück (2)	1.10E+05	2.07E+06	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
DE_Trier (1)	n.a.	n.a.	7.40E+02	1.61E+04	5.18E+01	8.20E+02	5.83E+00	5.90E+00
DE_Trier (2)	4.84E+04	6.28E+05	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

43 n.a. not analyzed

44 BLANK>50 % If the TU of the weighted blank was larger than 50 % of the TU of the sample, this sample was excluded from further data analysis.

45 **Table S5.** Bioanalytical equivalent concentrations (BEQs) for sediment processed using passive equilibrium sampling (PES)  
 46 for the active bioassays and their respective standard errors (SE).

Sample name	BEQ <sub>AHR</sub> µg <sub>TCDD</sub> /kg <sub>OC</sub>	SE BEQ <sub>AHR</sub> µg <sub>TCDD</sub> /kg <sub>OC</sub>	BEQ <sub>AREc32</sub> mg <sub>tBHQ</sub> /kg <sub>OC</sub>	SE BEQ <sub>AREc32</sub> mg <sub>tBHQ</sub> /kg <sub>OC</sub>	BEQ <sub>PPARγ</sub> µg <sub>Rosiglitazone</sub> / kg <sub>OC</sub>	SE BEQ <sub>PPARγ</sub> µg <sub>Rosiglitazone</sub> / kg <sub>OC</sub>
SE_Ålöfjärden	1.18E+02	3.83E+00	7.17E+02	2.68E+01	2.37E+02	2.03E+01
SE_Oxundasjön	1.67E+01	1.81E+00	1.44E+02	6.93E+00	n.a.	n.a.
SE_Nordmalingsfjärden	1.51E+00	1.54E-01	4.97E+01	2.76E+00	5.66E+01	7.40E+00
SE_Klara Sjö	1.80E+02	1.15E+01	2.88E+02	1.88E+01	5.72E+02	4.94E+01
ARK_N4	9.96E-01	5.93E-02	7.09E+01	3.35E+00	1.98E+01	2.29E+00
ARK_EG1+2	8.78E-01	4.29E-02	2.81E+01	1.19E+00	2.72E+01	3.64E+00
ARK_EG3	6.31E-01	3.75E-02	3.35E+01	1.44E+00	1.49E+01	3.04E+00
ARK_Svalbard-HS	7.96E-01	4.66E-02	9.14E+01	5.53E+00	1.30E+02	1.23E+01
ARK_Svalbard-RF2	7.70E-01	6.58E-02	7.76E+01	3.32E+00	8.67E+01	7.51E+00
ARK_Svalbard-HL1	7.92E-01	4.82E-02	1.48E+02	7.54E+00	7.95E+01	7.59E+00
ARK_Svalbard-HL2	1.76E+00	8.18E-02	1.36E+02	9.65E+00	1.27E+02	1.18E+01
ARK_Svalbard-KF4	2.06E+00	6.91E-02	7.72E+01	4.24E+00	6.04E+01	6.03E+00
ARK_Svalbard-WLH	7.97E-01	5.97E-02	1.58E+02	1.11E+01	1.82E+02	1.67E+01
AUS_Gladstone Harbour	n.a.	n.a.	1.09E+02	4.19E+00	5.80E+01	6.78E+00
AUS_Calliope River	4.44E-01	3.92E-02	4.44E+01	1.61E+00	4.24E+01	5.09E+00
AUS_Brisbane River	1.09E+01	9.11E-01	1.87E+02	1.56E+01	n.a.	n.a.
AUS_Daintree River	n.a.	n.a.	3.79E+01	3.02E+00	4.04E+01	4.77E+00
DE_Marina	7.73E+00	5.87E-01	3.84E+02	5.96E+01	1.16E+02	1.01E+01
DE_Saarbrücken	1.07E+00	7.57E-02	1.23E+02	9.53E+00	8.62E+01	7.60E+00
DE_Völklingen	1.11E+00	1.30E-01	n.a.	n.a.	5.96E+02	5.65E+01
DE_Lisdorf	1.27E+00	1.01E-01	5.14E+02	7.57E+01	2.62E+02	2.90E+01
DE_Dillingen	4.72E+00	7.77E-01	1.22E+02	1.02E+01	1.31E+02	1.15E+01
DE_Rehlingen	1.70E+01	8.59E-01	2.32E+02	1.80E+01	6.29E+01	5.50E+00
DE_Mettlach	8.12E-01	5.45E-02	n.a.	n.a.	4.93E+02	5.62E+01
DE_Schoden	5.08E+00	2.65E-01	6.69E+01	6.77E+00	1.32E+02	1.10E+01
DE_Konzerbrück	1.75E+00	1.36E-01	2.27E+02	1.94E+01	7.38E+01	6.24E+00
DE_Trier	6.57E+00	6.58E-01	n.a.	n.a.	4.40E+02	4.12E+01

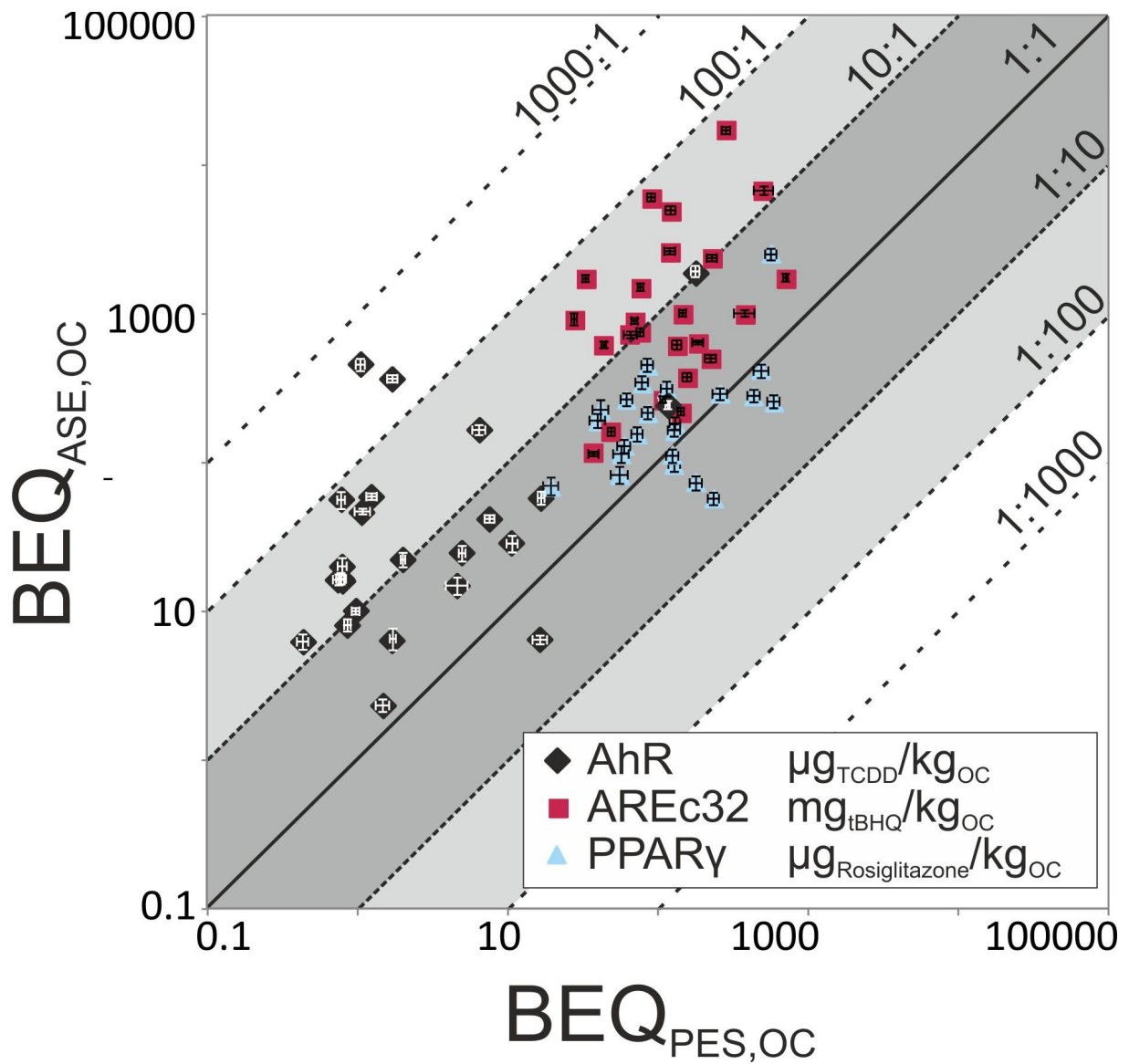
47 n.a. not analyzed



48 **Table S6.** Bioanalytical equivalent concentrations (BEQs) for sediment processed using accelerated solvent extraction (ASE)  
 49 for the active bioassays and their respective standard errors (SE).

Sample name	BEQ <sub>Ahr</sub> µg <sub>TCDD</sub> /kg <sub>OC</sub>	SE BEQ <sub>Ahr</sub> µg <sub>TCDD</sub> /kg <sub>OC</sub>	BEQ <sub>AREc32</sub> mg <sub>tBHQ</sub> /kg <sub>OC</sub>	SE BEQ <sub>AREc32</sub> mg <sub>tBHQ</sub> /kg <sub>OC</sub>	BEQ <sub>PPARγ</sub> µg <sub>Rosiglitazone</sub> / kg <sub>OC</sub>	SE BEQ <sub>PPARγ</sub> µg <sub>Rosiglitazone</sub> / kg <sub>OC</sub>
SE_Ålöfjärden	2.40E+02	1.56E+01	1.71E+03	1.05E+02	5.64E+01	5.33E+00
SE_Oxundasjön	6.37E+00	4.28E-01	2.17E+02	1.22E+01	2.18E+02	1.84E+01
SE_Nordmalingsfjärden	2.32E+00	2.24E-01	1.59E+02	1.00E+01	8.14E+01	1.07E+01
SE_Klara Sjö	1.89E+03	1.64E+02	1.66E+04	9.31E+02	2.45E+03	2.14E+02
ARK_N4	9.91E+00	5.07E-01	8.78E+02	3.84E+01	6.87E+01	9.32E+00
ARK_EG1+2	8.01E+00	7.52E-01	9.04E+02	8.39E+01	n.a.	n.a.
ARK_EG3	n.a.	n.a.	1.69E+03	9.24E+01	n.a.	n.a.
ARK_Svalbard-HS	5.52E+01	7.16E+00	5.92E+03	3.68E+02	1.62E+02	1.54E+01
ARK_Svalbard-RF2	1.61E+01	1.33E+00	1.48E+03	8.73E+01	2.12E+02	1.99E+01
ARK_Svalbard-HL1	1.64E+01	1.44E+00	9.89E+02	4.96E+01	3.40E+02	3.40E+01
ARK_Svalbard-HL2	6.49E+00	1.07E+00	6.07E+02	4.42E+01	1.09E+02	1.12E+01
ARK_Svalbard-KF4	2.20E+01	2.43E+00	7.38E+02	4.74E+01	1.27E+02	1.28E+01
ARK_Svalbard-WLH	1.64E+01	1.40E+00	3.69E+02	2.40E+01	7.17E+01	7.68E+00
AUS_Gladstone Harbour	1.10E+01	2.39E+00	2.61E+02	1.26E+01	1.12E+02	1.46E+01
AUS_Calliope River	6.19E+00	7.34E-01	6.06E+02	3.04E+01	2.23E+02	3.54E+01
AUS_Brisbane River	2.81E+01	3.55E+00	6.29E+02	1.92E+01	n.a.	n.a.
AUS_Daintree River	7.93E-01	2.93E-01	1.13E+02	4.07E+00	1.88E+02	2.01E+01
DE_Marina	4.13E+01	2.35E+00	9.86E+02	4.87E+01	3.08E+02	3.52E+01
DE_Saarbrücken	4.46E+02	4.22E+01	4.85E+03	3.09E+02	4.45E+02	4.47E+01
DE_Völklingen	4.62E+01	1.99E+00	1.46E+03	1.13E+02	2.52E+02	2.52E+01
DE_Lisdorf	5.82E+01	2.91E+00	6.57E+03	4.25E+02	2.84E+02	2.59E+01
DE_Dillingen	1.47E+01	1.95E+00	2.58E+03	1.24E+02	9.64E+01	1.12E+01
DE_Rehlingen	5.70E+01	5.68E+00	2.32E+03	1.14E+02	2.61E+02	2.57E+01
DE_Mettlach	1.99E+01	2.61E+00	1.08E+03	7.80E+01	4.05E+02	4.17E+01
DE_Schoden	2.43E+01	2.91E+00	7.08E+02	3.61E+01	1.80E+02	1.71E+01
DE_Konzerbrück	3.59E+02	1.99E+01	4.91E+02	2.91E+01	1.53E+02	1.71E+01
DE_Trier	1.63E+02	1.28E+01	5.21E+03	2.46E+02	2.76E+02	2.64E+01

50 n.a. not analyzed

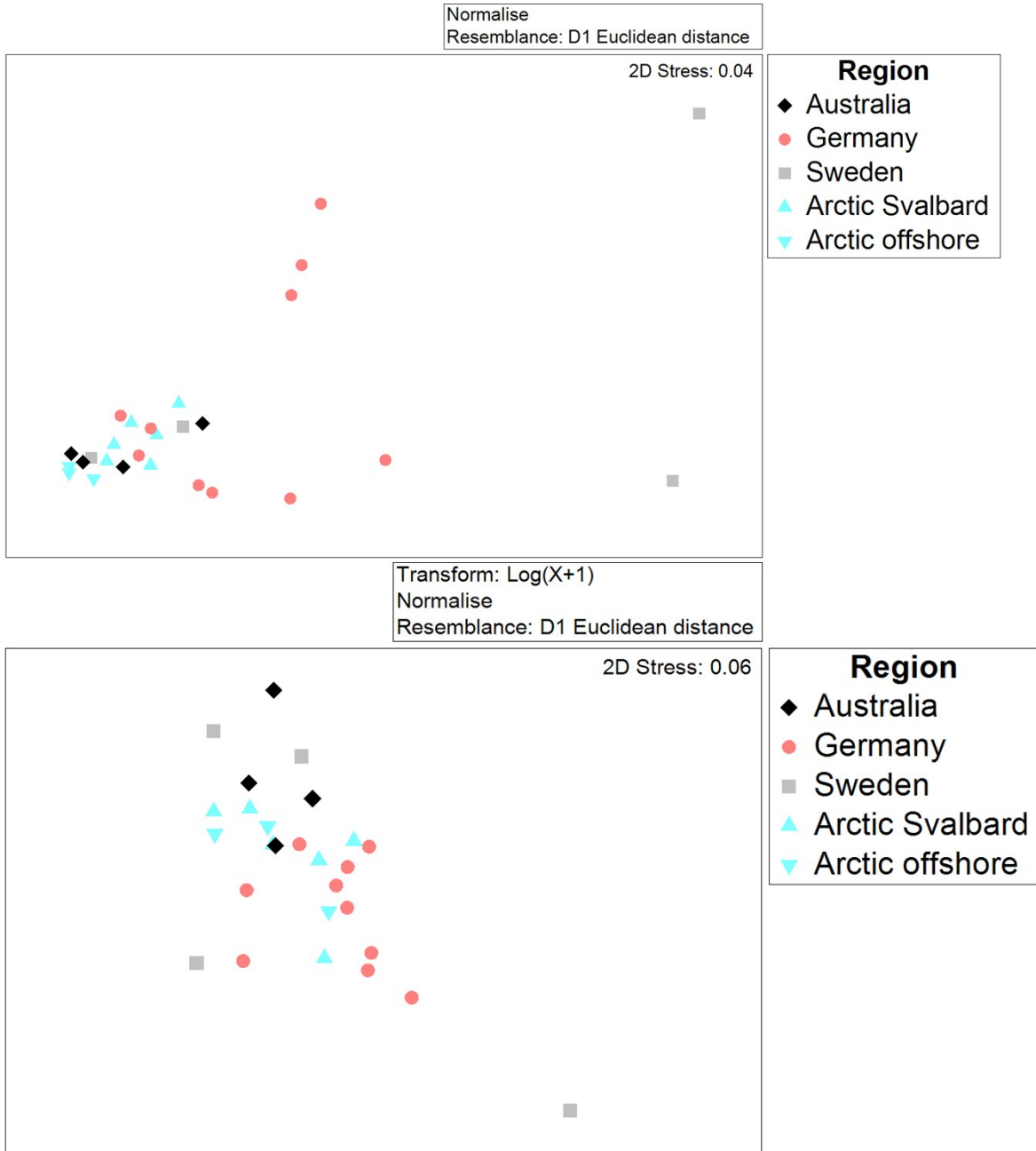


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52 **Figure S1. Bioanalytical equivalent concentrations (BEQ) from ASE vs. silicone-based PES,**  
 53 **normalized to OC. The 1:1 line indicates that the complete contaminant mixture captured by ASE**  
 54 **was also captured by PES, whereas the broken lines mark differences of 1-3 orders of magnitude**  
 55 **in both directions. Error bars represent the standard errors, plotted on top of the symbols for**  
 56 **visualization.**

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*Figure S2. Results of the statistical testing, multidimensional scaling (MDS) plots of the BEQs derived from PES (upper panel) and ASE (lower panel). For details, see the main manuscript.*

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