CERTIFICATE OF ANALYSIS

Work Order	: **PR2477609**	Issue Date	: 11-Jul-2024
Customer	: **ALS Laboratory Services doo**	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: Milica Bozovic	Contact	: Client Service
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Project	: Dioxin emission analyses	Page	: 1 of 3
Order number	: ----	Date Samples Received	: 24-Jun-2024
		Quote number	: PR2023ALSLA-RS0001 (CZ-251-23-0421)
Site	: Serbia	Date of test	: 27-Jun-2024 - 11-Jul-2024
Sampled by	: customer	QC Level	: ALS CR Standard Quality Control Schedule

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory. The laboratory is not responsible for the sample data supplied by the customer and their impact on the validity of the result.
The laboratory declares that the test results relate only to the listed samples. If "ALS" is not included in the test report in the "Sampled by" section, then the results refer to the sample as received.

Responsible for accuracy

Testing Laboratory No. 1163
Accredited by CAI according to
CSN EN ISO/IEC 17025:2018

Signatories	*Position*
Lubomír Pokorný	Country Manager

The company is certified according to ČSN EN ISO 14001 (Environmental management systems) and ČSN ISO 45001 (Occupational health and safety management systems)

Analytical Results

Sub-Matrix: **AIR**

				Client sample ID	5		6		----	
				Laboratory sample ID	PR2477609001		PR2477609002		----	
				Client sampling date / time	[24-Jun-2024]		[24-Jun-2024]		----	
Parameter	*Method*	*LOR*	*Unit*	**Result**	**MU**	**Result**	**MU**	**Result**	**MU**
PCDDs and PCDFs (Dioxins and Furans)									
2378-TCDD	A-DFHMS02	-	ng/sample	**0.390**	± 30.0%	**0.0760**	± 30.0%	**----**	----
12378-PeCDD	A-DFHMS02	-	ng/sample	**3.90**	± 30.0%	**0.450**	± 30.0%	**----**	----
123478-HxCDD	A-DFHMS02	-	ng/sample	**4.10**	± 30.0%	**0.260**	± 30.0%	**----**	----
123678-HxCDD	A-DFHMS02	-	ng/sample	**9.80**	± 30.0%	**0.790**	± 30.0%	**----**	----
123789-HxCDD	A-DFHMS02	-	ng/sample	**4.80**	± 30.0%	**0.410**	± 30.0%	**----**	----
1234678-HpCDD	A-DFHMS02	-	ng/sample	**41.0**	± 30.0%	**3.40**	± 30.0%	**----**	----
OCDD	A-DFHMS02	-	ng/sample	**18.0**	± 30.0%	**1.70**	± 30.0%	**----**	----
2378-TCDF	A-DFHMS02	-	ng/sample	**7.40**	± 30.0%	**0.980**	± 30.0%	**----**	----
12378-PeCDF	A-DFHMS02	-	ng/sample	**8.40**	± 30.0%	**0.540**	± 30.0%	**----**	----
23478-PeCDF	A-DFHMS02	-	ng/sample	**10.0**	± 30.0%	**0.890**	± 30.0%	**----**	----
123478-HxCDF	A-DFHMS02	-	ng/sample	**10.0**	± 30.0%	**0.550**	± 30.0%	**----**	----
123678-HxCDF	A-DFHMS02	-	ng/sample	**11.0**	± 30.0%	**0.830**	± 30.0%	**----**	----
123789-HxCDF	A-DFHMS02	-	ng/sample	**3.10**	± 30.0%	**0.0950**	± 30.0%	**----**	----
234678-HxCDF	A-DFHMS02	-	ng/sample	**19.0**	± 30.0%	**0.920**	± 30.0%	**----**	----
1234678-HpCDF	A-DFHMS02	-	ng/sample	**21.0**	± 30.0%	**1.50**	± 30.0%	**----**	----
1234789-HpCDF	A-DFHMS02	-	ng/sample	**1.80**	± 30.0%	**0.180**	± 30.0%	**----**	----
OCDF	A-DFHMS02	-	ng/sample	**2.80**	± 30.0%	**0.240**	± 30.0%	**----**	----
TEQ-Lowerbound	A-DFHMS02	-	ng/sample	**15**	----	**1.3**	----	**----**	----
TEQ-Upperbound	A-DFHMS02	-	ng/sample	**15**	----	**1.3**	----	**----**	----
PCB dioxin-like HRMS									
PCB 77	A-PCBHMS03	-	ng/sample	**28.0**	± 30.0%	**9.20**	± 30.0%	**----**	----
PCB 81	A-PCBHMS03	-	ng/sample	**6.90**	± 30.0%	**1.80**	± 30.0%	**----**	----
PCB 105	A-PCBHMS03	-	ng/sample	**23.0**	± 30.0%	**9.10**	± 30.0%	**----**	----
PCB 114	A-PCBHMS03	-	ng/sample	<4.7	----	<1.8	----	**----**	----
PCB 118	A-PCBHMS03	-	ng/sample	**11.0**	± 30.0%	**7.80**	± 30.0%	**----**	----
PCB 123	A-PCBHMS03	-	ng/sample	<4.9	----	<2	----	**----**	----
PCB 126	A-PCBHMS03	-	ng/sample	**24.0**	± 30.0%	**4.40**	± 30.0%	**----**	----
PCB 156	A-PCBHMS03	-	ng/sample	**13.0**	± 30.0%	**3.50**	± 30.0%	**----**	----
PCB 157	A-PCBHMS03	-	ng/sample	**10.0**	± 30.0%	**2.90**	± 30.0%	**----**	----
PCB 167	A-PCBHMS03	-	ng/sample	<4.4	----	<1.8	----	**----**	----
PCB 169	A-PCBHMS03	-	ng/sample	**11.0**	± 30.0%	**1.60**	± 30.0%	**----**	----
PCB 170	A-PCBHMS03	-	ng/sample	**14.0**	± 30.0%	**6.00**	± 30.0%	**----**	----
PCB 180	A-PCBHMS03	-	ng/sample	**9.20**	± 30.0%	**8.20**	± 30.0%	**----**	----
PCB 189	A-PCBHMS03	-	ng/sample	**8.00**	± 30.0%	<2.3	----	**----**	----
TEQ (dl-PCB) - lower	A-PCBHMS03	-	ng/sample	**2.7**	----	**0.49**	----	**----**	----
TEQ (dl-PCB) - upper	A-PCBHMS03	-	ng/sample	**2.7**	----	**0.49**	----	**----**	----

When sampling date is not provided by the client, the laboratory determines it for procedural reasons, then it is equal to the date of receipt of the sample to the laboratory and is displayed in brackets. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.
Key: LOR = Limit of reporting; MU = Measurement Uncertainty. The MU does not include sampling uncertainty.

Brief Method Summaries

Analytical Methods	*Method Descriptions*
Location of test performance: V Raji 906 Pardubice - Zelene Predmesti Czech Republic 530 02	
A-DFHMS02	CZ_SOP_D06_06_174 (CSN EN 1948-2, CSN EN 1948-3): Determination of polychlorinated dibenzo-p-dioxins and dibenzofuranes in emission samples by isotope dilution method using HRGC-HRMS and calculation of TEQ parameters from measured values. The samples were stored in laboratory in the darkness and under temperature <4°C. Actual LOQ are noticed in the attachment.

Analytical Methods	*Method Descriptions*
A-PCBHMS03	CZ_SOP_D06_06_179 (ČSN EN 1948-4, US EPA Method TO-4A) Determination of PCB by isotope dilution method using HRGC-HRMS and calculation of PCB sums from measured values. The samples were stored in laboratory in the darkness and under temperature <4°C. Actual LOQ are noticed in the annex.

Preparation Methods	*Method Descriptions*
Location of test performance: V Raji 906 Pardubice - Zelene Predmesti Czech Republic 530 02	
* A-PP-XAD	Preparation of cleaned XAD-2 sorbent dose for emission sampling

The symbol "*" for the method indicates a test outside the scope of accreditation of the laboratory or subcontractor. If the UNICO-SUB code is stated in the method table, this only informs that the tests have been performed by a subcontractor and the results are given in an annex to the test report, including information on test accreditation. If the lab used for matrix outside the scope of accreditation or non-standard sample matrix procedure specified in the accredited method and issues non-accredited results, this fact is stated on the title page of this protocol in the section "Notes". If the test report shows the results of subcontracting, the place of performance of the test is outside the laboratories of ALS Czech Republic, s.r.o.
The method for calculating of the summation parameters is available on request in the customer service.

The end of the certificate of analysis

Attachment no. 1 to the Certificate of Analysis for work order PR2477609

Sample: 5

ALS SAMPLE ID: **PR2477609/ 001**

Measurement results PCDD/Fs:

Sample:	5	Final extract [µl]:	60
		Injection volume [µl]:	4
		Acquisition date [d.m.y h:m]:	5.7.24 7:22

2,3,7,8-PCDD/Fs	Result [ng/sample]	Limit of Detection [ng/sample]	Limit of Quantification [ng/sample]	[1]I-TEFs	I-TEQ Upperbound [ng/sample]
2,3,7,8-TCDD	0.39	0.011	0.022	1	0.39
1,2,3,7,8-PeCDD	3.9	0.015	0.03	0.5	2
1,2,3,4,7,8-HxCDD	4.1	0.021	0.042	0.1	0.41
1,2,3,6,7,8-HxCDD	9.8	0.021	0.042	0.1	0.98
1,2,3,7,8,9-HxCDD	4.8	0.021	0.042	0.1	0.48
1,2,3,4,6,7,8-HpCDD	41	0.022	0.045	0.01	0.41
OCDD	18	0.048	0.095	0.001	0.018
2,3,7,8-TCDF	7.4	0.0091	0.018	0.1	0.74
1,2,3,7,8-PeCDF	8.4	0.016	0.031	0.05	0.42
2,3,4,7,8-PeCDF	10	0.016	0.031	0.5	5
1,2,3,4,7,8-HxCDF	10	0.014	0.027	0.1	1
1,2,3,6,7,8-HxCDF	11	0.014	0.027	0.1	1.1
1,2,3,7,8,9-HxCDF	3.1	0.014	0.027	0.1	0.31
2,3,4,6,7,8-HxCDF	19	0.014	0.027	0.1	1.9
1,2,3,4,6,7,8-HpCDF	21	0.012	0.024	0.01	0.21
1,2,3,4,7,8,9-HpCDF	1.8	0.012	0.024	0.01	0.018
OCDF	2.8	0.041	0.083	0.001	0.0028
I-TEQ from quantified 2,3,7,8-PCDD/Fs -"Lowerbound"					**15**
I-TEQ from 2,3,7,8-PCDD/Fs -„Mediumbound"					15
Maximum possible I-TEQ -"Upperbound"					**15**

PCDDs	Result [ng/sample]	**PCDFs**	Result [ng/sample]
Tetra-CDDs	150	Tetra-CDFs	390
Penta-CDDs	180	Penta-CDFs	280
Hexa-CDDs	200	Hexa-CDFs	110
Hepta-CDDs	95	Hepta-CDFs	31
OCDD	18	OCDF	2.8

[1]I-TEF according to NATO.

Limits of quantification are defined as double of the detection limits.

The limit of detection is defined as the amount of analyte producing a signal with S/N≥3.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double (k=2) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each 2,3,7,8-PCDD/F congener is 30% and total I-TEQ is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked with "<" are bellow limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is levels defined in Regulation 2017/644.

Attachment no. 1 to the Certificate of Analysis for work order PR2477609

Sample: 5

Standards recovery:

Sample: 5

Final extract [µl]:	60
Injection volume [µl]:	4
Acquisition date [d.m.y h:m]:	5.7.24 7:22

Extraction standard	Recovery	Acceptable range [%]		Accept. rec. with respect to	
PCDDs	[%]	Basic	Extended	basic range	extended range
13C12 - 2,3,7,8-TCDD	98	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,7,8-PeCDD	100	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,4,7,8-HxCDD	84	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,6,7,8-HxCDD	93	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,4,6,7,8-HpCDD	57	40 - 130	20 - 150	YES	-
13C12 - OCDD	45	40 - 130	20 - 150	YES	-
PCDFs					
13C12 - 2,3,7,8-TCDF	68	50 - 130	30 - 150	YES	-
13C12 - 2,3,4,7,8-PeCDF	84	50 - 130	30 - 150	YES	-
13C12 -1,2,3,4,7,8-HxCDF	84	50 - 130	30 - 150	YES	-
13C12 -1,2,3,6,7,8-HxCDF	81	50 - 130	30 - 150	YES	-
13C12 -2,3,4,6,7,8-HxCDF	77	50 - 130	30 - 150	YES	-
13C12 -1,2,3,4,6,7,8-HpCDF	82	40 - 130	20 - 150	YES	-
13C12 - OCDF	45	40 - 130	20 - 150	YES	-

Sampling standard	Recovery	Acceptable range	Rec. in range?
	[%]	[%]	
13C12-1,2,3,7,8-PeCDF	110	> 50	YES
13C12-1,2,3,7,8,9-HxCDF	110	> 50	YES
13C12-1,2,3,4,7,8,9-HpCDF	78	> 50	YES

Attachment no. 2 to the Certificate of Analysis for work order PR2477609

Sample: 6

ALS SAMPLE ID: **PR2477609/ 002**

Measurement results PCDD/Fs:

Sample:	6	Final extract [µl]:	60
		Injection volume [µl]:	4
		Acquisition date [d.m.y h:m]:	5.7.24 8:14

2,3,7,8-PCDD/Fs	Result [ng/sample]	Limit of Detection [ng/sample]	Limit of Quantification [ng/sample]	[1]I-TEFs	I-TEQ Upperbound [ng/sample]
2,3,7,8-TCDD	0.076	0.0059	0.012	1	0.076
1,2,3,7,8-PeCDD	0.45	0.008	0.016	0.5	0.22
1,2,3,4,7,8-HxCDD	0.26	0.01	0.021	0.1	0.026
1,2,3,6,7,8-HxCDD	0.79	0.01	0.021	0.1	0.079
1,2,3,7,8,9-HxCDD	0.41	0.01	0.021	0.1	0.041
1,2,3,4,6,7,8-HpCDD	3.4	0.011	0.022	0.01	0.034
OCDD	1.7	0.025	0.051	0.001	0.0017
2,3,7,8-TCDF	0.98	0.0053	0.011	0.1	0.098
1,2,3,7,8-PeCDF	0.54	0.0074	0.015	0.05	0.027
2,3,4,7,8-PeCDF	0.89	0.0074	0.015	0.5	0.44
1,2,3,4,7,8-HxCDF	0.55	0.0085	0.017	0.1	0.055
1,2,3,6,7,8-HxCDF	0.83	0.0085	0.017	0.1	0.083
1,2,3,7,8,9-HxCDF	0.095	0.0085	0.017	0.1	0.0095
2,3,4,6,7,8-HxCDF	0.92	0.0085	0.017	0.1	0.092
1,2,3,4,6,7,8-HpCDF	1.5	0.013	0.027	0.01	0.015
1,2,3,4,7,8,9-HpCDF	0.18	0.013	0.027	0.01	0.0018
OCDF	0.24	0.022	0.044	0.001	0.00024
I-TEQ from quantified 2,3,7,8-PCDD/Fs -"Lowerbound"					**1.3**
I-TEQ from 2,3,7,8-PCDD/Fs -„Mediumbound"					1.3
Maximum possible I-TEQ -"Upperbound"					**1.3**

PCDDs	Result [ng/sample]	**PCDFs**	Result [ng/sample]
Tetra-CDDs	30	Tetra-CDFs	63
Penta-CDDs	28	Penta-CDFs	25
Hexa-CDDs	22	Hexa-CDFs	9.7
Hepta-CDDs	7.6	Hepta-CDFs	2.6
OCDD	1.7	OCDF	0.24

[1]I-TEF according to NATO.

Limits of quantification are defined as double of the detection limits.

The limit of detection is defined as the amount of analyte producing a signal with S/N≥3.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double (k=2) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each 2,3,7,8-PCDD/F congener is 30% and total I-TEQ is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked with "<" are bellow limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is levels defined in Regulation 2017/644.

Attachment no. 2 to the Certificate of Analysis for work order PR2477609

Sample: 6

Standards recovery:

Sample: 6

Final extract [µl]:	60
Injection volume [µl]:	4
Acquisition date [d.m.y h:m]:	5.7.24 8:14

Extraction standard	Recovery	Acceptable range [%]		Accept. rec. with respect to	
PCDDs	[%]	Basic	Extended	basic range	extended range
13C12 - 2,3,7,8-TCDD	100	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,7,8-PeCDD	110	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,4,7,8-HxCDD	110	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,6,7,8-HxCDD	110	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,4,6,7,8-HpCDD	79	40 - 130	20 - 150	YES	-
13C12 - OCDD	57	40 - 130	20 - 150	YES	-
PCDFs					
13C12 - 2,3,7,8-TCDF	83	50 - 130	30 - 150	YES	-
13C12 - 2,3,4,7,8-PeCDF	110	50 - 130	30 - 150	YES	-
13C12 -1,2,3,4,7,8-HxCDF	120	50 - 130	30 - 150	YES	-
13C12 -1,2,3,6,7,8-HxCDF	100	50 - 130	30 - 150	YES	-
13C12 -2,3,4,6,7,8-HxCDF	100	50 - 130	30 - 150	YES	-
13C12 -1,2,3,4,6,7,8-HpCDF	96	40 - 130	20 - 150	YES	-
13C12 - OCDF	56	40 - 130	20 - 150	YES	-

Sampling standard	Recovery	Acceptable range	Rec. in range?
	[%]	[%]	
13C12-1,2,3,7,8-PeCDF	110	> 50	YES
13C12-1,2,3,7,8,9-HxCDF	110	> 50	YES
13C12-1,2,3,4,7,8,9-HpCDF	94	> 50	YES

Attachment no. 3 to the Certificate of Analysis for work order PR2477609

Sample: 5

ALS SAMPLE ID: PR2477609/ 001

Measurement results PCBs:

Sample:			5		
			Final extract [µl]:		250
			Injection volume [µl]:		4
			Acquisition date [d.m.y h:m]:		6.7.24 11:58
PCBs	Result [ng/sample]	Limit of Detection [ng/sample]	Limit of Quantification [ng/sample]	[1]WHO-TEFs	WHO-TEQ Upperbound [ng/sample]
PCB #77	28	1.4	4.5	0.0001	0.0028
PCB #81	6.9	1.3	4.2	0.0003	0.0021
PCB #126	24	1.2	4.1	0.1	2.4
PCB #169	11	0.99	3.3	0.03	0.32
PCB #105	23	1.9	6.4	0.00003	0.00068
PCB #114	< 4.7	1.4	4.7	0.00003	0.00014
PCB #118	11	1.1	3.7	0.00003	0.00033
PCB #123	< 4.9	1.5	4.9	0.00003	0.00015
PCB #156	13	0.94	3.1	0.00003	0.0004
PCB #157	10	1	3.5	0.00003	0.00031
PCB #167	< 4.4	1.3	4.4	0.00003	0.00013
PCB #170	14	1.9	6.2	-	0
PCB #180	9.2	1.7	5.7	-	0
PCB #189	8	1.7	5.6	0.00003	0.00024
WHO-TEQ from quantified PCBs -"Lowerbound"					2.7
WHO-TEQ from PCBs -„Mediumbound"					2.7
Maximum possible WHO-TEQ -"Upperbound"					**2.7**
PCBs	Result [ng/sample]	Limit of Detection [ng/sample]	Limit of Quantification [ng/sample]	Σindicator PCB Lowerbound [ng/sample]	Σindicator PCB Upperbound [ng/sample]
PCB #28	24	0.88	7.9	24	24
PCB #52	5.9	1.7	5.7	5.9	5.9
PCB #101	6.4	1.6	5.3	6.4	6.4
PCB #118	11	1.1	3.7	11	11
PCB #138	16	1.8	6	16	16
PCB #153	6.8	1.7	6.3	6.8	6.8
PCB #180	9.2	1.7	5.7	9.2	9.2
Σindicator PCB6 -"Lowerbound"				68	
Maximal possible Σindicator PCB6 -"Upperbound"					**68**
Σindicator PCB7 -"Lowerbound"				79	
Maximal possible Σindicator PCB7 -"Upperbound"					**79**

[1]WHO 2005 TEF according to Van den Berg et al: Toxicological Sciences Advance Acces, 7 July 2006

Limits of quantification are defined on the base of blank level.

The limit of detection is defined as the amount of analyte producing a signal with S/N≥3.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double (k=2) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each PCB congener is 30% , total WHO-TEQ and PCB6/PCB7 is 20%. These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked "<" are lower than the limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is level defined in Regulation 2017/644.

Attachment no. 3 to the Certificate of Analysis for work order PR2477609

Sample:	5	Final extract [µl]:	250
		Injection volume [µl]:	4
		Acquisition date [d.m.y h:m]:	6.7.24 11:58
Sampling standard	Recovery [%]	Acceptable range [%]	Rec. in range?
13C12-2,3,4,4´-tetraCB (60)	118	> 50	YES
13C12-2,3,3´,4,5,5´-hexaCB (159)	116	> 50	YES

Attachment no. 4 to the Certificate of Analysis for work order PR2477609

Sample: 6

ALS SAMPLE ID: PR2477609/ 002

Measurement results PCBs:

Sample:			6		
			Final extract [µl]:		250
			Injection volume [µl]:		4
			Acquisition date [d.m.y h:m]:		6.7.24 12:40
PCBs	Result [ng/sample]	Limit of Detection [ng/sample]	Limit of Quantification [ng/sample]	[1]WHO-TEFs	WHO-TEQ Upperbound [ng/sample]
PCB #77	9.2	0.56	1.9	0.0001	0.00092
PCB #81	1.8	0.53	1.8	0.0003	0.00055
PCB #126	4.4	0.47	1.6	0.1	0.44
PCB #169	1.6	0.41	1.4	0.03	0.048
PCB #105	9.1	0.77	2.6	0.00003	0.00027
PCB #114	< 1.8	0.53	1.8	0.00003	0.000053
PCB #118	7.8	0.45	2.4	0.00003	0.00023
PCB #123	< 2	0.59	2	0.00003	0.000059
PCB #156	3.5	0.37	1.2	0.00003	0.00011
PCB #157	2.9	0.43	1.4	0.00003	0.000086
PCB #167	< 1.8	0.55	1.8	0.00003	0.000055
PCB #170	6	0.8	2.7	-	0
PCB #180	8.2	0.73	2.4	-	0
PCB #189	< 2.3	0.7	2.3	0.00003	0.00007
WHO-TEQ from quantified PCBs -"Lowerbound"					0.49
WHO-TEQ from PCBs -„Mediumbound"					0.49
Maximum possible WHO-TEQ -"Upperbound"					**0.49**
PCBs	Result [ng/sample]	Limit of Detection [ng/sample]	Limit of Quantification [ng/sample]	Σindicator PCB Lowerbound [ng/sample]	Σindicator PCB Upperbound [ng/sample]
PCB #28	9.7	0.47	7.9	9.7	9.7
PCB #52	6.4	1	4.9	6.4	6.4
PCB #101	13	0.59	5.2	13	13
PCB #118	7.8	0.45	2.4	7.8	7.8
PCB #138	15	0.74	4.9	15	15
PCB #153	16	0.65	6.3	16	16
PCB #180	8.2	0.73	2.4	8.2	8.2
Σindicator PCB6 -"Lowerbound"				69	
Maximal possible Σindicator PCB6 -"Upperbound"					**69**
Σindicator PCB7 -"Lowerbound"				76	
Maximal possible Σindicator PCB7 -"Upperbound"					**76**

[1]WHO 2005 TEF according to Van den Berg et al: Toxicological Sciences Advance Acces, 7 July 2006

Limits of quantification are defined on the base of blank level.

The limit of detection is defined as the amount of analyte producing a signal with S/N≥3.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double (k=2) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each PCB congener is 30% , total WHO-TEQ and PCB6/PCB7 is 20%. These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked "<" are lower than the limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is level defined in Regulation 2017/644.

Attachment no. 4 to the Certificate of Analysis for work order PR2477609

Sample:	6	Final extract [µl]:	250
		Injection volume [µl]:	4
		Acquisition date [d.m.y h:m]:	6.7.24 12:40
Sampling standard	Recovery [%]	Acceptable range [%]	Rec. in range?
13C12-2,3,4,4´-tetraCB (60)	122	> 50	YES
13C12-2,3,3´,4,5,5´-hexaCB (159)	105	> 50	YES

Attachment no. 5 to the Certificate of Analysis for work order PR2477609

Sample: 5 (21.3. - 23.4.2024)

Measurement results PCDD/Fs:

Sample:	5 (21.3. - 23.4.2024)		Final extract [µl]:		60
			Injection volume [µl]:		4
Sampled volume [m³]:	439.31		Acquisition date [d.m.y h:m]:		5.7.24 7:22
2,3,7,8-PCDD/F	Result [ng/m³]	Limit of Detection [ng/m³]	Limit of Quantification [ng/m³]	[1]I-TEFs	I-TEQ Upperbound [ng/m³]
2,3,7,8-TCDD	0.00089	0.000025	0.000051	1	0.00089
1,2,3,7,8-PeCDD	0.0089	0.000034	0.000067	0.5	0.0045
1,2,3,4,7,8-HxCDD	0.0092	0.000048	0.000095	0.1	0.00092
1,2,3,6,7,8-HxCDD	0.022	0.000048	0.000095	0.1	0.0022
1,2,3,7,8,9-HxCDD	0.011	0.000048	0.000095	0.1	0.0011
1,2,3,4,6,7,8-HpCDD	0.092	0.000051	0.0001	0.01	0.00092
OCDD	0.041	0.00011	0.00022	0.001	0.000041
2,3,7,8-TCDF	0.017	0.000021	0.000041	0.1	0.0017
1,2,3,7,8-PeCDF	0.019	0.000035	0.000071	0.05	0.00095
2,3,4,7,8-PeCDF	0.023	0.000035	0.000071	0.5	0.011
1,2,3,4,7,8-HxCDF	0.023	0.000031	0.000062	0.1	0.0023
1,2,3,6,7,8-HxCDF	0.026	0.000031	0.000062	0.1	0.0026
1,2,3,7,8,9-HxCDF	0.007	0.000031	0.000062	0.1	0.0007
2,3,4,6,7,8-HxCDF	0.042	0.000031	0.000062	0.1	0.0042
1,2,3,4,6,7,8-HpCDF	0.047	0.000027	0.000054	0.01	0.00047
1,2,3,4,7,8,9-HpCDF	0.0041	0.000027	0.000054	0.01	0.000041
OCDF	0.0063	0.000094	0.00019	0.001	0.0000063
I-TEQ from quantified 2,3,7,8-PCDD/Fs -"Lowerbound"					**0.035**
I-TEQ from 2,3,7,8-PCDD/Fs -„Mediumbound"					0.035
Maximum possible I-TEQ -"Upperbound"					**0.035**

PCDD	Result [ng/m³]	**PCDF**	Result [ng/m³]
Tetra-CDD	0.34	Tetra-CDF	0.89
Penta-CDD	0.42	Penta-CDF	0.64
Hexa-CDD	0.46	Hexa-CDF	0.26
Hepta-CDD	0.22	Hepta-CDF	0.071
OCDD	0.041	OCDF	0.0063

[1]I-TEF according to NATO.

Limits of quantification are defined as double of the detection limits.

The limit of detection is defined as the amount of analyte producing a signal with S/N≥3.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double (k=2) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each 2,3,7,8-PCDD/F congener is 30% and total I-TEQ is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked with "<" are bellow limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is levels defined in Regulation 2017/644.

Attachment no. 5 to the Certificate of Analysis for work order PR2477609

Sample: 5 (21.3. - 23.4.2024)

Standards recovery:

Sample: 5 (21.3. - 23.4.2024)

Final extract [µl]:	60
Injection volume [µl]:	4
Acquisition date [d.m.y h:m]:	5.7.24 7:22

Extraction standard	Recovery	Acceptable range [%]		Accept. rec. with respect to	
PCDDs	[%]	Basic	Extended	basic range	extended range
13C12 - 2,3,7,8-TCDD	98	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,7,8-PeCDD	100	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,4,7,8-HxCDD	84	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,6,7,8-HxCDD	93	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,4,6,7,8-HpCDD	57	40 - 130	20 - 150	YES	-
13C12 - OCDD	45	40 - 130	20 - 150	YES	-
PCDFs					
13C12 - 2,3,7,8-TCDF	68	50 - 130	30 - 150	YES	-
13C12 - 2,3,4,7,8-PeCDF	84	50 - 130	30 - 150	YES	-
13C12 -1,2,3,4,7,8-HxCDF	84	50 - 130	30 - 150	YES	-
13C12 -1,2,3,6,7,8-HxCDF	81	50 - 130	30 - 150	YES	-
13C12 -2,3,4,6,7,8-HxCDF	77	50 - 130	30 - 150	YES	-
13C12 -1,2,3,4,6,7,8-HpCDF	82	40 - 130	20 - 150	YES	-
13C12 - OCDF	45	40 - 130	20 - 150	YES	-

Sampling standard	Recovery	Acceptable range	Rec. in range?
	[%]	[%]	
13C12-1,2,3,7,8-PeCDF	110	> 50	YES
13C12-1,2,3,7,8,9-HxCDF	110	> 50	YES
13C12-1,2,3,4,7,8,9-HpCDF	78	> 50	YES

Attachment no. 6 to the Certificate of Analysis for work order PR2477609

Sample: 5 (21.3. - 23.4.2024)

ALS SAMPLE ID: PR2477609/ 001

Measurement results PCBs:

Sample:			5 (21.3. - 23.4.2024)		
			Final extract [µl]:		250
Sampled volume [Nm3] 439.31			Injection volume [µl]:		4
			Acquisition date [d.m.y]:		08.07.2024
PCBs	Result [ng/Nm3]	Limit of Detection [ng/Nm3]	Limit of Quantification [ng/Nm3]	[1]WHO-TEFs	WHO-TEQ Upperbound [ng/Nm3]
PCB #77	0.063	0.0031	0.01	0.0001	0.0000063
PCB #81	0.016	0.0029	0.0095	0.0003	0.0000047
PCB #126	0.055	0.0028	0.0093	0.1	0.0055
PCB #169	0.024	0.0022	0.0075	0.03	0.00072
PCB #105	0.052	0.0044	0.015	0.00003	0.0000015
PCB #114	< 0.011	0.0032	0.011	0.00003	0.00000032
PCB #118	0.025	0.0025	0.0085	0.00003	0.00000075
PCB #123	< 0.011	0.0033	0.011	0.00003	0.00000033
PCB #156	0.03	0.0021	0.0071	0.00003	0.0000009
PCB #157	0.024	0.0024	0.0079	0.00003	0.00000072
PCB #167	< 0.01	0.003	0.01	0.00003	0.0000003
PCB #170	0.033	0.0042	0.014	-	0
PCB #180	0.021	0.0039	0.013	-	0
PCB #189	0.018	0.0038	0.013	0.00003	0.00000055
WHO-TEQ from quantified PCBs -"Lowerbound"					0.0063
WHO-TEQ from PCBs -„Mediumbound"					0.0063
Maximum possible WHO-TEQ -"Upperbound"					**0.0063**

[1]WHO 2005 TEF according to Van den Berg et al: Toxicological Sciences Advance Acces, 7 July 2006

Limits of quantification are defined on the base of blank level.

The limit of detection is defined as the amount of analyte producing a signal with S/N≥3.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double (k=2) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each PCB congener is 30% , total WHO-TEQ and PCB6/PCB7 is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked "<" are lower than the limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is level defined in Regulation 2017/644.

Sample:	5 (21.3. - 23.4.2024)	Final extract [µl]:	250
		Injection volume [µl]:	4
		Acquisition date [d.m.y h:m]:	6.7.24 11:58
Sampling standard	Recovery [%]	Acceptable range [%]	Rec. in range?
13C12-2,3,4,4´-tetraCB (60)	118	> 50	YES
13C12-2,3,3´,4,5,5´-hexaCB (159)	116	> 50	YES

Attachment no. 7 to the Certificate of Analysis for work order PR2477609

Sample: 6 (22.4. - 21.5.2024)

Measurement results PCDD/Fs:

Sample:	6 (22.4. - 21.5.2024)	Final extract [µl]:	60
		Injection volume [µl]:	4
Sampled volume [m³]:	409.9	Acquisition date [d.m.y h:m]:	5.7.24 8:14

2,3,7,8-PCDD/F	Result [ng/m³]	Limit of Detection [ng/m³]	Limit of Quantification [ng/m³]	[1]I-TEFs	I-TEQ Upperbound [ng/m³]
2,3,7,8-TCDD	0.00019	0.000014	0.000029	1	0.00019
1,2,3,7,8-PeCDD	0.0011	0.000019	0.000039	0.5	0.00054
1,2,3,4,7,8-HxCDD	0.00062	0.000025	0.00005	0.1	0.000062
1,2,3,6,7,8-HxCDD	0.0019	0.000025	0.00005	0.1	0.00019
1,2,3,7,8,9-HxCDD	0.00099	0.000025	0.00005	0.1	0.000099
1,2,3,4,6,7,8-HpCDD	0.0083	0.000026	0.000053	0.01	0.000083
OCDD	0.0041	0.000062	0.00012	0.001	0.0000041
2,3,7,8-TCDF	0.0024	0.000013	0.000026	0.1	0.00024
1,2,3,7,8-PeCDF	0.0013	0.000018	0.000036	0.05	0.000066
2,3,4,7,8-PeCDF	0.0022	0.000018	0.000036	0.5	0.0011
1,2,3,4,7,8-HxCDF	0.0013	0.000021	0.000042	0.1	0.00013
1,2,3,6,7,8-HxCDF	0.002	0.000021	0.000042	0.1	0.0002
1,2,3,7,8,9-HxCDF	0.00023	0.000021	0.000042	0.1	0.000023
2,3,4,6,7,8-HxCDF	0.0023	0.000021	0.000042	0.1	0.00023
1,2,3,4,6,7,8-HpCDF	0.0036	0.000033	0.000066	0.01	0.000036
1,2,3,4,7,8,9-HpCDF	0.00043	0.000033	0.000066	0.01	0.0000043
OCDF	0.00059	0.000054	0.00011	0.001	0.00000059
I-TEQ from quantified 2,3,7,8-PCDD/Fs -"Lowerbound"					**0.0032**
I-TEQ from 2,3,7,8-PCDD/Fs -„Mediumbound"					0.0032
Maximum possible I-TEQ -"Upperbound"					**0.0032**

PCDD	Result [ng/m³]	**PCDF**	Result [ng/m³]
Tetra-CDD	0.074	Tetra-CDF	0.15
Penta-CDD	0.068	Penta-CDF	0.062
Hexa-CDD	0.054	Hexa-CDF	0.024
Hepta-CDD	0.019	Hepta-CDF	0.0063
OCDD	0.0041	OCDF	0.00059

[1]I-TEF according to NATO.

Limits of quantification are defined as double of the detection limits.

The limit of detection is defined as the amount of analyte producing a signal with S/N≥3.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double (k=2) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each 2,3,7,8-PCDD/F congener is 30% and total I-TEQ is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked with "<" are bellow limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is levels defined in Regulation 2017/644.

Attachment no. 7 to the Certificate of Analysis for work order PR2477609

Sample: 6 (22.4. - 21.5.2024)

Standards recovery:

Sample: 6 (22.4. - 21.5.2024)

Final extract [µl]:	60
Injection volume [µl]:	4
Acquisition date [d.m.y h:m]:	5.7.24 8:14

Extraction standard	Recovery	Acceptable range [%]		Accept. rec. with respect to	
PCDDs	[%]	Basic	Extended	basic range	extended range
13C12 - 2,3,7,8-TCDD	100	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,7,8-PeCDD	110	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,4,7,8-HxCDD	110	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,6,7,8-HxCDD	110	50 - 130	30 - 150	YES	-
13C12 - 1,2,3,4,6,7,8-HpCDD	79	40 - 130	20 - 150	YES	-
13C12 - OCDD	57	40 - 130	20 - 150	YES	-
PCDFs					
13C12 - 2,3,7,8-TCDF	83	50 - 130	30 - 150	YES	-
13C12 - 2,3,4,7,8-PeCDF	110	50 - 130	30 - 150	YES	-
13C12 -1,2,3,4,7,8-HxCDF	120	50 - 130	30 - 150	YES	-
13C12 -1,2,3,6,7,8-HxCDF	100	50 - 130	30 - 150	YES	-
13C12 -2,3,4,6,7,8-HxCDF	100	50 - 130	30 - 150	YES	-
13C12 -1,2,3,4,6,7,8-HpCDF	96	40 - 130	20 - 150	YES	-
13C12 - OCDF	56	40 - 130	20 - 150	YES	-

Sampling standard	Recovery	Acceptable range	Rec. in range?
	[%]	[%]	
13C12-1,2,3,7,8-PeCDF	110	> 50	YES
13C12-1,2,3,7,8,9-HxCDF	110	> 50	YES
13C12-1,2,3,4,7,8,9-HpCDF	94	> 50	YES

Attachment no. 8 to the Certificate of Analysis for work order PR2477609

Sample: 6 (22.4. - 21.5.2024)

ALS SAMPLE ID: PR2477609/ 002

Measurement results PCBs:

Sample:			6 (22.4. - 21.5.2024)		
			Final extract [µl]:		250
Sampled volume [Nm3] 409.9			Injection volume [µl]:		4
			Acquisition date [d.m.y]:		08.07.2024
PCBs	Result [ng/Nm3]	Limit of Detection [ng/Nm3]	Limit of Quantification [ng/Nm3]	[1]WHO-TEFs	WHO-TEQ Upperbound [ng/Nm3]
PCB #77	0.022	0.0014	0.0045	0.0001	0.0000022
PCB #81	0.0045	0.0013	0.0043	0.0003	0.0000014
PCB #126	0.011	0.0011	0.0038	0.1	0.0011
PCB #169	0.0039	0.001	0.0034	0.03	0.00012
PCB #105	0.022	0.0019	0.0063	0.00003	0.00000067
PCB #114	< 0.0043	0.0013	0.0043	0.00003	0.00000013
PCB #118	0.019	0.0011	0.0058	0.00003	0.00000057
PCB #123	< 0.0048	0.0014	0.0048	0.00003	0.00000014
PCB #156	0.0087	0.0009	0.003	0.00003	0.00000026
PCB #157	0.007	0.0011	0.0035	0.00003	0.00000021
PCB #167	< 0.0045	0.0013	0.0045	0.00003	0.00000013
PCB #170	0.015	0.002	0.0065	-	0
PCB #180	0.02	0.0018	0.0059	-	0
PCB #189	< 0.0057	0.0017	0.0057	0.00003	0.00000017
WHO-TEQ from quantified PCBs -"Lowerbound"					0.0012
WHO-TEQ from PCBs -„Mediumbound"					0.0012
Maximum possible WHO-TEQ -"Upperbound"					**0.0012**

[1]WHO 2005 TEF according to Van den Berg et al: Toxicological Sciences Advance Acces, 7 July 2006

Limits of quantification are defined on the base of blank level.

The limit of detection is defined as the amount of analyte producing a signal with S/N≥3.

The value of the detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double (k=2) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each PCB congener is 30% , total WHO-TEQ and PCB6/PCB7 is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked "<" are lower than the limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is level defined in Regulation 2017/644.

Sample:	6 (22.4. - 21.5.2024)	Final extract [µl]:	250
		Injection volume [µl]:	4
		Acquisition date [d.m.y h:m]:	6.7.24 12:40
Sampling standard	Recovery [%]	Acceptable range [%]	Rec. in range?
13C12-2,3,4,4´-tetraCB (60)	122	> 50	YES
13C12-2,3,3´,4,5,5´-hexaCB (159)	105	> 50	YES