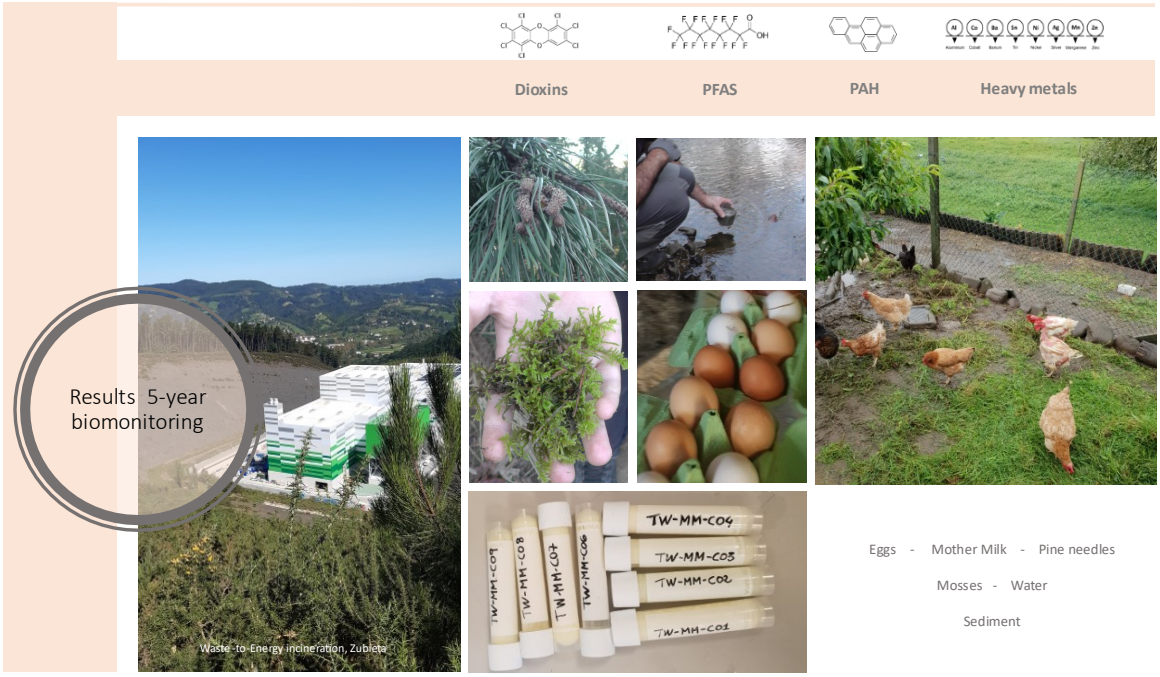
TOXICO WATCH

Biomonitoring research on persistent organic pollutants (POPs) in the surrounding environment of the WtE waste incinerator in Zubieta 2019 – 2023



A.Arkenbout, K.J.A.M. Bouman

21 May - 2024

ZERO WASTE EUROPE

Biomonitoring research persistent organic pollutants, (POPs)
in the surrounding environment of
the WtE waste incinerator in Zubieta 2019 – 2023

Acknowledgement

Gratitude for the support of the local citizens and especially thanks to
M&F, P&M, X& J team
and Zero Waste support in 2023.

AUTHORS: A. ARKENBOUT Head of Research, CEO & Founder ToxicoWatch
K.J.A.M. BOUMAN Research, Staff member ToxicoWatch

HARLINGEN, THE NETHERLANDS, TOXICOWATCH FOUNDATION, MAY 2024
PUBLICATION NUMBER: 2024-Z01
CLIENT: ZUBIETA-LANTZEN

All photographs, graphs and tables made and designed by ToxicoWatch, except mentioned else.
Photographs on cover: Incinerator Zubieta under construction 2019, chicken on location 2 eggs on location 4, mother milk samples Andoain and natural water stream in mountain environment in the region of this biomonitoring research.

www.toxicowatch.org

Acronyms

APCD	Air Pollution Control Devices
BAT	Best Available Techniques
BEQ	Bioanalytical EQuivalents
dl-PCB	Dioxin-Like Polychlorinated Biphenyls
DR CALUX®	Dioxin Responsive Chemical-Activated LUciferase gene eXpression
EFSA	European Food and Safety Authority
GC-MS	Gas Chromatography Mass Spectrometry GC-MS
LB	Lower Bound
LOD	Limit of Detection
MB	Medium Bound
MWI	Medical Waste Incineration
MSWI	Municipal Solid Waste Incineration
ndl-PCB	Non-Dioxin-Like Polychlorinated Biphenyl (Non-Dioxin-Like PCB)
ng	Nanogram; 10^{-9} gram
OTNOC	Other Than Normal Operating Conditions
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PCDD	Polychlorinated Dibenzodioxins
PCDF	Polychlorinated Dibenzofurans
PBDD/F	Polybrominated-dibenzodioxins and furans
pg	Picogram; 10^{-12} gram
POP	Persistent Organic Pollutants
PFOS	Perfluorooctanesulfonic acid
PFOA	Perfluorooctanoic acid
PFNA	Perfluorononanoic acid
PFDA	Perfluorodecanoic acid
PFUnDA	Perfluoroundecanoic acid
PFDoA	Perfluoroundecanoic acid
PFTrDA	Perfluorotridecanoic acid
PFTeDA	Perfluorotetradecanoic acid
PFBS	Perfluorobutanesulfonic acid
SVHC	Substances of Very High Concern
TCDD	2,3,7,8-tetrachloordibenzo-p-dioxine
TDI	Tolerable Daily Intake = Aanvaardbare Dagelijkse Inname
TEF	Toxic Equivalency Factor
TEQ	Toxic Equivalents
TW	ToxicoWatch
TWI	Tolerable Weekly Intake
UB	Upper Bound (UB)
UPOP	Unintentional POP (Persistent Organic Pollutants)
µg	Microgram 10^{-3} gram
WtE	Waste to Energy (waste incinerator)

Table of contents

Introduction

This biomonitoring research is conducted in an environmental area in Basque country, in the north of Spain. In the region of a newly built waste incinerator in the municipal district of Donostia/San Sebastián, near the village of Zubieta. The organisation of Zubieta Lantzen asked the Dutch Foundation ToxicoWatch (TW) in 2019 to perform a multi-year biomonitoring research in the nearby environment (< 5 km) of this newly built waste incinerator. Therefore, TW started in 2019 with 'zero-measurement' biomonitoring research in the surrounding area, before the plant started incinerating.

Waste incinerators are used worldwide as part of waste management strategy. However, combusting waste is accompanied by the unintentional production of toxic compounds, such as dioxins. The effectiveness of gas cleaning and regulatory compliance for eliminating the emissions of hazardous substances are topics of research by TW. Technical research of waste incineration equipment in the Netherlands and France shows the other-than-normal operating conditions (OTNOC), such as shutdowns and startups, as the most vulnerable phase in emissions of POPs.

This biomonitoring program of TW focuses on determining the environmental impact and human health risks derived from emissions of Persistent Organic Pollutants (abbreviated as POPs). POPs are persistent, bioaccumulative and extremely toxic. The substances in this research are polychlorinated dibenzo-p-dioxins (PCDDs), dibenzofurans (PCDFs), dioxin-like polychlorinated biphenyls (dl-PCBs), PAH, heavy metals (HM) and PFAS.

A broad scale of biomatrices is applied in this biomonitoring research: human mother milk, eggs of backyard chicken, Pine needles (*Pinus Radiata*), Holy (*Ilex aquifolium*), Gorse (*Ulex europaeus*), moss (*Bryophyta*), soil, sediment, and water. The complexity of the tremendously extensive group of potentially toxic substances requires multiple analytical measurement methods, such as innovative bioassays and chemical analysis.

TW aims to create awareness among the public, governments, and industry about Unintentionally (produced) Persistent Organic Pollutants (UPOPs). Substances which have the characteristics to accumulate cumulatively in vegetation, animals and humans, and extreme toxicity pose a major threat to public health and the environment. Transparent and regular environmental monitoring should be included in any process of ecological impact assessment in support of regulatory procedures to fulfil the basics of the Stockholm and Basel Conventions: Eliminating or reducing at the utmost of the emissions of Substances of Very High Concern (SVHC) into the environment, like dioxins PAH, heavy metals and PFAS.

Research area

The waste incinerator Zubieta is located in the province of Gipuzkoa between the municipalities of Donostia/San Sebastián and Usurbil. The physical geography of Gipuzkoa is very rugged, with numerous valleys, deep and narrow. The mountains are foothills of the Cantabrian-Pyrenean Mountain range, with mountain passes that exceed 1,000 meters just 30 km from the coast (figure 1).
Towns in the neighbourhood of the waste incinerator are Usurbil (1700 m north-west), Lasarte (1800 m north-east) and Andoain (4000 m south-east). The capital city of the province of Gipuzkoa, Donostia/San Sebastian, is 7100 m northeast.

Figure 1: Incinerator of Zubieta

The wind direction in this research area is mainly from the northeast towards the South/southwest due to mountain positions. However, air recirculation by the influence of the surrounding mountains and the Atlantic Ocean can complicate the deposition patterns. The waste incinerator of Zubieta is built in a kind of “bowl” and with the very short stack, this can give other deposition patterns than in a flat country. The location and construction of an incinerator will have a specific effect on the emission deposition patterns in the area.

Sampling

Within a 5 km radius, fourteen (14) locations with backyard chickens were selected for egg sampling (Figure 2) in these past five years. In 2019 for reference, eggs of backyard chicken from Zaldibia (26 km) were analysed, and in 2020 reference eggs were taken from a local supermarket. The TW team visited each egg location to collect 6 - 10 fresh eggs. Pictures of sampling were taken to minimise ambiguity about the origin of the eggs. The total content of the eggs (egg yolk and white) is stored in HDPE lab containers in a freezer until the analyses.

A location inspection and a TW questionnaire were performed at each backyard chicken egg location (see checklist eggs sampling appendix). From every location also sampled soil from the chicken enclosure and chicken feed were sampled. In 2019 TW could start with ten (10) selected egg samples to be analysed. In 2023 seven (7) egg locations could be analysed.

Eggs of backyard chicken locations & possible confounders POPs, Zubieta 2019-2023

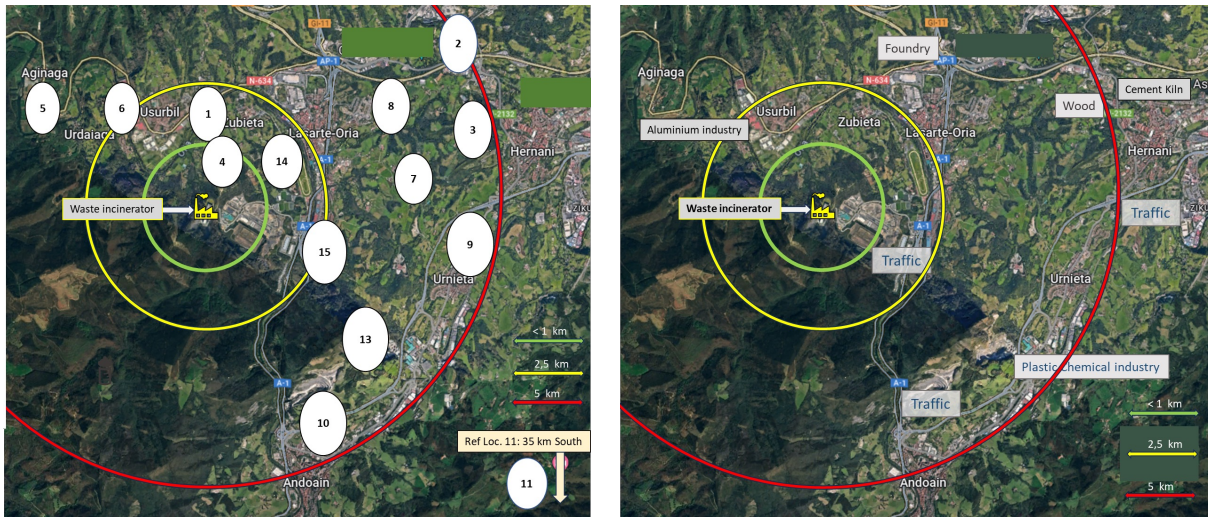


Figure 2: Sample locations eggs of backyard chicken and possible confounders

Five (5) locations in the direct surrounding (< 1 km) around the incinerator were selected for sampling mosses, vegetation, and soil in all wind directions.
Vegetation: from pine trees, *Picea radiata*, 200-300 grams of fresh pine needles were collected for analyses and for mosses (*Bryophyta*) 200-300-gram. Evergreen vegetation: 200–300 grams of Holly leaves (*Ilex aquifolium*) and leaves from Gorse (*Ulex europaeus*). All samples were stored in HDPE lab bags, cool, dark, and dry. Samples of soil and sediment (250 grams) were taken from the top layer (0-2 cm). Water samples (500 -1000 ml) were taken at four (4) locations from a freshwater stream near the incinerator (W1-W4) and two (2) locations with groundwater resources.

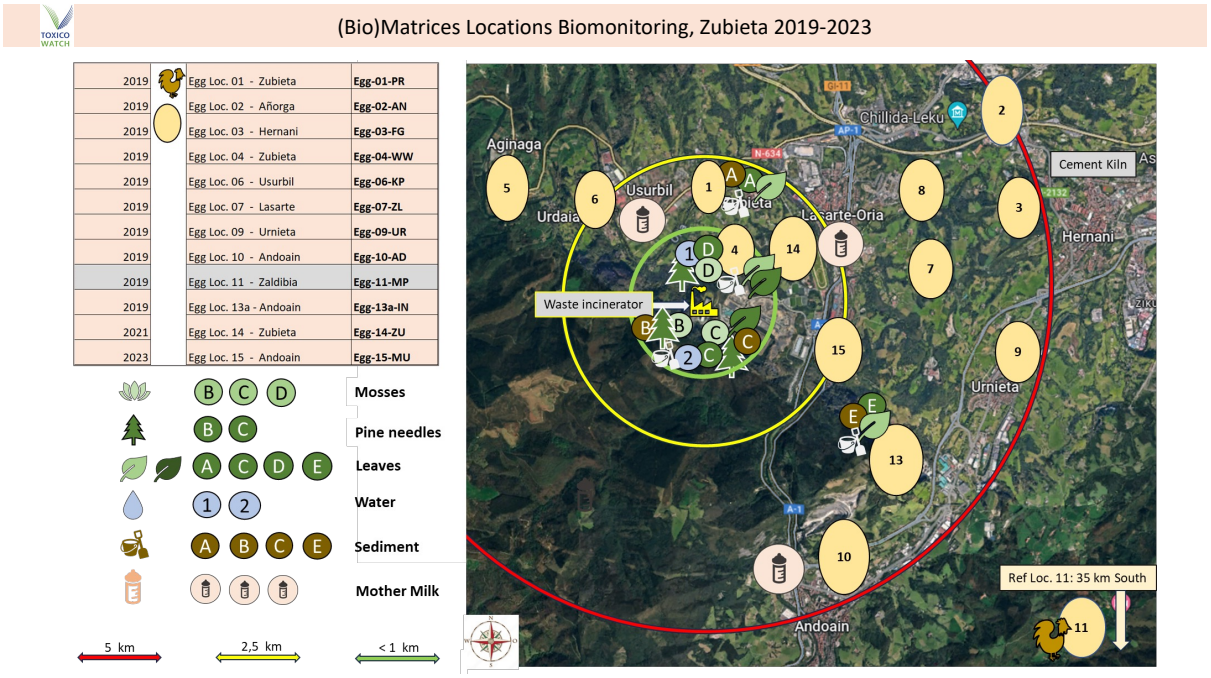


Figure 3: (Bio)matrices locations

Analysis methods

The collected samples undergo analysis for persistent organic pollutants (POPs) using both bioassays (CALUX) and chemical analyses. The substances of interest are PCDD/F/dl-PCB (dioxins), Per- and poly-fluoroalkyl Substances (PFAS), Polycyclic Aromatic Hydrocarbons (PAH), and analyses of 6-14 heavy metals: Arsenic, Cadmium, Cobalt, Chromium, Lead, Nickel, Aluminium, Barium, Copper, Manganese, Mercury, Silver, Tin, and Zinc.

In this research, bioassay analysis employs DR CALUX® for dioxins/furans (PCDD/F) and dioxin-like PCBs (dL-PCBs), PAH CALUX for PAH substances, and FITC-T4 for the PFAS. Additionally, DR CALUX®, PFAS CALUX®, FITC-T4 and GC-MS are used for dioxins analysis in eggs, when results from DR CALUX exceed the EU Limits for eggs (1.7 pg BEQ/g fat for PCDD/F and 3.3. pg BEQ/g fat for the sum of dioxins (PCDD/F/dl-PCB)). The analysis are performed by BioDetection Systems in Amsterdam, the Netherlands (NL). BDS is accredited under RvA L401. Chemical analysis for PAH, PFAS and heavy metals are conducted by the accredited laboratory Normec, Groen Agro Control, located in Delft, the Netherlands (NL). PFAS chemical analyses employ LC-MS/MS to detect 24 PFAS, while heavy metals analysis utilises ICP-MS also by Normec laboratory.

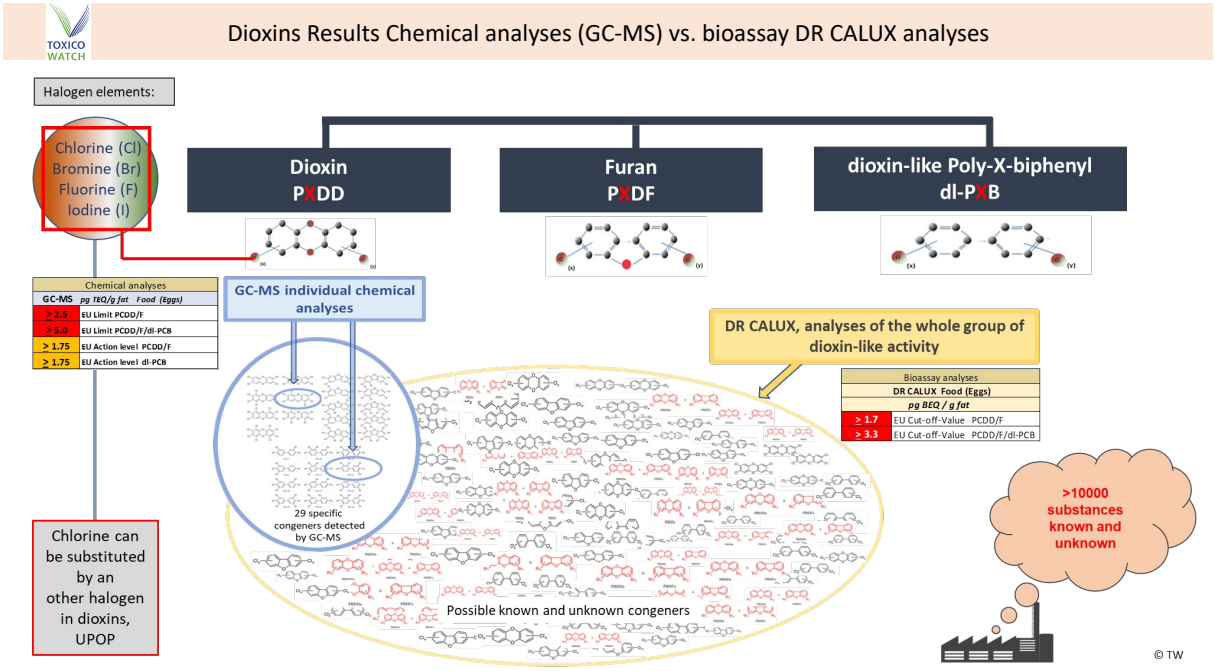


Figure 4: Chemical versus bioassay analyses

Results

Eggs

PCDD/F/dl-PCB

TW Biomonitoring started in the surrounding environment of the Zubieta incinerator in the autumn of 2019, with analyses at ten (10) locations of backyard chicken eggs on dioxins (PCDD/F) and dioxin-like PCBs (dl-PCB) with DR CALUX. The biomonitoring program continued with two and three analyses in 2021 and 2022. In 2023 seven (7) egg locations could be analysed and show an increase of 130-460% of the total dioxins of PCDD/F/dl-PCB compared to the results in 2019 (Figure 5). While in 2019 57 % complied with the EU regulations of safe egg consumption for commercial consumption, in 2023 none of the analysed eggs of backyard chicken complied with the dioxin EU limit set for the DR CALUX analyses.

Results Sum of dioxins (PCDD/F/dl-PCB) with bioassay DR CALUX in Eggs of backyard chicken, Zubieta 2019-2023

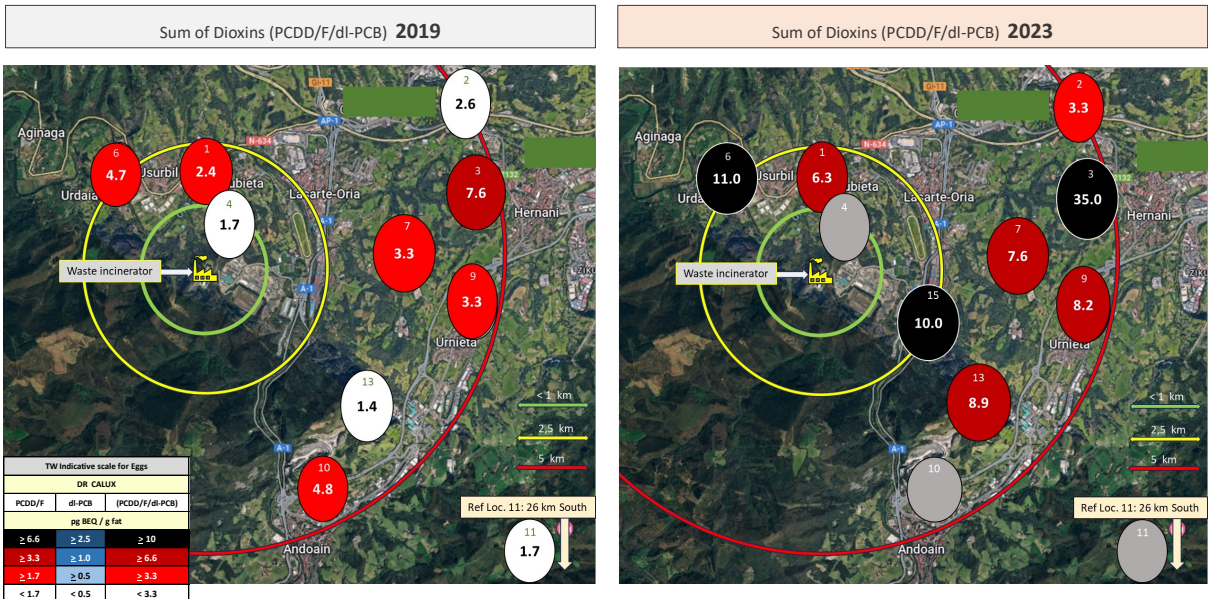


Figure 5: Dioxins (PCDD/F/dl-PCB) in backyard chicken eggs

Figure 6 shows the measurements on eggs with the factors of increasing levels of dioxins at seven (7) comparable locations from 2019 to 2023.

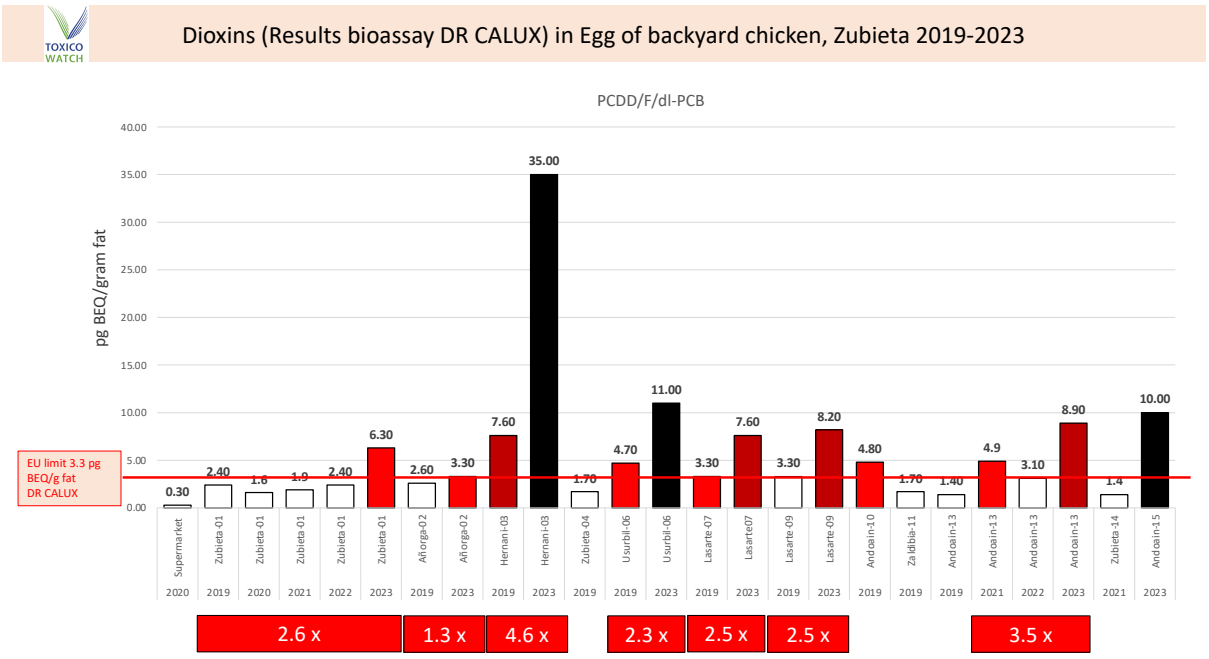


Figure 6: Dioxins in eggs of backyard chicken, Zubieta 2019 - 2023

The dioxin level in backyard chicken eggs found in Hernani with 35 pg BEQ/g fat, represents the highest value for dioxins ever measured in eggs of backyard chicken near waste incinerations (old: Madrid and Paris) and (new build: Belgium/Zubieta) in our TW biomonitoring of the last 10 years in Europe. Figure 7 shows the top of all analysed dioxins in eggs with the one in Hernani with 35 pg BEQ/g fat at the top of this graph.

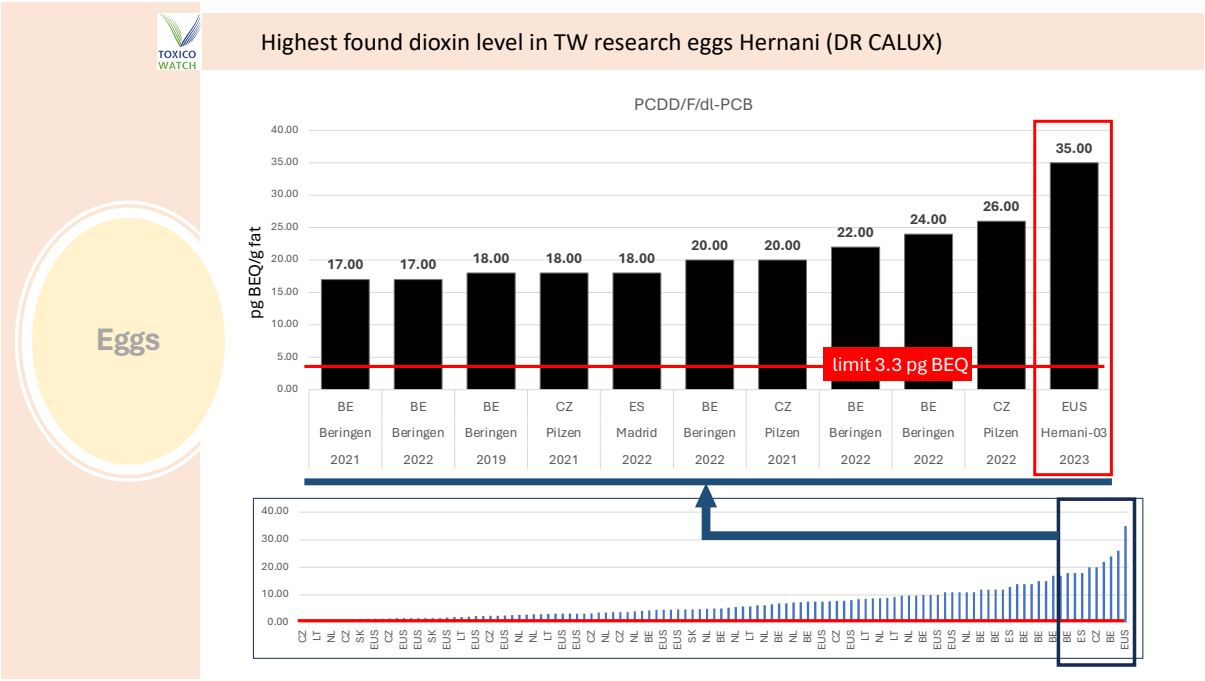


Figure 7: Highest dioxin level in Hernani-06

Dioxins PCDD/F

Figure 8 below shows the changes in levels of chlorinated dioxins (PCDD) and furans (PCDF) from 2019 to 2023. All the locations with eggs of the backyard chicken show increased dioxins, with values exceeding EU safety standards for commercial chicken eggs and therefore requiring verification with the chemical analysis GC-MS on these exceeding DR CALUX results.

Results dioxins (PCDD/F) with bioassay DR CALUX in Eggs of backyard chicken, Zubieta 2019-2023

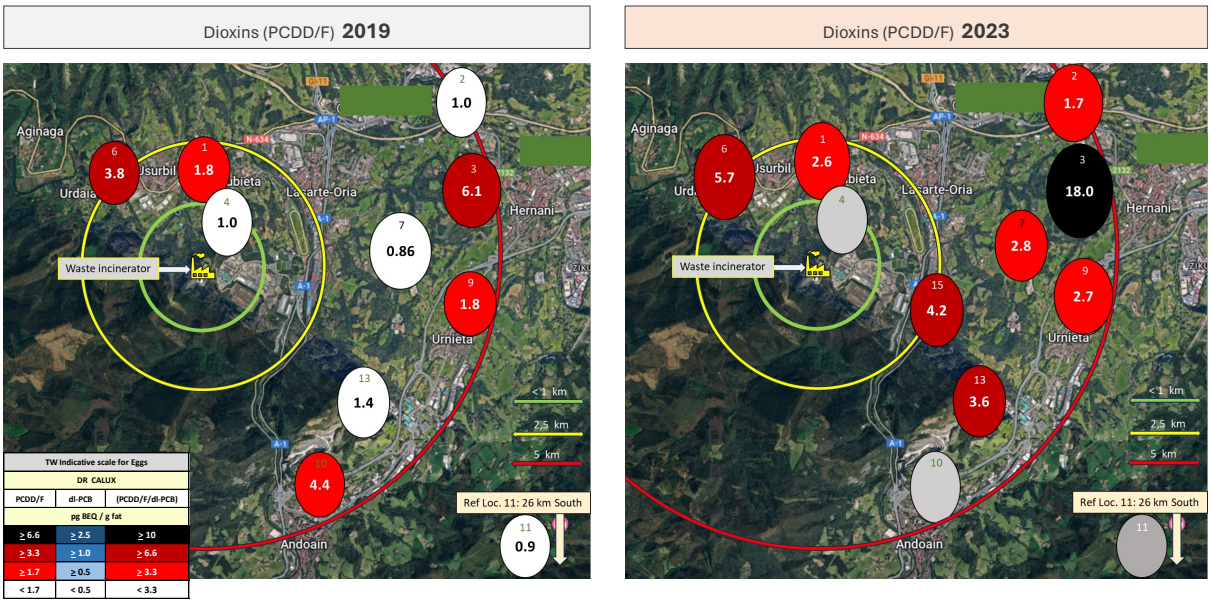


Figure 8: PCDD/F in backyard chicken eggs

Dioxin-like PCB (dl-PCB)

Dioxin-like PCBs (dl-PCBs) pose health hazards that can include increased risk of cancer, immune deficiencies, neurotoxicity, reproductive impacts, developmental effects, and skin changes. Dl-PCBs are concerning due to their persistence (p) in the environment, ability to bioaccumulate (B) up the food chain, and their toxicity (T), and as such, they are considered **P**ersistent, **B**ioaccumulative and **T**oxic substances (PBTs). All locations, except one, show an increase in the contribution of dl-PCB to the DR CALUX response. It is noticeable, that not only the concentration of dl-PCB increased at all sites, but also the contribution of dl-PCB as a percentage of total toxicity increased, see figures 9 and 10.

Results dioxin-like PCBs (dl-PCBs) with bioassay DR CALUX in Eggs of backyard chicken, Zubieta 2019-2023

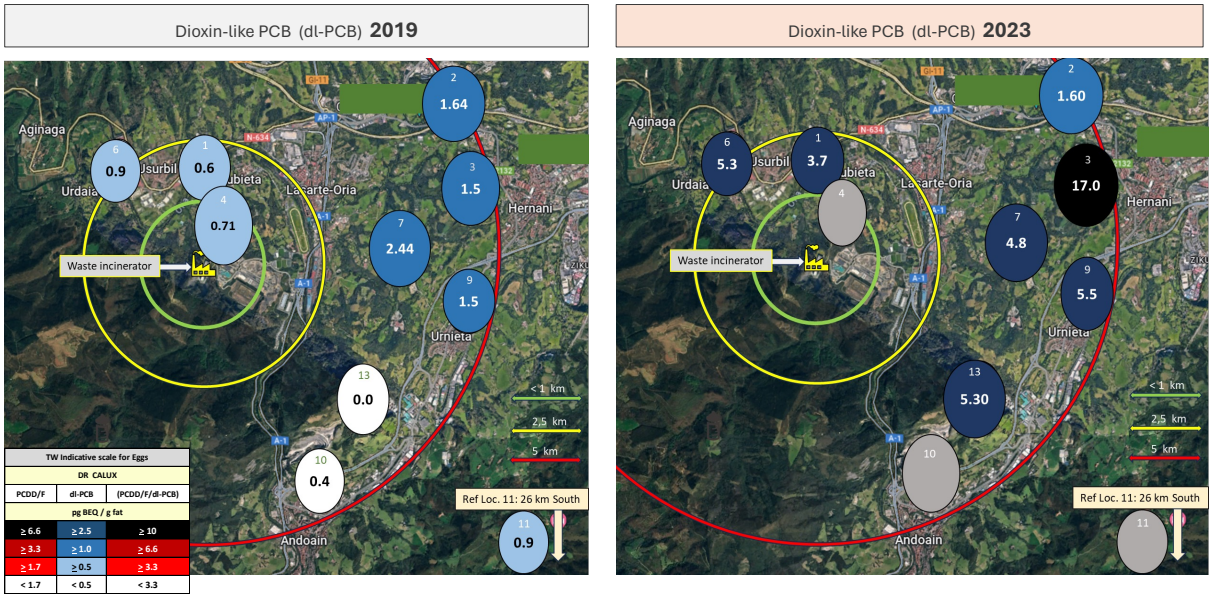


Figure 9: Contribution of dl-PCB in the toxicity of PCDD/F/Dl-PCB in backyard chicken eggs, Zubieta 2019 - 2023

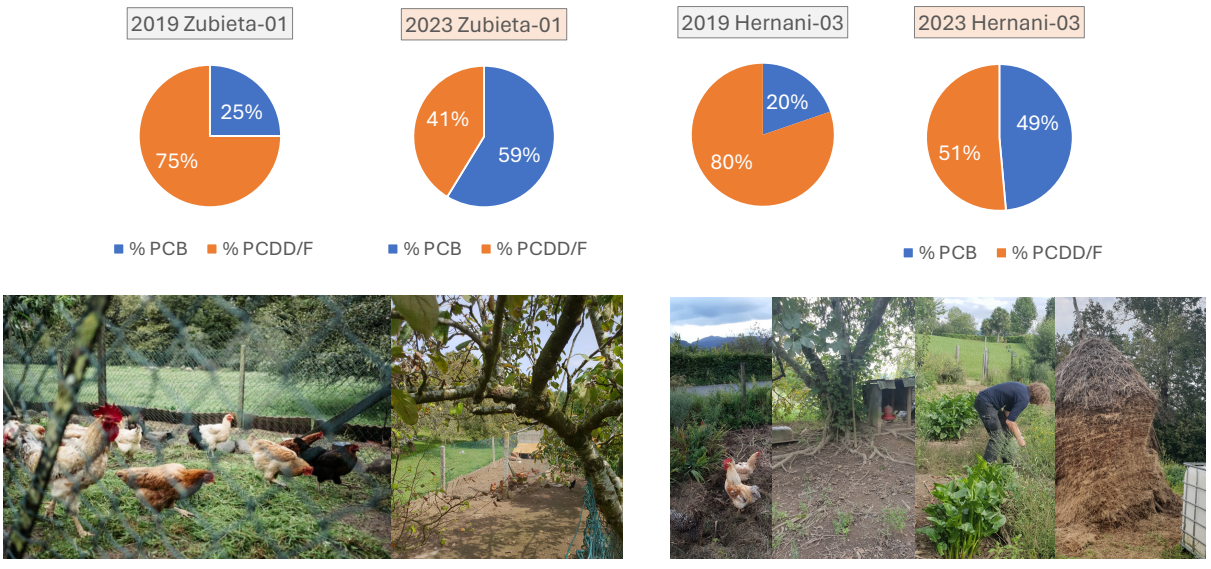


Figure 10: Dioxin-like PCB in backyard chicken eggs

Location Hernani-03 with the highest DR CALUX response, has an increase of 1130% of dl-PCB. The intentional production of PCBs has been banned for more than 50 years. The reason for this huge increase in dl-PCBs needs to be determined, as the EU mandated in their regulations, figure 11.

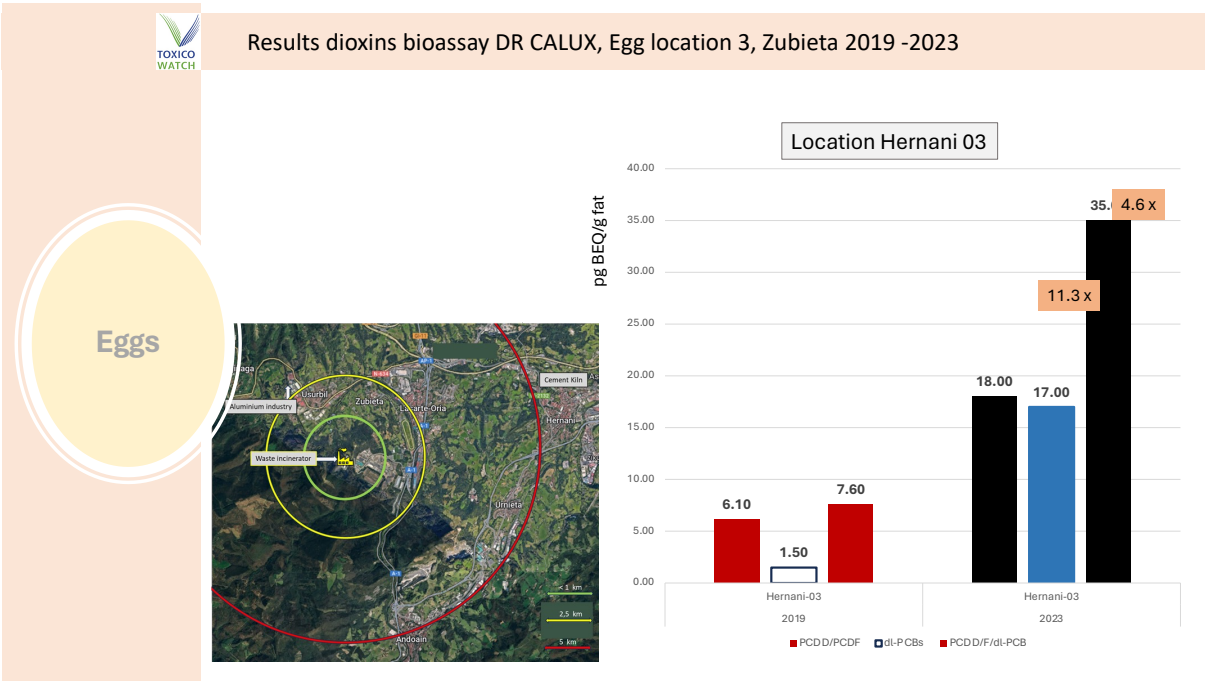


Figure 11: Dioxins in eggs of backyard chicken, location Hernani-03, 2019 - 2023

Figure 12 shows the results of 4-year biomonitoring on eggs of backyard chickens at location Zubieta-01. In previous years, levels of dioxins (PCDD/F/dl-PCB) comply with the EU limit of 3.3 pg BEQ/g fat set for the DR CALUX. The last measurement in 2023 passes the EU limit with 190% with 6.3 pg BEQ/g fat for the sum of PCDD/F/dl-PCB with a level of dioxin-like PCB of 3.7 pg BEQ/g fat.

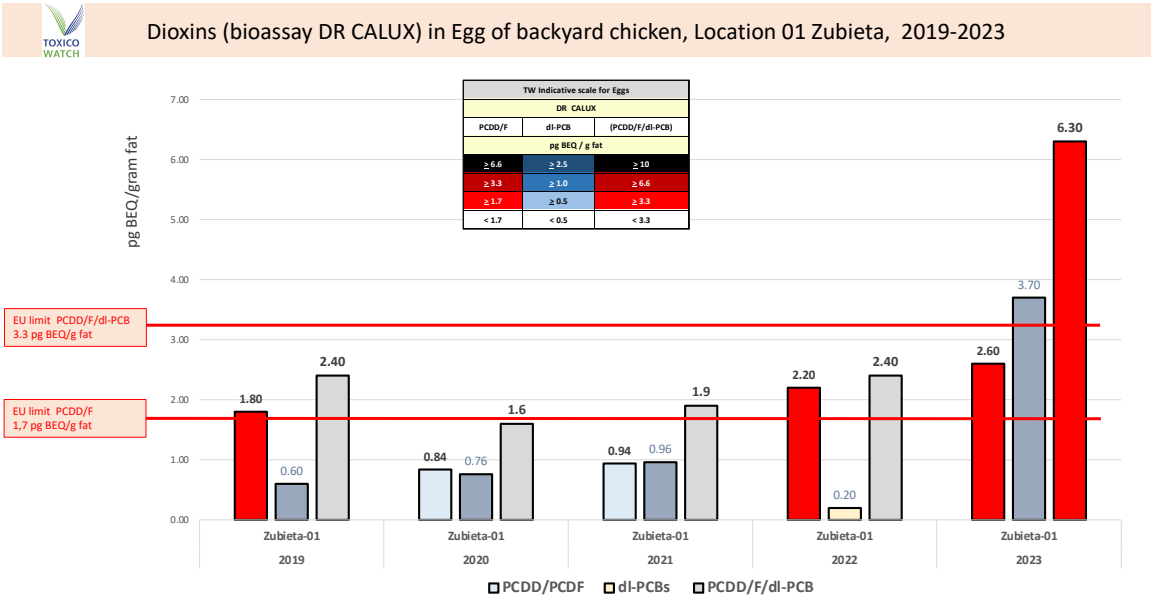


Figure 12: Dioxins in eggs, location Zubieta-01, 2019 - 2023

GC-MS analyses

The results of the chemical analyses for dioxins (PCDD/F/dl-PCB) in eggs are shown in Figure 13. Five (5) locations exceed the EU limit of 5 pg TEQ /g fat for dioxins. Location Hernani exceeds the limit by a factor of 3. Six (6) locations passed the action limit for dl-PCB. It should be noted, however, that the DR CALUX measures more dioxin-like activity than the 29 chlorinated congeners with the chemical analyses. The toxic load of brominated and other mixed halogenated dioxins is excluded by this method. It is a recommendation to extend analyses to brominated dioxins to have a more complete picture of the total dioxin toxicity.

Results dioxins (PCDD/F/dl-PCBs) with chemical analyses (GC-MS) in Eggs of backyard chicken, Zubieta **2023**

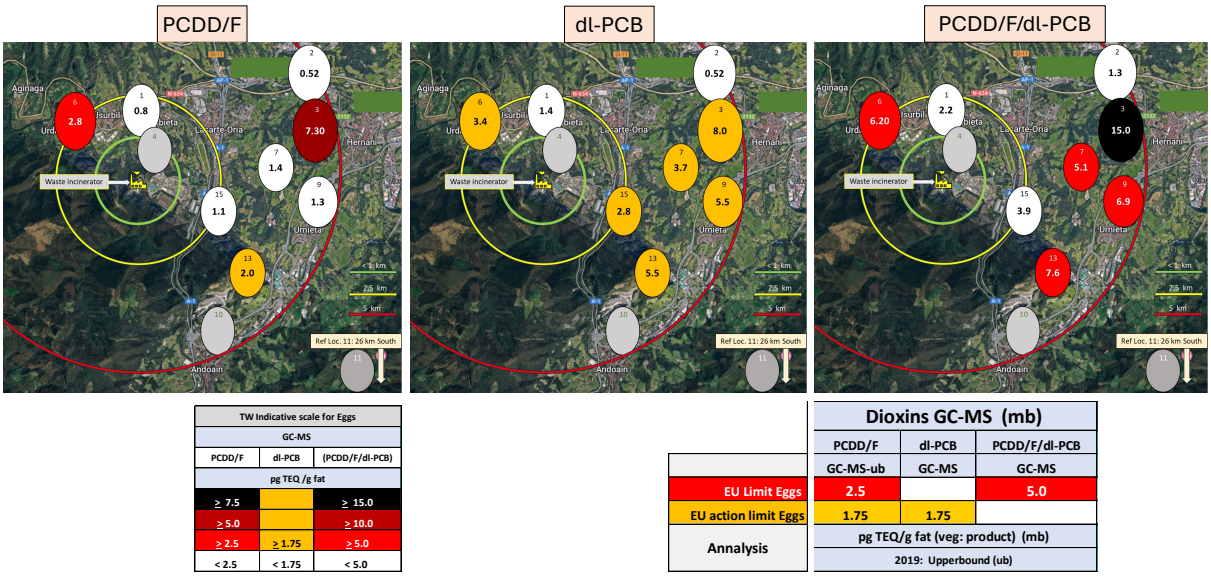


Figure 13: Results dioxins with chemical analyses, eggs Zubieta 2023

In 2018, EFSA updated the toxicity of dioxins by a factor of 7 and advised the adoption of the EU limits for food, feed and emissions limits in the industry. However, this has still not been incorporated.

If the results are placed in a temporal perspective, it is evident the region is under pressure from increasing dioxin pollution, Figure 14.

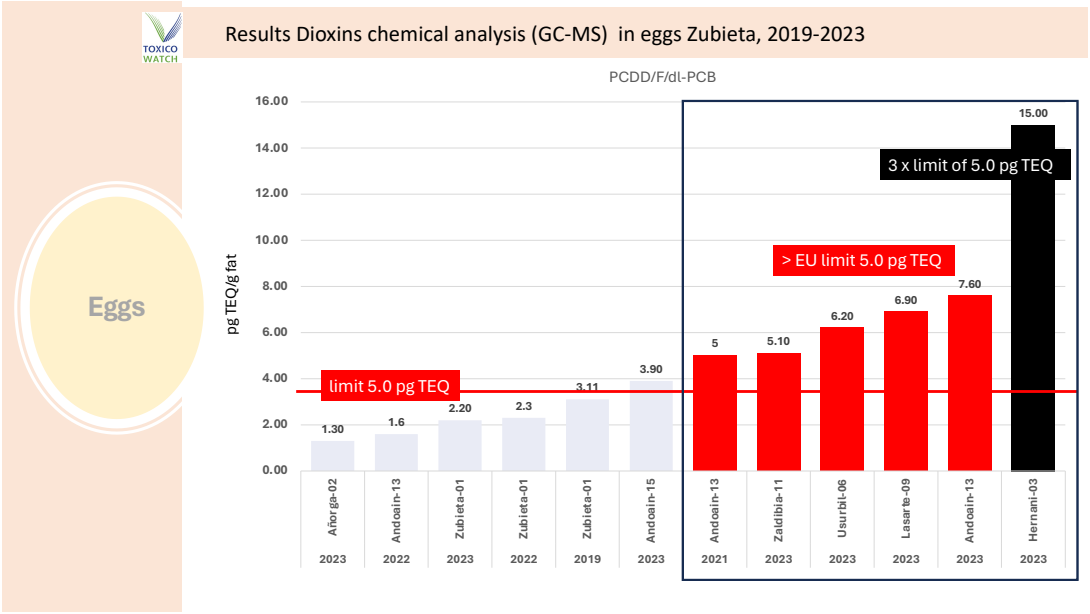


Figure 15: Chemical analyses dioxins in eggs, Zubieta 2019 - 2023

Congener patterns

Figure 16 shows some dioxin (PCDD/F) congeners in the eggs of backyard chickens. More research is needed to interpret these results. In 2024 more chemical analyses will be performed at the eggs of these locations.

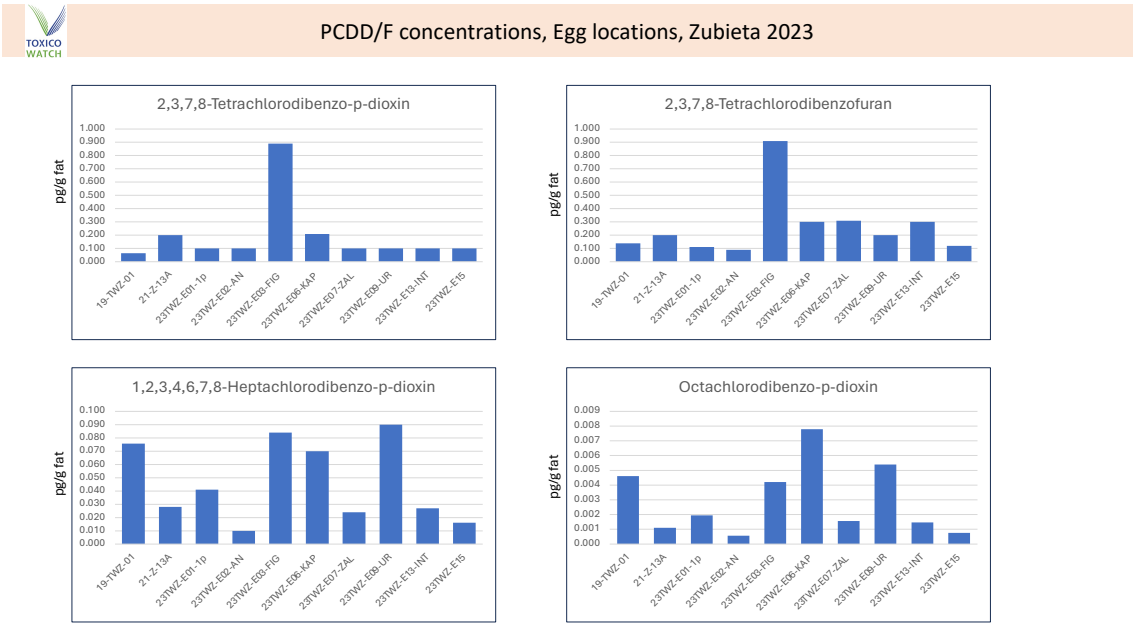


Figure 16: PCDD/F congeners in eggs of backyard chicken, 2023 Zubieta

The congener patterns from location Hernani are most consistent with patterns of incomplete combustion, both with concentration and TEQ distribution, Figure 17.

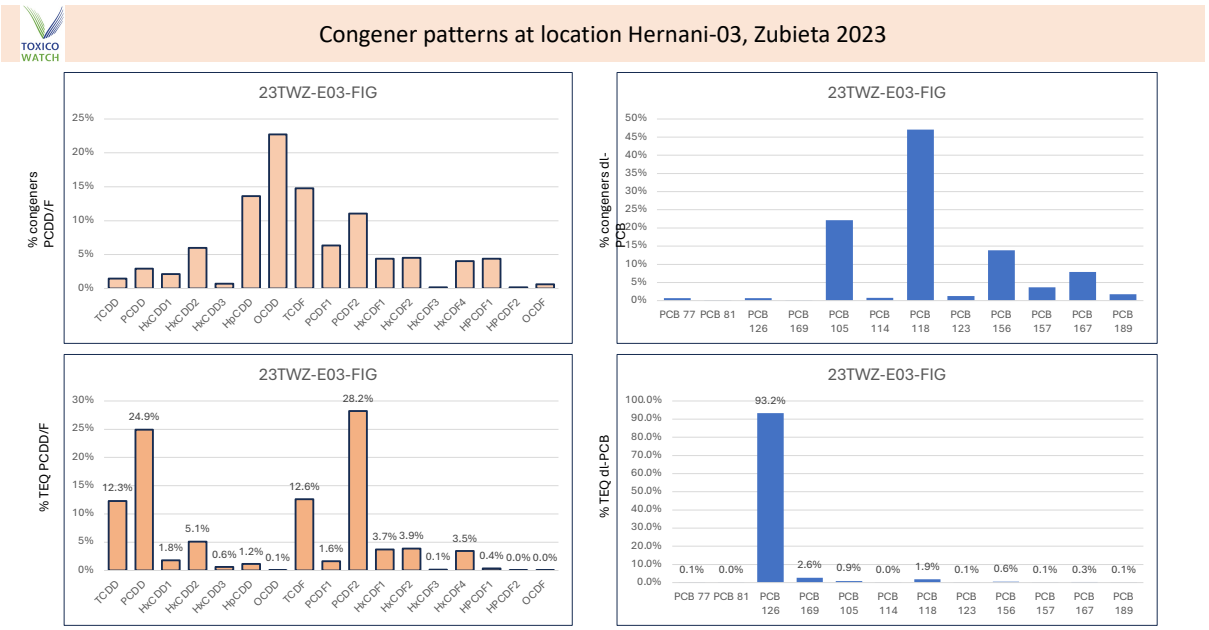


Figure 17: Congener patterns at location Hernani-03, % concentrations and % TEQ

Results PFAS

In 2021 eggs of Zubieta and Andoain were analysed with the screening method of FITC-T4 on the presence of PFAS. The result was for both locations 1900 ng PFOA equivalent/g fat. In 2022, PFAS is analysed with the chemical analyses of LC-MS/MS, the results were 1.51 and 1.75 ng ∑ 24 PFAS/g (mb). In 2023 the results on eggs of three locations were higher: 3.1 – 10.54 ng ∑ 24 PFAS/g (mb). Location Andoain 2 km from the incinerator measured the value of 10.54 ng ∑ 24 PFAS/g (MB), Figure 18.
The elevation of factor 7 of PFAS in eggs in Andoain needs further research. The dominant C8 compound PFOS measured 4.4 ng PFOS at locations Hernani and Andoain. This value surpasses the EU limit for PFOS by 440%. The other PFAS in eggs are PFOA, PFNA, PFDA, PFUnDA, PFDoA, PFTrDA and PFTeDA (see acronyms). The C4 compound PFBS, found in mosses, was not detected above the limit of detection (LOD) in eggs, Figure 19.

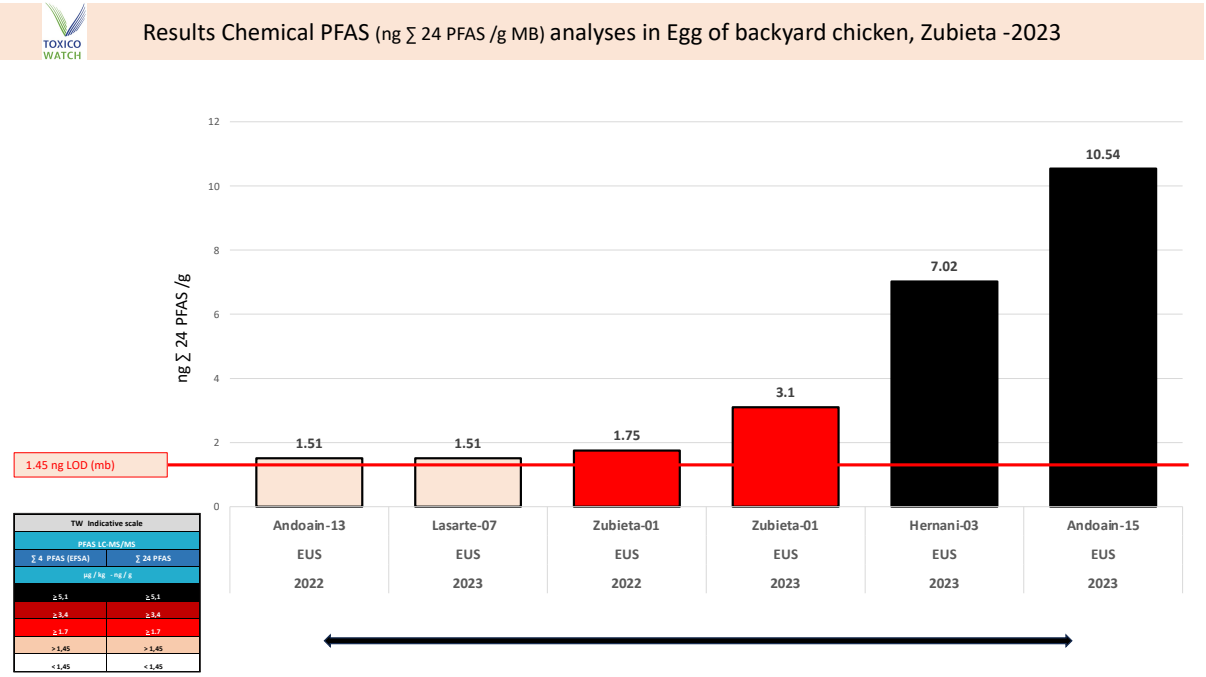


Figure 18: PFAS in eggs

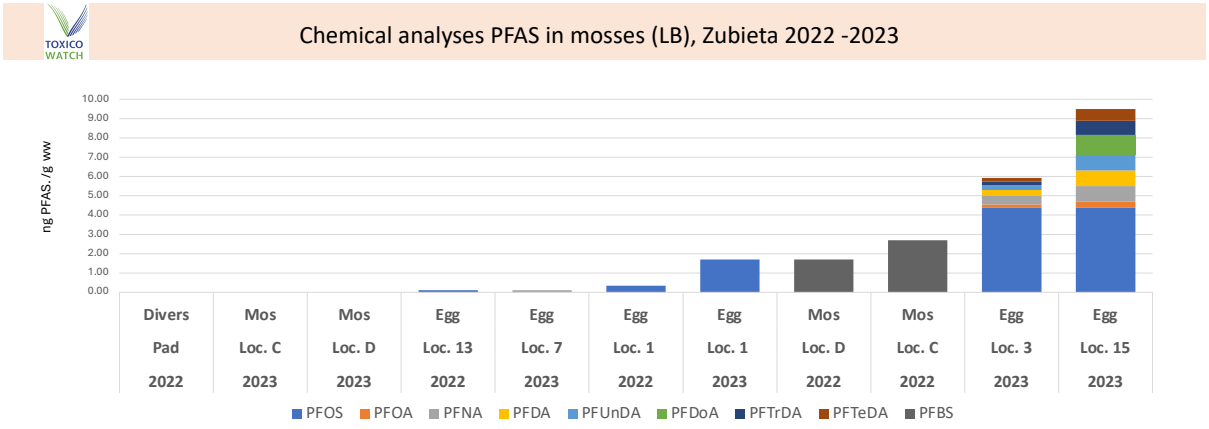


Figure 19: Chemical analyses PFAS, 2023 Zubieta

Mosses (Bryophyta)

Dioxins

At the start of this biomonitoring research in 2019, no dioxins could be detected above the detection limit in mosses near the incinerator (Figures 20 and 21). The analyses were performed with the bioassay of DR CALUX. In the following years, high values of dioxins were measured, except in 2023 in mosses at location D. In 2022, an extremely high dioxin level of 29.8 pg TEQ (TCDD)/g product was found at location C, directly located near the waste incinerator. This could be due to the calamities of many shutdowns and start-ups from the incinerator in that year. Research of the uncorrected minute data of semi-continuous measurements could exclude this hypothesis. In 2023 the dioxin level decreased to 6.15 pg TEQ(TCDD)/g product dw 88%. When this level is compared with the EU limits for animal feed, the dioxin level still exceeds this limit almost five (5) times.

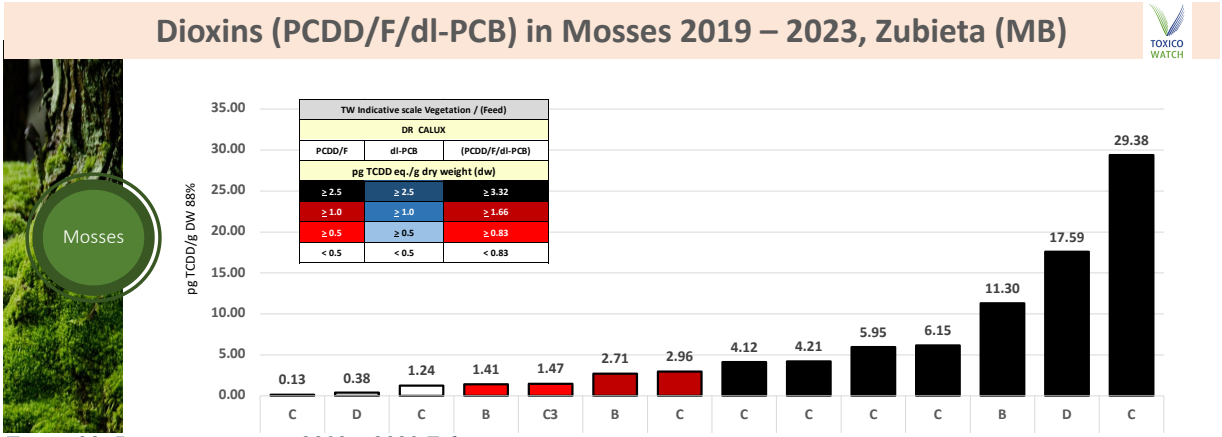


Figure 20: Dioxins in mosses, 2019 – 2023 Zubieta

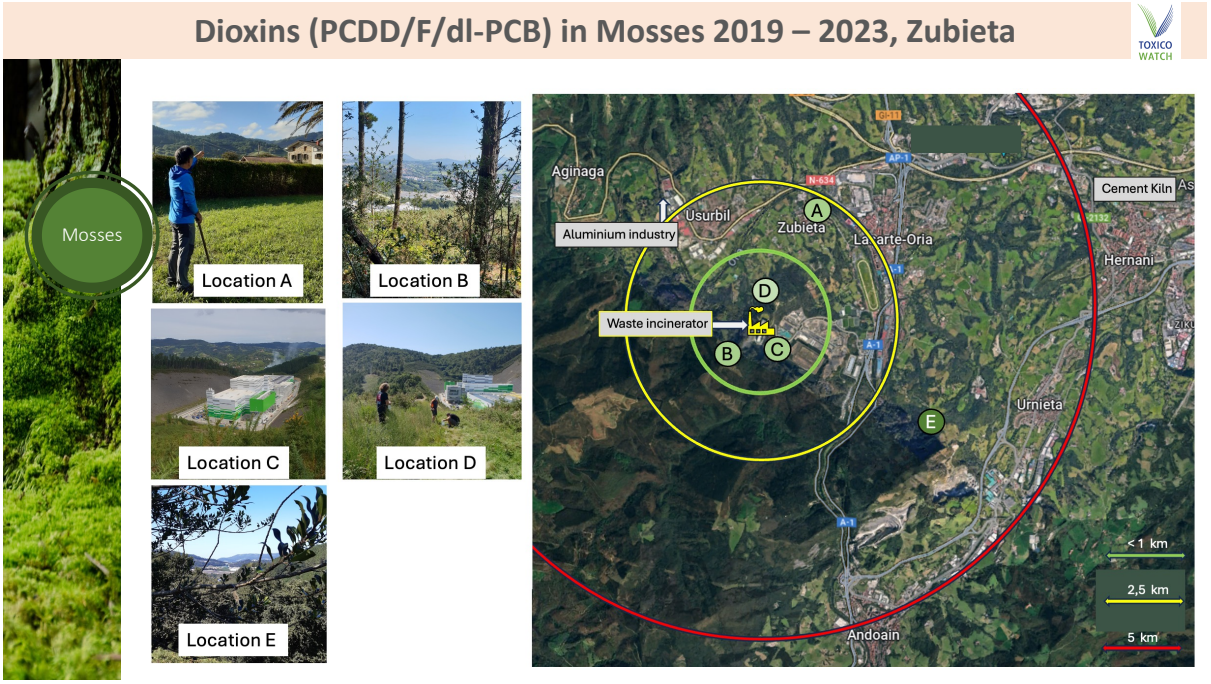


Figure 21: Sample locations of mosses

Polycyclic Aromatic Hydrocarbons (PAH)

A chemical PAH analysis with GC-MS/MS is performed on mosses at locations C and D. The results were 43.2 ng/g for location C and 2.7 ng/g for location D. A difference of a factor of 16. This is also reflected in the results of dioxins in mosses at these locations. In 2023 high levels of dioxins of 6.15 pg TEQ/g were found at location C, while only 0.38 ng TEQ/g was found at location D (all expressed in 88% dw). It is quite feasible, that the increased vegetation in these five years expand (2019-2023) plays a role in the deposition patterns by air-reduced contamination of POPs at location D (see Figure 22).

PAH in Mosses

PAH in Mosses (GC-MS/MS)		
2023		
	D	C
	ng/g	
Benzo(a)anthracene	0.5	4.7
Chrysen	0.5	14.1
Benzo(b)fluoranthene	1.2	15.7
Benzo(a)pyrene	0.5	8.7
Sum Chr, B(b)f, B(a)p, B(a)a (UB)	2.7	43.2

Location C

Location D

Figure 22: PAH in mosses location C and D

PFAS

In 2020, mosses at locations B and C were tested with the bioassay PFAS CALUX. The results were, expressed in PFOA equivalents, 1500 - 5000 ng PFOA equivalent per gram wet weight. In 2021 a value of 17000 ng PFOA eq./g PFAS was detected with the method of FITC-T4.

In 2022 and 2023, chemical analysis of LCMSMS on 24 PFAS congeners was applied on mosses. In 2022, values of 3.1 - 4.1 ng PFAS/g were measured. The PFAS component detected was perfluorobutanesulfonic acid (PFBS), at 1.7 and 2.7 ng PFBS/g ww, at locations D and C, respectively. PFBS is a chemical substitute for the persistent, toxic, and bioaccumulative compound perfluorooctanesulfonic acid (PFOS) in example, Scotchgard stain repellents from 3M. In 2023 could no PFAS be detected above the detection limit. The reduction of PFAS is in line with the decrease in dioxins in moss by 2023, see Figure 23.

These findings contrast with the increased PFAS levels in the biomarkers from eggs where an increase in PFAS was found. However, we must put a caveat on the current shortcomings of PFAS analyses. Only a very small amount of 24 PFAS can be analysed, while as explained in the introduction, there are far more PFAS compounds in the environment.

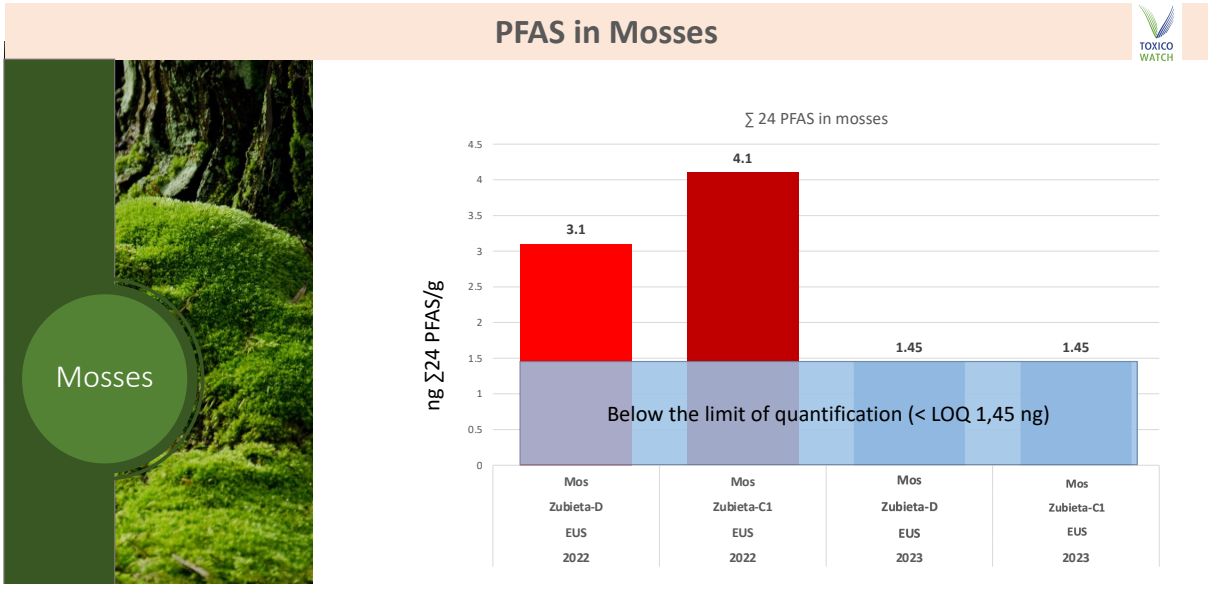
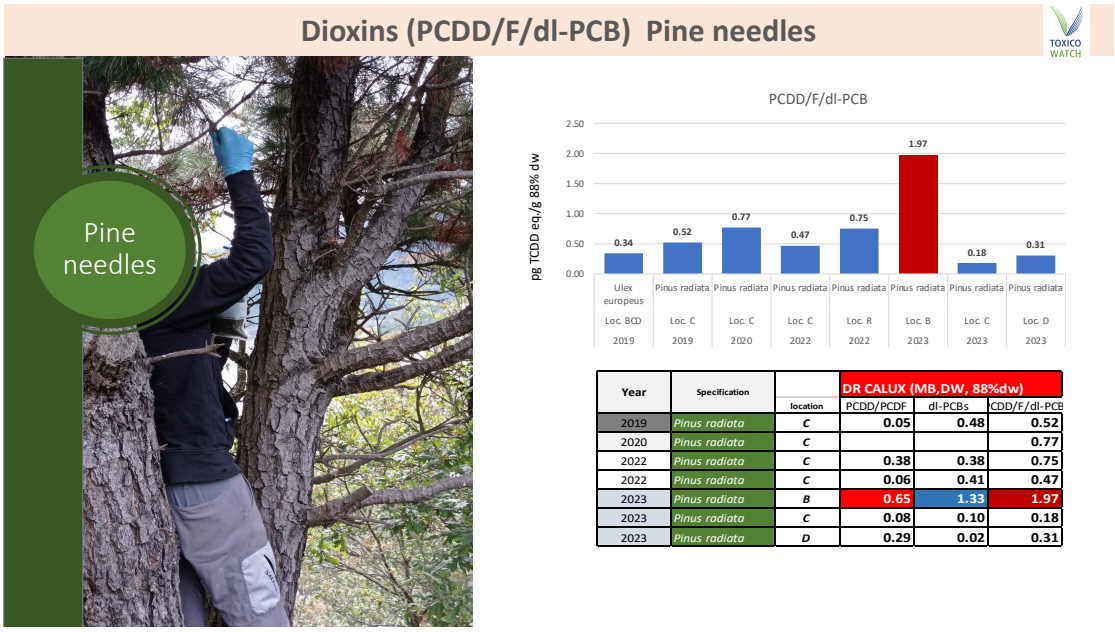


Figure 23: PFAS in mosses

Pine needles

Dioxins

In 2023 the results for dioxins (PCDD/F/dl-PCBs) in pine needles of the species *Pinus radiata were:* 0.18 – 1.97 pg TEQ/g (88% dw, MB). The highest level of 1.97 pg TEQ/g was found at location B, figure 24.



Year	Specification	location	DR CALUX (MB,DW, 88%dw)		
			PCDD/PCDF	dl-PCBs	PCDD/F/dl-PCB
2019	*Pinus radiata*	*C*	0.05	0.48	0.52
2020	*Pinus radiata*	*C*			0.77
2022	*Pinus radiata*	*C*	0.38	0.38	0.75
2022	*Pinus radiata*	*C*	0.06	0.41	0.47
2023	*Pinus radiata*	*B*	0.65	1.33	1.97
2023	*Pinus radiata*	*C*	0.08	0.10	0.18
2023	*Pinus radiata*	*D*	0.29	0.02	0.31

Figure 24: Dioxins in pine needles

Ilex aquifolium

Dioxins

In 2023 an elevation is found of 230 % of dioxins in the leaves of *Ilex aquifolium*, at location E. The distance towards the incinerator is 2620 meters, see Figure 25. More sampling is needed to confirm the elevation. Noteworthy is the doubling of cadmium (Cd) and nickel (Ni) in these leaves (see heavy metals appendix).

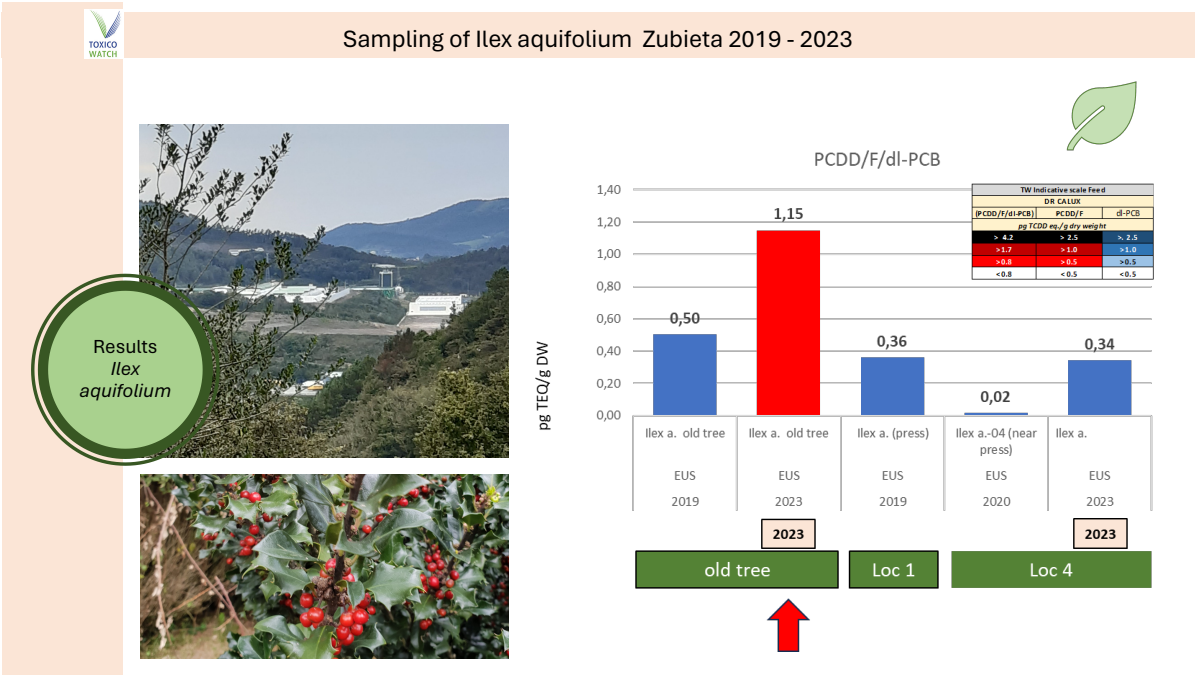


Figure 25: Dioxins in Ilex aquifolium

Sediment

In 2019, measurements with the bioassay ERA CALUX were taken to measure hormonal activity in the sediment of water streams around the waste incinerator. In 2019, values of 5.1 -270 ng 17b Estradiol eq./g dry weight was measured. In 2020 18.0 – 180.0 ng 17b Estradiol eq./g dry weight. In 2022, 31.0 - 63.0 ng 17b Estradiol eq./g dry weight, Figure 26.

Estrogenic activity in sediments

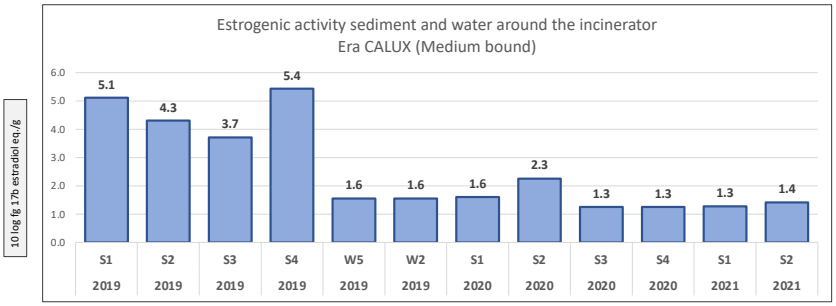


Figure 26: Estrogenic activity and PFAS activity in water

In 2020, the water stream at the *Arkaitz erreka* measured down and upstream 63 and 140 ng PFOA eq./litre with the PFAS CALUX. This result exceeded the recently set Dutch limit for water in 2023 of 0.3 nanograms per litre for PFOA by more than a factor of 210 – 466.[1] The PFAS CALUX is a method that measures the total toxic effect of a mixture of PFAS congeners and is currently used by the Dutch government to screen for PFAS in surface water and inform policy measures for source reduction. This year research will be continued for measuring PFAS activity in the water stream and sediments in the surrounding area of the waste incinerator Zubieta.

Calamities Arkaitz erreka, May 10, 2020 & July 13, 2022

On May 10, 2020 & July 13, 2022, two calamities occurred in the mountain river *Arkaitz erreka*. The figure below compares the find results with the results of TW in this water stream in 2019 and heavy metals analyses in 2023 groundwater results, figure 27.

Figure 27: Calamities Arkaitz erreka

[1] *Smit C.E., Verbruggen E.M.J. (2022). Risicogrenzen voor PFAS in oppervlaktewaterRIVM-briefrapport 2022-0074 C.E. Smit | E.M.J. Verbruggen*

Water

Heavy metals

Analyses of heavy metals were taken in 2019 and 2023. Several metals, such as Arsenic, Lead, Copper, Nickel and Chromium, show increased concentrations and need to be monitored more, Figure 28, 29.

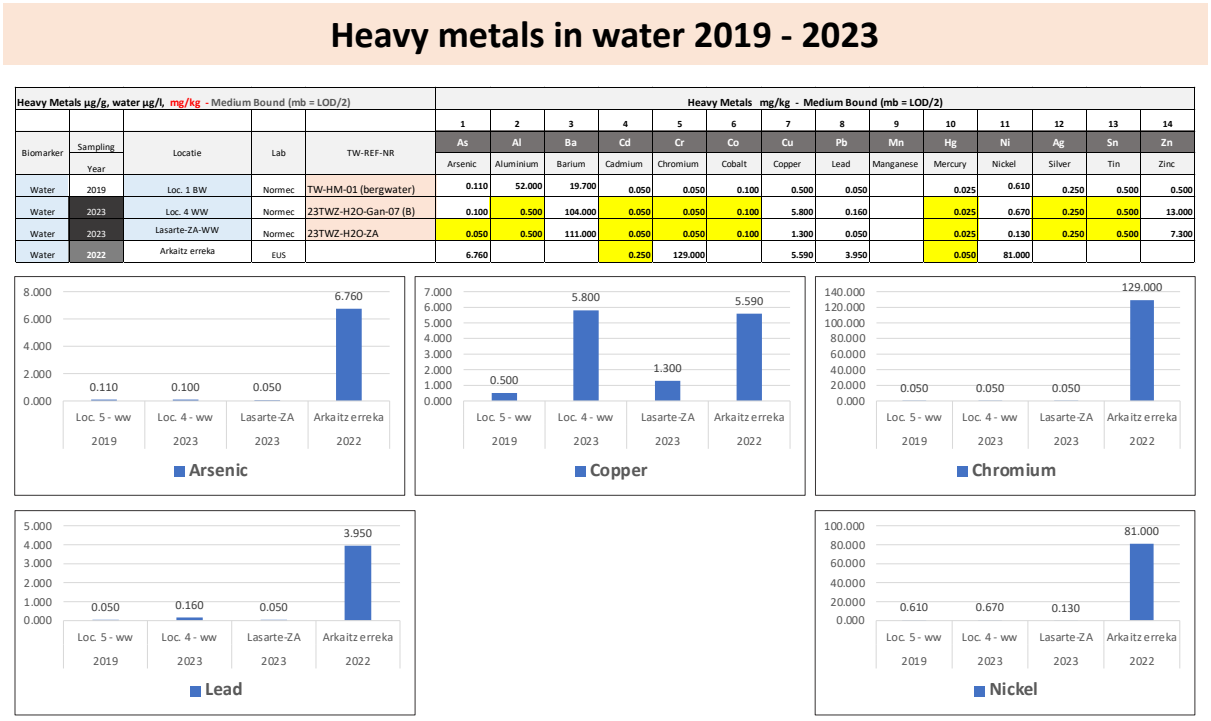


Figure 28: Heavy metals in water 2019 – 2023, Zubieta

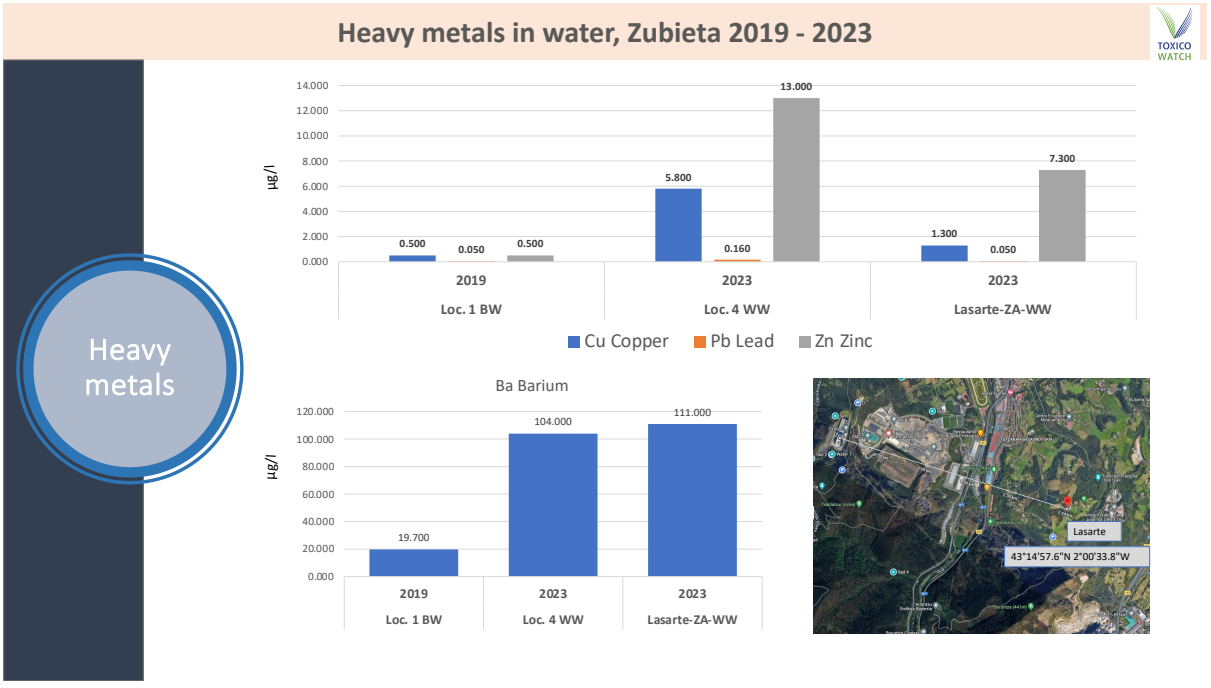


Figure 29: Levels of heavy metals in water, 2019 – 2023 Zubieta

Vegetation

Heavy Metals

In 2019, firm Geyser (lab Eurofins) conducted analyses on 6 heavy metals in vegetation and soil. Analyses of 14 heavy metals in vegetation, soil and water in 2023 are performed by TW. (see annexe). The research will be continued in the coming years. Below is an example of an increase in the heavy metals of cadmium and mercury in vegetation, to be investigated further in 2024-2025, figure 30. See full overview in Annex.

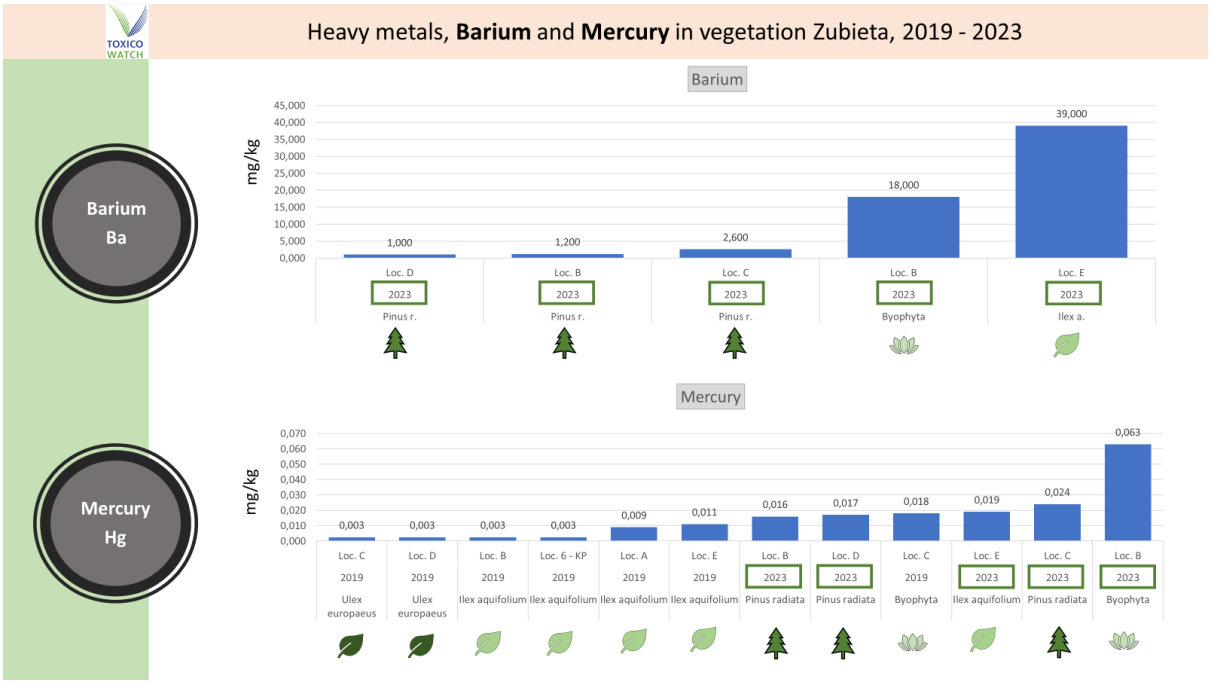


Figure 30: Heavy metals in vegetation, Zubieta 2019 - 2023

Mother milk

It is well known that dl-PCB and PCDD/F concentrations in breast milk reflect the long-term exposure of the mother and give information about the exposure of the breastfed infant.
Research by Xu (2020) shows a significantly higher body burden of PCDD/Fs and dl-PCBs in mothers and their breastfed infants living in proximity of an incinerator[2]. Breast milk monitoring is a non-invasive method to collect samples for determining levels of chemical contaminants of interest in humans, therefore, breast milk is a good matrix for the analysis of dl-PCBs and PCDD/Fs, see Figure 31.

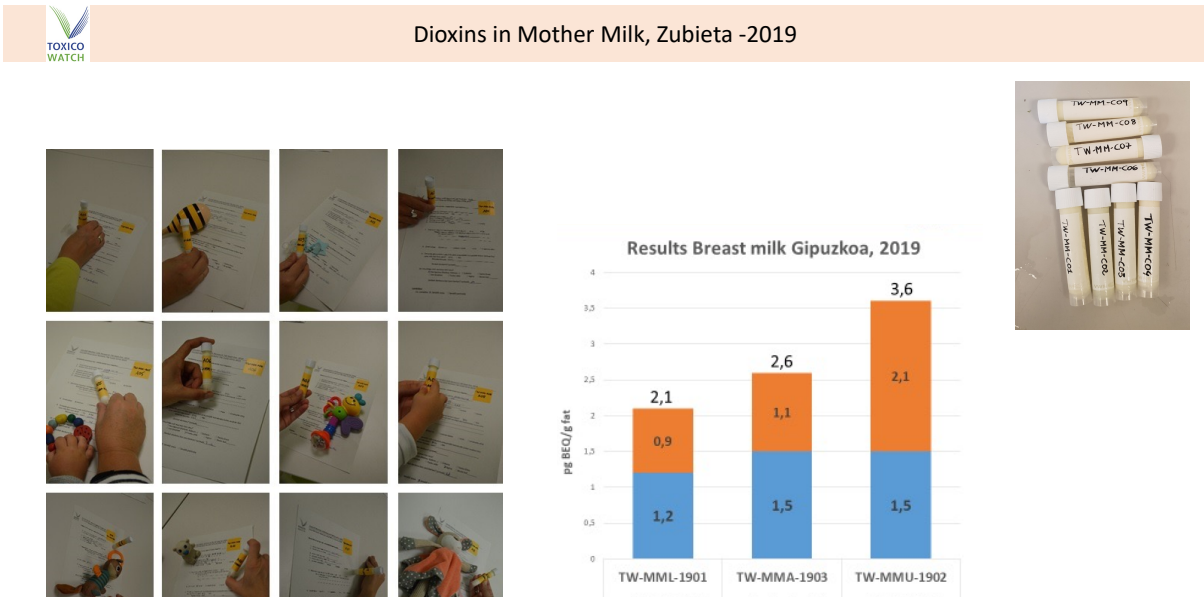


Figure 31: Results Mother Milk (Breast milk) in pg BEQ/g fat, DR CALUX in Usurbil, Lasarte, and Andoain, 2019.

In 2019 TW set up a baseline study with 39 participants. Mother milk was pooled in three samples in the three villages around the incinerator: Usurbil (n=12), Lasarte (n=19) and Andoain (n=8), respectively 1200-2500m, 1800-2800m and 4000-4900 m from the waste incinerator in Zubieta. The results of baseline analyses with the DR CALUX are shown in the graph on the right side. Compared to other results in Europe these results are relatively low, and it would be interesting to measure the results of dioxins in breast milk in 2024-2025. The results of this research can give information about the state of public health and the possible toxic load in this environment. The results of the first biomonitoring of mother milk are also shown in the table below (pg BEQ/g fat).

BREAST MILK/ Mother Milk (MM)						
	Location	**TW number**	**PCDD/F**	**dl-PCB**	**PCDD/F/dL-PCB**	**Date**
A	Usurbil	TW-MMU-1902	**1,5**	**2,1**	**3,6**	okt.2019
B	Lasarte	TW-MML-1901	**1,2**	**0,9**	**2,1**	okt. 2019
C	Andoain	TW-MMA-1903	**1,5**	**1,1**	**2,6**	okt. 2019

[2] *Xu P., et al (2020). High intake of persistent organic pollutants generated by a municipal waste incinerator by breastfed infants, Environmental Pollution 250 (2019) 662 - 668*

Conclusions

In 2019, at the request of the local group Zubieta-Lantzen, the foundation of ToxicoWatch (TW) initiated multi-year (2019-2023) biomonitoring research on persistent organic pollutants (POPs) in the surrounding environment of a newly 2019 constructed Waste-to-Energy (WtE) waste incinerator in Zubieta, which started into production in 2020.
Analyses on dioxins (PCDD/F/dl-PCBs) were performed on backyard chicken eggs, vegetation (pine needles, leaves of evergreen shrubs, and mosses), human mother milk, water, and sediments. As well analysis of PAH and PFAS using chemical (GC-MS, LC-MS/MS) and innovative bioassay techniques (PAH CALUX, PFAS CALUX, and FITC-T4 for PFAS are used on the biomatrices of this research. This multi-year biomonitoring started before the incinerator came into production.

The results in 2023 show increasing levels of dioxins (PCDD/F and dioxin-like PCB) in all chicken egg locations. At Hernani, even the highest dioxin level in 10 years of TW biomonitoring in Europe around waste incineration facilities was found in eggs of backyard chicken nearby waste incinerators.

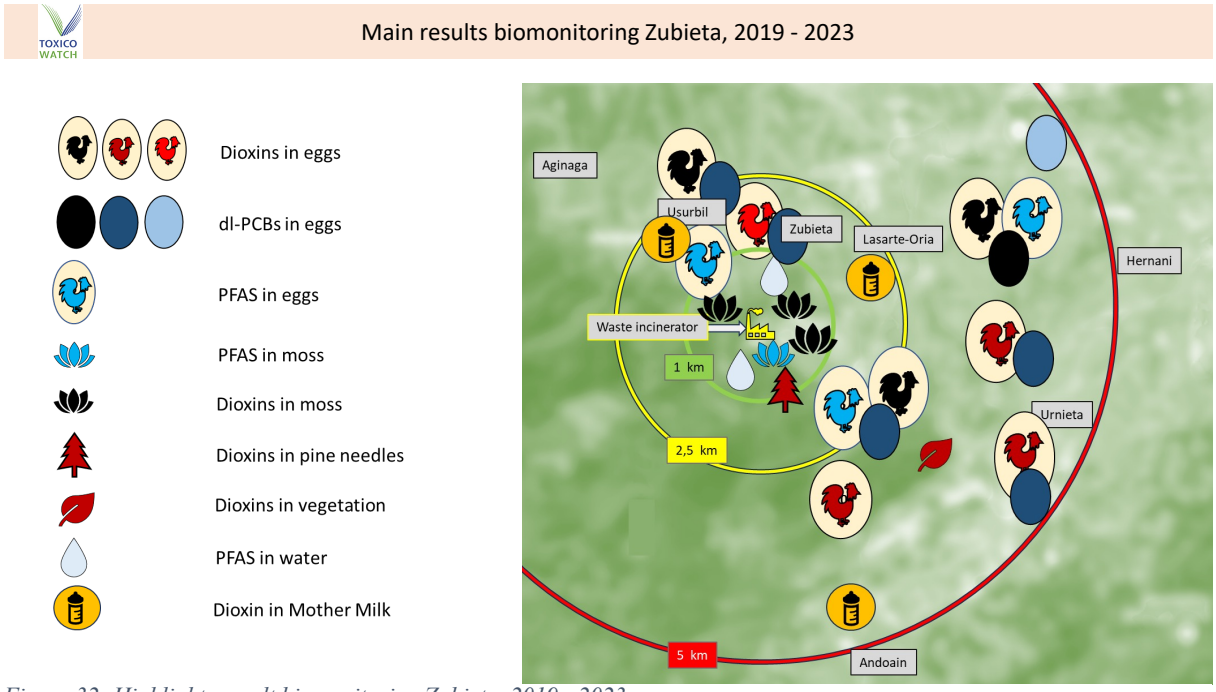


Figure 32: Highlights result biomonitoring Zubieta, 2019 - 2023

The results of biomonitoring in 2023 show an exceedance of 2-3 times above the EU limits for the safe consumption of chicken eggs. The chemical analysis on eggs shows lower values since only 29 chlorinated dioxins are mandated by EU regulations, excluded are all the other possible (mixed) halogenated substances, i.e. brominated dioxins.

The contamination of Substances of Very High Concern (SVHC) is not only an egg problem but a general POP contamination issue in the environment around the waste incinerator of Zubieta. 2019 no dioxins were measured in mosses (*Bryophyta*) and pine needles (*Pinus radiata*). In subsequent years, high dioxin levels were found at several locations, especially in mosses.

An alarming discovery was the finding of PFAS in eggs, moss and vegetation. PFOS levels in eggs of Hernani and Andoain surpass the EU limit for PFOS by 440%.

The increase of dioxins (PCDD/F/dl-PCB) and PFAS necessitates a thorough investigation of sources. One of the steps to be taken is an independent study on the (semi-)continuous raw minute data (uncorrected, non-averaged periodic monitoring data) of the flue gases of Zubieta's waste incinerator. The primary minute (not corrected) data on various parameters provides insight into the effectiveness of flue gas treatment management and the frequency of *Other Than Normal Operating Conditions* (OTNOC), such as start-ups and shutdowns. This assessment is needed to evaluate and possibly exclude the waste incinerator in Zubieta as a source of dioxins (PCDD/F/dl-PCBs), PAH, and PFAS in the nearby environment.

In 2019 TW set up a baseline study for dioxins in human mother milk. Following up on this mother milk study in 2024-2025 is recommended. The results of this research can give additional information about the human toxic load in this environment. ToxicoWatch will continue and expand this multi-year biomonitoring research in 2024 and 2025 on backyard chicken eggs, vegetation, water/sediment, soil and potentially a follow-up on the human mother milk research study.

Conclusions Biomonitoring Zubieta 2019 - 2023

- In 2023 all chicken egg locations show increasing dioxins (PCDD/F)
- In 2023 all chicken egg locations show increasing dioxin-like PCBs (dl-PCBs)
- In 2023 chicken egg locations show exceeding PFAS values
- Since 2021 increasing high concentrations of dioxins are found in Mosses
- In 2023 PAH with a chemical analyses is found in Mosses
- In 2022 PFAS with a chemical analyses is found in Mosses
- In 2023 increasing values of dioxins are found in pine needles and leaves
- In 2023 in Water and Sediment increasing levels of Heavy metals is found
- In 2021 PFAS is found with the bioassay PFAS CALUX method in water
- More research on dioxins, PFAS, PAH and Heavy Metals is needed.
- Mother Milk research 2019, needs to be followed up in 2025

TW – May 2024

List of figures

Annex

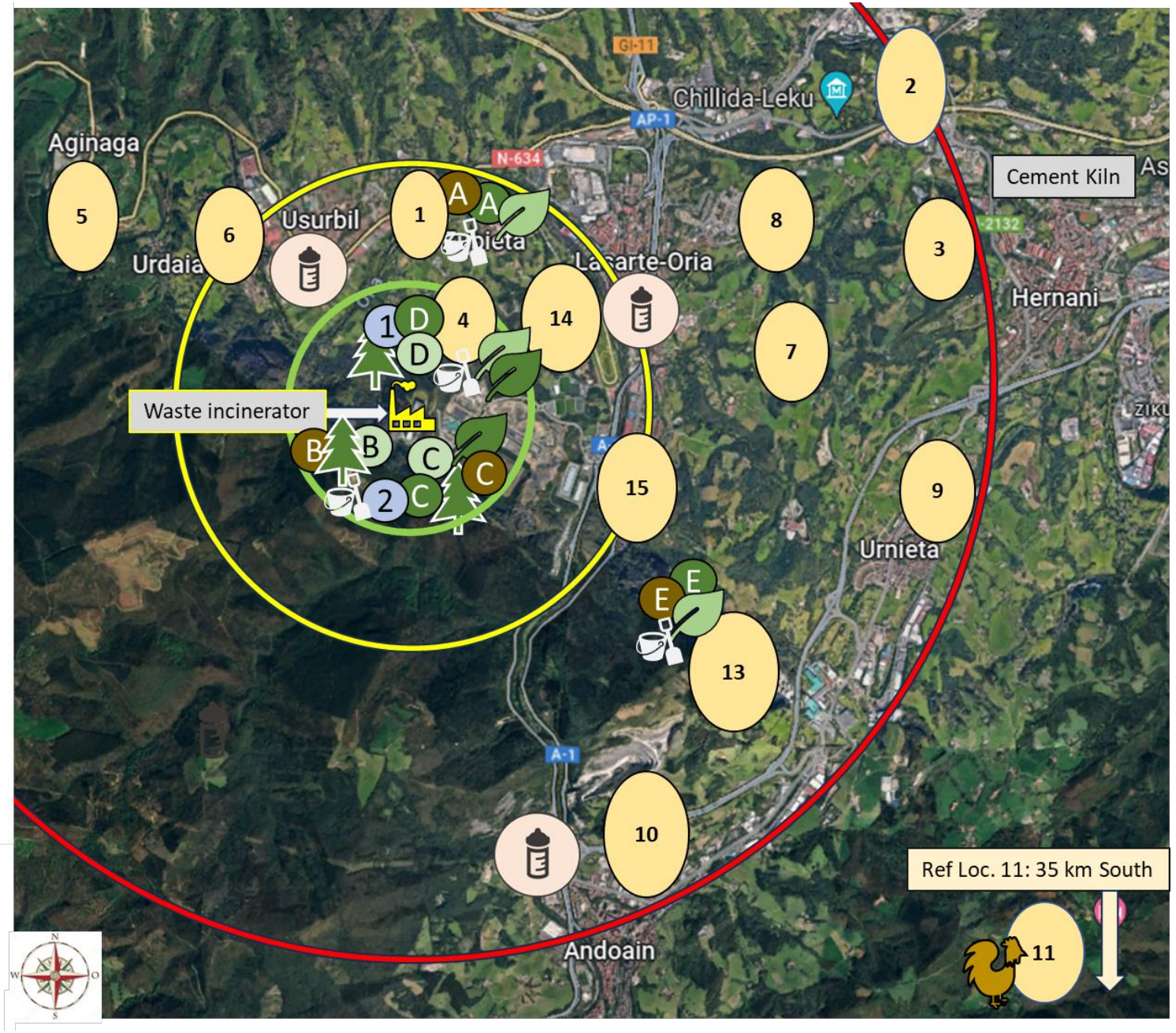
TW Biomonitoring Zubieta
2019-2023

(Bio)Matrices Locations Biomonitoring, Zubieta 2019-2023

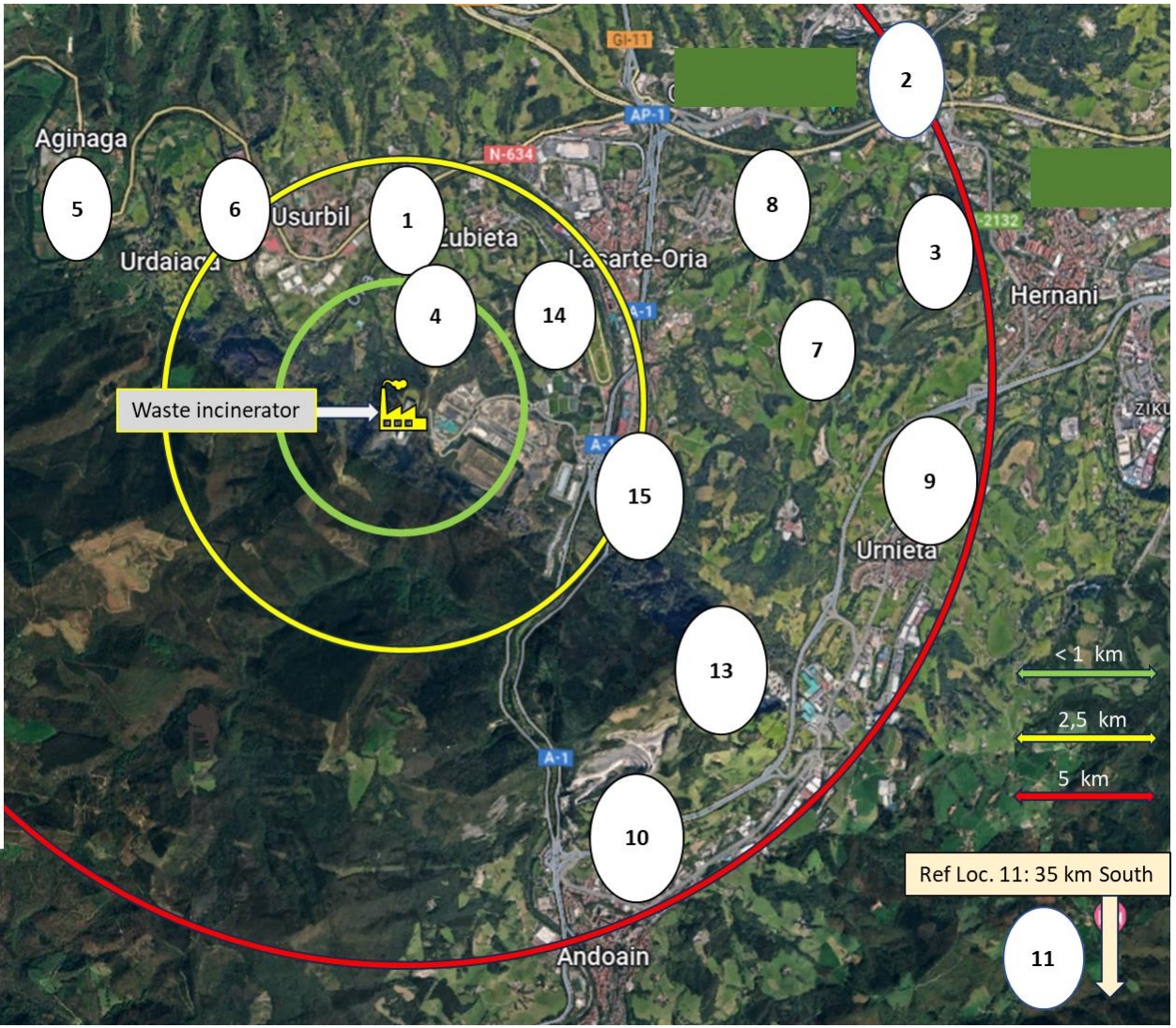
2019	Egg Loc. 01 - Zubieta	**Egg-01-PR**
2019	Egg Loc. 02 - Añorga	**Egg-02-AN**
2019	Egg Loc. 03 - Hernani	**Egg-03-FG**
2019	Egg Loc. 04 - Zubieta	**Egg-04-WW**
2019	Egg Loc. 06 - Usurbil	**Egg-06-KP**
2019	Egg Loc. 07 - Lasarte	**Egg-07-ZL**
2019	Egg Loc. 09 - Urnieta	**Egg-09-UR**
2019	Egg Loc. 10 - Andoain	**Egg-10-AD**
2019	Egg Loc. 11 - Zaldibia	**Egg-11-MP**
2019	Egg Loc. 13a - Andoain	**Egg-13a-IN**
2021	Egg Loc. 14 - Zubieta	**Egg-14-ZU**
2023	Egg Loc. 15 - Andoain	**Egg-15-MU**

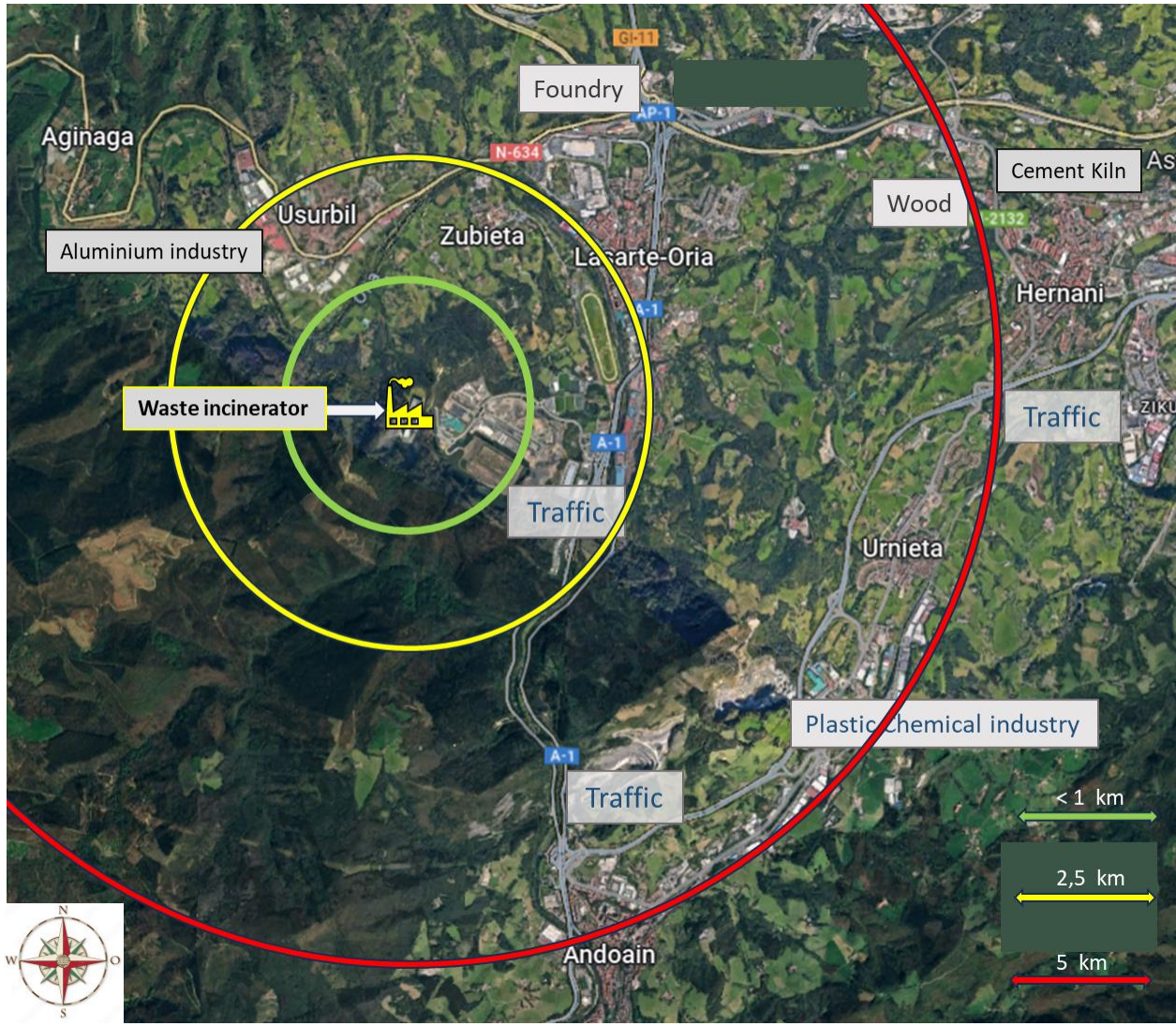
B C D	**Mosses**
B C	**Pine needles**
A C D E	**Leaves**
1 2	**Water**
A B C E	**Sediment**
	Mother Milk

5 km 2,5 km < 1 km



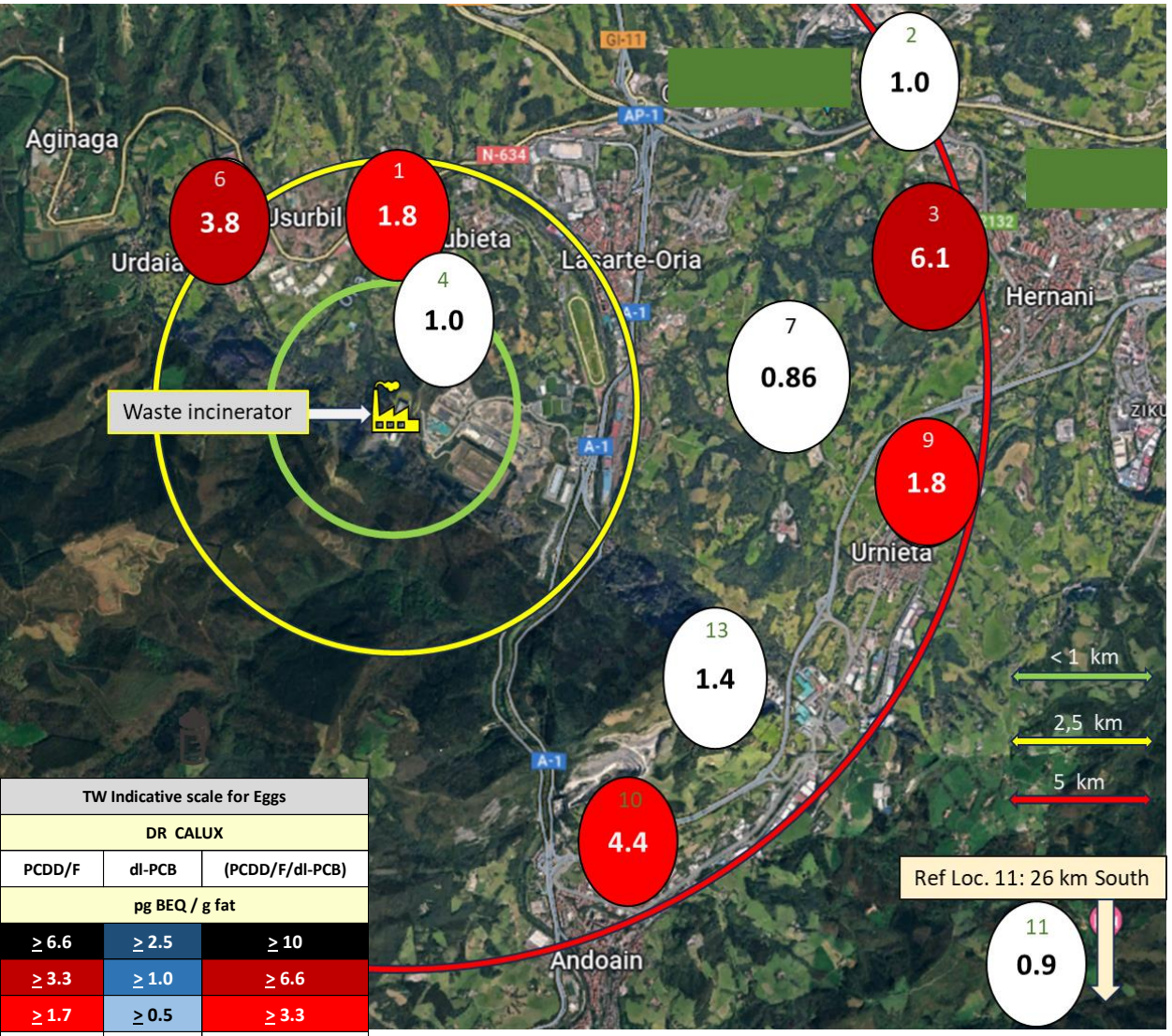
Eggs of backyard chicken locations & possible confounders POPs, Zubieta 2019-2023





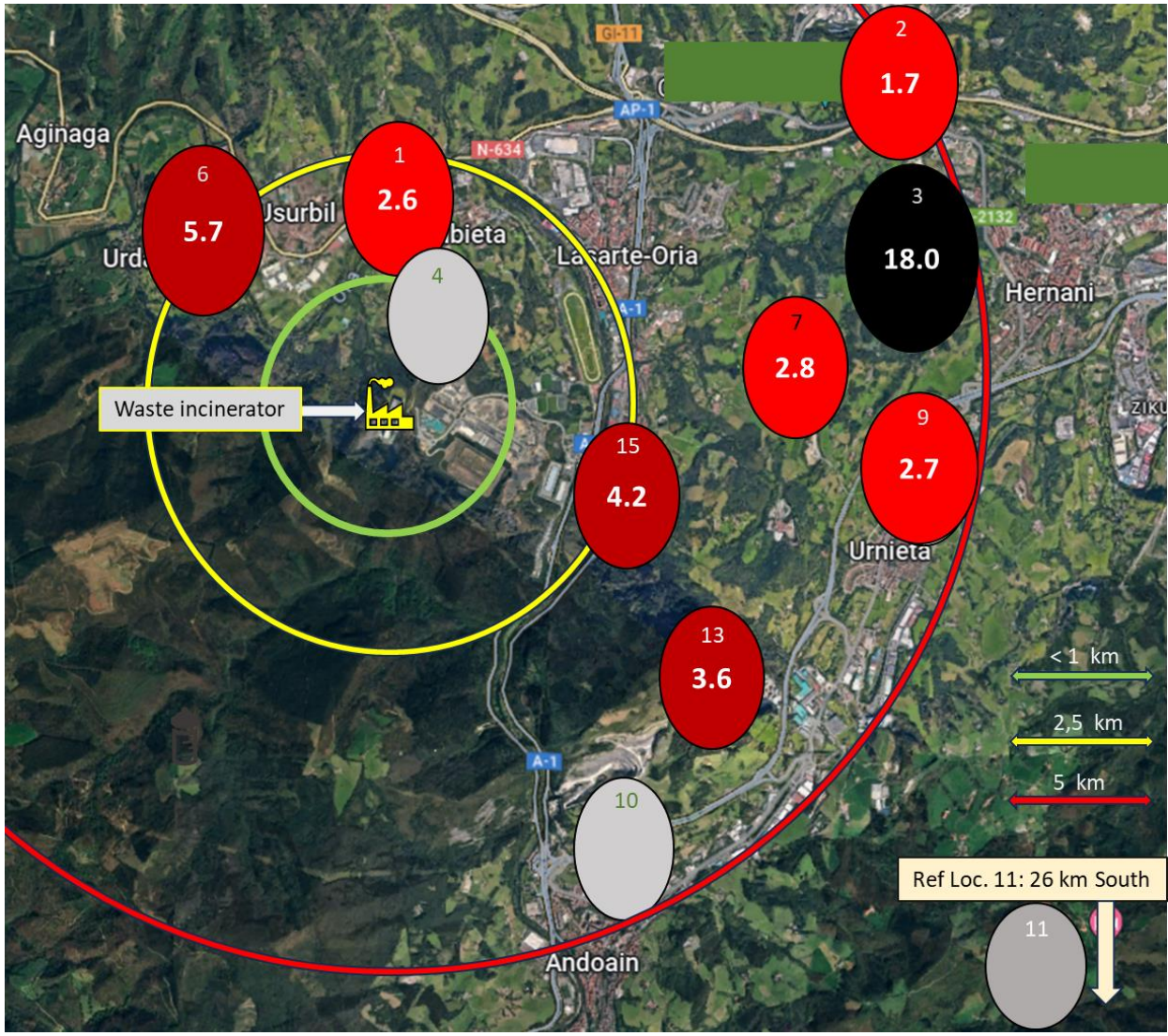
Results dioxins (PCDD/F) with bioassay DR CALUX in Eggs of backyard chicken, Zubieta 2019-2023

Dioxins (PCDD/F) **2019**



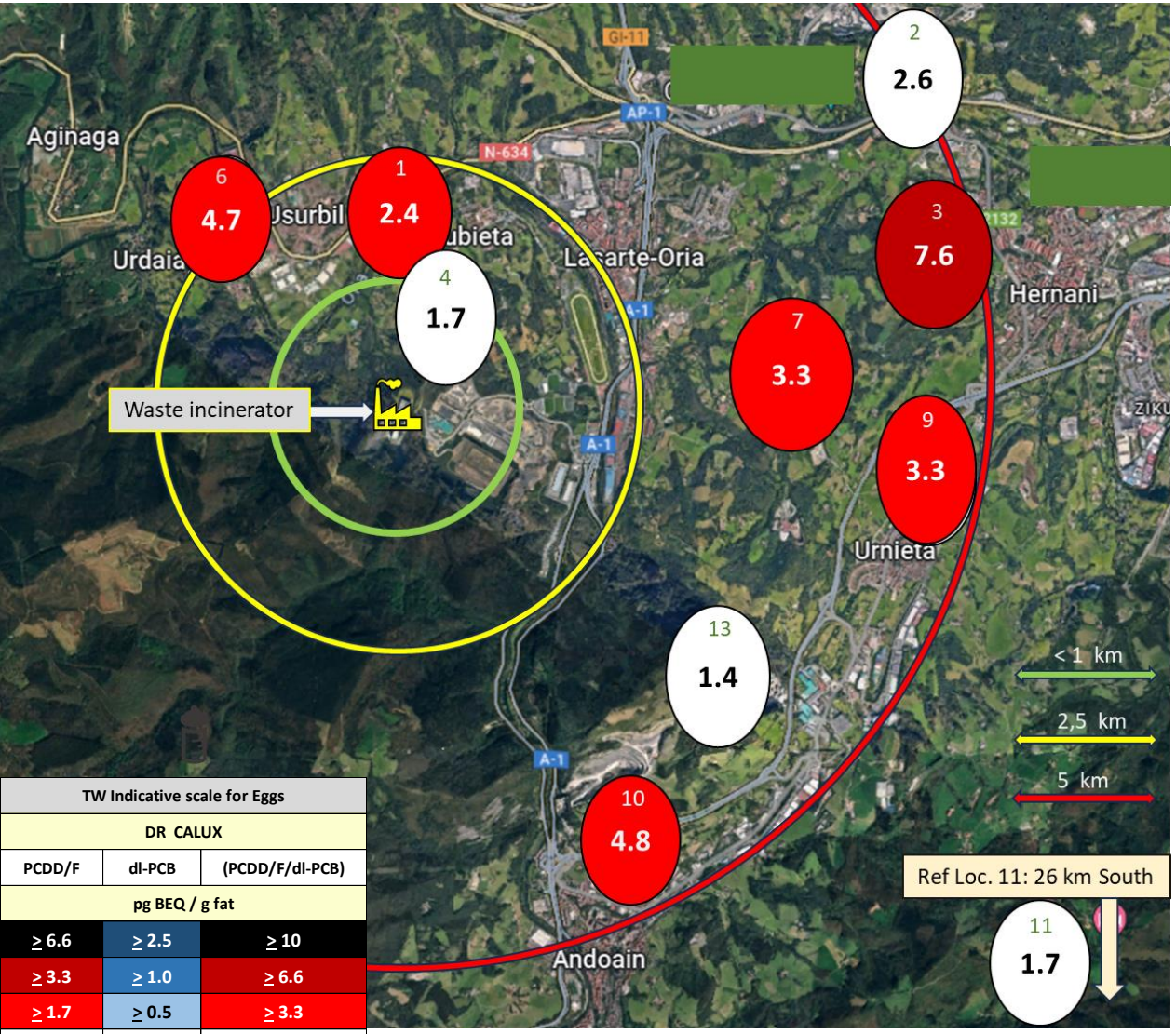
TW Indicative scale for Eggs		
DR CALUX		
PCDD/F	dl-PCB	(PCDD/F/dl-PCB)
pg BEQ / g fat		
≥ 6.6	≥ 2.5	≥ 10
≥ 3.3	≥ 1.0	≥ 6.6
≥ 1.7	≥ 0.5	≥ 3.3
< 1.7	< 0.5	< 3.3

Dioxins (PCDD/F) **2023**



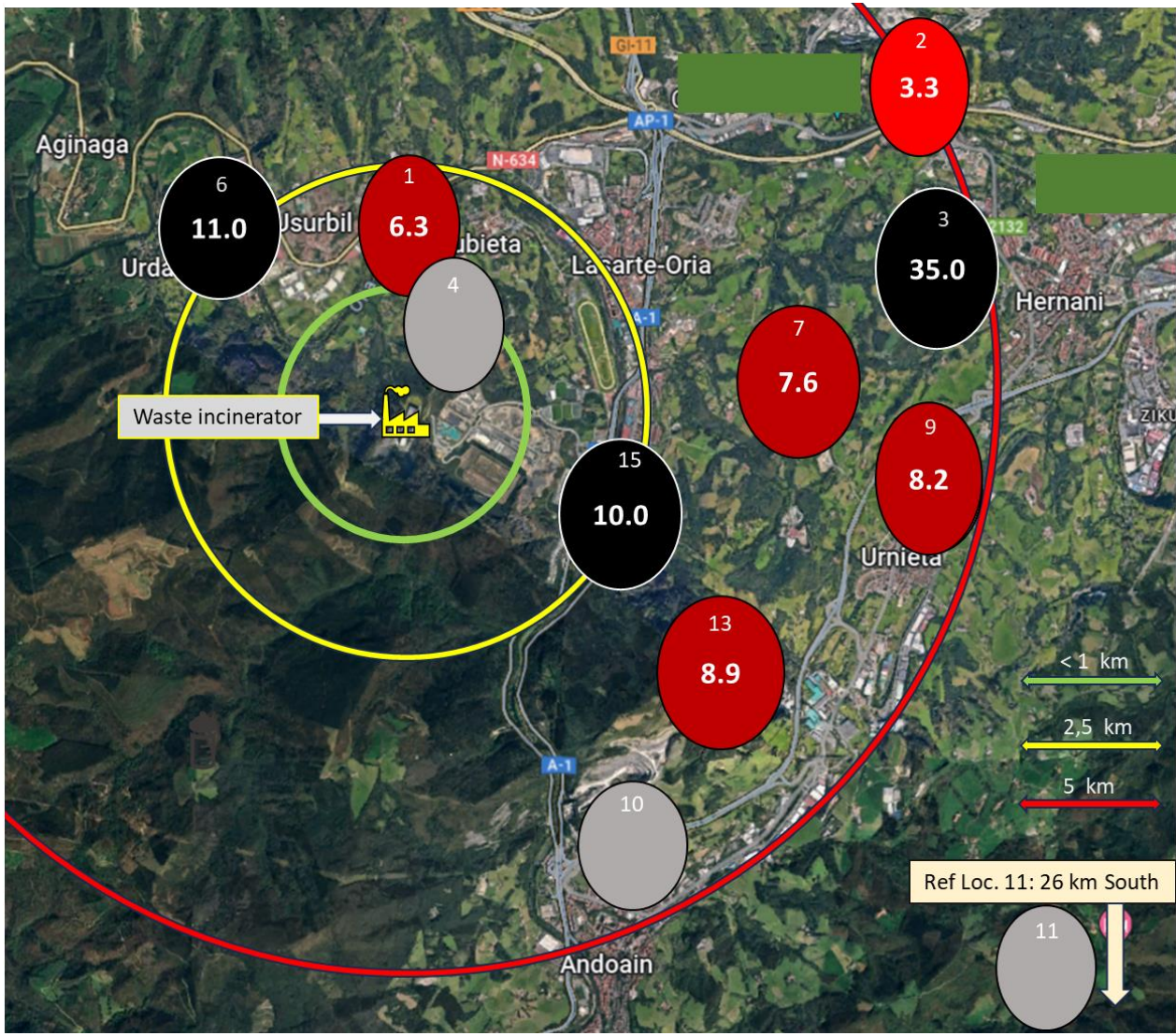
Results Sum of dioxins (PCDD/F/dl-PCB) with bioassay DR CALUX in Eggs of backyard chicken, Zubieta 2019-2023

Sum of Dioxins (PCDD/F/dl-PCB) 2019



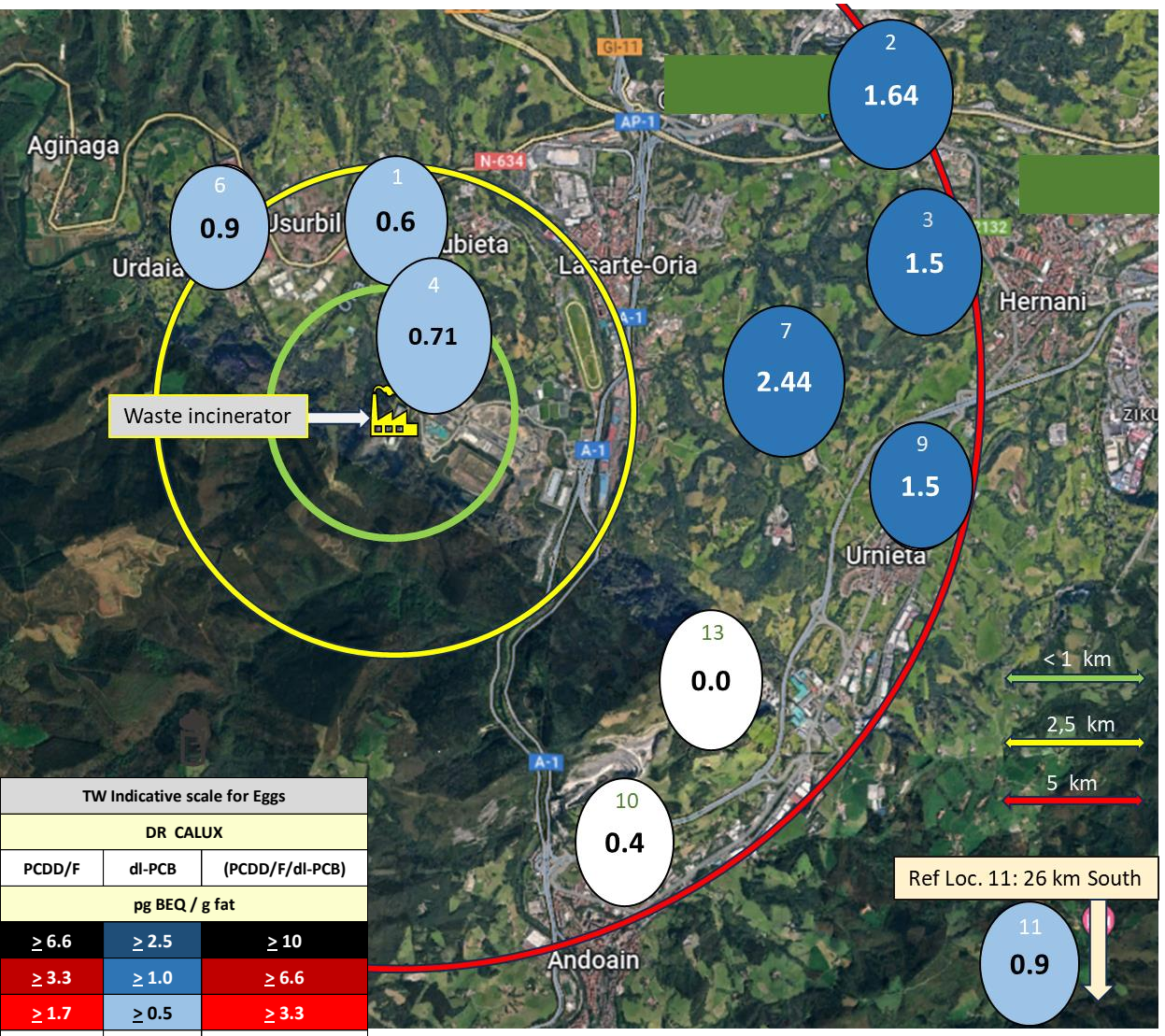
TW Indicative scale for Eggs		
DR CALUX		
PCDD/F	dl-PCB	(PCDD/F/dl-PCB)
pg BEQ / g fat		
≥ 6.6	≥ 2.5	≥ 10
≥ 3.3	≥ 1.0	≥ 6.6
≥ 1.7	≥ 0.5	≥ 3.3
< 1.7	< 0.5	< 3.3

Sum of Dioxins (PCDD/F/dl-PCB) 2023



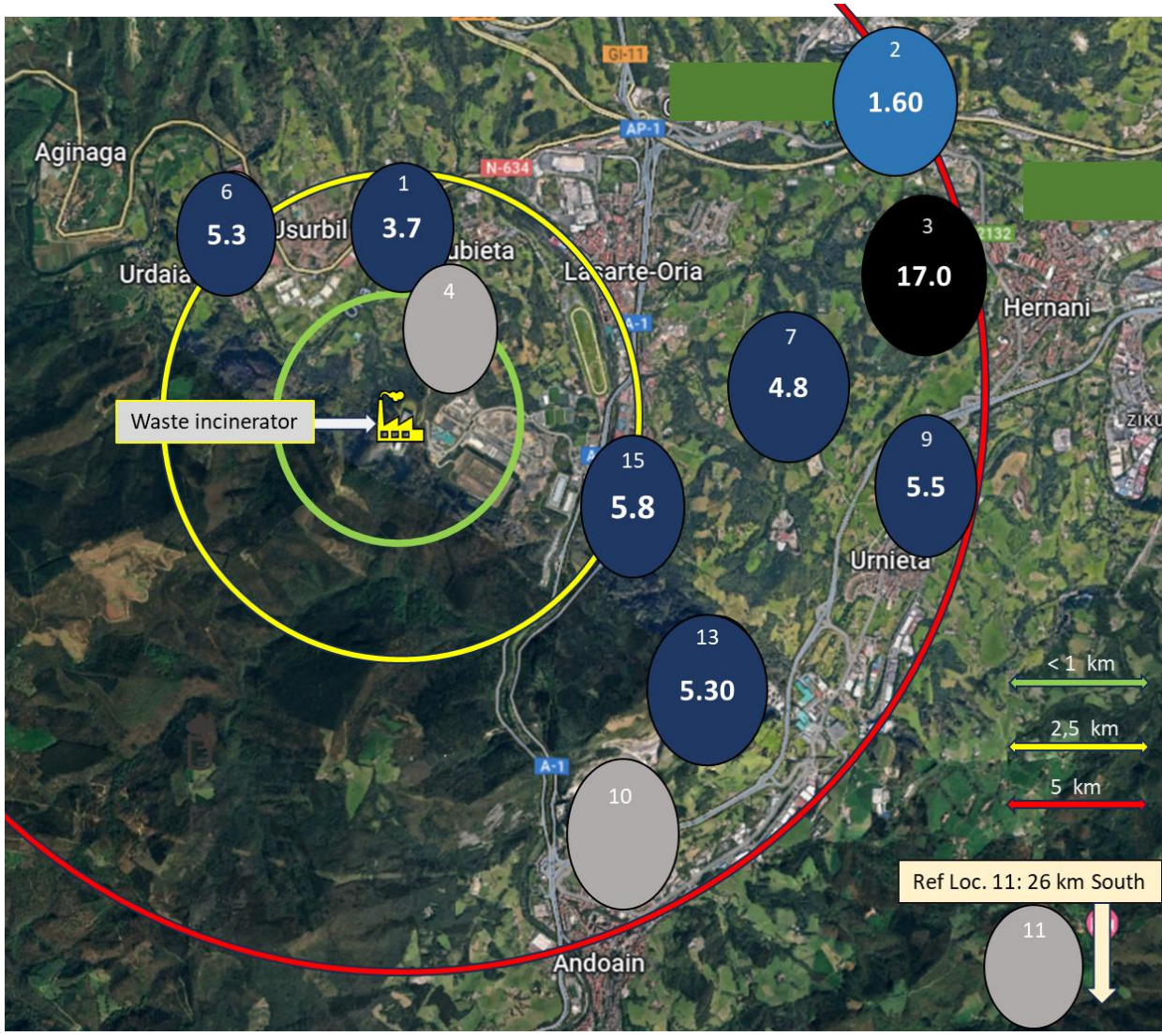
Results dioxin-like PCBs (dl-PCBs) with bioassay DR CALUX in Eggs of backyard chicken, Zubieta 2019-2023

Dioxin-like PCB (dl-PCB) **2019**



TW Indicative scale for Eggs		
DR CALUX		
PCDD/F	dl-PCB	(PCDD/F/dl-PCB)
pg BEQ / g fat		
≥ 6.6	≥ 2.5	≥ 10
≥ 3.3	≥ 1.0	≥ 6.6
≥ 1.7	≥ 0.5	≥ 3.3
< 1.7	< 0.5	< 3.3

Dioxin-like PCB (dl-PCB) **2023**



Results overview Eggs of backyard chicken, Zubieta 2019-2023

TOXICO WATCH

TW Biomonitoring, Eggs backyard chicken Zubieta 2019 - 2023

Sample Year	Sample Date	Total	Samples locations	Loc. Code		Wind direction	Distance (m)	Lab nr	TW-REF-NR number	Annalysis
										EU Limit Eggs
										EU action limit Eggs
	Eggs		Location 1 Zubieta							
2019	10-9-2019	1	Location 1 Zubieta	Egg-01-PR		North	1610	35905	TWZ-001	DR CALUX
2019	10-9-2019		Location 1 Zubieta	Egg-01-PR		North	1610		TWZ-001	GC-MS (1901)
2020	30-11-2020	1	Location 1 Zubieta	Egg-01-PR		North	1610	39359	20TWZ-001-1p	DR CALUX
2021	1-10-2021	1	Location 1 Zubieta	Egg-01-PR		North	1610	41611	21TWZ-E01-1p	DR CALUX
2021	1-10-2021		Location 1 Zubieta	Egg-01-PR		North	1610	41611	21TWZ-E01-1p	PFAS / FITC-T4
2022		1	Location 1 Zubieta	Egg-01-PR		North	1610		22TWZ-E01-1p	DR CALUX
2022			Location 1 Zubieta	Egg-01-PR		North	1610		22TWZ-E01-1p	GC-MS
2022			Location 1 Zubieta	Egg-01-PR		North	1610		22TWZ-E01-1p	PFAS / LC-MS/MS
2023	11-10-2023	1	Location 1 Zubieta	Egg-01-PR		North	1610		23TWZ-E01-1p	DR CALUX
2023	11-10-2023		Location 1 Zubieta	Egg-01-PR		North	1610		23TWZ-E01-1p (B)	GC-MS
2023	11-10-2023		Location 1 Zubieta	Egg-01-PR		North	1610		23TWZ-E01-1p (B)	PFAS / LC-MS/MS
	Eggs		Location 2 Añorga							
2019	9-9-2019	2	Location 2 Añorga	Egg-02-AN		North-East	5470	35906	TWZ-002	DR CALUX
2023	11-10-2023	2	Location 2 Añorga	Egg-02-AN		North-East	5470		23TWZ-E02-AN	DR CALUX
2023	11-10-2023		Location 2 Añorga	Egg-02-AN		North-East	5470		23TWZ-E02-AN (B)	GC-MS
	Eggs		Location 3 Hernani							
2019	9-9-2019	3	Location 3 Hernani	Egg-03-FG		North-East	4250	35928	TWZ-003	DR CALUX
2023	11-10-2023	3	Location 3 Hernani	Egg-03-FG		North-East	4250		23TWZ-E03-FIG	DR CALUX
2023	11-10-2023		Location 3 Hernani	Egg-03-FG		North-East	4250		23TWZ-E03-FIG	GC-MS
2023	11-10-2023		Location 3 Hernani	Egg-03-FG		North-East	4250		23TWZ-E03-FIG	PFAS / LC-MS/MS

TW Biomonitoring, Eggs backyard chicken Zubieta 2019 - 2023

BDS Dioxins DR CALUX (mb)			BDS Dioxins GC-MS (mb)			BDS	NORMEC	
PCDD/F	dl-PCB	PCDD/F/dl-PCB	PCDD/F	dl-PCB	PCDD/F/dl-PCB	PFAS	PFAS	
DR CALUX	DR CALUX	DR CALUX	GC-MS-ub	GC-MS	GC-MS	FITC-T4	LC-MS/MS	
1.7		3.3.	2.5		5.0	µg /g (dry weight / dw)	∑ 4 PFAS	∑ 24 PFAS
Mediumbound (mb)			1.75	1.75		µg /lt (wet weight / ww)	Mediumbound (mb)	
pg BEQ (TCDD)/g fat (veg: product)			pg TEQ/g fat (veg: product) (mb)			µg PFOA eq./g product	µg / kg	µg / kg
2019: Upperbound (ub)			2019: Upperbound (ub)				2019: Lower bound (LB)	
Location 1 Zubieta								
1.8	0.6	2.4						
			1.17	1.94	3.11			
0.84	0.76	1.6						
0.94	0.96	1.9						
						1,9		
2,2	0,2	2,4						
			1,0	1,3	2,3			
								1,75
2,60	3,70	6,30						
			0,79	1,40	2,20			
								3.1
Location 2 Añorga								
0.96	1.64	2.6						
1,70	1,60	3,30						
			0,52	0,79	1,30			
Location 3 Hernani								
6.1	1,5	7.6						
18,00	17,00	35,00						
			7,30	8,00	15,00			
								7,02

TW Indicative scale for Eggs DR CALUX			TW Indicative scale for Eggs GC-MS			TW Indicative scale FITC-T4	TW Indicative scale PFAS LC-MS/MS	
PCDD/F	dl-PCB	(PCDD/F/dl-PCB)	PCDD/F	dl-PCB	(PCDD/F/dl-PCB)		∑ 4 PFAS (EFSA)	∑ 24 PFAS
pg BEQ / g fat			pg TEQ /g fat			µg PFOA eq./ lt	µg / kg - ng / g	
≥ 6.6	≥ 2.5	≥ 10	≥ 7.5		≥ 15.0	≥ 1,76 µg	≥ 5,1	≥ 5,1
≥ 3.3	≥ 1.0	≥ 6.6	≥ 5.0		≥ 10.0	≥ 0,88 µg	≥ 3,4	≥ 3,4
≥ 1.7	≥ 0.5	≥ 3.3	≥ 2.5	≥ 1.75	≥ 5.0	≥ 0,44 µg	≥ 1.7	≥ 1.7
< 1.7	< 0.5	< 3.3	< 2.5	< 1.75	< 5.0	> 0,22 µg	> 1,45	> 1,45
						< 0,22 µg	< 1,45	< 1,45

Results overview Eggs of backyard chicken, Zubieta 2019-2023

TOXICO WATCH

TW Biomonitoring, Eggs backyard chicken Zubieta 2019 - 2023

Sample Year	Sample Date	Total	Samples locations	Loc. Code		Wind direction	Distance (m)	Lab nr	TW-REF-NR number	Annalysis
										EU Limit Eggs
										EU action limit Eggs
	Eggs		Location 4 Zubieta							
2019	9-9-2019	4	Location 4 Zubieta	Egg-04-WW		North-East	955	35907	TWZ-004	DR CALUX
	Eggs		Location 6 Usurbil							
2019	10-9-2019	5	Location 6 Usurbil	Egg-06-KP		North-West	2570	35909	TWZ-006	DR CALUX
2023	11-10-2023	4	Location 6 Usurbil	Egg-06-KP		North-West	2570		23TWZ-E06-KAP	DR CALUX
2023	11-10-2023		Location 6 Usurbil	Egg-06-KP		North-West	2570		23TWZ-E06-KAP (B)	GC-MS
	Eggs		Location 7 Lasarte							
2019	10-9-2019	6	Location 7 Lasarte	Egg-07-ZL		North-East	3280	35910	TWZ-007	DR CALUX
2023	11-10-2023	5	Location 7 Lasarte	Egg-07-ZL		North-East	3280		23TWZ-E07-ZAL	DR CALUX
2023	11-10-2023		Location 7 Lasarte	Egg-07-ZL		North-East	3280		23TWZ-E07-ZAL (B)	GC-MS
2023	11-10-2023		Location 7 Lasarte	Egg-07-ZL		North-East	3280		23TWZ-E07-ZAL (B)	PFAS / LC-MS/MS
	Eggs		Location 9 Urnieta							
2019	12-9-2019	7	Location 9 Urnieta	Egg-09-UR		North-East	4490	35929	TWZ-009	DR CALUX
2023	11-10-2023	6	Location 9 Urnieta	Egg-09-UR		North-East	4490		23TWZ-E09-UR	DR CALUX
2023	11-10-2023		Location 9 Urnieta	Egg-09-UR		North-East	4490		23TWZ-E09-UR (B)	GC-MS

TW Biomonitoring, Eggs backyard chicken Zubieta 2019 - 2023

BDS Dioxins DR CALUX (mb)			BDS Dioxins GC-MS (mb)			BDS	NORMEC	
PCDD/F	dl-PCB	PCDD/F/dl-PCB	PCDD/F	dl-PCB	PCDD/F/dl-PCB	PFAS	PFAS	
DR CALUX	DR CALUX	DR CALUX	GC-MS-ub	GC-MS	GC-MS	FITC-T4	LC-MS/MS	
1.7		3.3.	2.5		5.0	µg /g (dry weight / dw)	∑ 4 PFAS	∑ 24 PFAS
Mediumbound (mb)			1.75	1.75		µg /lt (wet weight / ww)	Mediumbound (mb)	
pg BEQ (TCDD)/g fat (veg: product)			pg TEQ/g fat (veg: product) (mb)			µg PFOA eq./g product	µg / kg	µg / kg
2019: Upperbound (ub)			2019: Upperbound (ub)				2019: Lower bound (LB)	
Location 4 Zubieta								
0.99	0.71	1.7						
Location 6 Usurbil								
3.8	0.9	4.7						
5,70	5,30	11,00						
			2,80	3,40	6,20			
Location 7 Lasarte								
0.86	2.44	3.3						
2,80	4,80	7,60						
			1,40	3,70	5,10			
								1.51
Location 9 Urnieta								
1.8	1,5	3.3						
2,70	5,50	8,20						
			1,30	5,50	6,90			

TW Indicative scale for Eggs DR CALUX			TW Indicative scale for Eggs GC-MS			TW Indicative scale FITC-T4	TW Indicative scale PFAS LC-MS/MS	
PCDD/F	dl-PCB	(PCDD/F/dl-PCB)	PCDD/F	dl-PCB	(PCDD/F/dl-PCB)		∑ 4 PFAS (EFSA)	∑ 24 PFAS
pg BEQ / g fat			pg TEQ /g fat			µg PFOA eq./ lt	µg / kg - ng / g	
≥ 6.6	≥ 2.5	≥ 10	≥ 7.5		≥ 15.0	≥ 1,76 µg	≥ 5,1	≥ 5,1
≥ 3.3	≥ 1.0	≥ 6.6	≥ 5.0		≥ 10.0	≥ 0,88 µg	≥ 3,4	≥ 3,4
≥ 1.7	≥ 0.5	≥ 3.3	≥ 2.5	≥ 1.75	≥ 5.0	≥ 0,44 µg	≥ 1.7	≥ 1.7
< 1.7	< 0.5	< 3.3	< 2.5	< 1.75	< 5.0	> 0,22 µg	> 1,45	> 1,45
						< 0,22 µg	< 1,45	< 1,45

Results overview Eggs of backyard chicken, Zubieta 2019-2023

TOXICO WATCH

TW Biomonitoring, Eggs backyard chicken Zubieta 2019 - 2023

Sample Year	Sample Date	Total	Samples locations	Loc. Code		Wind direction	Distance (m)	Lab nr	TW-REF-NR number	Annalysis
										EU Limit Eggs
										EU action limit Eggs
	Eggs		Location 10 Andoain							
2019	12-9-2019	8	Location 10 Andoain	Egg-10-AD		South	3870	35930	TWZ-010	DR CALUX
	Eggs		Location 11 Zaldibia							
2019	13-9-2019	9	Location 11 Zaldibia	Egg-11-MP		South	26400	35911	TWZ-011	DR CALUX
	Eggs		Location 13a Andoian							
2019	1-12-2019	10	Location 13a Andoian	Egg-13a-IN		Sout-S.East	3560	36673	TWZ-013	DR CALUX
2021	1-10-2021	2	Location 13A - Andoain	Egg-13a-IN		Sout-S.East	3560	41612	21TWZ-E03-13A	DR CALUX
2021	4-11-2021		Location 13A - Andoain	Egg-13a-IN		Sout-S.East	3560	41730	21TWZ-E03-13A	GC-MS
2021				Egg-13a-IN				41730	21TWZ-E03-13A	PFAS / FITC-T4
2022		2	Location 13A - Andoain	Egg-13a-IN		Sout-S.East	3560		22TWZ-E02-13A	DR CALUX
2022			Location 13A - Andoain	Egg-13a-IN		Sout-S.East	3560		22TWZ-E02-13A	GC-MS
2022			Location 13A - Andoain	Egg-13a-IN		Sout-S.East	3560		22TWZ-E02-13A	PFAS / LC-MS/MS
2023	11-10-2023	7	Location 13A - Andoain	Egg-13a-IN		Sout-S.East	3560		23TWZ-E13-INT	DR CALUX
2023	11-10-2023		Location 13A - Andoain	Egg-13a-IN		Sout-S.East	3560		23TWZ-E13-INT (B)	GC-MS
	Eggs		Loaction 14p - Zubieta							
2021	1-10-2021	3	Loaction 14p - Zubieta	Egg-14-ZU		North	1370	41613	21TWZ-E02-14p	DR CALUX
	Eggs		Location 15 Andoian							
2023	11-10-2023	8	Location 15 Andoian	Egg-15-MU		South	2580		23TWZ-E15-MU	DR CALUX
2023	11-10-2023		Location 15 Andoian	Egg-15-MU		South	2580		23TWZ-E15-MU (B)	GC-MS
2023	11-10-2023		Location 15 Andoian	Egg-15-MU		South	2580	C6589004	23TWZ-E15-MU (B)	PFAS / LC-MS/MS
	Eggs		Supermarket Eggs							
2020	30-11-2020	2	Supermarket Eggs					39360	20TWZ-000-sup	DR CALUX

TW Biomonitoring, Eggs backyard chicken Zubieta 2019 - 2023

BDS Dioxins DR CALUX (mb)			BDS Dioxins GC-MS (mb)			BDS	NORMEC	
PCDD/F	dl-PCB	PCDD/F/dl-PCB	PCDD/F	dl-PCB	PCDD/F/dl-PCB	PFAS	PFAS	
DR CALUX	DR CALUX	DR CALUX	GC-MS-ub	GC-MS	GC-MS	FITC-T4	LC-MS/MS	
1.7		3.3.	2.5		5.0	µg /g (dry weight / dw)	∑ 4 PFAS	∑ 24 PFAS
Mediumbound (mb)			1.75	1.75		µg /lt (wet weight / ww)	Mediumbound (mb)	
pg BEQ (TCDD)/g fat (veg: product)			pg TEQ/g fat (veg: product) (mb)			µg PFOA eq./g product	µg / kg	µg / kg
2019: Upperbound (ub)			2019: Upperbound (ub)				2019: Lower bound (LB)	
			Location 10 Andoain					
4.4	0.4	4.8						
			Location 11 Zaldibia					
0.89	0.81	1.7						
			Location 13a Andoian					
1.4	0.0	1.4						
2.6	2.3	4.9						
			1.5	3.5	5.0			
						1,9		
2,0	1,1	3,1						
			1,1	1,5	2,6			
								1,51
3,60	5,30	8,90						
			2,00	5,50	7,60			
			Loaction 14p Zubieta					
0.81	0.59	1.4						
			Location 15 Andoian					
4,20	5,80	10,00						
			1,10	2,80	3,90			
								10,54
			Supermarket Eggs					
LOQ < 0.3	LOQ < 0.3	LOQ < 0.6						

TW Indicative scale for Eggs DR CALUX			TW Indicative scale for Eggs GC-MS			TW Indicative scale FITC-T4	TW Indicative scale PFAS LC-MS/MS	
PCDD/F	dl-PCB	(PCDD/F/dl-PCB)	PCDD/F	dl-PCB	(PCDD/F/dl-PCB)		∑ 4 PFAS (EFSA)	∑ 24 PFAS
pg BEQ / g fat			pg TEQ /g fat			µg PFOA eq./ lt	µg / kg - ng / g	
≥ 6.6	≥ 2.5	≥ 10	≥ 7.5		≥ 15.0	≥ 1,76 µg	≥ 5,1	≥ 5,1
≥ 3.3	≥ 1.0	≥ 6.6	≥ 5.0		≥ 10.0	≥ 0,88 µg	≥ 3,4	≥ 3,4
≥ 1.7	≥ 0.5	≥ 3.3	≥ 2.5	≥ 1.75	≥ 5.0	≥ 0,44 µg	≥ 1.7	≥ 1.7
< 1.7	< 0.5	< 3.3	< 2.5	< 1.75	< 5.0	> 0,22 µg	> 1,45	> 1,45
						< 0,22 µg	< 1,45	< 1,45

Results Mosses Bryophyta, Zubieta - Biomonitoring 2019-2023

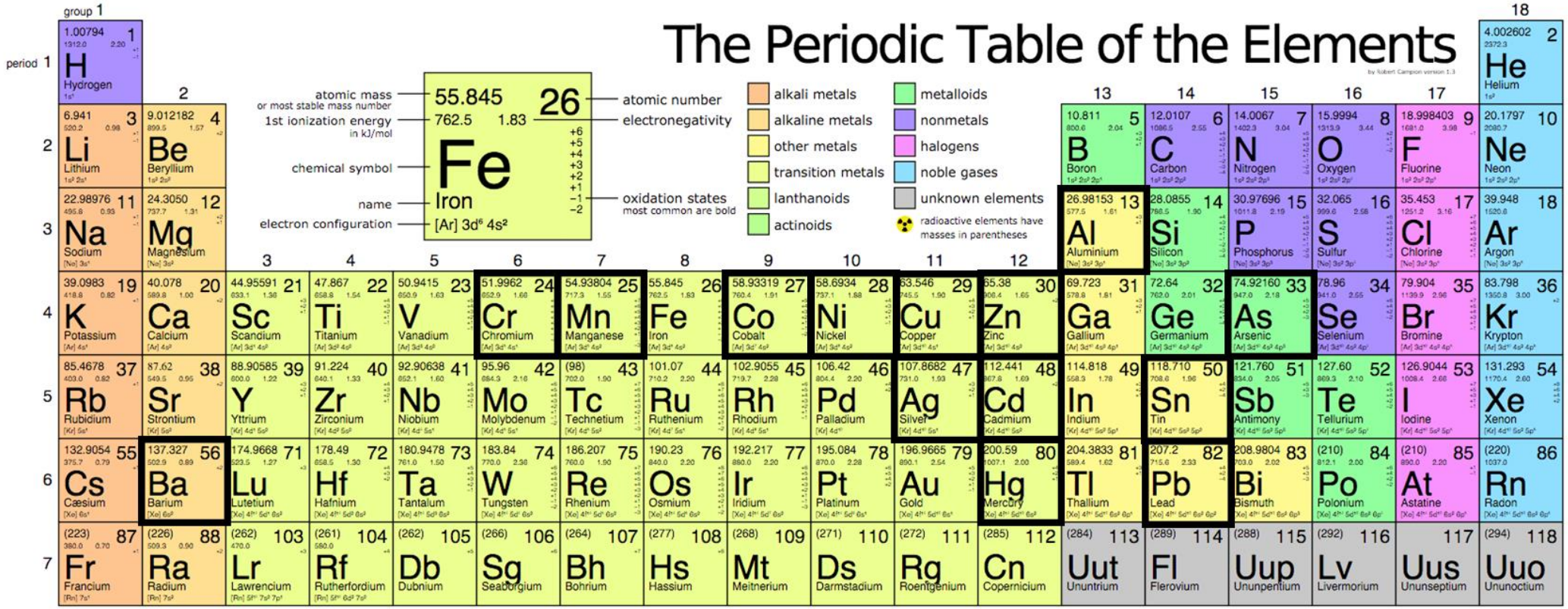
Biomonitoring Zubieta 2019 - 2023

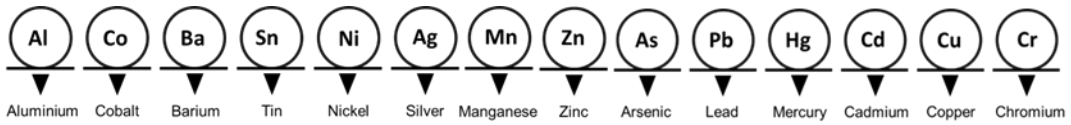
Results Zubieta 2019 - 2023

											BDS			NORMEC	BDS		BDS		NORMEC	NORMEC
											Dioxins DR CALUX (mb)									
											PCDD/F	dl-PCB	PCDD/F/dl-PCB	4 PAH	PFAS	PFAS	PFAS	PFAS	PFAS	
											DR CALUX	DR CALUX	DR CALUX	GC-MS/MS	CALUX	CALUX	FITC-T4	FITC-T4	LC-MS/MS	Heavy Metals
											DR CALUX (MB,DW, 88 % dw)				µg PFOA	ng / g	µg PFOA	ng / g PFOA	∑ 4 PFAS ∑ 24 PFAS	
											Mediumbound (mb) dry weight (dw)			∑ 4 PAH	wet weight (ww)	wet weight (ww)	(wet weight / ww)	(wet weight / ww)	Mediumbound (mb)	14
	Sample Year	Sample Date	Total	Sample locations	Note	Wind direction	Distance (m)	Lab nr	TW-REF-NR number	Analysis	pg BEQ (TCDD)/g fat (veg: product)			ng / g	µg PFOA eq./g prod.	ng PFOA eq./g prod.	µg PFOA eq./g product	µg PFOA eq./g product	µg / kg µg / kg	
											pg /g				µg	ng	µg	ng	2019: Lower bound (LB)	mg/kg
				Mosses - Bryophyta - 2019																
	2019	30-9-2019	1	Loc. C	Near MWI	South-East	370	36670	TW-MOS-DR-1901	DR CALUX	LOQ<0.06	LOQ<0.04	LOQ<0.1							
	2019	13-9-2019	2	Loc. B, C (pooled)	Near MWI pooled	South-East	400-370	Geyser	TW-MOS-HM-1902	Heavy Metals*										
				Mosses - Bryophyta - 2020																
	2020	29-11-2020	1	Loc. C	Near MWI	South-East	370	39356	20TWC-MOS-01	DR CALUX	1.06	0.18	1.24							
	2020	29-11-2020		Loc. C	Near MWI	South-East	370	39356	20TWC-MOS-01	PFAS CALUX					1.5	1500				
	2020	2-5-2021	2	F (20TWF-MOS-01PF)	Near MWI	South	406	40625	20TWF-MOS-01DR	DR CALUX	2.58	0.06	2.71							
		2-5-2021		F=B	Near MWI	South	406	40628	20TWB-MOS_01DR	PFAS CALUX					5.0	5000				
	2020	2-5-2021	3	C' =Loc C1	Near MWI	South-East	355	40624	20TWC-MOS-02DR	DR CALUX	2.84	0.06	2.96							
	2020	2-5-2021		C' =Loc C1	Near MWI	South-East	355	40627	20TWC-MOS-02PF	PFAS CALUX					3,9	3900,0				
	2020	2-5-2021	4	Zaldibia	Reference	South-West	26000	40626	20TWZ-MOS-03DR	DR CALUX	3.61	0.06	3.74							
	2020	2-5-2021		Zaldibia	Reference	South-West	26000	40629	20TWZ-MOS-03PF	PFAS CALUX					2.8	2800,0				
				Mosses - Bryophyta - 2021																
	2021	9-10-2021	1	Loc. C	glass jar	South-East	370	41614	21TWZ-MOS-01-C	DR CALUX	1.06	0.19	1.25							
	2021	9-10-2021	2	Loc. C1	plastic- food freeze bag	South-East	355	41615	21TWZ-MOS-04-C1	DR CALUX pooled	5.15	0.8	5.95							
	2021	9-10-2021		Extra analyse 17-06-2022	plastic- food freeze bag	South-East	355	43132	21TWZ-MOS-04-C1	DR CALUX pooled	1.52	0.23	1.75							
	2021	9-10-2021			plastic- food freeze bag	South-East	355	41615	21TWZ-MOS-04-C1	FITC-T4							17,0	17000,0		
	2021				glass jar		355		21TWZ-MOS-05-C1	DR CALUX										
	2021	9-10-2021		Extra analyse 17-06-2022	glass jar	South-East	355	43131	21TWZ-MOS-05-C1	DR CALUX pooled	2.47	0.06	2.54							
	2021	9-10-2021	3	Loc. C3	glass jar	South-East	460	41617	21TWZ-MOS-06-C3	DR CALUX	1.16	0.31	1.47							
	2021	9-10-2021	4	Zaldibia	Reference glass jar	South-West	26000	41616	21TWZ-MOS-07-ZAL	DR CALUX	1.19	0.08	1.34							
	2021	9-10-2021		Zaldibia	Reference glass jar	South-West	26000	41616	21TWZ-MOS-07-ZAL	FITC-T4							4,2	4200,0		
				Mosses - Bryophyta - 2022																
	2022		1	Loc. C1	Near MWI	South-East	355	44131	22TWZ-MOS-01-C1 (b)	DR CALUX	23,88	5,50	29,38							
	2022			Loc. C1	Near MWI	South-East	355		22TWZ-MOS-01-C1 (b)	PFAS/ LC-MS/MS									0,20	4,1
	2022		2	Loc. C3	Near MWI	South-East	460	44132	22TWZ-MOS-02-C3 (a)	DR CALUX	3,03	1,17	4,21							
	2022		3	Loc. B	Near MWI	South	520	44133	22TWZ-MOS-03-B (b)	DR CALUX	5,65	5,65	11,30							
	2022		4	Loc. D	Near MWI	North	470	44134	22TWZ-MOS-04-D	DR CALUX	10,31	7,28	17,59							
	2022			Loc. D	Near MWI	North	470		22TWZ-MOS-04-D	PFAS/ LC-MS/MS									0,20	3,1
	2022		5	Loc. Ref	Reference LKB	South-East	30000		22TWZ-MOS-05-REF	DR CALUX	0,84	3,40	4,24							
				Mosses - Bryophyta - 2023																
	2023	11-10-2023	1	Loc. C1	Near MWI	South-East	355	47074	23TWZ-MOS-01-C1-1	DR CALUX	4,77	1,38	6,15							
	2023	11-10-2023		Loc. C1	Near MWI	South-East	355		23TWZ-MOS-01-C1 (A)	Heavy Metals										
	2023	11-10-2023		Loc. C1	Near MWI	South-East	355		23TWZ-MOS-01-C1 (B)	PFAS/ LC-MS/MS									0,20	1,45
	2023	11-10-2023		Loc. C1	Near MWI	South-East	355	UOD231024673	23TWZ-MOS-01-C1 (B)-C	PAH GC-MS				43,20						
	2023	11-10-2023	2	Loc. C3 ?	Near MWI	South-East	460		23TWZ-MOS-02-C3 (a)	DR CALUX										
	2023	11-10-2023	3	Loc. B	Near MWI	South	520	47075	23TWZ-MOS-03-B (A)	DR CALUX	1,26	0,15	1,41							
	2023	11-10-2023		Loc. B	Near MWI	South	520		23TWZ-MOS-03-B (B)	Heavy Metals										
	2023	11-10-2023	4	Loc. D	Near MWI	North	470	47076	23TWZ-MOS-04-D	DR CALUX	0,26	0,12	0,38							
	2023	11-10-2023		Loc. D	Near MWI	North	470		23TWZ-MOS-04-D (A)	Heavy Metals										
	2023	11-10-2023		Loc. D	Near MWI	North	470		23TWZ-MOS-04-D (B)	PFAS/ LC-MS/MS									0,20	1,45
	2023	11-10-2023		Loc. D	Near MWI	North	470	UOD231024675	23TWZ-MOS-04-D (C.)	PAH GC-MS				2,70						

18

TW Indicative scale Vegetation / (Feed)			TW Ind. Scale	TW Indicative scale		TW Indicative scale		TW Indicative scale		TW Ind. Scale
DR CALUX			PAH GC-MS/MS	PFAS CALLUX	PFAS CALLUX	PFAS FITC-T4	PFAS FITC-T4	PFAS LC-MS/MS		Heavy Metals
PCDD/F	dl-PCB	(PCDD/F/dl-PCB)	∑ 4 PAH	wet weight (ww)	wet weight (ww)	wet weight (ww)	wet weight (ww)	∑ 4 PFAS (EFSA)	∑ 24 PFAS	mos/veg
pg TCDD eq./g dry weight (dw)			ng/g product	µg PFOA eq./g prod.	ng PFOA eq./g prod.	µg PFOA eq./g product	ng PFOA eq./g prod.	µg / kg - ng / g		mg/kg
≥ 2.5	≥ 2.5	≥ 3.32	> 500 ng			≥ 0,0768 ng		≥ 5,1	≥ 5,1	
≥ 1.0	≥ 1.0	≥ 1.66	> 250 ng			≥ 0,0384 ng		≥ 3,4	≥ 3,4	
≥ 0.5	≥ 0.5	≥ 0.83	≥ 100 ng			≥ 0,0192 ng		≥ 1.7	≥ 1.7	
< 0.5	< 0.5	< 0.83	≥ 10 ng			> 0,0096 ng		> 1,45	> 1,45	
			< 10 ng			< 0,0048 ng		< 1,45	< 1,45	


The Periodic Table of the Elements
group 1
18
period 1
2
3
4
5
6
7
atomic mass
or most stable mass number
1st ionization energy
in kJ/mol
chemical symbol
name
electron configuration
55.845
762.5
1.83
26
Fe
Iron
[Ar] 3d⁶ 4s²
atomic number
electronegativity
oxidation states
most common are bold
alkali metals
alkaline metals
other metals
transition metals
lanthanoids
actinoids
metalloids
nonmetals
halogens
noble gases
unknown elements
radioactive elements have masses in parentheses
1.00794 1 H Hydrogen
4.002602 2 He Helium
6.941 3 Li Lithium
9.012182 4 Be Beryllium
10.811 5 B Boron
12.0107 6 C Carbon
14.0067 7 N Nitrogen
15.9994 8 O Oxygen
18.998403 9 F Fluorine
20.1797 10 Ne Neon
22.98976 11 Na Sodium
24.3050 12 Mg Magnesium
26.98153 13 Al Aluminium
28.0855 14 Si Silicon
30.97696 15 P Phosphorus
32.065 16 S Sulfur
35.453 17 Cl Chlorine
39.948 18 Ar Argon
39.0983 19 K Potassium
40.078 20 Ca Calcium
44.95591 21 Sc Scandium
47.867 22 Ti Titanium
50.9415 23 V Vanadium
51.9962 24 Cr Chromium
54.93804 25 Mn Manganese
55.845 26 Fe Iron
58.93319 27 Co Cobalt
58.6934 28 Ni Nickel
63.546 29 Cu Copper
65.38 30 Zn Zinc
69.723 31 Ga Gallium
72.64 32 Ge Germanium
74.92160 33 As Arsenic
78.96 34 Se Selenium
79.904 35 Br Bromine
83.798 36 Kr Krypton
85.4678 37 Rb Rubidium
87.62 38 Sr Strontium
88.90585 39 Y Yttrium
91.224 40 Zr Zirconium
92.90638 41 Nb Niobium
95.96 42 Mo Molybdenum
(98) 43 Tc Technetium
101.07 44 Ru Ruthenium
102.9055 45 Rh Rhodium
106.42 46 Pd Palladium
107.8682 47 Ag Silver
112.441 48 Cd Cadmium
114.818 49 In Indium
118.710 50 Sn Tin
121.760 51 Sb Antimony
127.60 52 Te Tellurium
126.9044 53 I Iodine
131.293 54 Xe Xenon
132.9054 55 Cs Cæsium
137.327 56 Ba Barium
174.9668 71 Lu Lutetium
178.49 72 Hf Hafnium
180.9478 73 Ta Tantalum
183.84 74 W Tungsten
186.207 75 Re Rhenium
190.23 76 Os Osmium
192.217 77 Ir Iridium
195.084 78 Pt Platinum
196.9665 79 Au Gold
200.59 80 Hg Mercury
204.3833 81 Tl Thallium
207.2 82 Pb Lead
208.9804 83 Bi Bismuth
(210) 84 Po Polonium
(210) 85 At Astatine
(220) 86 Rn Radon
(223) 87 Fr Francium
(226) 88 Ra Radium
(262) 103 Lr Lawrencium
(261) 104 Rf Rutherfordium
(262) 105 Db Dubnium
(266) 106 Sg Seaborgium
(264) 107 Bh Bohrium
(277) 108 Hs Hassium
(268) 109 Mt Meitnerium
(271) 110 Ds Darmstadium
(272) 111 Rg Roentgenium
(285) 112 Cn Copernicium
(284) 113 Uut Ununtrium
(289) 114 Fl Flerovium
(288) 115 Uup Ununpentium
(292) 116 Lv Livermorium
117 Uus Ununseptium
(294) 118 Uuo Ununoctium
138.9054 57 La Lanthanum
140.116 58 Ce Cerium
140.9076 59 Pr Praseodymium
144.242 60 Nd Neodymium
(145) 61 Pm Promethium
150.36 62 Sm Samarium
151.964 63 Eu Europium
157.25 64 Gd Gadolinium
158.9253 65 Tb Terbium
162.500 66 Dy Dysprosium
164.9303 67 Ho Holmium
167.259 68 Er Erbium
168.9342 69 Tm Thulium
173.054 70 Yb Ytterbium
(227) 89 Ac Actinium
232.0380 90 Th Thorium
231.0358 91 Pa Protactinium
238.0289 92 U Uranium
(237) 93 Np Neptunium
(244) 94 Pu Plutonium
(243) 95 Am Americium
(247) 96 Cm Curium
(247) 97 Bk Berkelium
(251) 98 Cf Californium
(252) 99 Es Einsteinium
(257) 100 Fm Fermium
(258) 101 Md Mendelevium
(259) 102 No Nobelium
electron configuration blocks
s
d
p
f
notes
• as of yet, elements 113,115,117 and 118 have no official name designated by the IUPAC.
• 1 kJ/mol ≈ 96.485 eV.
• all elements are implied to have an oxidation state of zero.


Al Aluminium
Co Cobalt
Ba Barium
Sn Tin
Ni Nickel
Ag Silver
Mn Manganese
Zn Zinc
As Arsenic
Pb Lead
Hg Mercury
Cd Cadmium
Cu Copper
Cr Chromium

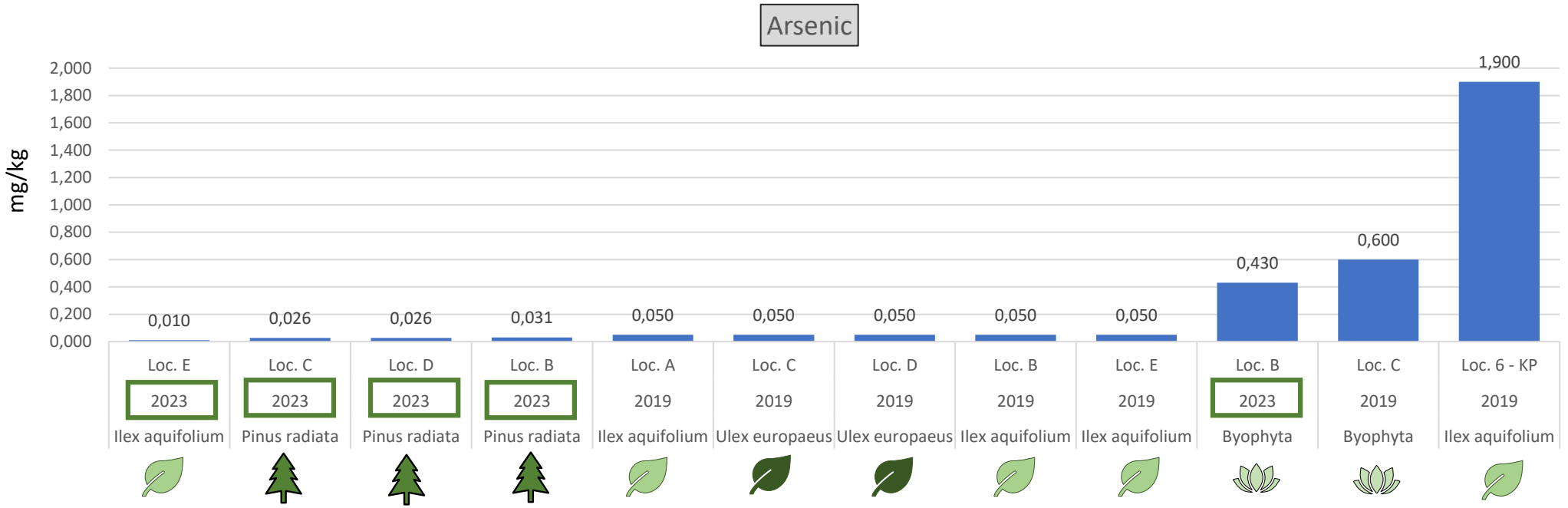
Results Heavy Metals in vegetation, soil, water and sediment, Zubieta 2019-2023

TOXICO WATCH

Heavy Metals µg/g, water µg/l, mg/kg - Medium Bound (mb = LOD/2)							Heavy Metals mg/kg - Medium Bound (mb = LOD/2)												
							1	2	3	4	5	6	7	8	9	10	11	12	13	14
Biomarker	Sampling Year	Locatie	Country	Species	Lab	TW-REF-NR	As	Al	Ba	Cd	Cr	Co	Cu	Pb	Mn	Hg	Ni	Ag	Sn	Zn
							Arsenic	Aluminium	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Silver	Tin	Zinc
Mos	2019	Loc. C	EUS	*Byophyta*	Gey	2019-C1 (3.3) Moss	0,600			0,040	5,200		1,700	2,200	83,000	0,018	1,300			14,000
Mos	2023	Loc. B	EUS	*Byophyta*	Normec	23TWZ-MOS-03-B (B)	0,430	2018,000	18,000	0,150	3,300	1,200	7,000	7,800		0,063	3,200	0,023	0,550	50,000
VEG	2019	Loc. 6 - KP	EUS	*Ilex aquifolium*	Gey	2019-Loc.6 KP	1,900			0,160	11,000		5,400	4,200	160,000	0,003	4,200			31,000
VEG	2019	Loc. A	EUS	*Ilex aquifolium*	Gey	2019-A (1.2) ILEX	0,050			0,400	0,160		1,800	0,080	210,000	0,009	0,300			120,000
VEG	2019	Loc. B	EUS	*Ilex aquifolium*	Gey	2019-B (2.2) ILEX	0,050			0,310	0,420		2,200	0,050	1400,000	0,003	1,400			68,000
VEG	2019	Loc. E	EUS	*Ilex aquifolium*	Gey	2019-E (5.2) ILEX	0,050			0,740	0,290		3,900	0,210	270,000	0,011	1,900			89,000
VEG	2023	Loc. E	EUS	*Ilex aquifolium*	Normec	23TWZ-IL-04-OT	0,010	368,000	39,000	1,500	0,170	0,180	11,000	0,320	-	0,019	4,300	0,005	0,035	158,000
VEG	2023	Loc. B	EUS	*Pinus radiata*	Normec	22TWZ-PR-03-D	0,031	203,000	1,200	0,130	0,360	0,650	3,900	0,150		0,016	2,300	0,005	0,053	44,000
VEG	2023	Loc. C	EUS	*Pinus radiata*	Normec	23TWZ-PR-01-C	0,026	258,000	2,600	0,250	0,360	0,370	2,000	0,260		0,024	0,860	0,033	0,085	43,000
VEG	2023	Loc. D	EUS	*Pinus radiata*	Normec	22TWZ-PR-02-B	0,026	210,000	1,000	0,091	0,390	0,680	5,100	0,170		0,017	4,100	0,005	0,049	44,000
VEG	2019	Loc. C	EUS	*Ulex europaeus*	Gey	2019-C (3.2) ULEX	0,050			0,090	0,330		1,900	0,025	22,000	0,003	1,200			12,000
VEG	2019	Loc. D	EUS	*Ulex europaeus*	Gey	2019-D (4.2) ULEX	0,050			0,020	0,820		1,700	0,025	25,000	0,003	1,200			7,500
Soil	2019	Loc. 6 - KP	EUS		Gey	23TWZ-Loc. 6 KP	15,000			0,200	22,000		13,000	23,000	300,000	0,050	24,000			65,000
Soil	2019	Loc. A	EUS		Gey	2019-A (1.1)	17,000			0,200	28,000		28,000	51,000	590,000	0,050	20,000			110,000
Soil	2019	Loc. B	EUS		Gey	2019-B (2.1)	8,100			0,200	15,000		16,000	77,000	230,000	0,240	10,000			87,000
Soil	2019	Loc. C	EUS		Gey	2019-C (3-.1)	14,000			0,200	18,000		11,000	33,000	100,000	0,050	11,000			42,000
Soil	2019	Loc. D	EUS		Gey	2019-D (4.1)	12,000			0,200	18,000		16,000	28,000	210,000	0,050	17,000			57,000
Soil	2019	Loc. E	EUS		Gey	2019-E (5.1)	15,000			0,200	23,000		17,000	80,000	180,000	0,050	18,000			84,000
Soil	2022	Loc. C	EUS		Normec	22-22TWZ-SO-HM-01-C	10,600	15938,000	42,900	0,059	18,200	1,100	8,600	28,100		0,056	5,800	0,039	1,300	30,600
Soil	2022	Sedn-01	EUS		Normec	22TWZ-SEDdn-01	30,100	9075,000	138,000	0,420	32,200	61,300	19,700	21,500		0,120	51,800	3,800	1,400	162,000
Soil	2023	Loc. B	EUS		Normec	23TWZ-SO-HM-02-B	10,000	24562,000	79,000	0,076	26,000	5,600	15,000	32,000		0,075	16,000	0,071	2,000	64,000
Soil	2023	Loc. C	EUS		Normec	23TWZ-SO-HM-01-C	11,000	23253,000	50,000	0,044	20,000	1,100	9,900	19,000		0,033	6,100	0,036	1,300	26,000
Soil	2023	Loc. D	EUS		Normec	23TWZ-SO-HM-03-D	11,000	24487,000	78,000	0,061	24,000	5,700	18,000	29,000		0,052	22,000	0,070	1,300	85,000
Soil	2023	Loc. E	EUS		Normec	23TWZ-SO-HM-04-OT	11,000	16197,000	32,000	0,130	16,000	7,300	16,000	43,000		0,053	20,000	0,036	1,200	95,000
Water	2019	Loc. 4 - ww	EUS	Loc. 4 WW	Normec	TW-HM-01 (bergwater)	0,110	52,000	19,700	0,050	0,050	0,100	0,500	0,050		0,025	0,610	0,250	0,500	0,500
Water	2023	Lasarte-ZA	EUS	Lasarte-ZA	Normec	23TWZ-H2O-ZA	0,050	0,500	111,000	0,050	0,050	0,100	1,300	0,050		0,025	0,130	0,250	0,500	7,300
Water	2023	Loc. 4 - ww	EUS	Loc. 4 WW	Normec	23TWZ-H2O-Gan-07 (B)	0,100	0,500	104,000	0,050	0,050	0,100	5,800	0,160		0,025	0,670	0,250	0,500	13,000

Heavy metals, **Arsenic** and **Lead** in vegetation, Zubieta 2019 - 2023

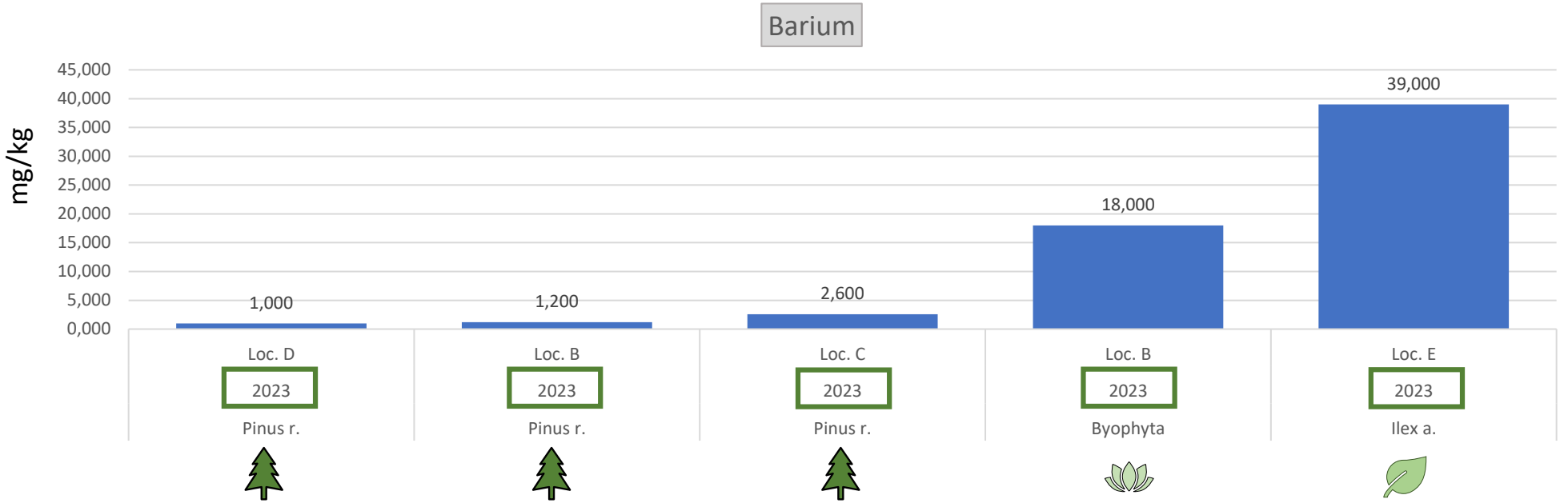
Arsenic
AS



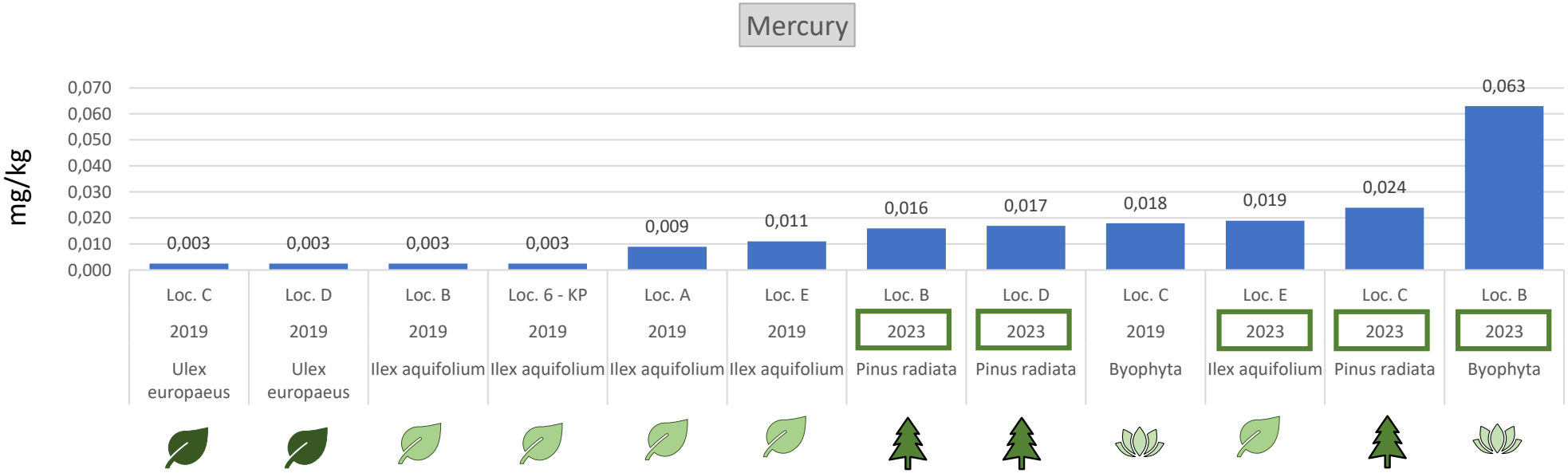
Lead
Pb

Heavy metals, **Barium** and **Mercury** in vegetation Zubieta, 2019 - 2023

Barium
Ba

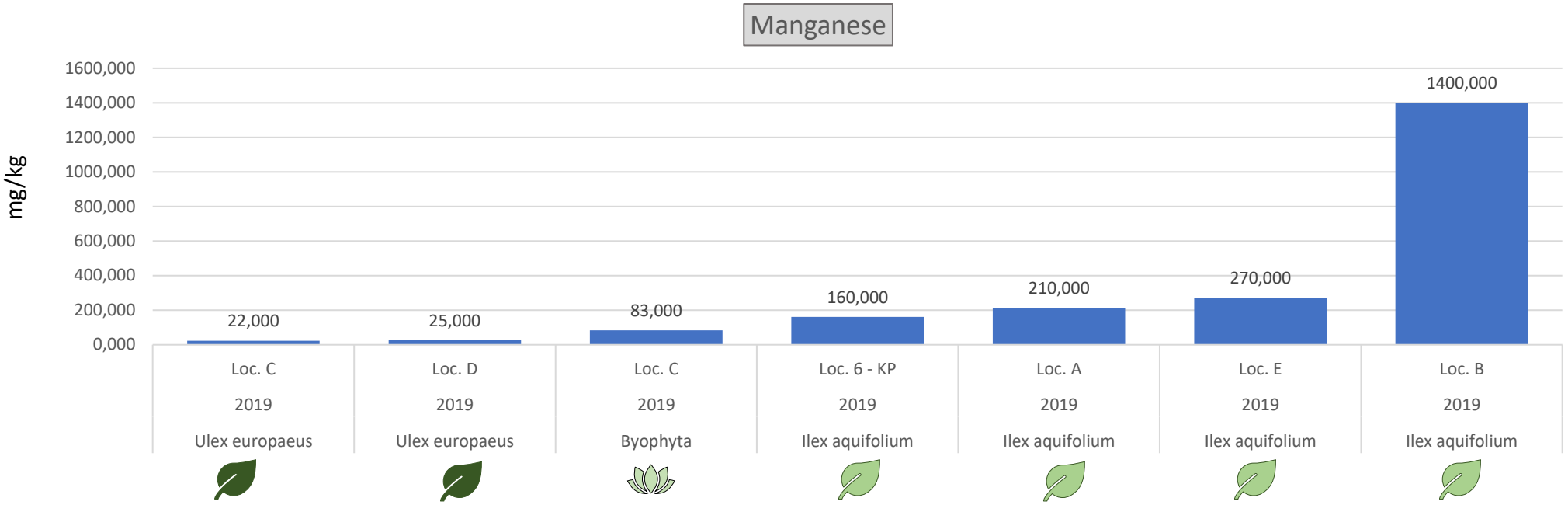


Mercury
Hg



Heavy metals, **Manganese** and **Aluminium** in vegetation, Zubieta 2019 - 2023

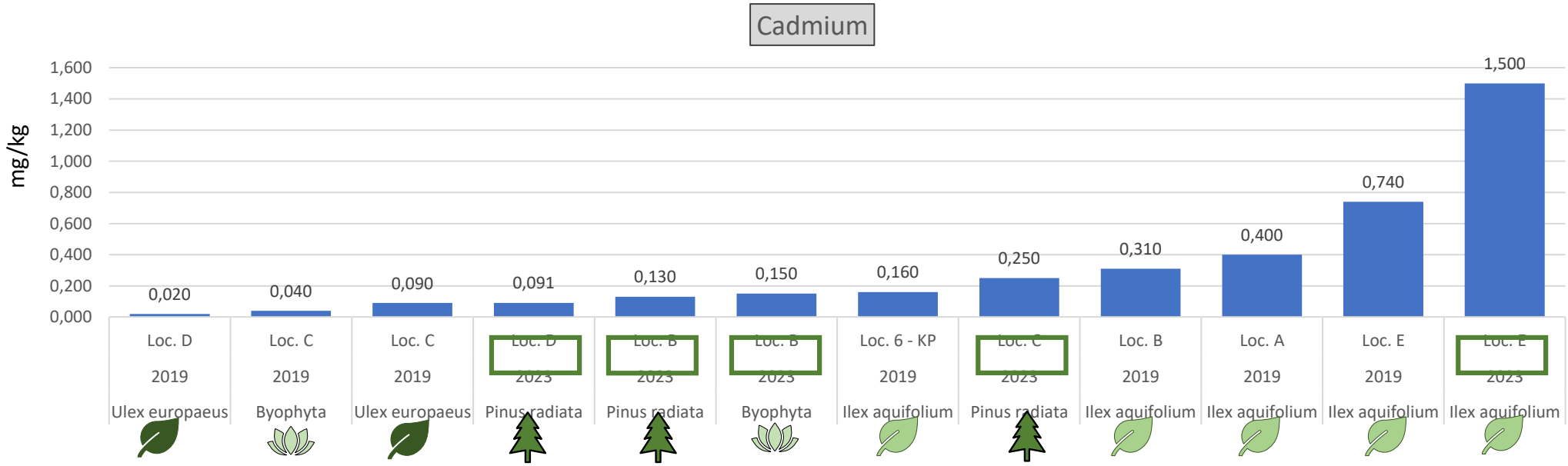
Manganese
Mn



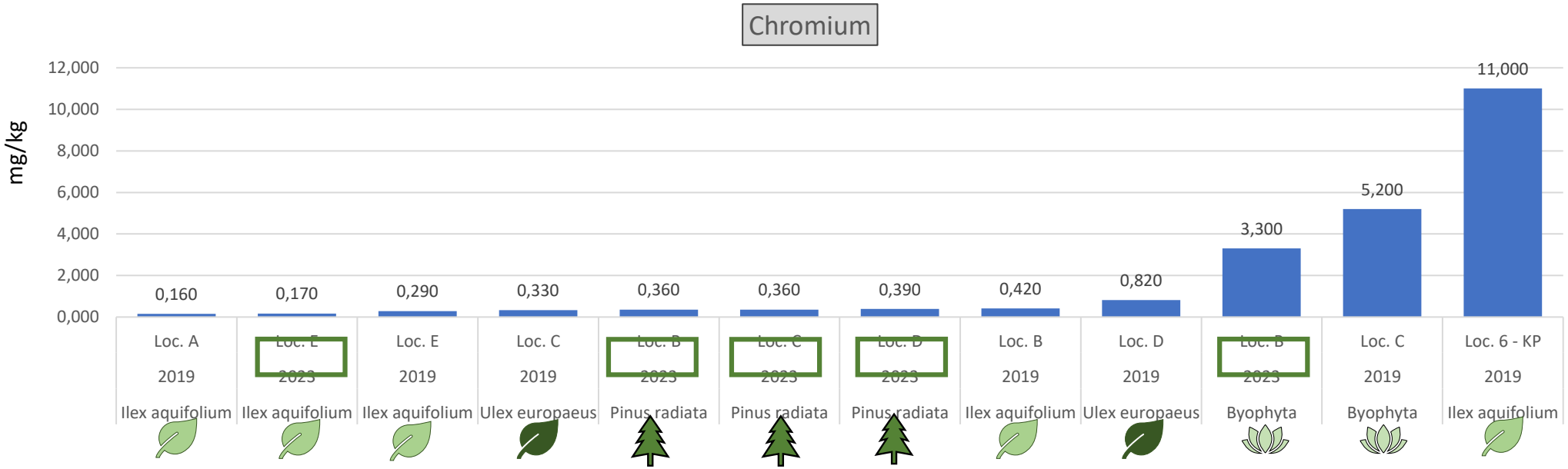
Aluminium
Al

Heavy metals, **Cadmium** and **Chromium** in vegetation, Zubieta 2019 - 2023

Cadmium
Cd

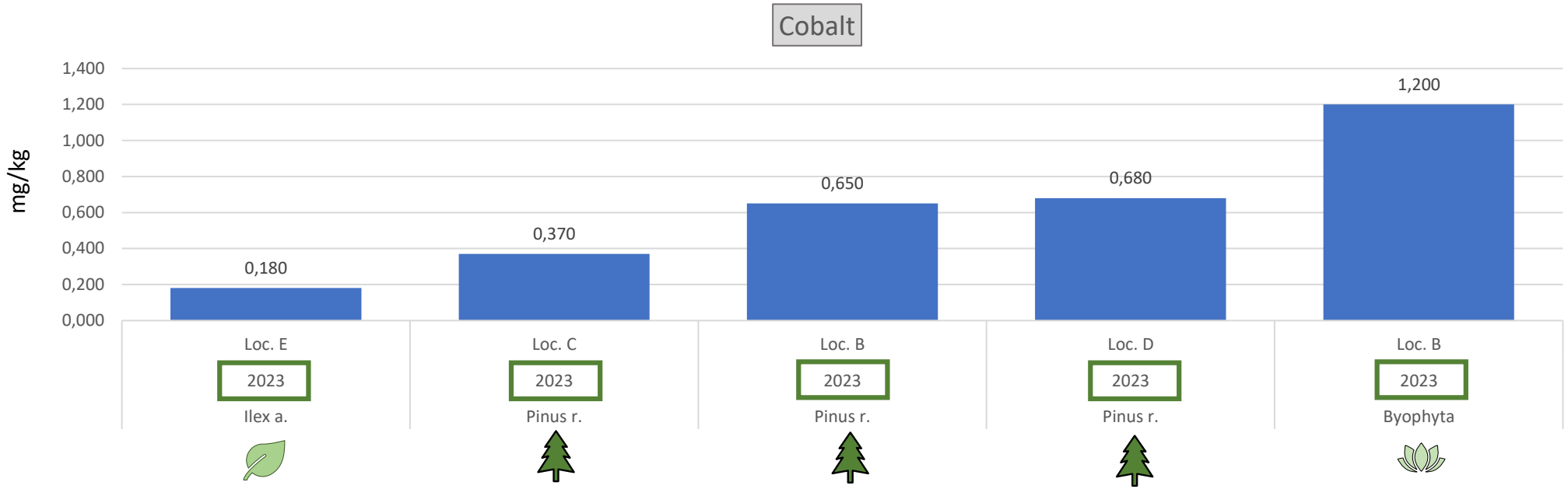


Chromium
Cr

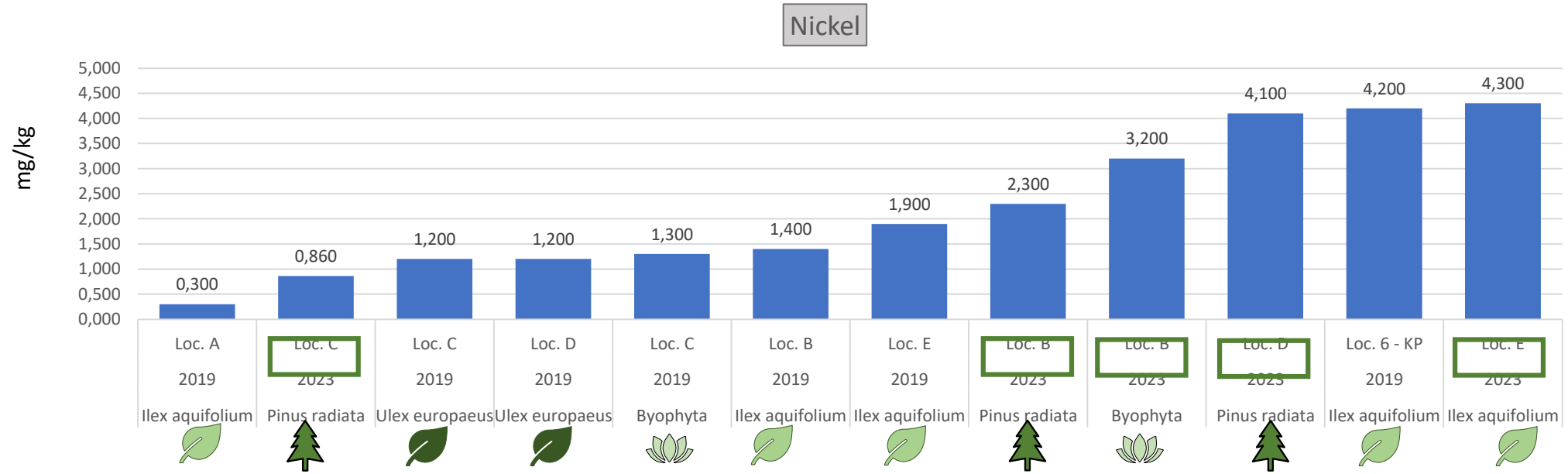


Heavy metals, **Cobalt** and **Nickel** in vegetation, Zubitea 2019 - 2023

Cobalt
Co



Nickel
Ni



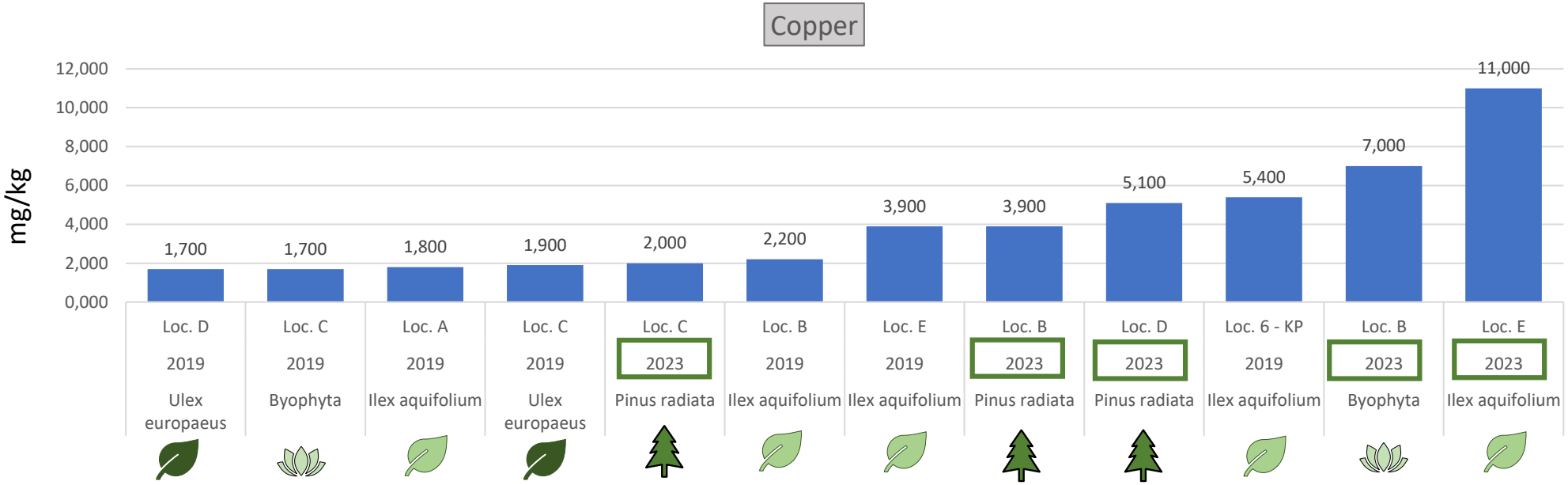
Heavy metals, **Silver** and **Tin** in vegetation, Zubieta 2019 - 2023

Silver
Ag

Tin
Sn

Heavy metals, **Copper** and **Zinc** in vegetation, Zubieta 2019 - 2023

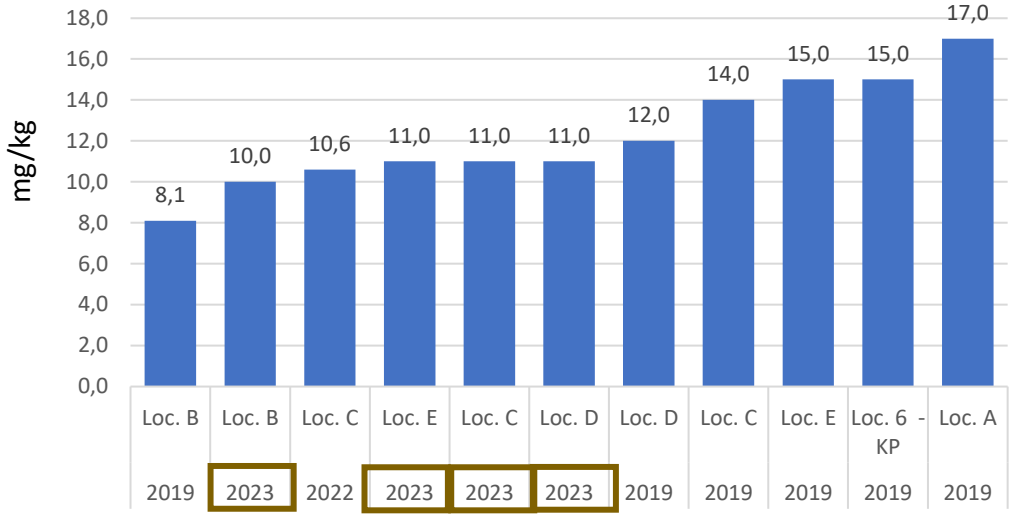
Copper
Cu



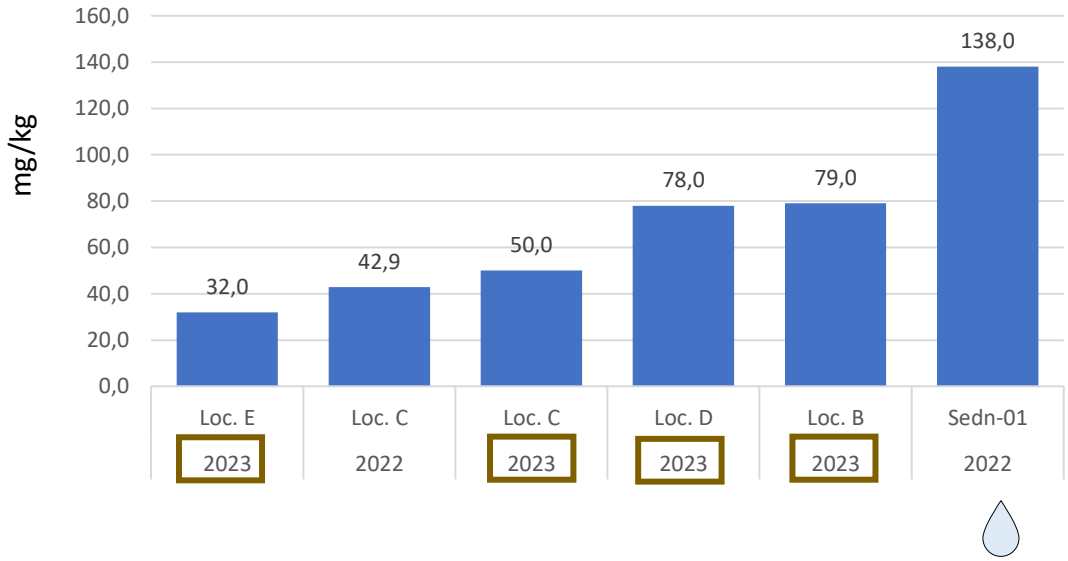
Zinc
Zn

Heavy metals in soil (Medium Bound, mb), Zubieta 2019 - 2023

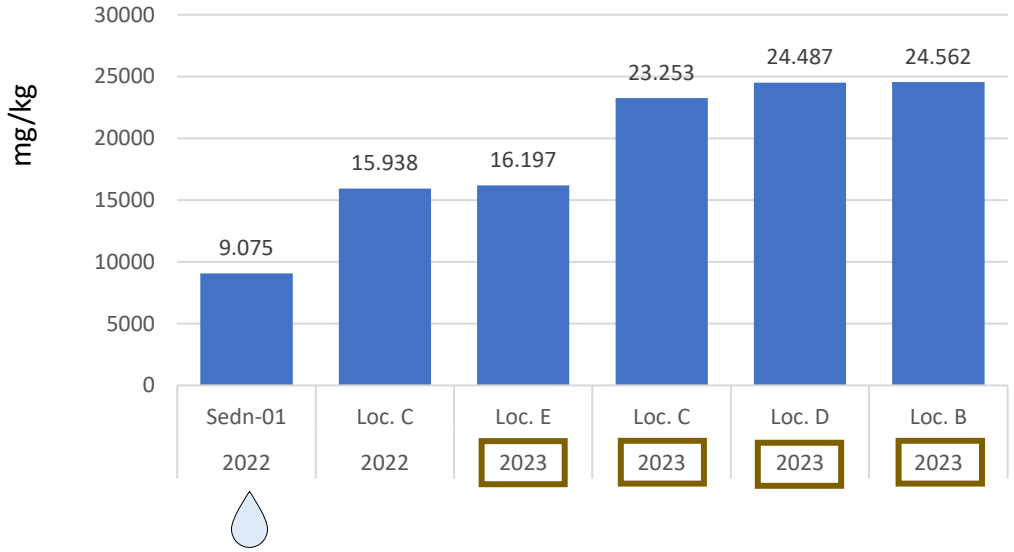
Arsenic - As



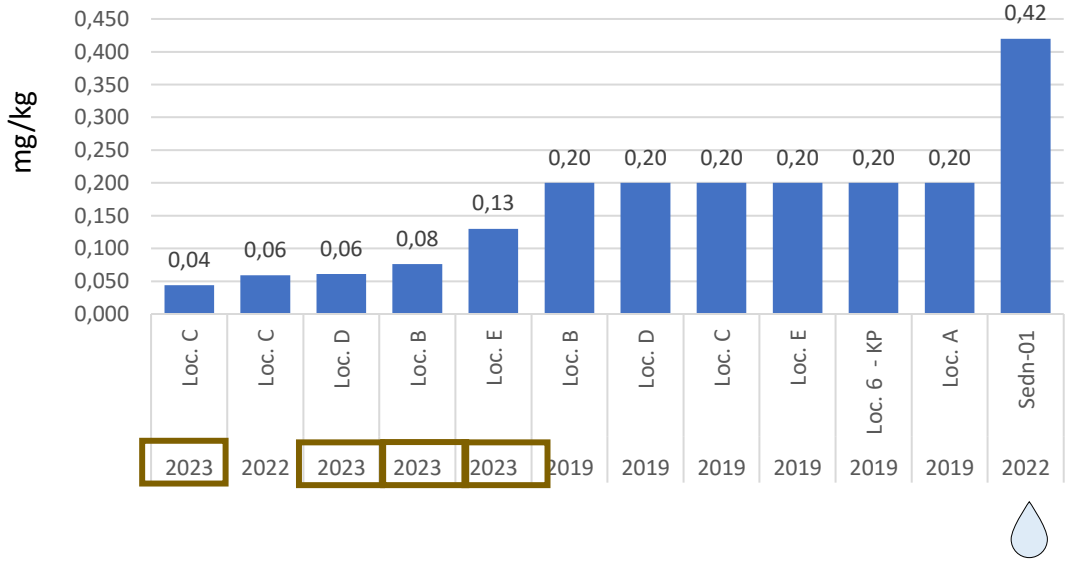
Barium - Ba

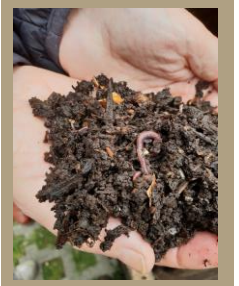


Aluminium - Al



Cadmium - Cd



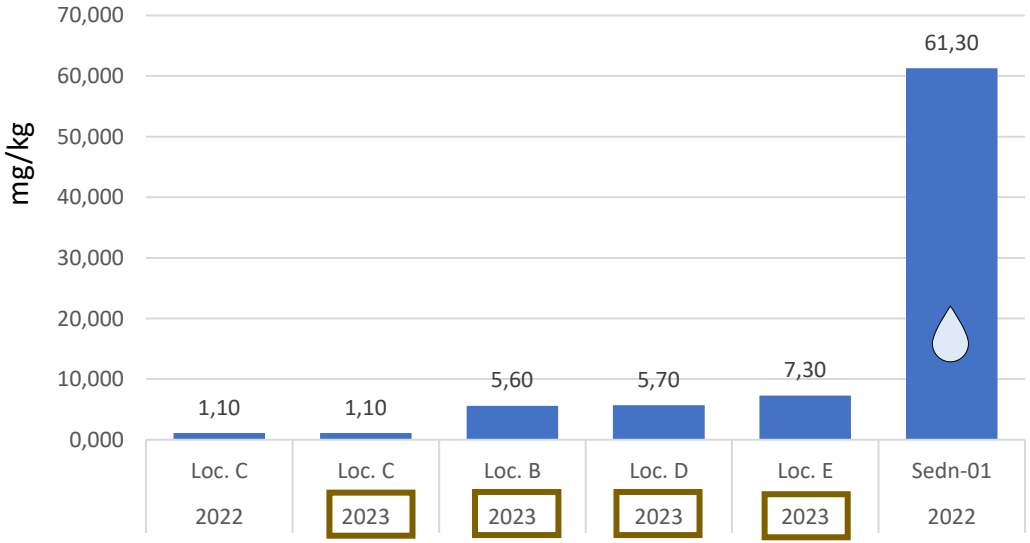


Heavy metals in soil (Medium Bound, mb), Zubieta 2019 - 2023

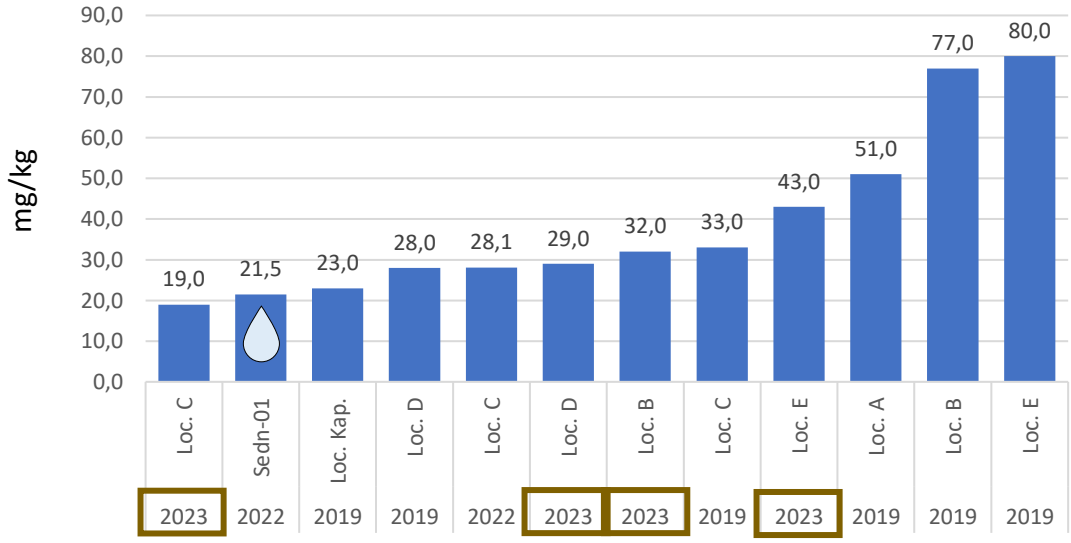
Chromium - Cr

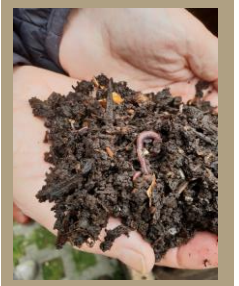
Copper - Cu

Cobalt - Co



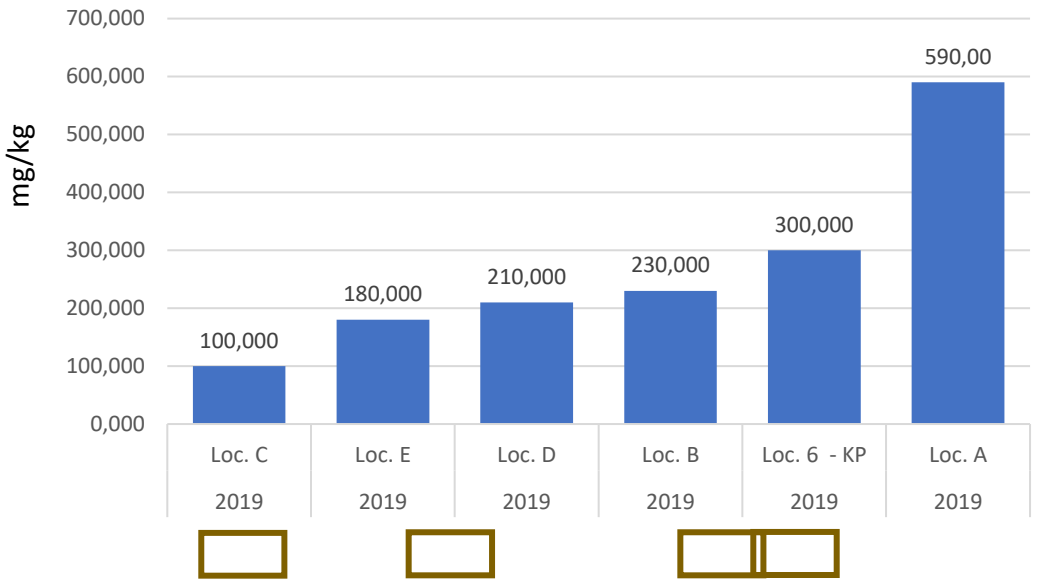
Lead - Pb



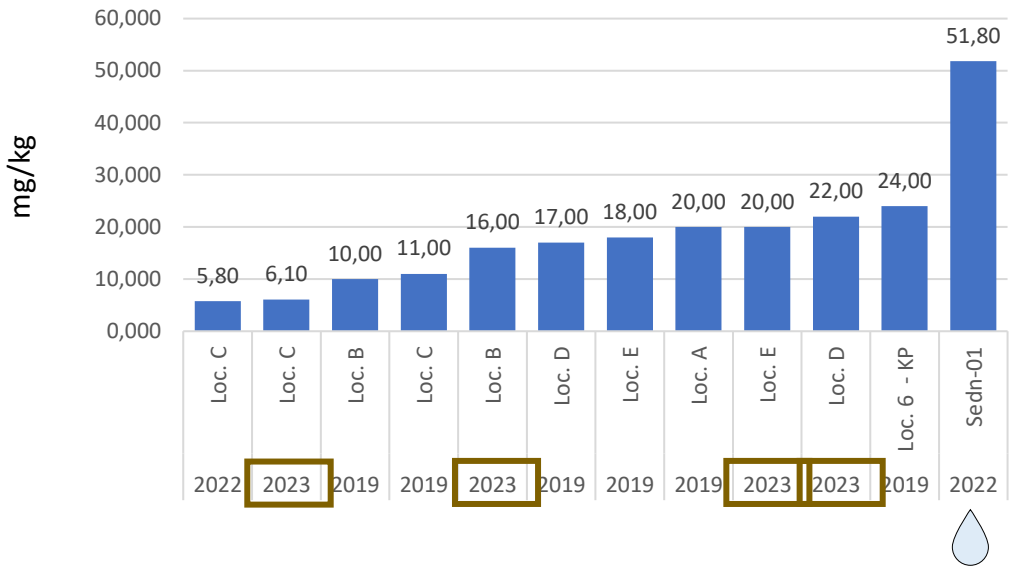


Heavy metals in soil (Medium Bound, mb), Zubieta 2019 - 2023

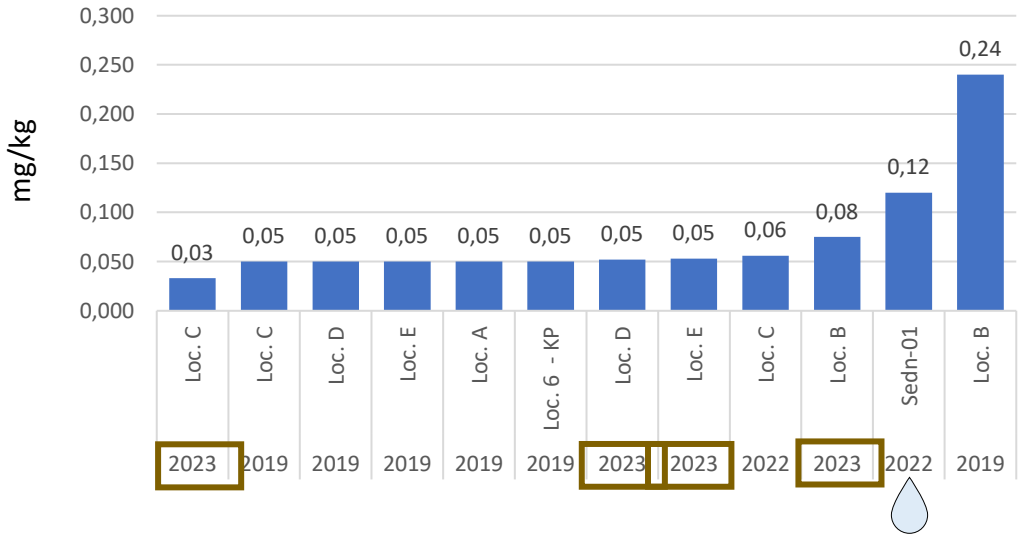
Manganese - Mn



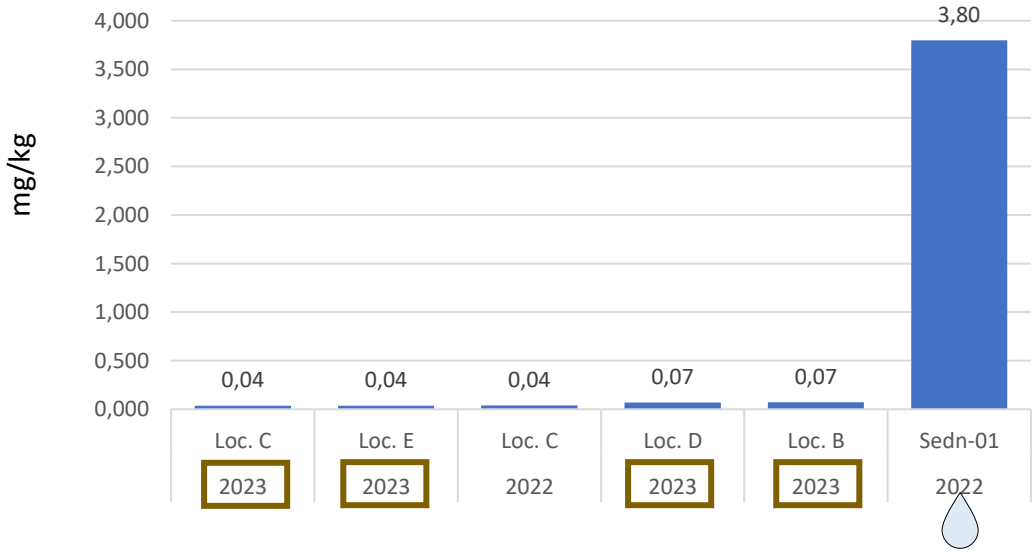
Nickel - Ni

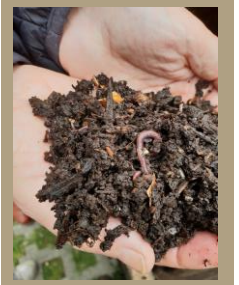


Mercury - Hg

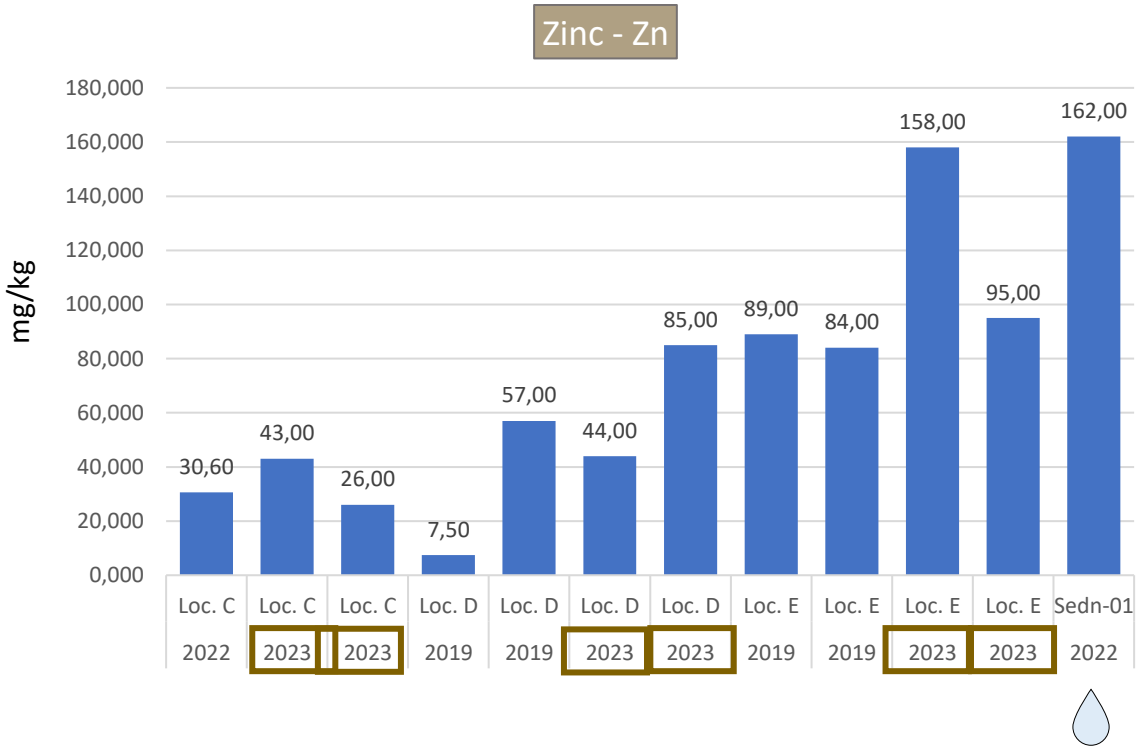


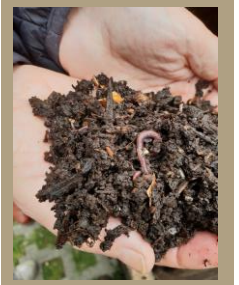
Silver - Ag





Heavy metals in soil (Medium Bound, mb), Zubieta 2019 - 2023





Analyses

2019 - 2023

Eggs – Moss

Vegetation

Water - Sediment

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
30-09-2019

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
If an analysis is accredited by ISO17025 (RvA L401) is indicated by a yes or a no
This report replace version 1

Reason change:
re-analysis
Date of the performance of the test: 30-09-2019

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Conclusion	Cut off	Unit
1	1b	DR CALUX	PCDD/PCDF (BEQ; semi)	1.8	suspected	1.7	pg BEQ / gram fat
2	1b	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	2.4	compliant	3.3	pg BEQ / gram fat
3	2	DR CALUX	PCDD/PCDF (BEQ; semi)	0.96	compliant	1.7	pg BEQ / gram fat
4	2	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	2.6	compliant	3.3	pg BEQ / gram fat
5	4	DR CALUX	PCDD/PCDF (BEQ; semi)	0.99	compliant	1.7	pg BEQ / gram fat
6	4	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	1.7	compliant	3.3	pg BEQ / gram fat
7	5	DR CALUX	PCDD/PCDF (BEQ; semi)	analyse stopped on request client		1.7	
8	5	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	analyse stopped on request client		3.3	
9	6	DR CALUX	PCDD/PCDF (BEQ; semi)	3.8	suspected	1.7	pg BEQ / gram fat
10	6	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	4.7	suspected	3.3	pg BEQ / gram fat
11	7	DR CALUX	PCDD/PCDF (BEQ; semi)	0.86	compliant	1.7	pg BEQ / gram fat
12	7	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	3.3	compliant	3.3	pg BEQ / gram fat
13	11	DR CALUX	PCDD/PCDF (BEQ; semi)	0.89	compliant	1.7	pg BEQ / gram fat
14	11	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	1.7	compliant	3.3	pg BEQ / gram fat
15	Illex aquifolium	DR CALUX	PCDD/PCDF (BEQ; semi)	0.10	---	n.a.	pg BEQ / g product
16	Illex aquifolium	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	0.28	---	n.a.	pg BEQ / g product
17	pinus radiata	DR CALUX	PCDD/PCDF (BEQ; semi)	LOQ <0.05	---	n.a.	pg BEQ / g product
18	pinus radiata	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	0.29	---	n.a.	pg BEQ / g product

For the suspected sample(s) to be non-compliant, the concentration has to be determined by a confirmatory method

For results below the limit of quantification (LOQ), behind the less than sign the limit of quantification is given

n.a.= no cut off according to EU guideline in BEQ established, maximal levels applicable if available

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	1b	35905	Food, egg(product)	yes	17-09-2019	
2	1b	35905	Food, egg(product)	yes	17-09-2019	
3	2	35906	Food, egg(product)	yes	17-09-2019	
4	2	35906	Food, egg(product)	yes	17-09-2019	
5	4	35907	Food, egg(product)	yes	17-09-2019	
6	4	35907	Food, egg(product)	yes	17-09-2019	
7	5	35908	Food, egg(product)	yes	17-09-2019	
8	5	35908	Food, egg(product)	yes	17-09-2019	

9	6	35909	Food, egg(product)	yes	17-09-2019
10	6	35909	Food, egg(product)	yes	17-09-2019
11	7	35910	Food, egg(product)	yes	17-09-2019
12	7	35910	Food, egg(product)	yes	17-09-2019
13	11	35911	Food, egg(product)	yes	17-09-2019
14	11	35911	Food, egg(product)	yes	17-09-2019
15	Illex aquifolium	35912	Food (Fruits and vegetables)	no	17-09-2019
16	Illex aquifolium	35912	Food (Fruits and vegetables)	no	17-09-2019
17	pinus radiata	35913	Food (Fruits and vegetables)	no	17-09-2019
18	pinus radiata	35913	Food (Fruits and vegetables)	no	17-09-2019

For the method DR CALUX and the sum parameter PCDD/PCDF (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

For the method DR CALUX and the sum parameter PCDD/PCDF and dl-PCBs (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F and dl-PCBs, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

All DR CALUX analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to COMMISSION REGULATION (EU) 2015/704 of 30 April 2015.

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
10-10-2019

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
If an analysis is accredited by ISO17025 (RvA L401) is indicated by a yes or a no
Date of the performance of the test: 10-10-2019

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Conclusion	Cut off	Unit
1	locatie 3	DR CALUX	PCDD/PCDF (BEQ; semi)	6.1	suspected	1.7	pg BEQ / gram fat
2	locatie 3	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	7.6	suspected	3.3	pg BEQ / gram fat
3	locatie 9	DR CALUX	PCDD/PCDF (BEQ; semi)	1.8	suspected	1.7	pg BEQ / gram fat
4	locatie 9	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	3.3	compliant	3.3	pg BEQ / gram fat
5	locatie 10	DR CALUX	PCDD/PCDF (BEQ; semi)	4.4	suspected	1.7	pg BEQ / gram fat
6	locatie 10	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	4.8	suspected	3.3	pg BEQ / gram fat

For the suspected sample(s) to be non-compliant, the concentration has to be determined by a confirmatory method

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	locatie 3	35928	Food, egg(product)	yes	18-09-2019	
2	locatie 3	35928	Food, egg(product)	yes	18-09-2019	
3	locatie 9	35929	Food, egg(product)	yes	18-09-2019	
4	locatie 9	35929	Food, egg(product)	yes	18-09-2019	
5	locatie 10	35930	Food, egg(product)	yes	18-09-2019	
6	locatie 10	35930	Food, egg(product)	yes	18-09-2019	

For the method DR CALUX and the sum parameter PCDD/PCDF (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

For the method DR CALUX and the sum parameter PCDD/PCDF and dl-PCBs (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F and dl-PCBs, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

All DR CALUX analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to COMMISSION REGULATION (EU) 2015/704 of 30 April 2015.

Results analysis eggs GC-MS

Eurofins GfA Lab Service GmbH
Neuländer Kamp 1 a
D-21079 Hamburg
GERMANY

Tel: +49 40 492 94 5050
Fax: +49 40 49294 5009

dioxins@eurofins.de
www.dioxine.de; www.dioxins.de

Eurofins GfA Lab Service GmbH · Neuländer Kamp 1 a · D-21079 Hamburg

BioDetection Systems b.v. (BDS)
attn. Dr. Peter Behnisch
Science Park 406
1098 XH Amsterdam
NIEDERLANDE

Person in charge Dr. N. Lohmann
ASM Dr. N. Lohmann

Report date 29.01.2020

Analytical report AR-20-GF-003730-01

Sample Code 710-2020-01808001

Reference	EGG
Sample sender	Dr. Peter Behnisch
Reception date time	24.01.2020
Transport by	Bote
Client Purchase order nr.	PHP16181
Purchase order date	23.01.2020
Client sample code	BOS 35905 twz-001-gcms-1901
Number of containers	1
Reception temperature	room temperature
End analysis	27.01.2020

Test results

GFFAT Fat Extraction for further analyses (°) (#)

Method Internal, GLS DF 110:2019-01-25, Gravimetry

Fat	9.18	%

GFL03 Dioxins and Furans (17 PCDD/F) (°) (#)

Method Internal, GLS DF 110:2019-01-25, GC-MS/MS

2,3,7,8-TetraCDD	0.0650	pg/g fat
1,2,3,7,8-PentaCDD	0.302	pg/g fat
1,2,3,4,7,8-HexaCDD	0.455	pg/g fat
1,2,3,6,7,8-HexaCDD	0.994	pg/g fat
1,2,3,7,8,9-HexaCDD	0.358	pg/g fat
1,2,3,4,6,7,8-HeptaCDD	7.57	pg/g fat

OctaCDD	15.4	pg/g fat
2,3,7,8-TetraCDF	1.39	pg/g fat
1,2,3,7,8-PentaCDF	0.518	pg/g fat
2,3,4,7,8-PentaCDF	0.701	pg/g fat
1,2,3,4,7,8-HexaCDF	0.487	pg/g fat
1,2,3,6,7,8-HexaCDF	0.345	pg/g fat
1,2,3,7,8,9-HexaCDF	< 0.124	pg/g fat
2,3,4,6,7,8-HexaCDF	0.747	pg/g fat
1,2,3,4,6,7,8-HeptaCDF	0.645	pg/g fat
1,2,3,4,7,8,9-HeptaCDF	< 0.121	pg/g fat
OctaCDF	0.384	pg/g fat
WHO(2005)-PCDD/F TEQ (lower-bound)	1.16	pg/g fat
WHO(2005)-PCDD/F TEQ (medium-bound)	1.16	pg/g fat
WHO(2005)-PCDD/F TEQ (upper-bound)	1.17	pg/g fat

GFL09 polychlorinated biphenyls (12 WHO PCB + 6 ICES PCB) (°) (#)

Method Internal, GLS DF 110:2019-01-25, GC-MS/MS

PCB 77	50.5	pg/g fat
PCB 81	6.98	pg/g fat
PCB 105	1110	pg/g fat
PCB 114	47.2	pg/g fat
PCB 118	2350	pg/g fat
PCB 123	50.5	pg/g fat
PCB 126	16.7	pg/g fat
PCB 156	687	pg/g fat
PCB 157	138	pg/g fat
PCB 167	275	pg/g fat
PCB 169	< 3.72	pg/g fat
PCB 189	80.8	pg/g fat
WHO(2005)-PCB TEQ (lower-bound)	1.82	pg/g fat
WHO(2005)-PCB TEQ (medium-bound)	1.88	pg/g fat
WHO(2005)-PCB TEQ (upper-bound)	1.94	pg/g fat

Eurofins GfA Lab Service GmbH · Neuländer Kamp 1 a · D-21079 Hamburg
Headquarters: Eurofins GfA Lab Service GmbH – Neuländer Kamp 1a D-21079 Hamburg
HRB 115907 AG Hamburg
General Managers: Dr. Scarlett Biselli
VAT No.: DE 275912372
Hypovereinsbank ● Bank code: 207 300 17 ● Account No.: 7000002400 ● SWIFT-BIC: HYVEDEMME17
IBAN: DE12 2073 0017 7000 0024 00

PCB 28	< 0.310	ng/g fat
PCB 52	< 0.310	ng/g fat
PCB 101	< 0.310	ng/g fat
PCB 138	8.40	ng/g fat
PCB 153	10.9	ng/g fat
PCB 180	6.73	ng/g fat
Total 6 ndl-PCB (lower-bound)	26.0	ng/g fat
Total 6 ndl-PCB (medium-bound)	26.5	ng/g fat
Total 6 ndl-PCB (upper-bound)	27.0	ng/g fat

GFTE1 TEQ-Totals WHO-PCDD/F and PCB (°) (#)

Method Internal, GLS DF 110, 120, 130, 140, Calculation

WHO(2005)-PCDD/F+PCB TEQ (lower-bound)	2.98	pg/g fat
WHO(2005)-PCDD/F+PCB TEQ (medium-bound)	3.04	pg/g fat
WHO(2005)-PCDD/F+PCB TEQ (upper-bound)	3.11	pg/g fat

(°) = The test was performed at the laboratory site: Am Neuländer Gewerbepark 4

(#) = Eurofins GfA Lab Service GmbH (Hamburg) is accredited for this test.

< - Concentration below the indicated limit of quantification (LOQ)

JUDGEMENT

According to Commission Regulation (EC) No 1881/2006 of 19 December 2006 in its currently valid version we declare as regards maximum levels for dioxins and polychlorinated biphenyls in hen eggs and egg products:

The sum of dioxins and furans of the above mentioned sample (expressed as WHO(2005)-PCDD/F TEQ (upper-bound)) is below the maximum level of 2.5 pg WHO-TEQ/g fat.

The sum of dioxins / furans and dioxin-like PCBs of the above mentioned sample (expressed as WHO(2005)-PCDD/F+PCB TEQ (upper-bound)) is below the maximum level of 5.0 pg WHO-TEQ/g fat.

The sum of non dioxin-like PCBs of the above mentioned sample (expressed as Total 6 ndl-PCB (upper-bound)) is below the maximum level of 40 ng/g fat.

According to Commission Recommendation 2013/711/EU of 3 December 2013 in its currently valid version we declare as regards action levels for dioxins and polychlorinated biphenyls in hen eggs and egg products:

The sum of dioxin-like PCBs of the above mentioned sample (expressed as WHO(2005)-PCB TEQ (upper-bound)) is **above** the action level of 1,75 pg WHO-TEQ/g fat.

Eurofins GfA Lab Service GmbH · Neuländer Kamp 1 a · D-21079 Hamburg
Headquarters: Eurofins GfA Lab Service GmbH – Neuländer Kamp 1a D-21079 Hamburg
HRB 115907 AG Hamburg
General Managers: Dr. Scarlett Biselli
VAT No.: DE 275912372
Hypovereinsbank ● Bank code: 207 300 17 ● Account No.: 7000002400 ● SWIFT-BIC: HYVEDEMME17
IBAN: DE12 2073 0017 7000 0024 00

Analytical report AR-20-GF-003730-01

Sample Code 710-2020-01808001

eurofins | GfA Lab Service

Analytical Service Manager (Fernando Schmidt)

Eurofins GfA Lab Service GmbH · Neuländer Kamp 1 a · D-21079 Hamburg
Headquarters: Eurofins GfA Lab Service GmbH – Neuländer Kamp 1a D-21079 Hamburg
HRB 115907 AG Hamburg
General Managers: Dr. Scarlett Biselli
VAT No.: DE 275912372
Hypovereinsbank ● Bank code: 207 300 17 ● Account No.: 7000002400 ● SWIFT-BIC: HYVEDEMME17
IBAN: DE12 2073 0017 7000 0024 00

Results analysis Leaves/Soil CALUX

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
08-01-2020

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
Accredation ISO 17025 (RvA L401) is not applicable for activities described in this report
Date of the performance of the test: 08-01-2020

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Conclusion	Cut off	Unit
1	TW- OS-DR-1901	DR CALUX	PCDD/PCDF (BEQ; semi)	LOQ <0.06	---	n.a.	pg BEQ / gram fat
2	TW- OS-DR-1901	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	LOQ <0.1	---	n.a.	pg BEQ / gram fat
3	TW-ILEX-AB14-1901	DR CALUX	PCDD/PCDF (BEQ; semi)	0.20	---	n.a.	pg BEQ / gram fat
4	TW-ILEX-AB14-1901	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	0.20	---	n.a.	pg BEQ / gram fat
5	TW-ULEX-BCD-1902	DR CALUX	PCDD/PCDF (BEQ; semi)	0.13	---	n.a.	pg BEQ / gram fat
6	TW-ULEX-BCD-1902	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	0.19	---	n.a.	pg BEQ / gram fat

For results below the limit of quantification (LOQ), behind the less than sign the limit of quantification is given

n.a.= no cut off according to EU guideline in BEQ established, maximal levels applicable if available

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	TW- OS-DR-1901	36670	Food (Fruits and vegetables)	no	19-12-2019	
2	TW- OS-DR-1901	36670	Food (Fruits and vegetables)	no	19-12-2019	
3	TW-ILEX-AB14-1901	36671	Food (Fruits and vegetables)	no	19-12-2019	
4	TW-ILEX-AB14-1901	36671	Food (Fruits and vegetables)	no	19-12-2019	
5	TW-ULEX-BCD-1902	36672	Food (Fruits and vegetables)	no	19-12-2019	
6	TW-ULEX-BCD-1902	36672	Food (Fruits and vegetables)	no	19-12-2019	

For the method DR CALUX and the sum parameter PCDD/PCDF (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

For the method DR CALUX and the sum parameter PCDD/PCDF and dl-PCBs (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F and dl-PCBs, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

All DR CALUX analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to COMMISSION REGULATION (EU) 2015/704 of 30 April 2015.

Results analysis Leaves/Soil GC-MS

Eurofins GfA Lab Service GmbH
Neuländer Kamp 1 a
D-21079 Hamburg
GERMANY

Tel: +49 40 492 94 5050
Fax: +49 40 49294 5009

dioxins@eurofins.de
www.dioxine.de; www.dioxins.de

Eurofins GfA Lab Service GmbH · Neuländer Kamp 1 a · D-21079 Hamburg

Eurofins Analytico B.V.
attn. Shantal Khemai
Gildeweg 42 - 48
3771 NB Barneveld
NIEDERLANDE

Person in charge Dr. D. Stegemann
ASM Dr. D. Stegemann

Report date 26.09.2019

Analytical report AR-19-GF-033666-01

Sample Code 710-2019-20424001

Reference	pine needles Certificate number: 2019133434
Sample sender	Shantal Khemai
Reception date time	19.09.2019
Transport by	UPS
Client Purchase order nr.	ZUBIETA LANTZEN
Purchase order date	17.09.2019
Client sample code	10927517
Number of containers	1
Reception temperature	room temperature
End analysis	26.09.2019

Test results

GFL05 Dioxins and Furans (17 PCDD/F) (°) (#)
Method Internal, GLS DF 110:2019-01-25, GC-MS/MS

2,3,7,8-TetraCDD	< 0.0118	pg/g
1,2,3,7,8-PentaCDD	< 0.0156	pg/g
1,2,3,4,7,8-HexaCDD	< 0.0237	pg/g
1,2,3,6,7,8-HexaCDD	< 0.0324	pg/g
1,2,3,7,8,9-HexaCDD	< 0.0305	pg/g
1,2,3,4,6,7,8-HeptaCDD	< 0.0498	pg/g
OctaCDD	< 0.361	pg/g
2,3,7,8-TetraCDF	< 0.0324	pg/g
1,2,3,7,8-PentaCDF	< 0.0224	pg/g
2,3,4,7,8-PentaCDF	< 0.0349	pg/g
1,2,3,4,7,8-HexaCDF	< 0.0368	pg/g

Analytical report AR-19-GF-033666-01

Sample Code 710-2019-20424001

eurofins | GfA Lab Service

1,2,3,6,7,8-HexaCDF	< 0.0336	pg/g
1,2,3,7,8,9-HexaCDF	< 0.0249	pg/g
2,3,4,6,7,8-HexaCDF	< 0.0305	pg/g
1,2,3,4,6,7,8-HeptaCDF	< 0.0349	pg/g
1,2,3,4,7,8,9-HeptaCDF	< 0.0243	pg/g
OctaCDF	< 0.0748	pg/g
WHO(2005)-PCDD/F TEQ (lower-bound)	ND	pg/g
WHO(2005)-PCDD/F TEQ (medium-bound)	0.0321	pg/g
WHO(2005)-PCDD/F TEQ (upper-bound)	0.0643	pg/g

(°) = The test was performed at the laboratory site: Am Neuländer Gewerbepark 4
(#) = Eurofins GfA Lab Service GmbH (Hamburg) is accredited for this test.

< - Concentration below the indicated limit of quantification (LOQ)
ND - not determined since none of the corresponding congeners was above the LOQ

Analytical Services Manager, ASM (Dieter Stegemann)

Eurofins GfA Lab Service GmbH
Neuländer Kamp 1 a
D-21079 Hamburg
GERMANY

Tel: +49 40 492 94 5050
Fax: +49 40 49294 5009

dioxins@eurofins.de
www.dioxine.de; www.dioxins.de

Eurofins GfA Lab Service GmbH · Neuländer Kamp 1 a · D-21079 Hamburg

Eurofins Analytico B.V.
attn. Shantal Khemai
Gildeweg 42 - 48
3771 NB Barneveld
NIEDERLANDE

Person in charge Dr. D. Stegemann
ASM Dr. D. Stegemann

Report date 28.09.2019

Analytical report AR-19-GF-033983-01

Sample Code 710-2019-20555001

Reference	ZUBIETA 3.1 Soil, Sediment Certificate number: 2019133681
Sample sender	Shantal Khemai
Reception date time	20.09.2019
Transport by	UPS
Client Purchase order nr.	ZUBIETA LANTZEN
Purchase order date	19.09.2019
Client sample code	10928269
Number of containers	1
Reception temperature	room temperature
End analysis	28.09.2019

Test results

GFDRY Dry Residue (°) (#)
Method Internal, , Gravimetry

dry residue	64.7	%

GFU04 polychlorinated dibenzodioxins and -furans (17 PCDD/F): (wet) sewage sludge, slag, ash, soil (°) (#)
Method Internal, GLS DF 130:2019-01-18, GC-HRMS

2,3,7,8-TetraCDD	< 0.183	ng/kg dw
1,2,3,7,8-PentaCDD	0.273	ng/kg dw
1,2,3,4,7,8-HexaCDD	< 0.488	ng/kg dw
1,2,3,6,7,8-HexaCDD	0.708	ng/kg dw
1,2,3,7,8,9-HexaCDD	0.501	ng/kg dw
1,2,3,4,6,7,8-HeptaCDD	6.93	ng/kg dw
OctaCDD	26.8	ng/kg dw

Analytical report AR-19-GF-033983-01

Sample Code 710-2019-20555001

eurofins | GfA Lab Service

2,3,7,8-TetraCDF	0.974	ng/kg dw
1,2,3,7,8-PentaCDF	0.655	ng/kg dw
2,3,4,7,8-PentaCDF	1.01	ng/kg dw
1,2,3,4,7,8-HexaCDF	0.869	ng/kg dw
1,2,3,6,7,8-HexaCDF	0.791	ng/kg dw
1,2,3,7,8,9-HexaCDF	< 0.407	ng/kg dw
2,3,4,6,7,8-HexaCDF	0.969	ng/kg dw
1,2,3,4,6,7,8-HeptaCDF	3.44	ng/kg dw
1,2,3,4,7,8,9-HeptaCDF	0.404	ng/kg dw
OctaCDF	5.20	ng/kg dw
WHO(2005)-PCDD/F TEQ (lower-bound)	1.19	ng/kg dw
WHO(2005)-PCDD/F TEQ (upper-bound)	1.47	ng/kg dw
I-TEQ (NATO/CCMS) (lower-bound)	1.30	ng/kg dw
I-TEQ (NATO/CCMS) (upper-bound)	1.57	ng/kg dw

(°) = The test was performed at the laboratory site: Am Neuländer Gewerbepark 4
(#) = Eurofins GfA Lab Service GmbH (Hamburg) is accredited for this test.

< - Concentration below the indicated limit of quantification (LOQ)

Analytical Service Manager (Dr. Michael Ambrosius)

Results analysis Leaves/Soil Heavy metals

GEYSER HPC, S.A.U.
A la atención de Inaki Ochoa
Avda. Iparraguirre 80
E-48940 LEIOA
SPAIN

Certificado de análisis

Fecha: 30-Sep-2019

Adjunto le enviamos los resultados analíticos de los siguientes análisis.

Número de certificado/versión	2019133434/1
Número de proyecto	2199115
Nombre de proyecto	ZUBIETA LANTZEN
Número de pedido	
Muestras recibidas el	12-Sep-2019

Este Certificado de Análisis solamente puede ser reproducido íntegramente.
Los resultados están solamente conectados a los artículos analizados.

Las muestras de suelo se guardarán durante un periodo de 4 semanas y las muestras de agua por un periodo de 2 semanas después de la recepción de las muestras en nuestro laboratorio. Salvo aviso contrario, las muestras serán eliminadas después de vencer los periodos arriba mencionados. Si quisiera que Analytico guarde las muestras por un periodo más largo, sírvase rellenar y firmar esta página y enviarla a Analytico por lo menos una semana antes de que caduque este periodo. Los costes de los periodos de almacenamiento prolongado figuran en nuestra lista de tarifas.

Periodo de almacenamiento:
Fecha: Nombre: Firma:

Confiamos en haber ejecutado el pedido según sus expectativas. Si tuviera cualquier pregunta acerca de este Certificado de Análisis, no dude en contactar nuestro Servicio al Cliente.

Atentamente,

Eurofins Analytico B.V.

Ing. A. Veldhuizen
Jefe de laboratorio

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Certificado de análisis

Número de proyecto	2199115	Número de certificado/versión	2019133434/1
Nombre de proyecto	ZUBIETA LANTZEN	Fecha de inicio	13-Sep-2019
Número de pedido		Fecha de informe	30-Sep-2019/08:43
		Anexo	A,C,D
Tomamuestras	Mikel Orueechevarria Otro	Página	1/2

Análisis	Unidad	1	2	3	4	5
Investigación variada						
Investigación externalizada				Ver anexo		
Trabajo externalizado		Ver anexo	Ver anexo		Ver anexo	Ver anexo

No.	Descripción de muestra	Fecha de muestreo	Analytico-#
1	ZUBIETA 1.2	12-Sep-2019	10927512
2	ZUBIETA 2.2	12-Sep-2019	10927514
3	ZUBIETA 3.2 DIOX	12-Sep-2019	10927517
4	ZUBIETA 3.2 HMETALS	12-Sep-2019	10927518
5	ZUBIETA 3.3	12-Sep-2019	10927519

Q: Operación acreditada por el Organismo de homologación holandés
A: AP04 operación acreditada
S: AS SIKB operación acreditada
V: VLAREL operación acreditada

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Certificado de análisis

Número de proyecto	2199115	Número de certificado/versión	2019133434/1
Nombre de proyecto	ZUBIETA LANTZEN	Fecha de inicio	13-Sep-2019
Número de pedido		Fecha de informe	30-Sep-2019/08:43
		Anexo	A,C,D
Tomamuestras	Mikel Orueechevarria Otro	Página	2/2

Análisis	Unidad	6	7
Trabajo externalizado		Ver anexo	Ver anexo

No.	Descripción de muestra	Fecha de muestreo	Analytico-#
6	ZUBIETA 4.2	12-Sep-2019	10927521
7	ZUBIETA 5.2	12-Sep-2019	10927523

Q: Operación acreditada por el Organismo de homologación holandés
A: AP04 operación acreditada
S: AS SIKB operación acreditada
V: VLAREL operación acreditada

Iniciales
Coord. de proy.
SF

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Anexo (A) con información de la submuestra sobre el certificado de análisis 2019133434/1

Analytico-#	# perforación	Descripción	De	A	Código de barras	Descripción de muestra
10927512	ZUBIETA 1.2	ZUBIETA 1.2				ZUBIETA 1.2
10927512					0904166800	ZUBIETA 1.2
10927514	ZUBIETA 2.2	ZUBIETA 2.2				ZUBIETA 2.2
10927514					0904166793	ZUBIETA 2.2
10927517	ZUBIETA 3.2 DZ	UBIETA 3.2 DIOX				ZUBIETA 3.2 DIOX
10927517					0904166794	ZUBIETA 3.2 DIOX
10927518	ZUBIETA 3.2 HZ	UBIETA 3.2 HMETALS				ZUBIETA 3.2 HMETALS
10927518					0904166795	ZUBIETA 3.2 HMETALS
10927519	ZUBIETA 3.3	ZUBIETA 3.3				ZUBIETA 3.3
10927519					0904166796	ZUBIETA 3.3
10927521	ZUBIETA 4.2	ZUBIETA 4.2				ZUBIETA 4.2
10927521					0904166797	ZUBIETA 4.2
10927523	ZUBIETA 5.2	ZUBIETA 5.2				ZUBIETA 5.2
10927523					0904166798	ZUBIETA 5.2

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Anexo (C) con referencias de métodos sobre el certificado de análisis 2019133434/1

Análisis	Método	Técnica	Referencia de método
Investigación externalizada (3)	W0004	Externalizado	Método externo

Más información sobre los métodos aplicados, así como sobre la clasificación de la precisión, se ha incluido en nuestro suplemento: "Especificación de métodos de análisis", versión junio de 2016.

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Anexo (D) observaciones sobre la toma de muestras y los plazos de conservación. 2019133434/1

Las directrices generales establecidas para la conservación y/o almacenamiento de las muestras se han excedido para los parámetros y muestras que se indican a continuación.

	Analytico-#
Temperatura de llegada de las muestras al laboratorio superior al límite de referencia	
	10927512
	10927514
	10927517
	10927518
	10927519
	10927521
	10927523

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

eurofins | — analytico®

Eurofins WEJ Contaminants GmbH
Neuländer Kamp 1
D-21079 Hamburg
GERMANY

Tel: +49 40 49294 2222
Fax: +49 40 49294 99 2222

wej-contaminants@eurofins.de
http://www.eurofins.de/wej-contaminants.aspx

Eurofins WEJ Contaminants · Neuländer Kamp 1 · D-21079 Hamburg

Eurofins Analytico B.V.
Gildeweg 42 - 48
attn. Report recipient
3771 NB Barneveld
NIEDERLANDE

Person in charge	Mrs J. Neprokin	- 2933
Client support	Mr I. Customer Service	- 2222

Report date 26.09.2019

Analytical report: AR-19-JC-172875-01

Sample Code 706-2019-00226811

Reference	ZUBIETA 1.2
Client Sample Code	10927512
Purchase Order Code	2019133434 ZUBIETA LANTZEN
Number	1
Amount	157 g
Reception temperature	cooled
Ordered by	Report recipient
Submitted by	Account Barneveld
Sender	UPS - United Parcel Service
Reception date time	19.09.2019
Packaging	plastic bag, other
Start/end of analyses	23.09.2019 / 25.09.2019

TEST RESULTS

Physical-chemical Analysis

J1001 Sample preparation (#)
Method: §64 LFGB L 00.00-19/1, CON-PV 00001 (2019-03), Digestion (microwave)

J8306 Lead (Pb) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Lead (Pb)	0.08	mg/kg
	± 0.04	mg/kg

J8308 Cadmium (Cd) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Cadmium (Cd)	0.4	mg/kg
	± 0.08	mg/kg

JCHG2 Mercury (Hg) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Mercury [Hg]	0.009	mg/kg
	± 0.004	mg/kg

J8312 Arsenic (As) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS

(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Arsenic (As)	<0.1	*	mg/kg

JJW2B Copper (Cu) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Copper (Cu)	1.8	mg/kg
	± 0.4	mg/kg

JJ0CG Chromium (Cr) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Chromium (Cr)	0.16	mg/kg
	± 0.05	mg/kg

JJ0CM Nickel (Ni) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Nickel (Ni)	0.3	mg/kg
	± 0.1	mg/kg

JJ0CR Zinc (Zn) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Zinc (Zn)	120	mg/kg
	± 24	mg/kg

JJ0CI Manganese (Mn) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Manganese (Mn)	210	mg/kg
	± 42	mg/kg

* = Below indicated quantification level

(#) = Eurofins WEJ Contaminants GmbH (Hamburg) is accredited for this test.

Result +/- expanded measurement uncertainty (95%; k=2), sampling not included

Signature

Analytical Service Manager (Stefanie Merkmann)

Eurofins WEJ Contaminants GmbH
Neuländer Kamp 1
D-21079 Hamburg
GERMANY

Tel: +49 40 49294 2222
Fax: +49 40 49294 99 2222

wej-contaminants@eurofins.de
http://www.eurofins.de/wej-contaminants.aspx

Eurofins WEJ Contaminants · Neuländer Kamp 1 · D-21079 Hamburg

Eurofins Analytico B.V.
Gildeweg 42 - 48
attn. Report recipient
3771 NB Barneveld
NIEDERLANDE

Person in charge	Mrs J. Neprokin	- 2933
Client support	Mr I. Customer Service	- 2222

Report date 26.09.2019

Analytical report: AR-19-JC-172876-01

Sample Code 706-2019-00226812

Reference	ZUBIETA 2.2
Client Sample Code	10927514
Purchase Order Code	2019133434 ZUBIETA LANTZEN
Number	1
Amount	84 g
Reception temperature	cooled
Ordered by	Report recipient
Submitted by	Account Barneveld
Sender	UPS - United Parcel Service
Reception date time	19.09.2019
Packaging	plastic bag, other
Start/end of analyses	23.09.2019 / 25.09.2019

TEST RESULTS

Physical-chemical Analysis

J1001 Sample preparation (#)
Method: §64 LFGB L 00.00-19/1, CON-PV 00001 (2019-03), Digestion (microwave)

J8306 Lead (Pb) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Lead (Pb)	0.05		mg/kg
	± 0.04		mg/kg

J8308 Cadmium (Cd) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Cadmium (Cd)	0.31		mg/kg
	± 0.06		mg/kg

JCHG2 Mercury (Hg) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Mercury [Hg]	<0.005	*	mg/kg

J8312 Arsenic (As) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS

(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Arsenic (As)	<0.1	*	mg/kg

JJW2B Copper (Cu) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Copper (Cu)	2.2		mg/kg
	± 0.4		mg/kg

JJ0CG Chromium (Cr) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Chromium (Cr)	0.42		mg/kg
	± 0.09		mg/kg

JJ0CM Nickel (Ni) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Nickel (Ni)	1.4		mg/kg
	± 0.3		mg/kg

JJ0CR Zinc (Zn) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Zinc (Zn)	68		mg/kg
	± 14		mg/kg

JJ0CI Manganese (Mn) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Manganese (Mn)	1400		mg/kg
	± 280		mg/kg

* = Below indicated quantification level

(#) = Eurofins WEJ Contaminants GmbH (Hamburg) is accredited for this test.

Result +/- expanded measurement uncertainty (95%; k=2), sampling not included

Signature

Analytical Service Manager (Stefanie Merkmann)

Eurofins WEJ Contaminants GmbH
Neuländer Kamp 1
D-21079 Hamburg
GERMANY

Tel: +49 40 49294 2222
Fax: +49 40 49294 99 2222

wej-contaminants@eurofins.de
http://www.eurofins.de/wej-contaminants.aspx

Eurofins WEJ Contaminants · Neuländer Kamp 1 · D-21079 Hamburg

Eurofins Analytico B.V.
Gildeweg 42 - 48
attn. Report recipient
3771 NB Barneveld
NIEDERLANDE

Person in charge	Mrs J. Neprokin	- 2933
Client support	Mr I. Customer Service	- 2222

Report date 26.09.2019

Analytical report: AR-19-JC-173287-01

Sample Code 706-2019-00226813

Reference	ZUBIETA 3.2 HMETALS
Client Sample Code	10927518
Purchase Order Code	2019133434 ZUBIETA LANTZEN
Number	1
Amount	128 g
Reception temperature	cooled
Ordered by	Report recipient
Submitted by	Account Barneveld
Sender	UPS - United Parcel Service
Reception date time	19.09.2019
Packaging	plastic bag, other
Start/end of analyses	23.09.2019 / 26.09.2019

TEST RESULTS

Physical-chemical Analysis

J1001 Sample preparation (#)
Method: §64 LFGB L 00.00-19/1, CON-PV 00001 (2019-03), Digestion (microwave)

J8306 Lead (Pb) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Lead (Pb)	<0.05	*	mg/kg

J8308 Cadmium (Cd) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Cadmium (Cd)	0.09		mg/kg
	± 0.02		mg/kg

JCHG2 Mercury (Hg) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Mercury [Hg]	<0.005	*	mg/kg

J8312 Arsenic (As) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Arsenic (As)	<0.1	*	mg/kg

JJW2B Copper (Cu) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS (Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Copper (Cu)	1.9	mg/kg
	± 0.4	mg/kg

JJ0CG Chromium (Cr) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS (Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Chromium (Cr)	0.33	mg/kg
	± 0.08	mg/kg

JJ0CM Nickel (Ni) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS (Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Nickel (Ni)	1.2	mg/kg
	± 0.3	mg/kg

JJ0CR Zinc (Zn) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS (Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Zinc (Zn)	12	mg/kg
	± 2.4	mg/kg

JJ0CI Manganese (Mn) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS (Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Manganese (Mn)	22	mg/kg
	± 4.4	mg/kg

* = Below indicated quantification level

(#) = Eurofins WEJ Contaminants GmbH (Hamburg) is accredited for this test.

Result +/- expanded measurement uncertainty (95%; k=2), sampling not included

Signature

Analytical Service Manager (Dagmar Hegemann)

Eurofins WEJ Contaminants GmbH
Neuländer Kamp 1
D-21079 Hamburg
GERMANY

Tel: +49 40 49294 2222
Fax: +49 40 49294 99 2222

wej-contaminants@eurofins.de
http://www.eurofins.de/wej-contaminants.aspx

Eurofins WEJ Contaminants · Neuländer Kamp 1 · D-21079 Hamburg

Eurofins Analytico B.V.
Gildeweg 42 - 48
attn. Report recipient
3771 NB Barneveld
NIEDERLANDE

Person in charge	Mrs J. Neprokin	- 2933
Client support	Mr I. Customer Service	- 2222

Report date 26.09.2019

Analytical report: AR-19-JC-172877-01

Sample Code 706-2019-00226814

Reference	ZUBIETA 3.3
Client Sample Code	10927519
Purchase Order Code	2019133434 ZUBIETA LANTZEN
Number	1
Amount	75 g
Reception temperature	cooled
Ordered by	Report recipient
Submitted by	Account Barneveld
Sender	UPS - United Parcel Service
Reception date time	19.09.2019
Packaging	plastic bag, other
Start/end of analyses	23.09.2019 / 25.09.2019

TEST RESULTS

Physical-chemical Analysis

J1001 Sample preparation (#)
Method: §64 LFGB L 00.00-19/1, CON-PV 00001 (2019-03), Digestion (microwave)

J8306 Lead (Pb) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Lead (Pb)	2.2	mg/kg
	± 0.44	mg/kg

J8308 Cadmium (Cd) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Cadmium (Cd)	0.04	mg/kg
	± 0.01	mg/kg

JCHG2 Mercury (Hg) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Mercury [Hg]	0.018	mg/kg
	± 0.005	mg/kg

J8312 Arsenic (As) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS

(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Arsenic (As)	0.6	mg/kg
	± 0.1	mg/kg

JJW2B Copper (Cu) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Copper (Cu)	1.7	mg/kg
	± 0.3	mg/kg

JJ0CG Chromium (Cr) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Chromium (Cr)	5.2	mg/kg
	± 1.0	mg/kg

JJ0CM Nickel (Ni) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Nickel (Ni)	1.3	mg/kg
	± 0.3	mg/kg

JJ0CR Zinc (Zn) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Zinc (Zn)	14	mg/kg
	± 2.8	mg/kg

JJ0CI Manganese (Mn) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Manganese (Mn)	83	mg/kg
	± 17	mg/kg

(#) = Eurofins WEJ Contaminants GmbH (Hamburg) is accredited for this test.

Result +/- expanded measurement uncertainty (95%; k=2), sampling not included

Signature

Analytical Service Manager (Stefanie Merkmann)

Eurofins WEJ Contaminants GmbH
Neuländer Kamp 1
D-21079 Hamburg
GERMANY

Tel: +49 40 49294 2222
Fax: +49 40 49294 99 2222

wej-contaminants@eurofins.de
http://www.eurofins.de/wej-contaminants.aspx

Eurofins WEJ Contaminants · Neuländer Kamp 1 · D-21079 Hamburg

Eurofins Analytico B.V.
Gildeweg 42 - 48
attn. Report recipient
3771 NB Barneveld
NIEDERLANDE

Person in charge Mrs J. Neprokin - 2933
Client support Mr I. Customer Service - 2222

Report date 25.09.2019

Analytical report: AR-19-JC-172555-01

Sample Code 706-2019-00226815

Reference	ZUBIETA 4.2
Client Sample Code	10927521
Purchase Order Code	2019133434 ZUBIETA LANTZEN
Number	1
Amount	79 g
Reception temperature	cooled
Ordered by	Report recipient
Submitted by	Account Barneveld
Sender	UPS - United Parcel Service
Reception date time	19.09.2019
Packaging	plastic bag, other
Start/end of analyses	23.09.2019 / 25.09.2019

TEST RESULTS

Physical-chemical Analysis

J1001 Sample preparation (#)
Method: §64 LFGB L 00.00-19/1, CON-PV 00001 (2019-03), Digestion (microwave)

J8306 Lead (Pb) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Lead (Pb)	<0.05	*	mg/kg

J8308 Cadmium (Cd) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Cadmium (Cd)	0.02		mg/kg
	± 0.01		mg/kg

JCHG2 Mercury (Hg) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Mercury [Hg]	<0.005	*	mg/kg

J8312 Arsenic (As) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Arsenic (As)	<0.1	*	mg/kg

JJW2B Copper (Cu) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS (Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Copper (Cu)	1.7	mg/kg
	± 0.3	mg/kg

JJ0CG Chromium (Cr) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS (Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Chromium (Cr)	0.82	mg/kg
	± 0.17	mg/kg

JJ0CM Nickel (Ni) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS (Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Nickel (Ni)	1.2	mg/kg
	± 0.3	mg/kg

JJ0CR Zinc (Zn) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS (Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Zinc (Zn)	7.5	mg/kg
	± 1.6	mg/kg

JJ0CI Manganese (Mn) (#)

Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS (Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Manganese (Mn)	25	mg/kg
	± 5.0	mg/kg

* = Below indicated quantification level

(#) = Eurofins WEJ Contaminants GmbH (Hamburg) is accredited for this test.

Result +/- expanded measurement uncertainty (95%; k=2), sampling not included

Signature

Analytical Service Manager (Dagmar Hegemann)

Eurofins WEJ Contaminants GmbH
Neuländer Kamp 1
D-21079 Hamburg
GERMANY

Tel: +49 40 49294 2222
Fax: +49 40 49294 99 2222

wej-contaminants@eurofins.de
http://www.eurofins.de/wej-contaminants.aspx

Eurofins WEJ Contaminants · Neuländer Kamp 1 · D-21079 Hamburg

Eurofins Analytico B.V.
Gildeweg 42 - 48
attn. Report recipient
3771 NB Barneveld
NIEDERLANDE

Person in charge	Mrs J. Neprokin	- 2933
Client support	Mr I. Customer Service	- 2222

Report date 27.09.2019

Analytical report: AR-19-JC-173964-01

Sample Code 706-2019-00226816

Reference	ZUBIETA 5.2
Client Sample Code	10927523
Purchase Order Code	2019133434 ZUBIETA LANTZEN
Number	1
Amount	66 g
Reception temperature	cooled
Ordered by	Report recipient
Submitted by	Account Barneveld
Sender	UPS - United Parcel Service
Reception date time	19.09.2019
Packaging	plastic bag, other
Start/end of analyses	23.09.2019 / 27.09.2019

TEST RESULTS

Physical-chemical Analysis

J1001 Sample preparation (#)
Method: §64 LFGB L 00.00-19/1, CON-PV 00001 (2019-03), Digestion (microwave)

J8306 Lead (Pb) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Lead (Pb)	0.21	mg/kg
	± 0.06	mg/kg

J8308 Cadmium (Cd) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Cadmium (Cd)	0.74	mg/kg
	± 0.15	mg/kg

JCHG2 Mercury (Hg) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Mercury [Hg]	0.011	mg/kg
	± 0.005	mg/kg

J8312 Arsenic (As) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS

(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Arsenic (As)	<0.1	*	mg/kg

JJW2B Copper (Cu) (#)
Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Copper (Cu)	3.9		mg/kg
	± 0.8		mg/kg

JJ0CG Chromium (Cr) (#)
Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Chromium (Cr)	0.29		mg/kg
	± 0.07		mg/kg

JJ0CM Nickel (Ni) (#)
Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Nickel (Ni)	1.9		mg/kg
	± 0.4		mg/kg

JJ0CR Zinc (Zn) (#)
Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Zinc (Zn)	89		mg/kg
	± 18		mg/kg

JJ0CI Manganese (Mn) (#)
Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Manganese (Mn)	270		mg/kg
	± 54		mg/kg

* = Below indicated quantification level

(#) = Eurofins WEJ Contaminants GmbH (Hamburg) is accredited for this test.

Result +/- expanded measurement uncertainty (95%; k=2), sampling not included

Signature

Analytical Service Manager (Dagmar Hegemann)

GEYSER HPC, S.A.U.
A la atención de Inaki Ochoa
Avda. Iparraguirre 80
E-48940 LEIOA
SPAIN

Certificado de análisis

Fecha: 23-Sep-2019

Adjunto le enviamos los resultados analíticos de los siguientes análisis.

Número de certificado/versión	2019133684/1
Número de proyecto	2199115
Nombre de proyecto	ZUBIETA LANTZEN
Número de pedido	
Muestras recibidas el	12-Sep-2019

Este Certificado de Análisis solamente puede ser reproducido íntegramente.
Los resultados están solamente conectados a los artículos analizados.

Las muestras de suelo se guardarán durante un periodo de 4 semanas y las muestras de agua por un periodo de 2 semanas después de la recepción de las muestras en nuestro laboratorio. Salvo aviso contrario, las muestras serán eliminadas después de vencer los periodos arriba mencionados. Si quisiera que Analytico guarde las muestras por un periodo más largo, sírvase rellenar y firmar esta página y enviarla a Analytico por lo menos una semana antes de que caduque este periodo. Los costes de los periodos de almacenamiento prolongado figuran en nuestra lista de tarifas.

Periodo de almacenamiento:
Fecha: Nombre: Firma:

Confiamos en haber ejecutado el pedido según sus expectativas. Si tuviera cualquier pregunta acerca de este Certificado de Análisis, no dude en contactar nuestro Servicio al Cliente.

Atentamente,

Eurofins Analytico B.V.

Ing. A. Veldhuizen
Jefe de laboratorio

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

eurofins | — analytico®

Certificado de análisis

Número de proyecto	2199115	Número de certificado/versión	2019133684/1
Nombre de proyecto	ZUBIETA LANTZEN	Fecha de inicio	13-Sep-2019
Número de pedido		Fecha de informe	23-Sep-2019/12:45
		Anexo	A,C
Tomamuestras	Mikel Orueechevarria Suelo, Sedimento	Página	1/1

	Análisis	Unidad	1
	Características		
Q	Materia seca	% (m/m)	78.9
	Metales		
Q	Arsénico (As)	mg/kg ms	15
Q	Cadmio (Cd)	mg/kg ms	<0.40
Q	Cromo (Cr)	mg/kg ms	22
Q	Cobre (Cu)	mg/kg ms	13
Q	Mercurio (Hg)	mg/kg ms	<0.10
Q	Manganeso (Mn)	mg/kg ms	300
Q	Níquel (Ni)	mg/kg ms	24
Q	Plomo (Pb)	mg/kg ms	23
Q	Zinc (Zn)	mg/kg ms	65

No.	Descripción de muestra	Fecha de muestreo	Analytico-#
1	KAPAROTZ 1.1	12-Sep-2019	10928295

Q: Operación acreditada por el Organismo de homologación holandés
A: AP04 operación acreditada
S: AS SIKB operación acreditada
V: VLAREL operación acreditada

Iniciales
Coord. de proy.
AI

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Anexo (A) con información de la submuestra sobre el certificado de análisis 2019133684/1

Analytico-#	# perforación	Descripción	De	A	Código de barras	Descripción de muestra
10928295	KAPAROTZ 1.1	KAPAROTZ 1.1			0520158401	KAPAROTZ 1.1

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Anexo (C) con referencias de métodos sobre el certificado de análisis 2019133684/1

Análisis	Método	Técnica	Referencia de método
Peso en seco	W0104	Gravimetría	Según NEN-EN 15934 & CMA 2/II/A.1
Arsénico (As)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Cadmio (Cd)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Cromo (Cr)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Cobre (Cu)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Mercurio (Hg)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Manganeso (Mn)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Níquel (Ni)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Plomo (Pb)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Zinc (Zn)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2

Más información sobre los métodos aplicados, así como sobre la clasificación de la precisión, se ha incluido en nuestro suplemento: "Especificación de métodos de análisis", versión junio de 2016.

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Número de certificado/versión	2019133684/1
Número de proyecto	2199115
Nombre de proyecto	ZUBIETA LANTZEN
Número de pedido	

Suplemento informativo :

A continuación se facilita el cálculo de la incertidumbre de la medición de cada determinación analítica individual. La incertidumbre expandida se da como el intervalo en el cuál se espera que se encuentre el valor obtenido con el método aplicado, con una seguridad del 95%. El valor de la incertidumbre expandida se expresa en porcentaje.

A nivel internacional no existe todavía consenso sobre cómo debe ser calculada la incertidumbre. Los valores aquí facilitados se han calculado siguiendo el cálculo más frecuentemente utilizado:
Urel = 2*sqrt(CVRw² + drel²).

CVRw = coeficiente de variación de la reproducibilidad intralaboratorio.
drel = sesgo relativo
Urel = incertidumbre de medición expandida

NOTA 1: El efecto de la heterogeneidad de la muestra en la incertidumbre de la medición no puede ser cuantificada en términos generales. Por ello, la posible influencia debida a la inhomogenidad de cada muestra no se incluye en los valores aue fiauran más abaio.

versión : 27 Jun 2019

Análisis	CVRw (%)	drel (%)	Urel (%)
Características			
Materia seca	0.51	0.90	2.1
Metales			
Arsénico (As)	4.0	3.2	10
Cadmio (Cd)	4.1	-5.3	13
Cromo (Cr)	3.3	0.20	6.6
Cobre (Cu)	3.0	-2.6	7.9
Mercurio (Hg)	3.9	1.8	8.6
Manganeso (Mn)	3.5	3.2	9.5
Níquel (Ni)	3.5	-2.8	9.0
Plomo (Pb)	3.3	2.8	8.7
Zinc (Zn)	3.3	-1.2	7.0

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

GEYSER HPC, S.A.U.
A la atención de Inaki Ochoa
Avda. Iparraguirre 80
E-48940 LEIOA
SPAIN

Certificado de análisis

Fecha: 30-Sep-2019

Adjunto le enviamos los resultados analíticos de los siguientes análisis.

Número de certificado/versión	2019133681/1
Número de proyecto	2199115
Nombre de proyecto	ZUBIETA LANTZEN
Número de pedido	
Muestras recibidas el	12-Sep-2019

Este Certificado de Análisis solamente puede ser reproducido íntegramente.
Los resultados están solamente conectados a los artículos analizados.

Las muestras de suelo se guardarán durante un periodo de 4 semanas y las muestras de agua por un periodo de 2 semanas después de la recepción de las muestras en nuestro laboratorio. Salvo aviso contrario, las muestras serán eliminadas después de vencer los periodos arriba mencionados. Si quisiera que Analytico guarde las muestras por un periodo más largo, sírvase rellenar y firmar esta página y enviarla a Analytico por lo menos una semana antes de que caduque este periodo. Los costes de los periodos de almacenamiento prolongado figuran en nuestra lista de tarifas.

Periodo de almacenamiento:
Fecha: Nombre: Firma:

Confiamos en haber ejecutado el pedido según sus expectativas. Si tuviera cualquier pregunta acerca de este Certificado de Análisis, no dude en contactar nuestro Servicio al Cliente.

Atentamente,

Eurofins Analytico B.V.

Ing. A. Veldhuizen
Jefe de laboratorio

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

eurofins | — analytico®

Certificado de análisis

Número de proyecto	2199115	Número de certificado/versión	2019133681/1
Nombre de proyecto	ZUBIETA LANTZEN	Fecha de inicio	13-Sep-2019
Número de pedido		Fecha de informe	30-Sep-2019/10:24
		Anexo	A,B,C,D
Tomamuestras	Mikel Orueechevarria	Página	1/2
	Suelo, Sedimento		

	Análisis	Unidad	1	2	3	4	5
	Características						
Q	Materia seca	% (m/m)	68.5	64.6	67.3	83.8	69.3
	Metales						
Q	Arsénico (As)	mg/kg ms	17	8.1	14	12	15
Q	Cadmio (Cd)	mg/kg ms	<0.40	<0.40	<0.40	<0.40	<0.40
Q	Cromo (Cr)	mg/kg ms	28	15	18	18	23
Q	Cobre (Cu)	mg/kg ms	28	16	11	16	17
Q	Mercurio (Hg)	mg/kg ms	<0.10	0.24	<0.10	<0.10	<0.10
Q	Manganeso (Mn)	mg/kg ms	590	230	100	210	180
Q	Níquel (Ni)	mg/kg ms	20	10	11	17	18
Q	Plomo (Pb)	mg/kg ms	51	77	33	28	80
Q	Zinc (Zn)	mg/kg ms	110	87	42	57	84
	Investigación variada						
	2378TetraCDD	ng/kg ms			< 0.183 [1)]		
	12378-PentaCDD	ng/kg ms			0.273 [1)]		
	123478-HexaCDD	ng/kg ms			< 0.488 [1)]		
	123678-HexaCDD	ng/kg ms			0.708 [1)]		
	123789-HexaCDD	ng/kg ms			0.501 [1)]		
	1234678-HeptaCDD	ng/kg ms			6.93 [1)]		
	OctaCDD	ng/kg ms			26.8 [1)]		
	2378-TetraCDF	ng/kg ms			0.974 [1)]		
	12378-PentaCDF	ng/kg ms			0.655 [1)]		
	23478-PentaCDF	ng/kg ms			1.01 [1)]		
	123478-HexaCDF	ng/kg ms			0.869 [1)]		
	123678-HexaCDF	ng/kg ms			0.791 [1)]		
	123789-HexaCDF	ng/kg ms			< 0.407 [1)]		
	234678-HexaCDF	ng/kg ms			0.969 [1)]		
	1234678-HeptaCDF	ng/kg ms			3.44 [1)]		
	1234789-HeptaCDF	ng/kg ms			0.404 [1)]		
	OctaCDF	ng/kg ms			5.20 [1)]		
	WHO(`05) PCDD/F TEQ excl LOQ	ng/kg ms			1.19 [1)]		

No.	Descripción de muestra	Fecha de muestreo	Analytico-#
1	ZUBIETA 1.1	12-Sep-2019	10928267
2	ZUBIETA 2.1	12-Sep-2019	10928268
3	ZUBIETA 3.1	12-Sep-2019	10928269
4	ZUBIETA 4.1	12-Sep-2019	10928270
5	ZUBIETA 5.1	12-Sep-2019	10928271

Q: Operación acreditada por el Organismo de homologación holandés
A: AP04 operación acreditada
S: AS SIKB operación acreditada
V: VLAREL operación acreditada

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Certificado de análisis

Número de proyecto	2199115	Número de certificado/versión	2019133681/1
Nombre de proyecto	ZUBIETA LANTZEN	Fecha de inicio	13-Sep-2019
Número de pedido		Fecha de informe	30-Sep-2019/10:24
		Anexo	A,B,C,D
Tomamuestras	Mikel Orueechevarria	Página	2/2
	Suelo, Sedimento		

Análisis	Unidad	1	2	3	4	5
WHO(`05) PCDD/F TEQ incl LOQ	ng/kg ms			1.47 [1)]		
I-TEQ (NATO/CCMS) excl. LOQ	ng/kg ms			1.30 [1)]		
I-TEQ (NATO/CCMS) incl. LOQ	ng/kg ms			1.57 [1)]		

No.	Descripción de muestra	Fecha de muestreo	Analytico-#
1	ZUBIETA 1.1	12-Sep-2019	10928267
2	ZUBIETA 2.1	12-Sep-2019	10928268
3	ZUBIETA 3.1	12-Sep-2019	10928269
4	ZUBIETA 4.1	12-Sep-2019	10928270
5	ZUBIETA 5.1	12-Sep-2019	10928271

Q: Operación acreditada por el Organismo de homologación holandés
A: AP04 operación acreditada
S: AS SIKB operación acreditada
V: VLAREL operación acreditada

Iniciales
Coord. de proy. SF

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Anexo (A) con información de la submuestra sobre el certificado de análisis 2019133681/1

Analytico-#	# perforación	Descripción	De	A	Código de barras	Descripción de muestra
10928267	ZUBIETA 1.1	ZUBIETA 1.1			0520158367	ZUBIETA 1.1
10928268	ZUBIETA 2.1	ZUBIETA 2.1			0520158395	ZUBIETA 2.1
10928269	ZUBIETA 3.1 D	ZUBIETA 3.1 DIOX			0520158400	ZUBIETA 3.1
10928269					0520158383	ZUBIETA 3.1
10928269					0904166885	ZUBIETA 3.1
10928270	ZUBIETA 4.1	ZUBIETA 4.1			0520158399	ZUBIETA 4.1
10928271	ZUBIETA 5.1	ZUBIETA 5.1			0520158384	ZUBIETA 5.1

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Anexo (B) con observaciones sobre el certificado de análisis 2019133681/1

Comentario 1)

Esta determinación fue externalizada a Eurofins GFA Hamburgo.

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Anexo (C) con referencias de métodos sobre el certificado de análisis 2019133681/1

Análisis	Método	Técnica	Referencia de método
Peso en seco	W0104	Gravimetría	Según NEN-EN 15934 & CMA 2/II/A.1
Arsénico (As)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Cadmio (Cd)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Cromo (Cr)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Cobre (Cu)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Mercurio (Hg)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Manganeso (Mn)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Níquel (Ni)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Plomo (Pb)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Zinc (Zn)	W0423	ICP-MS	Cf. NEN-EN-ISO 17294-2
Dioxinas, GFA	W0004	Externalizado	Método externo

Más información sobre los métodos aplicados, así como sobre la clasificación de la precisión, se ha incluido en nuestro suplemento: "Especificación de métodos de análisis", versión junio de 2016.

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Anexo (D) observaciones sobre la toma de muestras y los plazos de conservación. 2019133681/1

Las directrices generales establecidas para la conservación y/o almacenamiento de las muestras se han excedido para los parámetros y muestras que se indican a continuación.

	Analytico-#
Temperatura de llegada de las muestras al laboratorio superior al límite de referencia	
	10928267
	10928268
	10928269
	10928270
	10928271

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Número de certificado/versión	2019133681/1
Número de proyecto	2199115
Nombre de proyecto	ZUBIETA LANTZEN
Número de pedido	

Suplemento informativo :

A continuación se facilita el cálculo de la incertidumbre de la medición de cada determinación analítica individual. La incertidumbre expandida se da como el intervalo en el cuál se espera que se encuentre el valor obtenido con el método aplicado, con una seguridad del 95%. El valor de la incertidumbre expandida se expresa en porcentaje.

A nivel internacional no existe todavía consenso sobre cómo debe ser calculada la incertidumbre. Los valores aquí facilitados se han calculado siguiendo el cálculo más frecuentemente utilizado:
Urel = 2*sqrt(CVRw² + drel²).

CVRw = coeficiente de variación de la reproducibilidad intralaboratorio.
drel = sesgo relativo
Urel = incertidumbre de medición expandida

NOTA 1: El efecto de la heterogeneidad de la muestra en la incertidumbre de la medición no puede ser cuantificada en términos generales. Por ello, la posible influencia debida a la inhomogenidad de cada muestra no se incluye en los valores aue fiauran más abaio.

versión : 27 Jun 2019

Análisis	CVRw (%)	drel (%)	Urel (%)
Características			
Materia seca	0.51	0.90	2.1
Metales			
Arsénico (As)	4.0	3.2	10
Cadmio (Cd)	4.1	-5.3	13
Cromo (Cr)	3.3	0.20	6.6
Cobre (Cu)	3.0	-2.6	7.9
Mercurio (Hg)	3.9	1.8	8.6
Manganeso (Mn)	3.5	3.2	9.5
Níquel (Ni)	3.5	-2.8	9.0
Plomo (Pb)	3.3	2.8	8.7
Zinc (Zn)	3.3	-1.2	7.0

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

GEYSER HPC, S.A.U.
A la atención de Inaki Ochoa
Avda. Iparraguirre 80
E-48940 LEIOA
SPAIN

Certificado de análisis

Fecha: 01-Oct-2019

Adjunto le enviamos los resultados analíticos de los siguientes análisis.

Número de certificado/versión	2019133442/1
Número de proyecto	2199115
Nombre de proyecto	ZUBIETA LANTZEN
Número de pedido	
Muestras recibidas el	12-Sep-2019

Este Certificado de Análisis solamente puede ser reproducido íntegramente.
Los resultados están solamente conectados a los artículos analizados.

Las muestras de suelo se guardarán durante un periodo de 4 semanas y las muestras de agua por un periodo de 2 semanas después de la recepción de las muestras en nuestro laboratorio. Salvo aviso contrario, las muestras serán eliminadas después de vencer los periodos arriba mencionados. Si quisiera que Analytico guarde las muestras por un periodo más largo, sírvase rellenar y firmar esta página y enviarla a Analytico por lo menos una semana antes de que caduque este periodo. Los costes de los periodos de almacenamiento prolongado figuran en nuestra lista de tarifas.

Periodo de almacenamiento:
Fecha: Nombre: Firma:

Confiamos en haber ejecutado el pedido según sus expectativas. Si tuviera cualquier pregunta acerca de este Certificado de Análisis, no dude en contactar nuestro Servicio al Cliente.

Atentamente,

Eurofins Analytico B.V.

Ing. A. Veldhuizen
Jefe de laboratorio

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Certificado de análisis

Número de proyecto	2199115	Número de certificado/versión	2019133442/1
Nombre de proyecto	ZUBIETA LANTZEN	Fecha de inicio	13-Sep-2019
Número de pedido		Fecha de informe	01-Oct-2019/08:18
		Anexo	A
Tomamuestras	Mikel Orueechevarria Otro	Página	1/1

Análisis	Unidad	1
Trabajo externalizado		Ver anexo

No.	Descripción de muestra	Fecha de muestreo	Analytico-#
1	KAPAROTZ 1.2	12-Sep-2019	10927536

Q: Operación acreditada por el Organismo de homologación holandés
A: AP04 operación acreditada
S: AS SIKB operación acreditada
V: VLAREL operación acreditada

Iniciales
Coord. de proy.
AI

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

Anexo (A) con información de la submuestra sobre el certificado de análisis 2019133442/1

Analytico-#	# perforación	Descripción	De	A	Código de barras	Descripción de muestra
10927536	KAPAROTZ 1.2	KAPAROTZ 1.2				KAPAROTZ 1.2
10927536					0904166792	KAPAROTZ 1.2

Eurofins Analytico B.V.

Gildeweg 42-46
3771 NB Barneveld
P.O. Box 459
3770 AL Barneveld NL

Tel. +31 (0)34 242 63 00
Fax +31 (0)34 242 63 99
E-mail info-env@eurofins.nl
Site www.eurofins.nl

BNP Paribas S.A. 227 9245 25
IBAN: NL71BNPA0227924525
BIC: BNPANL2A
KvK/CoC No. 09088623
BTW/VAT No. NL 8043.14.883.B01

eurofins | — analytico®

Eurofins WEJ Contaminants GmbH
Neuländer Kamp 1
D-21079 Hamburg
GERMANY

Tel: +49 40 49294 2222
Fax: +49 40 49294 99 2222

wej-contaminants@eurofins.de
http://www.eurofins.de/wej-contaminants.aspx

Eurofins WEJ Contaminants · Neuländer Kamp 1 · D-21079 Hamburg

Eurofins Analytico B.V.
Gildeweg 42 - 48
attn. Report recipient
3771 NB Barneveld
NIEDERLANDE

Person in charge	Mrs J. Neprokin	- 2933
Client support	Mr I. Customer Service	- 2222

Report date 30.09.2019

Analytical report: AR-19-JC-175318-01

Sample Code 706-2019-00226805

Reference	KAPAROTZ 1.2
Client Sample Code	10927536
Purchase Order Code	2019133442 ZUBIETA LANTZEN
Number	1
Amount	52 g
Reception temperature	cooled
Ordered by	Report recipient
Submitted by	Account Barneveld
Sender	UPS - United Parcel Service
Reception date time	19.09.2019
Packaging	plastic bag, other
Start/end of analyses	23.09.2019 / 30.09.2019

TEST RESULTS

Physical-chemical Analysis

J1001 Sample preparation (#)
Method: §64 LFGB L 00.00-19/1, CON-PV 00001 (2019-03), Digestion (microwave)

J8306 Lead (Pb) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Lead (Pb)	4.2		mg/kg
	± 0.84		mg/kg

J8308 Cadmium (Cd) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Cadmium (Cd)	0.16		mg/kg
	± 0.03		mg/kg

JCHG2 Mercury (Hg) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Mercury [Hg]	<0.005	*	mg/kg

J8312 Arsenic (As) (#)
Method: DIN EN 15763:2010 (2010-04), mod., CON-PV 01274 (2017-12), ICP-MS

(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Arsenic (As)	1.9	mg/kg
	± 0.4	mg/kg

JJW2B Copper (Cu) (#)
Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Copper (Cu)	5.4	mg/kg
	± 1.1	mg/kg

JJ0CG Chromium (Cr) (#)
Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Chromium (Cr)	11	mg/kg
	± 2.1	mg/kg

JJ0CM Nickel (Ni) (#)
Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Nickel (Ni)	4.2	mg/kg
	± 0.8	mg/kg

JJ0CR Zinc (Zn) (#)
Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Zinc (Zn)	31	mg/kg
	± 6.1	mg/kg

JJ0CI Manganese (Mn) (#)
Method: DIN EN ISO 17294-2 (2017-01), mod., CON-PV 01274 (2017-12), ICP-MS
(Modification: incl. ICP-MS/MS, extension of the analysis parameters, extension of the application scope to feed and tabacco/-products)

Manganese (Mn)	160	mg/kg
	± 31	mg/kg

* = Below indicated quantification level

(#) = Eurofins WEJ Contaminants GmbH (Hamburg) is accredited for this test.

Result +/- expanded measurement uncertainty (95%; k=2), sampling not included

Signature

Analytical Service Manager (Dagmar Hegemann)

Results analysis Sediment Era CALUX

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
20-01-2020

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
Accredation ISO 17025 (RvA L401) is not applicable for activities described in this report

Extra Information:
Samples were dried at 103 degrees Celsius for 4 hours before extraction in ASE
Date of the performance of the test: 20-01-2020

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Unit
1	TW-SED-01-1901	ERa CALUX	Estrogens	0.13	ng 17b Estradiol eq./g
2	TW-SED-03-1902	ERa CALUX	Estrogens	0.020	ng 17b Estradiol eq./g
3	TW-SED-04-1903	ERa CALUX	Estrogens	0.0051	ng 17b Estradiol eq./g

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	TW-SED-01-1901	36674	Sediment	no	19-12-2019	
2	TW-SED-03-1902	36675	Sediment	no	19-12-2019	
3	TW-SED-04-1903	36676	Sediment	no	19-12-2019	

For the method ERa CALUX and the sum parameter Estrogens the used method is Extracts are dissolved in DMSO. The ERa CALUX activity is determined (24h exposure) and benchmarked against 17-beta oestradiol. The ERa CALUX analysis is done according to p-bds-052

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Emiel Felzel
Head of Testing Laboratory

Date report (dd-mm-yyyy):
21-02-2020

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
Accredation ISO 17025 (RvA L401) is not applicable for activities described in this report
Date of the performance of the test: 21-02-2020

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Unit
1	TW-SED-02-1904	ERa CALUX	Estrogens	0.27	ng 17b Estradiol eq./g dry weight

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	TW-SED-02-1904	36836	Soil	no	27-01-2020	

For the method ERa CALUX and the sum parameter Estrogens the used method is Extracts are dissolved in DMSO. The ERa CALUX activity is determined (24h exposure) and benchmarked against 17-beta oestradiol. The ERa CALUX analysis is done according to p-bds-052

Results analysis Water Era CALUX

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
18-10-2019

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
If an analysis is accredited by ISO17025 (RvA L401) is indicated by a yes or a no
Date of the performance of the test: 16-10-2019

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Unit
1	WO-O	ERa CALUX	Estrogens	0.033	ng 17b Estradiol eq./l
2	W4-2	ERa CALUX	Estrogens	0.036	ng 17b Estradiol eq./l

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	WO-O	36052	Water	yes	03-10-2019	
2	W4-2	36053	Water	yes	03-10-2019	

For the method ERa CALUX and the sum parameter Estrogens the used method is Extracts are dissolved in DMSO. The ERa CALUX activity is determined (24h exposure) and benchmarked against 17-beta oestradiol. The ERa CALUX analysis is done according to p-bds-052

Results analysis Water Heavy metals

Groen Agro Control
LABORATORIUMONDERZOEK & ADVIES

Distributieweg 1
2645 EG Delfgauw
Tel. : +31 (0)15 2572511
Fax : +31 (0)15 2572522
Mail: info@agrocontrol.nl

Analyse zware metalen

ToxicoWatch Consultancy
Abraham Kuyperstraat 6
8862 VS HARLINGEN

Rapport

Rapportnummer	: C5941089	Bemonsterd	: niet door GAC	Aantal pagina's	: 1
Monstercode	: EWW190925663	Monsterlocatie	:		
Datum rapport	: 27-9-2019	Klantnummer	: 11492		
Datum ontvangst	: 25-9-2019	Locatie	: ToxicoWatch Consultancy		
Gebruikte methoden	: ICP-MS zwaremetalen (A095)				

Monsterinformatie

Product	: (Berg)water
Variëteit	:
Leverancier	:
Land van herkomst	: Spanje
Klantcode	: TW-HM-01
Referentie	:

De resultaten in het rapport hebben alleen betrekking op het onderzochte monster

Resultaten

Methode	Component	Eenheid	Concentratie				
ICP-MS	Aluminium (Al)	µg/l	52.0				
ICP-MS	Arseen (As)	µg/l	0.11				
ICP-MS	Barium (Ba)	µg/l	19.7				
ICP-MS	Cadmium (Cd)	µg/l	< 0.1				
ICP-MS	Chroom (Cr)	µg/l	< 0.1				
ICP-MS	Cobalt (Co)	µg/l	< 0.2				
ICP-MS	Koper (Cu)	µg/l	< 1				
ICP-MS	Kwik (Hg)	µg/l	< 0.05				
ICP-MS	Lood (Pb)	µg/l	< 0.1				
ICP-MS	Nikkel (Ni)	µg/l	0.61				
ICP-MS	Tin (Sn)	µg/l	< 1				
ICP-MS	Zink (Zn)	µg/l	< 1				
ICP-MS	Zilver (Ag)	µg/l	< 0.5				

Akkoord directeur

Dr. J.B.A. van Tol

'<': geen residu gedetecteerd boven de weergegeven aantoonbaarheidsgrens.

Results analysis Mother milk DR CALUX

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Emiel Felzel
Head of Testing Laboratory

Date report (dd-mm-yyyy):
28-04-2020

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
Accredation ISO 17025 (RvA L401) is not applicable for activities described in this report
This report replace version 1

Reason change:
In previous report all samples were indicated als pg BEQ per gram of fat but the unit was incorrect, this was in fact pg BEQ per gram of product.
In this report all the samples are correct displayed as pg BEQ per gram of fat
Date of the performance of the test: 28-04-2020

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Conclusion	Cut off	Unit
1	TW-MMU-1902	DR CALUX	PCDD/PCDF (BEQ; semi)	1.5	---	n.a.	pg BEQ / gram fat
2	TW-MMU-1902	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	3.6	---	n.a.	pg BEQ / gram fat
3	TW-MML-1901	DR CALUX	PCDD/PCDF (BEQ; semi)	1.2	---	n.a.	pg BEQ / gram fat
4	TW-MML-1901	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	2.1	---	n.a.	pg BEQ / gram fat
5	TW-MMA-1903	DR CALUX	PCDD/PCDF (BEQ; semi)	1.5	---	n.a.	pg BEQ / gram fat
6	TW-MMA-1903	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	2.6	---	n.a.	pg BEQ / gram fat

n.a.= no cut off according to EU guideline in BEQ established, maximal levels applicable if available

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	TW-MMU-1902	36667	Humane milk	no	19-12-2019	
2	TW-MMU-1902	36667	Humane milk	no	19-12-2019	
3	TW-MML-1901	36668	Humane milk	no	19-12-2019	
4	TW-MML-1901	36668	Humane milk	no	19-12-2019	
5	TW-MMA-1903	36669	Humane milk	no	19-12-2019	
6	TW-MMA-1903	36669	Humane milk	no	19-12-2019	

For the method DR CALUX and the sum parameter PCDD/PCDF (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

For the method DR CALUX and the sum parameter PCDD/PCDF and dl-PCBs (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F and dl-PCBs, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Emiel Felzel
Head of Testing Laboratory

Date report (dd-mm-yyyy):
28-01-2021

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
If an analysis is accredited by ISO17025 (RvA L401) is indicated by a yes or a no
This report replace version 1

Reason change (identification change at the end of report in table 3):

addition of PFAS results

Date of the performance of the test: 28-01-2021

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Conclusion	Cut off	Unit
1	20TW-SEDdn-01	ERa CALUX	Estrogens	0.040	---	n.a.	ng 17b Estradiol eq./g dry weight
2	20TW-SEDdn-01	PFAS CALUX	Thyroid disruption	0.063	---	n.a.	ug PFOA eq./g dry weight
3	20TW-SEDup-02	ERa CALUX	Estrogens	0.18	---	n.a.	ng 17b Estradiol eq./g dry weight
4	20TW-SEDup-02	PFAS CALUX	Thyroid disruption	0.14	---	n.a.	ug PFOA eq./g dry weight
5	20TW-SED-03	ERa CALUX	Estrogens	LOQ <0.036	---	n.a.	ng 17b Estradiol eq./g dry weight
6	20TW-SED-04	ERa CALUX	Estrogens	LOQ <0.036	---	n.a.	ng 17b Estradiol eq./g dry weight
7	20TWC-MOS-01	DR CALUX	PCDD/PCDF and dl-PCBs (total BEQ; semi)	1.6	---	n.a.	pg BEQ / gram product
8	20TWC-MOS-01	PFAS CALUX	Thyroid disruption	1.5	---	n.a.	ug PFOA eq./g product
9	20TWC-PR--02	DR CALUX	PCDD/PCDF and dl-PCBs (total BEQ; semi)	0.43	---	n.a.	pg BEQ / gram product
10	20TW1-IL-04	DR CALUX	PCDD/PCDF and dl-PCBs (total BEQ; semi)	LOQ <0.02	---	n.a.	pg BEQ / gram product
11	20TWZ-001/1p	DR CALUX	PCDD/PCDF (BEQ; semi)	0.84	compliant	1.7	pg BEQ / gram fat
12	20TWZ-001/1p	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	1.6	compliant	3.3	pg BEQ / gram fat
13	20TWZ-000/sup	DR CALUX	PCDD/PCDF (BEQ; semi)	LOQ <0.3	compliant	1.7	pg BEQ / gram fat
14	20TWZ-000/sup	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	LOQ <0.6	compliant	3.3	pg BEQ / gram fat

For results below the limit of quantification (LOQ), behind the less than sign the limit of quantification is given

n.a.= no cut off according to EU guideline in BEQ established, maximal levels applicable if available

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	20TW-SEDdn-01	39352	Soil	no	15-12-2020	
2	20TW-SEDdn-01	39352	Soil	no	15-12-2020	
3	20TW-SEDup-02	39353	Soil	no	15-12-2020	
4	20TW-SEDup-02	39353	Soil	no	15-12-2020	
5	20TW-SED-03	39354	Soil	no	15-12-2020	
6	20TW-SED-04	39355	Soil	no	15-12-2020	
7	20TWC-MOS-01	39356	Not defined	no	15-12-2020	
8	20TWC-MOS-01	39356	Not defined	no	15-12-2020	
9	20TWC-PR--02	39357	Not defined	no	15-12-2020	
10	20TW1-IL-04	39358	Not defined	no	15-12-2020	
11	20TWZ-001/1p	39359	Food, egg(product)	yes	15-12-2020	

12	20TWZ-001/1p	39359	Food, egg(product)	yes	15-12-2020
13	20TWZ-000/sup	39360	Food, egg(product)	yes	15-12-2020
14	20TWZ-000/sup	39360	Food, egg(product)	yes	15-12-2020

For the method DR CALUX and the sum parameter PCDD/PCDF and dl-PCBs (total BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

For the method ERa CALUX and the sum parameter Estrogens the used method is Extracts are dissolved in DMSO. The ERa CALUX activity is determined (24h exposure) and benchmarked against 17-beta oestradiol. The ERa CALUX analysis is done according to p-bds-052

For the method DR CALUX and the sum parameter PCDD/PCDF (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

For the method DR CALUX and the sum parameter PCDD/PCDF and dl-PCBs (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F and dl-PCBs, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

For the method PFAS CALUX and the sum parameter Thyroid disruption the used method is

All DR CALUX analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to COMMISSION REGULATION (EU) 2015/704 of 30 April 2015.

Table 3 Changes according to previous version report

sample 39352, method PFAS CALUX, parameter Thyroid disruption: Result sample changed from to 0.063

sample 39352, method PFAS CALUX, parameter Thyroid disruption: Unit sample changed from to ug PFOA eq./g dry weight

sample 39353, method PFAS CALUX, parameter Thyroid disruption: Result sample changed from to 0.14

sample 39353, method PFAS CALUX, parameter Thyroid disruption: Unit sample changed from to ug PFOA eq./g dry weight

sample 39356, method PFAS CALUX, parameter Thyroid disruption: Result sample changed from to 1.5

sample 39356, method PFAS CALUX, parameter Thyroid disruption: Unit sample changed from to ug PFOA eq./g product

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Emiel Felzel
Head of Testing Laboratory

Date report (dd-mm-yyyy):
21-06-2021

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
Accredation ISO 17025 (RvA L401) is not applicable for activities described in this report
Date of the performance of the test: 18-06-2021

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Unit
1	20TWC-MOS-02DR (LOCATIE C')	DR CALUX	dl-PCBs (separated TEQ)	LOQ <0.05	pg TEQ / gram product
2	20TWC-MOS-02DR (LOCATIE C')	DR CALUX	PCDD/PCDF (separated TEQ)	1.1	pg TEQ / gram product
3	20TWB-MOS-01DR (LOCATIE F=B)	DR CALUX	dl-PCBs (separated TEQ)	LOQ <0.05	pg TEQ / gram product
4	20TWB-MOS-01DR (LOCATIE F=B)	DR CALUX	PCDD/PCDF (separated TEQ)	1.0	pg TEQ / gram product
5	20TWZ-MOS-03DR (LOCATIE Zaldibia)	DR CALUX	dl-PCBs (separated TEQ)	LOQ <0.05	pg TEQ / gram product
6	20TWZ-MOS-03DR (LOCATIE Zaldibia)	DR CALUX	PCDD/PCDF (separated TEQ)	1.4	pg TEQ / gram product
7	20TWZ-MOS-02PF(LOCATIE C')	PFAS CALUX	Thyroid disruption	3.9	ug PFOA eq./gram product
8	20TWB-MOS-02PF(LOCATIE F=B)	PFAS CALUX	Thyroid disruption	5.0	ug PFOA eq./gram product
9	20TWZ-MOS-03PF(LOCATIE Zaldibia)	PFAS CALUX	Thyroid disruption	2.8	ug PFOA eq./gram product

For results below the limit of quantification (LOQ), behind the less than sign the limit of quantification is given

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	20TWC-MOS-02DR (LOCATIE C')	40624	Not defined	no	02-06-2021	no
2	20TWC-MOS-02DR (LOCATIE C')	40624	Not defined	no	02-06-2021	no
3	20TWB-MOS-01DR (LOCATIE F=B)	40625	Not defined	no	02-06-2021	no
4	20TWB-MOS-01DR (LOCATIE F=B)	40625	Not defined	no	02-06-2021	no
5	20TWZ-MOS-03DR (LOCATIE Zaldibia)	40626	Not defined	no	02-06-2021	no
6	20TWZ-MOS-03DR (LOCATIE Zaldibia)	40626	Not defined	no	02-06-2021	no
7	20TWZ-MOS-02PF(LOCATIE C')	40627	Not defined	no	02-06-2021	no
8	20TWB-MOS-02PF(LOCATIE F=B)	40628	Not defined	no	02-06-2021	no
9	20TWZ-MOS-03PF(LOCATIE Zaldibia)	40629	Not defined	no	02-06-2021	no

For the method DR CALUX and the sum parameter PCDD/PCDF (separated TEQ) the used method is extraction with organic solvents; the extracts are cleaned on an acid silica column and separation is done with a florisil column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure) and benchmarked against 2,3,7,8-TCDD. The DR CALUX analysis is done according to p-bds-051

For the method DR CALUX and the sum parameter dl-PCBs (separated TEQ) the used method is extraction with organic solvents; the extracts are cleaned on an acid silica column futher clean-up is done with a florisil column; The cleaned extracts are dissolved in DMSO; Seperation is done with alumina; ; the DR CALUX Analysis is done according to p-bds-051extraction with organic solvents; the extracts are cleaned on an acid silica column and separation is done with a alumina column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure) and benchmar

For the method PFAS CALUX and the sum parameter Thyroid disruption the used method is

2021

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Emiel Felzel
Head of Testing Laboratory

Date report (dd-mm-yyyy):
10-11-2021

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
If an analysis is accredited by ISO17025 (RvA L401) is indicated by a yes or a no
Date of the performance of the test: 04-11-2021

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Conclusion	Cut off	Unit
1	21TWZ-E01-1p	DR CALUX	PCDD/PCDF (BEQ; semi)	0.94	compliant	1.7	pg BEQ / gram fat
2	21TWZ-E01-1p	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	1.9	compliant	3.3	pg BEQ / gram fat
3	21TWZ-E03-13A	DR CALUX	PCDD/PCDF (BEQ; semi)	2.6	suspected	1.7	pg BEQ / gram fat
4	21TWZ-E03-13A	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	4.9	suspected	3.3	pg BEQ / gram fat
5	21TWZ-E02-14p	DR CALUX	PCDD/PCDF (BEQ; semi)	0.81	compliant	1.7	pg BEQ / gram fat
6	21TWZ-E02-14p	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	1.4	compliant	3.3	pg BEQ / gram fat
7	21TWZ-MOS-01-C	DR CALUX	dl-PCBs (separated TEQ)	0.074	---	n.a.	pg TEQ / gram product
8	21TWZ-MOS-01-C	DR CALUX	PCDD/PCDF (separated TEQ)	0.41	---	n.a.	pg TEQ / gram product
9	21TWZ-MOS-04-C1	DR CALUX	dl-PCBs (separated TEQ)	0.31	---	n.a.	pg TEQ / gram product
10	21TWZ-MOS-04-C1	DR CALUX	PCDD/PCDF (separated TEQ)	2.0	---	n.a.	pg TEQ / gram product
11	21TWZ-MOS-07-ZAL	DR CALUX	dl-PCBs (separated TEQ)	LOQ <0.06	---	n.a.	pg TEQ / gram product
12	21TWZ-MOS-07-ZAL	DR CALUX	PCDD/PCDF (separated TEQ)	0.46	---	n.a.	pg TEQ / gram product
13	21TWZ-MOS-06-c3	DR CALUX	dl-PCBs (separated TEQ)	0.12	---	n.a.	pg TEQ / gram product
14	21TWZ-MOS-06-c3	DR CALUX	PCDD/PCDF (separated TEQ)	0.45	---	n.a.	pg TEQ / gram product
15	21TWZ-SEDdn-01	ERa CALUX	Estrogens	LOQ <0.0039	---	n.a.	ng 17b Estradiol eq./g
16	21TWZ-SEDdn-02	ERa CALUX	Estrogens	LOQ <0.0051	---	n.a.	ng 17b Estradiol eq./g

For the suspected sample(s) to be non-compliant, the concentration has to be determined by a confirmatory method

For results below the limit of quantification (LOQ), behind the less than sign the limit of quantification is given

n.a.= no cut off according to EU guideline in BEQ established, maximal levels applicable if available

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	21TWZ-E01-1p	41611	Food, egg(product)	yes	18-10-2021	
2	21TWZ-E01-1p	41611	Food, egg(product)	yes	18-10-2021	
3	21TWZ-E03-13A	41612	Food, egg(product)	yes	18-10-2021	
4	21TWZ-E03-13A	41612	Food, egg(product)	yes	18-10-2021	
5	21TWZ-E02-14p	41613	Food, egg(product)	yes	18-10-2021	
6	21TWZ-E02-14p	41613	Food, egg(product)	yes	18-10-2021	
7	21TWZ-MOS-01-C	41614	Not defined	no	18-10-2021	
8	21TWZ-MOS-01-C	41614	Not defined	no	18-10-2021	
9	21TWZ-MOS-04-C1	41615	Not defined	no	18-10-2021	
10	21TWZ-MOS-04-C1	41615	Not defined	no	18-10-2021	
11	21TWZ-MOS-07-ZAL	41616	Not defined	no	18-10-2021	
12	21TWZ-MOS-07-ZAL	41616	Not defined	no	18-10-2021	
13	21TWZ-MOS-06-c3	41617	Not defined	no	18-10-2021	
14	21TWZ-MOS-06-c3	41617	Not defined	no	18-10-2021	

15	21TWZ-SEDdn-01	41618	Sediment	no	18-10-2021
16	21TWZ-SEDdn-02	41619	Sediment	no	18-10-2021

For the method DR CALUX and the sum parameter PCDD/PCDF (separated TEQ) the used method is extraction with organic solvents; the extracts are cleaned on an acid silica column and separation is done with a florisil column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure) and benchmarked against 2,3,7,8-TCDD. The DR CALUX analysis is done according to p-bds-051

For the method DR CALUX and the sum parameter dl-PCBs (separated TEQ) the used method is extraction with organic solvents; the extracts are cleaned on an acid silica column futher clean-up is done with a florisil column; The cleaned extracts are dissolved in DMSO; Seperation is done with alumina; ; the DR CALUX Analysis is done according to p-bds-051extraction with organic solvents; the extracts are cleaned on an acid silica column and separation is done with a alumina column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure) and benchmar

For the method ERa CALUX and the sum parameter Estrogens the used method is Extracts are dissolved in DMSO. The ERa CALUX activity is determined (24h exposure) and benchmarked against 17-beta oestradiol. The ERa CALUX analysis is done according to p-bds-052

For the method DR CALUX and the sum parameter PCDD/PCDF (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

For the method DR CALUX and the sum parameter PCDD/PCDF and dl-PCBs (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F and dl-PCBs, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

For the method DR CALUX and the sum parameter dl-PCBs (BEQ; semi) the used method is

All DR CALUX analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to COMMISSION REGULATION (EU) 2015/704 of 30 April 2015.

DR CALUX analyses mosses

2021

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Emiel Felzel
Head of Testing Laboratory

Date report (dd-mm-yyyy):
11-07-2022

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
Accredation ISO 17025 (RvA L401) is not applicable for activities described in this report
Date of the performance of the test: 11-07-2022

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Unit
1	21TWZ-MOS-04-C1	DR CALUX	dl-PCBs (separated TEQ)	0.085	pg TEQ / gram product
2	21TWZ-MOS-04-C1	DR CALUX	PCDD/PCDF (separated TEQ)	0.59	pg TEQ / gram product
3	21TWZ-MOS-05-C1	DR CALUX	dl-PCBs (separated TEQ)	LOQ <0.05	pg TEQ / gram product
4	21TWZ-MOS-05-C1	DR CALUX	PCDD/PCDF (separated TEQ)	0.96	pg TEQ / gram product

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	21TWZ-MOS-04-C1	43131	Not defined	no	21-06-2022	
2	21TWZ-MOS-04-C1	43131	Not defined	no	21-06-2022	
3	21TWZ-MOS-05-C1	43132	Not defined	no	21-06-2022	
4	21TWZ-MOS-05-C1	43132	Not defined	no	21-06-2022	

For the method DR CALUX and the sum parameter PCDD/PCDF (separated TEQ) the used method is extraction with organic solvents; the extracts are cleaned on an acid silica column and separation is done with a florisil column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure) and benchmarked against 2,3,7,8-TCDD. The DR CALUX analysis is done according to p-bds-051

For the method DR CALUX and the sum parameter dl-PCBs (separated TEQ) the used method is extraction with organic solvents; the extracts are cleaned on an acid silica column futher clean-up is done with a florisil column; The cleaned extracts are dissolved in DMSO; Seperation is done with alumina; ; the DR CALUX Analysis is done according to p-bds-051extraction with organic solvents; the extracts are cleaned on an acid silica column and separation is done with a alumina column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure) and benchmar

DR CALUX analyses

2022

Eggs – mos

ERA CALUX

Water Sediment

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Emiel Felzel
Head of Testing Laboratory

Date report (dd-mm-yyyy):
09-12-2022

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
If an analysis is accredited by ISO17025 (RvA L401) is indicated by a yes or a no
Date of the performance of the test: 30-11-2022

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Conclusion	Cut off	Unit
1	TW22-MD2-Jul-V1/2	DR CALUX	dl-PCBs (separated TEQ)	1.7	---	n.a.	pg TEQ / gram product
2	TW22-MD2-Jul-V1/2	DR CALUX	PCDD/PCDF (separated TEQ)	2.6	---	n.a.	pg TEQ / gram product
3	TW22-MD2-Jul-V1/2	PAH CALUX	Polycyclic aromatic hydrocarbons	86	---	n.a.	ng Benzo[a]pyrene eq./gram fresh weig
4	TW22-MD2-Sept-V1/2	DR CALUX	dl-PCBs (separated TEQ)	0.88	---	n.a.	pg TEQ / gram product
5	TW22-MD2-Sept-V1/2	DR CALUX	PCDD/PCDF (separated TEQ)	2.4	---	n.a.	pg TEQ / gram product
6	TW22-MD2-Sept-V1/2	PAH CALUX	Polycyclic aromatic hydrocarbons	62	---	n.a.	ng Benzo[a]pyrene eq./gram fresh weig
7	TW22-MD2-V3A	DR CALUX	dl-PCBs (separated TEQ)	0.35	---	n.a.	pg TEQ / gram product
8	TW22-MD2-V3A	DR CALUX	PCDD/PCDF (separated TEQ)	0.61	---	n.a.	pg TEQ / gram product
9	TW22-MD2-V3A	PAH CALUX	Polycyclic aromatic hydrocarbons	49	---	n.a.	ng Benzo[a]pyrene eq./gram fresh weig
10	TW22-MD2-V4A	DR CALUX	dl-PCBs (separated TEQ)	0.40	---	n.a.	pg TEQ / gram product
11	TW22-MD2-V4A	DR CALUX	PCDD/PCDF (separated TEQ)	0.81	---	n.a.	pg TEQ / gram product
12	TW22-MD2-V4A	PAH CALUX	Polycyclic aromatic hydrocarbons	46	---	n.a.	ng Benzo[a]pyrene eq./gram fresh weig
13	TW-MD22-CA-Veg04	DR CALUX	dl-PCBs (separated TEQ)	0.18	---	n.a.	pg TEQ / gram product
14	TW-MD22-CA-Veg04	DR CALUX	PCDD/PCDF (separated TEQ)	1.0	---	n.a.	pg TEQ / gram product
15	22TWZ-PR-01-C	DR CALUX	dl-PCBs (separated TEQ)	0.18	---	n.a.	pg TEQ / gram product
16	22TWZ-PR-01-C	DR CALUX	PCDD/PCDF (separated TEQ)	LOQ <0.05	---	n.a.	pg TEQ / gram product
17	22TWZ-PR-05-REF	DR CALUX	dl-PCBs (separated TEQ)	0.19	---	n.a.	pg TEQ / gram product
18	22TWZ-PR-05-REF	DR CALUX	PCDD/PCDF (separated TEQ)	0.19	---	n.a.	pg TEQ / gram product
19	TW22-MD2-M01A	DR CALUX	dl-PCBs (separated TEQ)	0.55	---	n.a.	pg TEQ / gram product
20	TW22-MD2-M01A	DR CALUX	PCDD/PCDF (separated TEQ)	1.2	---	n.a.	pg TEQ / gram product
21	TW22-MD2-M02A	DR CALUX	dl-PCBs (separated TEQ)	0.59	---	n.a.	pg TEQ / gram product
22	TW22-MD2-M02A	DR CALUX	PCDD/PCDF (separated TEQ)	1.4	---	n.a.	pg TEQ / gram product
23	TW22-MD2-M03A	DR CALUX	dl-PCBs (separated TEQ)	1.6	---	n.a.	pg TEQ / gram product
24	TW22-MD2-M03A	DR CALUX	PCDD/PCDF (separated TEQ)	5.9	---	n.a.	pg TEQ / gram product
25	TW22-MD2-M04A	DR CALUX	dl-PCBs (separated TEQ)	1.2	---	n.a.	pg TEQ / gram product
26	TW22-MD2-M04A	DR CALUX	PCDD/PCDF (separated TEQ)	6.2	---	n.a.	pg TEQ / gram product
27	TW22-MD2-M05A	DR CALUX	dl-PCBs (separated TEQ)	0.22	---	n.a.	pg TEQ / gram product
28	TW22-MD2-M05A	DR CALUX	PCDD/PCDF (separated TEQ)	0.91	---	n.a.	pg TEQ / gram product
29	TW22-MD2-M06A	DR CALUX	dl-PCBs (separated TEQ)	0.27	---	n.a.	pg TEQ / gram product
30	TW22-MD2-M06A	DR CALUX	PCDD/PCDF (separated TEQ)	1.3	---	n.a.	pg TEQ / gram product
31	TW22-MD2-M07A	DR CALUX	dl-PCBs (separated TEQ)	0.27	---	n.a.	pg TEQ / gram product
32	TW22-MD2-M07A	DR CALUX	PCDD/PCDF (separated TEQ)	0.63	---	n.a.	pg TEQ / gram product
33	TW22-MD2-M08A	DR CALUX	dl-PCBs (separated TEQ)	0.26	---	n.a.	pg TEQ / gram product
34	TW22-MD2-M08A	DR CALUX	PCDD/PCDF (separated TEQ)	0.55	---	n.a.	pg TEQ / gram product
35	22TWZ-MOS-01-C1b	DR CALUX	dl-PCBs (separated TEQ)	0.20	---	n.a.	pg TEQ / gram product
36	22TWZ-MOS-01-C1b	DR CALUX	PCDD/PCDF (separated TEQ)	0.87	---	n.a.	pg TEQ / gram product

37	22TWZ-MOS-02-C3a	DR CALUX	dl-PCBs (separated TEQ)	0.20	---	n.a.	pg TEQ / gram product
38	22TWZ-MOS-02-C3a	DR CALUX	PCDD/PCDF (separated TEQ)	0.52	---	n.a.	pg TEQ / gram product
39	22TWZ-MOS-03-Bb	DR CALUX	dl-PCBs (separated TEQ)	0.21	---	n.a.	pg TEQ / gram product
40	22TWZ-MOS-03-Bb	DR CALUX	PCDD/PCDF (separated TEQ)	0.21	---	n.a.	pg TEQ / gram product
41	22TWZ-MOS-04-D	DR CALUX	dl-PCBs (separated TEQ)	0.17	---	n.a.	pg TEQ / gram product
42	22TWZ-MOS-04-D	DR CALUX	PCDD/PCDF (separated TEQ)	0.24	---	n.a.	pg TEQ / gram product
43	22TWZ-MOS-05-REF	DR CALUX	dl-PCBs (separated TEQ)	0.15	---	n.a.	pg TEQ / gram product
44	22TWZ-MOS-05-REF	DR CALUX	PCDD/PCDF (separated TEQ)	0.61	---	n.a.	pg TEQ / gram product
45	TW22-CZ2-E03	DR CALUX	PCDD/PCDF (BEQ; semi)	2.5	suspected	1.7	pg BEQ / gram fat
46	TW22-CZ2-E03	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	4.7	suspected	3.3	pg BEQ / gram fat
47	TW22-CZ2-E08	DR CALUX	PCDD/PCDF (BEQ; semi)	4.2	suspected	1.7	pg BEQ / gram fat
48	TW22-CZ2-E08	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	10	suspected	3.3	pg BEQ / gram fat
49	22TWZ-E01-1p	DR CALUX	PCDD/PCDF (BEQ; semi)	2.2	suspected	1.7	pg BEQ / gram fat
50	22TWZ-E01-1p	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	2.4	compliant	3.3	pg BEQ / gram fat
51	22TWZ-E02-13a	DR CALUX	PCDD/PCDF (BEQ; semi)	2.0	suspected	1.7	pg BEQ / gram fat
52	22TWZ-E02-13a	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	3.1	compliant	3.3	pg BEQ / gram fat
53	TW22-CZ-F05M	DR CALUX	PCDD/PCDF (BEQ; semi)	LOQ <0.1	compliant	0.5	ng BEQ / kg product
54	TW22-CZ-F05M	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	LOQ <0.2	compliant	1	ng BEQ / kg product
55	TW22-CZ-F05G	DR CALUX	PCDD/PCDF (BEQ; semi)	LOQ <0.1	compliant	0.5	ng BEQ / kg product
56	TW22-CZ-F05G	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	LOQ <0.2	compliant	1	ng BEQ / kg product
57	TW22-CZ-F05S	DR CALUX	dl-PCBs (separated TEQ)	0.61	---	n.a.	pg TEQ / gram dry weight
58	TW22-CZ-F05S	DR CALUX	PCDD/PCDF (separated TEQ)	2.1	---	n.a.	pg TEQ / gram dry weight
59	22TWZ-SEDdn-01	ERa CALUX	Estrogens	0.063	---	n.a.	ng 17b Estradiol eq./g
60	22TWZ-SEDup-02	ERa CALUX	Estrogens	0.031	---	n.a.	ng 17b Estradiol eq./g
61	22TWZ-H2O-05	ERa CALUX	Estrogens	0.00021	---	n.a.	ng 17b Estradiol eq./g

For the suspected sample(s) to be non-compliant, the concentration has to be determined by a confirmatory method

For results below the limit of quantification (LOQ), behind the less than sign the limit of quantification is given

n.a.= no cut off according to EU guideline in BEQ established, maximal levels applicable if available

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	TW22-MD2-Jul-V1/2	44116	Not defined	no	31-10-2022	
2	TW22-MD2-Jul-V1/2	44116	Not defined	no	31-10-2022	
3	TW22-MD2-Jul-V1/2	44116	Not defined	no	31-10-2022	
4	TW22-MD2-Sept-V1/2	44117	Not defined	no	31-10-2022	
5	TW22-MD2-Sept-V1/2	44117	Not defined	no	31-10-2022	
6	TW22-MD2-Sept-V1/2	44117	Not defined	no	31-10-2022	
7	TW22-MD2-V3A	44118	Not defined	no	31-10-2022	
8	TW22-MD2-V3A	44118	Not defined	no	31-10-2022	
9	TW22-MD2-V3A	44118	Not defined	no	31-10-2022	
10	TW22-MD2-V4A	44119	Not defined	no	31-10-2022	
11	TW22-MD2-V4A	44119	Not defined	no	31-10-2022	
12	TW22-MD2-V4A	44119	Not defined	no	31-10-2022	
13	TW-MD22-CA-Veg04	44120	Not defined	no	31-10-2022	
14	TW-MD22-CA-Veg04	44120	Not defined	no	31-10-2022	
15	22TWZ-PR-01-C	44121	Not defined	no	31-10-2022	
16	22TWZ-PR-01-C	44121	Not defined	no	31-10-2022	
17	22TWZ-PR-05-REF	44122	Not defined	no	31-10-2022	
18	22TWZ-PR-05-REF	44122	Not defined	no	31-10-2022	
19	TW22-MD2-M01A	44123	Not defined	no	31-10-2022	
20	TW22-MD2-M01A	44123	Not defined	no	31-10-2022	
21	TW22-MD2-M02A	44124	Not defined	no	31-10-2022	
22	TW22-MD2-M02A	44124	Not defined	no	31-10-2022	
23	TW22-MD2-M03A	44125	Not defined	no	31-10-2022	
24	TW22-MD2-M03A	44125	Not defined	no	31-10-2022	
25	TW22-MD2-M04A	44126	Not defined	no	31-10-2022	
26	TW22-MD2-M04A	44126	Not defined	no	31-10-2022	
27	TW22-MD2-M05A	44127	Not defined	no	31-10-2022	
28	TW22-MD2-M05A	44127	Not defined	no	31-10-2022	
29	TW22-MD2-M06A	44128	Not defined	no	31-10-2022	
30	TW22-MD2-M06A	44128	Not defined	no	31-10-2022	
31	TW22-MD2-M07A	44129	Not defined	no	31-10-2022	
32	TW22-MD2-M07A	44129	Not defined	no	31-10-2022	
33	TW22-MD2-M08A	44130	Not defined	no	31-10-2022	
34	TW22-MD2-M08A	44130	Not defined	no	31-10-2022	
35	22TWZ-MOS-01-C1b	44131	Not defined	no	31-10-2022	

36	22TWZ-MOS-01-C1b	44131	Not defined	no	31-10-2022
37	22TWZ-MOS-02-C3a	44132	Not defined	no	31-10-2022
38	22TWZ-MOS-02-C3a	44132	Not defined	no	31-10-2022
39	22TWZ-MOS-03-Bb	44133	Not defined	no	31-10-2022
40	22TWZ-MOS-03-Bb	44133	Not defined	no	31-10-2022
41	22TWZ-MOS-04-D	44134	Not defined	no	31-10-2022
42	22TWZ-MOS-04-D	44134	Not defined	no	31-10-2022
43	22TWZ-MOS-05-REF	44135	Not defined	no	31-10-2022
44	22TWZ-MOS-05-REF	44135	Not defined	no	31-10-2022
45	TW22-CZ2-E03	44136	Food, egg(product)	yes	31-10-2022
46	TW22-CZ2-E03	44136	Food, egg(product)	yes	31-10-2022
47	TW22-CZ2-E08	44137	Food, egg(product)	yes	31-10-2022
48	TW22-CZ2-E08	44137	Food, egg(product)	yes	31-10-2022
49	22TWZ-E01-1p	44138	Food, egg(product)	yes	31-10-2022
50	22TWZ-E01-1p	44138	Food, egg(product)	yes	31-10-2022
51	22TWZ-E02-13a	44139	Food, egg(product)	yes	31-10-2022
52	22TWZ-E02-13a	44139	Food, egg(product)	yes	31-10-2022
53	TW22-CZ-F05M	44140	Feedingstuff	yes	31-10-2022
54	TW22-CZ-F05M	44140	Feedingstuff	yes	31-10-2022
55	TW22-CZ-F05G	44141	Feedingstuff	yes	31-10-2022
56	TW22-CZ-F05G	44141	Feedingstuff	yes	31-10-2022
57	TW22-CZ-F05S	44142	Soil	yes	31-10-2022
58	TW22-CZ-F05S	44142	Soil	yes	31-10-2022
59	22TWZ-SEDdn-01	44143	Sediment	no	31-10-2022
60	22TWZ-SEDup-02	44144	Sediment	no	31-10-2022
61	22TWZ-H2O-05	44145	Sediment	no	31-10-2022

For the method DR CALUX and the sum parameter PCDD/PCDF (separated TEQ) the used method is extraction with organic solvents; the extracts are cleaned on an acid silica column and separation is done with a florisil column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure) and benchmarked against 2,3,7,8-TCDD. The DR CALUX analysis is done according to p-bds-051

For the method DR CALUX and the sum parameter dl-PCBs (separated TEQ) the used method is extraction with organic solvents; the extracts are cleaned on an acid silica column futher clean-up is done with a florisil column; The cleaned extracts are dissolved in DMSO; Seperation is done with alumina; ; the DR CALUX Analysis is done according to p-bds-051extraction with organic solvents; the extracts are cleaned on an acid silica column and separation is done with a alumina column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure) and benchmar

For the method ERa CALUX and the sum parameter Estrogens the used method is Extracts are dissolved in DMSO. The ERa CALUX activity is determined (24h exposure) and benchmarked against 17-beta oestradiol. The ERa CALUX analysis is done according to p-bds-052

For the method PAH CALUX and the sum parameter Polycyclic aromatic hydrocarbons the used method is Extracts are dissolved in DMSO. The PAH CALUX activity is determined (4h exposure) and benchmarked against Benzo[a]pyrene.

For the method DR CALUX and the sum parameter PCDD/PCDF (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

For the method DR CALUX and the sum parameter PCDD/PCDF and dl-PCBs (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F and dl-PCBs, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

All DR CALUX analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to COMMISSION REGULATION (EU) 2015/704 of 30 April 2015.

All DR CALUX analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/771 of 3 May 2017 as regards the determination of the levels of dioxins and polychlorinated biphenyls; feedstuffs). The results are normalised for 12% moisture. Maximal levels according to COMMISSION REGULATION (EU) No 277/2012.

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org

8861 CP
Harlingen
Nederland

Authorized by:
Emiel Felzel

Date report (dd-mm-yyyy):
14-12-2022

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report

The results of examination refer exclusively to the checked samples.
All analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to COMMISSION REGULATION (EU) 2015/704 of 30 April 2015.
For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	44348
Client identification	22TWZ-E01-1p
Sample recieved on	18-11-2022
Start of test	21-11-2022
End of test	29-11-2022
Matrix	Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	0.54	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	0.8	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	1	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	1.3	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	1.3	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	1.3	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	1.8	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	2.1	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	2.3	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	LOQ (<0.2)	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	LOQ (<0.2)	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	LOQ (<0.2)	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.0	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.50	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2.8	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	5.9	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	0.88	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	0.35	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	0.75	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	LOQ (<0.2)	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	LOQ (<0.2)	pg / gram fat	U+/-	25%
1,2,3,7,8,9-Hexachlorodibenzofuran	LOQ (<0.2)	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	LOQ (<0.2)	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	3.7	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	LOQ (<0.2)	pg / gram fat	U+/-	28%

Octachlorodibenzofuran	LOQ (<0.2)	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	25	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	3.7	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	12	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	LOQ (<0.2)	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	450	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	18	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	850	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	32	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	240	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	54	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	150	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	60	pg / gram fat	U+/-	37%

compound out of recovery range

3,3',4,4',5-Pentachlorobiphenyl (#126)	49.8%

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org

8861 CP
Harlingen
Nederland

Authorized by:
Emiel Felzel

Date report (dd-mm-yyyy):
14-12-2022

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report

The results of examination refer exclusively to the checked samples.
All analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to COMMISSION REGULATION (EU) 2015/704 of 30 April 2015.
For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	44349
Client identification	22TWZ-E02-13a
Sample recieved on	18-11-2022
Start of test	21-11-2022
End of test	29-11-2022
Matrix	Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	0.66	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	0.87	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	1.1	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	1.5	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	1.5	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	1.5	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	2.1	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	2.3	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	2.6	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	LOQ (<0.2)	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	LOQ (<0.2)	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.29	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.63	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.79	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.4	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	1.9	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	0.98	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	0.54	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	0.79	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	0.29	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	0.46	pg / gram fat	U+/-	25%
1,2,3,7,8,9-Hexachlorodibenzofuran	LOQ (<0.2)	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	0.35	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.6	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	LOQ (<0.2)	pg / gram fat	U+/-	28%

Octachlorodibenzofuran	LOQ (<0.2)	pg / gram fat	U+/-	37%
dl-PCBs (accredited under RvA L401)				
3,3',4,4'-Tetrachlorobiphenyl (#77)	23	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	3.0	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	14	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	2.0	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	210	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	10	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	650	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	22	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	240	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	42	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	200	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	62	pg / gram fat	U+/-	37%

Laboratory analysis

2023 Eggs

DR CALUX – GC-MS

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: +31 20 4350 750
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
01-11-2023

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
The measurement uncertainty for CALUX method is typically below 30%. For the calculation a coverage factor of 1 is used.
If an analysis is accredited by ISO17025 (RvA L401) is indicated by a yes or a no
This report replace version 1

Reason change (identification change at the end of report in table 3):

Re-analysis met GC-MS/MS analyses.

Date of the performance of the test: 01-11-2023

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Conclusion	Cut off	Unit
1	23TWZ-E01-1p	DR CALUX	PCDD/PCDF (BEQ; semi)	2.6	suspected	1.7	pg BEQ / gram fat
2	23TWZ-E01-1p	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	6.3	suspected	3.3	pg BEQ / gram fat
3	23TWZ-E02-AN	DR CALUX	PCDD/PCDF (BEQ; semi)	1.7	suspected	1.7	pg BEQ / gram fat
4	23TWZ-E02-AN	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	3.3	compliant	3.3	pg BEQ / gram fat
5	23TWZ-E03-FIG	DR CALUX	PCDD/PCDF (BEQ; semi)	18	suspected	1.7	pg BEQ / gram fat
6	23TWZ-E03-FIG	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	35	suspected	3.3	pg BEQ / gram fat
7	23TWZ-E06-KAP	DR CALUX	PCDD/PCDF (BEQ; semi)	5.7	suspected	1.7	pg BEQ / gram fat
8	23TWZ-E06-KAP	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	11	suspected	3.3	pg BEQ / gram fat
9	23TWZ-E07-ZAL	DR CALUX	PCDD/PCDF (BEQ; semi)	2.8	suspected	1.7	pg BEQ / gram fat
10	23TWZ-E07-ZAL	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	7.6	suspected	3.3	pg BEQ / gram fat
11	23TWZ-E09-UR	DR CALUX	PCDD/PCDF (BEQ; semi)	2.7	suspected	1.7	pg BEQ / gram fat
12	23TWZ-E09-UR	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	8.2	suspected	3.3	pg BEQ / gram fat
13	23TWZ-E13-INT	DR CALUX	PCDD/PCDF (BEQ; semi)	3.6	suspected	1.7	pg BEQ / gram fat
14	23TWZ-E13-INT	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	8.9	suspected	3.3	pg BEQ / gram fat
15	23TWZ-E15-MU	DR CALUX	PCDD/PCDF (BEQ; semi)	4.2	suspected	1.7	pg BEQ / gram fat
16	23TWZ-E15-MU	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	10	suspected	3.3	pg BEQ / gram fat
17	23TWH-Eggs-WH-01-5	DR CALUX	PCDD/PCDF (BEQ; semi)	5.2	suspected	1.7	pg BEQ / gram fat
18	23TWH-Eggs-WH-01-5	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	9.8	suspected	3.3	pg BEQ / gram fat
19	23TWZ-MOS-01-C1-1	DR CALUX	PCDD/PCDF (BEQ; semi)	3.1	suspected	0.5	ng BEQ / kg product
20	23TWZ-MOS-01-C1-1	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	4.0	suspected	0.83	ng BEQ / kg product
21	23TWZ-MOS-03-B	DR CALUX	PCDD/PCDF (BEQ; semi)	0.76	suspected	0.5	ng BEQ / kg product
22	23TWZ-MOS-03-B	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	0.85	suspected	0.83	ng BEQ / kg product
23	23TWZ-MOS-04-D	DR CALUX	PCDD/PCDF (BEQ; semi)	0.23	compliant	0.5	ng BEQ / kg product
24	23TWZ-MOS-04-D	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	0.34	compliant	0.83	ng BEQ / kg product
25	23TWZ-PR-01-C	DR CALUX	PCDD/PCDF (BEQ; semi)	<0.09	compliant	0.5	ng BEQ / kg product
26	23TWZ-PR-01-C	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	<0.2	compliant	0.83	ng BEQ / kg product
27	23TWZ-PR-02-B	DR CALUX	PCDD/PCDF (BEQ; semi)	0.36	compliant	0.5	ng BEQ / kg product
28	23TWZ-PR-02-B	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	1.1	suspected	0.83	ng BEQ / kg product
29	23TWZ-PR-03-D	DR CALUX	PCDD/PCDF (BEQ; semi)	0.16	compliant	0.5	ng BEQ / kg product
30	23TWZ-PR-03-D	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	0.17	compliant	0.83	ng BEQ / kg product

31	23TWZ-IL-04-OT	DR CALUX	PCDD/PCDF (BEQ; semi)	0.24	compliant	0.5	ng BEQ / kg product
32	23TWZ-IL-04-OT	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	0.64	compliant	0.83	ng BEQ / kg product
33	23-TWZ-IL-05-GA	DR CALUX	PCDD/PCDF (BEQ; semi)	0.19	compliant	0.5	ng BEQ / kg product
34	23-TWZ-IL-05-GA	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	0.19	compliant	0.83	ng BEQ / kg product
35	23TWH-FrAPpU-WH-01-2	DR CALUX	PCDD/PCDF (BEQ; semi)	<0.05	---	n.a.	pg BEQ / gram product
36	23TWH-FrAPpU-WH-01-2	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	<0.1	---	n.a.	pg BEQ / gram product
37	23TWH-GrBoPu-WH-01-3	DR CALUX	PCDD/PCDF (BEQ; semi)	<0.05	---	n.a.	pg BEQ / gram product
38	23TWH-GrBoPu-WH-01-3	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	<0.1	---	n.a.	pg BEQ / gram product
39	23TWH-GrWiPu-WH-01-4	DR CALUX	PCDD/PCDF (BEQ; semi)	<0.05	---	n.a.	pg BEQ / gram product
40	23TWH-GrWiPu-WH-01-4	DR CALUX	PCDD/PCDF and dl-PCBs (BEQ; semi)	0.15	---	n.a.	pg BEQ / gram product

For the suspected sample(s) to be non-compliant, the concentration has to be determined by a confirmatory method

Results given behind the less than sign are the limit of quantification.

n.a.= no cut off according to EU guideline in BEQ established, maximal levels applicable if available

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	23TWZ-E01-1p	47065	Food, egg(product)	yes	13-10-2023	
2	23TWZ-E01-1p	47065	Food, egg(product)	yes	13-10-2023	
3	23TWZ-E02-AN	47066	Food, egg(product)	yes	13-10-2023	
4	23TWZ-E02-AN	47066	Food, egg(product)	yes	13-10-2023	
5	23TWZ-E03-FIG	47067	Food, egg(product)	yes	13-10-2023	
6	23TWZ-E03-FIG	47067	Food, egg(product)	yes	13-10-2023	
7	23TWZ-E06-KAP	47068	Food, egg(product)	yes	13-10-2023	
8	23TWZ-E06-KAP	47068	Food, egg(product)	yes	13-10-2023	
9	23TWZ-E07-ZAL	47069	Food, egg(product)	yes	13-10-2023	
10	23TWZ-E07-ZAL	47069	Food, egg(product)	yes	13-10-2023	
11	23TWZ-E09-UR	47070	Food, egg(product)	yes	13-10-2023	
12	23TWZ-E09-UR	47070	Food, egg(product)	yes	13-10-2023	
13	23TWZ-E13-INT	47071	Food, egg(product)	yes	13-10-2023	
14	23TWZ-E13-INT	47071	Food, egg(product)	yes	13-10-2023	
15	23TWZ-E15-MU	47072	Food, egg(product)	yes	13-10-2023	
16	23TWZ-E15-MU	47072	Food, egg(product)	yes	13-10-2023	
17	23TWH-Eggs-WH-01-5	47073	Food, egg(product)	yes	13-10-2023	
18	23TWH-Eggs-WH-01-5	47073	Food, egg(product)	yes	13-10-2023	
19	23TWZ-MOS-01-C1-1	47074	Feed, plant orgin	yes	13-10-2023	
20	23TWZ-MOS-01-C1-1	47074	Feed, plant orgin	yes	13-10-2023	
21	23TWZ-MOS-03-B	47075	Feed, plant orgin	yes	13-10-2023	
22	23TWZ-MOS-03-B	47075	Feed, plant orgin	yes	13-10-2023	
23	23TWZ-MOS-04-D	47076	Feed, plant orgin	yes	13-10-2023	
24	23TWZ-MOS-04-D	47076	Feed, plant orgin	yes	13-10-2023	
25	23TWZ-PR-01-C	47077	Feed, plant orgin	yes	13-10-2023	
26	23TWZ-PR-01-C	47077	Feed, plant orgin	yes	13-10-2023	
27	23TWZ-PR-02-B	47078	Feed, plant orgin	yes	13-10-2023	
28	23TWZ-PR-02-B	47078	Feed, plant orgin	yes	13-10-2023	
29	23TWZ-PR-03-D	47079	Feed, plant orgin	yes	13-10-2023	
30	23TWZ-PR-03-D	47079	Feed, plant orgin	yes	13-10-2023	
31	23TWZ-IL-04-OT	47080	Feed, plant orgin	yes	13-10-2023	
32	23TWZ-IL-04-OT	47080	Feed, plant orgin	yes	13-10-2023	
33	23-TWZ-IL-05-GA	47081	Feed, plant orgin	yes	13-10-2023	
34	23-TWZ-IL-05-GA	47081	Feed, plant orgin	yes	13-10-2023	
35	23TWH-FrAPpU-WH-01-2	47082	Food (Fruits and vegetables)	yes	13-10-2023	
36	23TWH-FrAPpU-WH-01-2	47082	Food (Fruits and vegetables)	yes	13-10-2023	
37	23TWH-GrBoPu-WH-01-3	47083	Food (Fruits and vegetables)	yes	13-10-2023	
38	23TWH-GrBoPu-WH-01-3	47083	Food (Fruits and vegetables)	yes	13-10-2023	
39	23TWH-GrWiPu-WH-01-4	47084	Food (Fruits and vegetables)	yes	13-10-2023	
40	23TWH-GrWiPu-WH-01-4	47084	Food (Fruits and vegetables)	yes	13-10-2023	

For the method DR CALUX and the sum parameter PCDD/PCDF (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

For the method DR CALUX and the sum parameter PCDD/PCDF and dl-PCBs (BEQ; semi) the used method is shake extraction with organic solvents (hexane); the extracts are cleaned on an acid silica column. The cleaned extracts are dissolved in DMSO. The DR CALUX activity is determined (24h exposure). The response of the sample is corrected for the background and subsequently corrected for the apparent bioassay recovery with a reference sample at the level of interest. The evaluation was done on the maximum level for PCDD/F and dl-PCBs, from which a cut off value has been established (2/3 of maximum level) to determine if a sample is compliant or suspected. As a maximum level the level of the matrix as described in the table above is used. After the evaluation an estimation is given of the sample in the form of a BEQ outcome. The DR CALUX analysis is done according to p-bds-051.

All DR CALUX analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to Commission Regulation (EC) No 1881/2006.
All DR CALUX analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/771 of 3 May 2017 as regards the determination of the levels of dioxins and polychlorinated biphenyls; feedstuffs). The results are normalised for 12% moisture. Maximal levels according to Directive 2002/32/EC.

Table 3 Changes according to previous version report

sample 47065, method DR CALUX, parameter PCDD/PCDF (BEQ; semi): Result sample changed from re-analysis to suspected 2.6
sample 47065, method DR CALUX, parameter PCDD/PCDF and dl-PCBs (BEQ; semi): Result sample changed from re-analysis to suspected 6.3
sample 47066, method DR CALUX, parameter PCDD/PCDF (BEQ; semi): Result sample changed from re-analysis to suspected 1.7
sample 47066, method DR CALUX, parameter PCDD/PCDF and dl-PCBs (BEQ; semi): Result sample changed from re-analysis to compliant 3.3
sample 47067, method DR CALUX, parameter PCDD/PCDF (BEQ; semi): Result sample changed from re-analysis to suspected 18
sample 47067, method DR CALUX, parameter PCDD/PCDF and dl-PCBs (BEQ; semi): Result sample changed from re-analysis to suspected 35
sample 47068, method DR CALUX, parameter PCDD/PCDF (BEQ; semi): Result sample changed from re-analysis to suspected 5.7
sample 47068, method DR CALUX, parameter PCDD/PCDF and dl-PCBs (BEQ; semi): Result sample changed from re-analysis to suspected 11
sample 47069, method DR CALUX, parameter PCDD/PCDF (BEQ; semi): Result sample changed from re-analysis to suspected 2.8
sample 47069, method DR CALUX, parameter PCDD/PCDF and dl-PCBs (BEQ; semi): Result sample changed from re-analysis to suspected 7.6
sample 47070, method DR CALUX, parameter PCDD/PCDF (BEQ; semi): Result sample changed from re-analysis to suspected 2.7
sample 47070, method DR CALUX, parameter PCDD/PCDF and dl-PCBs (BEQ; semi): Result sample changed from re-analysis to suspected 8.2
sample 47071, method DR CALUX, parameter PCDD/PCDF (BEQ; semi): Result sample changed from re-analysis to suspected 3.6
sample 47071, method DR CALUX, parameter PCDD/PCDF and dl-PCBs (BEQ; semi): Result sample changed from re-analysis to suspected 8.9
sample 47072, method DR CALUX, parameter PCDD/PCDF (BEQ; semi): Result sample changed from re-analysis to suspected 4.2
sample 47072, method DR CALUX, parameter PCDD/PCDF and dl-PCBs (BEQ; semi): Result sample changed from re-analysis to suspected 10
sample 47073, method DR CALUX, parameter PCDD/PCDF (BEQ; semi): Result sample changed from re-analysis to suspected 5.2
sample 47073, method DR CALUX, parameter PCDD/PCDF and dl-PCBs (BEQ; semi): Result sample changed from re-analysis to suspected 9.8

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: +31 20 4350 750
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org

8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
09-11-2023

Information about report

The results of examination refer exclusively to the checked samples.
All analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to Commission Regulation (EC) No 1881/2006.
For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	47202
Client identification	23TWZ-E01-1p
Sample recieved on	06-11-2023
Start of test	06-11-2023
End of test	06-11-2023
Matrix	Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	0.57	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	0.79	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	1	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	1.4	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	1.4	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	1.4	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	1.9	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	2.2	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	2.4	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.58	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.78	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	4.1	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	6.5	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	1.1	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	0.43	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	0.49	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	0.46	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	0.24	pg / gram fat	U+/-	25%
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	0.45	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.45	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.2	pg / gram fat	U+/-	28%

Octachlorodibenzofuran	0.28	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	23	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	2.8	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	13	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	0.71	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	450	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	20	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	860	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	41	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	240	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	63	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	150	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	32	pg / gram fat	U+/-	37%

Results given behind the less than sign are the limit of quantification.

compound out of recovery range

3,3',4,4',5-Pentachlorobiphenyl (#126)	46.2%

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: +31 20 4350 750
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org

8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
09-11-2023

Information about report
The results of examination refer exclusively to the checked samples.
All analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to Commission Regulation (EC) No 1881/2006.
For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	47203
Client identification	23TWZ-E02-AN
Sample recieved on	06-11-2023
Start of test	06-11-2023
End of test	06-11-2023
Matrix	Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	0.27	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	0.52	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	0.77	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	0.75	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	0.75	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	0.75	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	1	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	1.3	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	1.5	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.0	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	1.9	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	0.89	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	0.27	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	0.35	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	0.30	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	0.21	pg / gram fat	U+/-	25%
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.29	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.2	pg / gram fat	U+/-	28%

Octachlorodibenzofuran	<0.2	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	11	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	<2	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	7.1	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	0.88	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	130	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	<8	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	250	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	11	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	100	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	21	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	39	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	16	pg / gram fat	U+/-	37%

Results given behind the less than sign are the limit of quantification.

compound out of recovery range

3,3',4,4',5-Pentachlorobiphenyl (#126)	53.9%

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: +31 20 4350 750
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org

8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
09-11-2023

Information about report
The results of examination refer exclusively to the checked samples.
All analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to Commission Regulation (EC) No 1881/2006.
For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	47204
Client identification	23TWZ-E03-FIG
Sample recieved on	06-11-2023
Start of test	06-11-2023
End of test	06-11-2023
Matrix	Food, egg(product)

Judgement

Non-compliant for maximal level limit (expressed as WHO PCDD/F TEQ) taking into account expanded measurement uncertainity.
Sample 23TWZ-E03-FIG is above the maximal level of 2.5 pg TEQ / gram fat.

Non-compliant for maximal level limit (expressed as WHO PCDD/F + dl-PCBs TEQ) taking into account expanded measurement uncertainity.
Sample 23TWZ-E03-FIG is above the maximal level of 5.0 pg TEQ / gram fat.

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	7.2	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	7.3	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	7.3	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	8	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	8	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	8	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	15	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	15	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	15	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.89	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.8	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.3	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	3.7	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.44	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	8.4	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	14	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	9.1	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	3.9	pg / gram fat	U+/-	31%

2,3,4,7,8-Pentachlorodibenzofuran	6.8	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	2.7	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	2.8	pg / gram fat	U+/-	25%
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	2.5	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.7	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.2	pg / gram fat	U+/-	28%
Octachlorodibenzofuran	0.38	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	74	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	10	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	75	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	7.1	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	2400	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	80	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	5100	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	140	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	1500	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	400	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	850	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	190	pg / gram fat	U+/-	37%

Results given behind the less than sign are the limit of quantification.

Recovery Dioxins/furans

2,3,7,8-Tetrachlorodibenzo-p-dioxin	45%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	57.4%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	55.1%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	46.3%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	49.6%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	45%
Octachlorodibenzo-p-dioxin	43.7%
2,3,7,8-Tetrachlorodibenzofuran	52.6%
1,2,3,7,8-Pentachlorodibenzofuran	51.2%
2,3,4,7,8-Pentachlorodibenzofuran	48.2%
1,2,3,4,7,8-Hexachlorodibenzofuran	57.2%
1,2,3,6,7,8-Hexachlorodibenzofuran	52.8%
1,2,3,7,8,9-Hexachlorodibenzofuran	54%
2,3,4,6,7,8-Hexachlorodibenzofuran	51.3%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	44.7%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	61.8%
Octachlorodibenzofuran	45.8%

Recovery dl-PCBs

3,3',4,4'-Tetrachlorobiphenyl (#77)	48.1%
3,4,4',5-Tetrachlorobiphenyl (#81)	44.6%
3,3',4,4',5-Pentachlorobiphenyl (#126)	54.6%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	67.1%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	71.3%
2,3,4,4',5-Pentachlorobiphenyl (#114)	73.5%
2,3',4,4',5-Pentachlorobiphenyl (#118)	66.4%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	71.7%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	78.2%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	75.8%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	67.3%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	85.8%

compound out of recovery range

1,2,3,7,8-Pentachlorodibenzo-p-dioxin	57.4%
2,3,4,7,8-Pentachlorodibenzofuran	48.2%
3,3',4,4',5-Pentachlorobiphenyl (#126)	54.6%

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: +31 20 4350 750
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org

8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
09-11-2023

Information about report
The results of examination refer exclusively to the checked samples.
All analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to Commission Regulation (EC) No 1881/2006.
For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	47205
Client identification	23TWZ-E06-KAP
Sample recieved on	06-11-2023
Start of test	06-11-2023
End of test	06-11-2023
Matrix	Food, egg(product)

Judgement

Non-compliant for maximal level limit (expressed as WHO PCDD/F + dl-PCBs TEQ) taking into account expanded measurement uncertainity.
Sample 23TWZ-E06-KAP is above the maximal level of 5.0 pg TEQ / gram fat.

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	2.8	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	2.8	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	2.8	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	3.4	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	3.4	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	3.4	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	6.2	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	6.2	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	6.2	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.21	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.72	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.68	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.3	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.50	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	7.0	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	26	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	3.0	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	1.5	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	2.5	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	1.6	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	1.1	pg / gram fat	U+/-	25%

1,2,3,7,8,9-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	1.5	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.21	pg / gram fat	U+/-	28%
Octachlorodibenzofuran	0.66	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	76	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	6.6	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	31	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	4.4	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	980	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	56	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	2800	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	70	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	1000	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	200	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	580	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	210	pg / gram fat	U+/-	37%

Results given behind the less than sign are the limit of quantification.

Recovery Dioxins/furans

2,3,7,8-Tetrachlorodibenzo-p-dioxin	58.9%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	59.4%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	54.2%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	50.1%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	51.3%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	48.9%
Octachlorodibenzo-p-dioxin	54.1%
2,3,7,8-Tetrachlorodibenzofuran	60.1%
1,2,3,7,8-Pentachlorodibenzofuran	53.6%
2,3,4,7,8-Pentachlorodibenzofuran	54.1%
1,2,3,4,7,8-Hexachlorodibenzofuran	48.5%
1,2,3,6,7,8-Hexachlorodibenzofuran	61.5%
1,2,3,7,8,9-Hexachlorodibenzofuran	51%
2,3,4,6,7,8-Hexachlorodibenzofuran	65.6%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	42.4%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	65.2%
Octachlorodibenzofuran	52.4%

Recovery dl-PCBs

3,3',4,4'-Tetrachlorobiphenyl (#77)	48.8%
3,4,4',5-Tetrachlorobiphenyl (#81)	49.1%
3,3',4,4',5-Pentachlorobiphenyl (#126)	58.4%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	77%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	53.6%
2,3,4,4',5-Pentachlorobiphenyl (#114)	55.4%
2,3',4,4',5-Pentachlorobiphenyl (#118)	52.8%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	53.4%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	64%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	60.4%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	53.9%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	71.1%

compound out of recovery range

1,2,3,7,8-Pentachlorodibenzo-p-dioxin	59.4%
2,3,4,7,8-Pentachlorodibenzofuran	54.1%
3,3',4,4',5-Pentachlorobiphenyl (#126)	58.4%

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: +31 20 4350 750
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org

8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
09-11-2023

Information about report
The results of examination refer exclusively to the checked samples.
All analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to Commission Regulation (EC) No 1881/2006.
For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	47206
Client identification	23TWZ-E07-ZAL
Sample recieved on	06-11-2023
Start of test	06-11-2023
End of test	06-11-2023
Matrix	Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	1.2	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	1.4	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	1.5	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	3.7	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	3.7	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	3.7	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	5	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	5.1	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	5.2	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.30	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.63	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2.4	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	5.2	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	3.1	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	0.75	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	1.3	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	0.45	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	0.30	pg / gram fat	U+/-	25%
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	0.51	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.44	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.2	pg / gram fat	U+/-	28%

Octachlorodibenzofuran	<0.2	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	160	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	9.9	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	35	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	2.2	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	1500	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	64	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	3600	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	99	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	780	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	180	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	400	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	110	pg / gram fat	U+/-	37%

Results given behind the less than sign are the limit of quantification.

compound out of recovery range

3,3',4,4',5-Pentachlorobiphenyl (#126)	52%

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: +31 20 4350 750
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org

8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
09-11-2023

Information about report
The results of examination refer exclusively to the checked samples.
All analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to Commission Regulation (EC) No 1881/2006.
For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	47207
Client identification	23TWZ-E09-UR
Sample recieved on	06-11-2023
Start of test	06-11-2023
End of test	06-11-2023
Matrix	Food, egg(product)

Judgement

Non-compliant for maximal level limit (expressed as WHO PCDD/F + dl-PCBs TEQ) taking into account expanded measurement uncertainity.
Sample 23TWZ-E09-UR is above the maximal level of 5.0 pg TEQ / gram fat.

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	1.2	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	1.3	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	1.5	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	5.5	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	5.5	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	5.5	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	6.8	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	6.9	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	7	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.27	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.36	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.4	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	9.0	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	18	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	2.0	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	1.1	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	0.89	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	0.48	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	0.42	pg / gram fat	U+/-	25%

1,2,3,7,8,9-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	0.84	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.5	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.2	pg / gram fat	U+/-	28%
Octachlorodibenzofuran	0.55	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	66	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	2.7	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	54	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	2.3	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	810	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	25	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	1600	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	35	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	490	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	150	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	230	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	31	pg / gram fat	U+/-	37%

Results given behind the less than sign are the limit of quantification.

Recovery Dioxins/furans

2,3,7,8-Tetrachlorodibenzo-p-dioxin	56.1%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	67.8%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	50.6%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	46.7%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	51%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	58.7%
Octachlorodibenzo-p-dioxin	55.9%
2,3,7,8-Tetrachlorodibenzofuran	58.5%
1,2,3,7,8-Pentachlorodibenzofuran	63.1%
2,3,4,7,8-Pentachlorodibenzofuran	56.2%
1,2,3,4,7,8-Hexachlorodibenzofuran	63.1%
1,2,3,6,7,8-Hexachlorodibenzofuran	64.1%
1,2,3,7,8,9-Hexachlorodibenzofuran	62.8%
2,3,4,6,7,8-Hexachlorodibenzofuran	48.6%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	58.6%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	71.4%
Octachlorodibenzofuran	58.1%

Recovery dl-PCBs

3,3',4,4'-Tetrachlorobiphenyl (#77)	62.9%
3,4,4',5-Tetrachlorobiphenyl (#81)	59.8%
3,3',4,4',5-Pentachlorobiphenyl (#126)	59.6%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	84.1%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	54.2%
2,3,4,4',5-Pentachlorobiphenyl (#114)	59%
2,3',4,4',5-Pentachlorobiphenyl (#118)	48%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	51.5%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	61.4%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	58.1%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	50.3%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	70.2%

compound out of recovery range

3,3',4,4',5-Pentachlorobiphenyl (#126)	59.6%

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: +31 20 4350 750
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org

8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
09-11-2023

Information about report
The results of examination refer exclusively to the checked samples.
All analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to Commission Regulation (EC) No 1881/2006.
For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	47208
Client identification	23TWZ-E13-INT
Sample recieved on	06-11-2023
Start of test	06-11-2023
End of test	06-11-2023
Matrix	Food, egg(product)

Judgement

Non-compliant for maximal level limit (expressed as WHO PCDD/F + dl-PCBs TEQ) taking into account expanded measurement uncertainity.
Sample 23TWZ-E13-INT is above the maximal level of 5.0 pg TEQ / gram fat.

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	1.9	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	2	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	2.2	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	5.5	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	5.5	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	5.5	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	7.4	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	7.6	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	7.7	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.61	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.55	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.0	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2.7	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	4.9	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	3.0	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	1.3	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	1.8	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	0.68	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	0.63	pg / gram fat	U+/-	25%

1,2,3,7,8,9-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	0.73	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.3	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.2	pg / gram fat	U+/-	28%
Octachlorodibenzofuran	0.34	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	37	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	5.0	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	52	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	3.8	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	1000	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	28	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	2300	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	88	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	970	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	210	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	660	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	180	pg / gram fat	U+/-	37%

Results given behind the less than sign are the limit of quantification.

Recovery Dioxins/furans

2,3,7,8-Tetrachlorodibenzo-p-dioxin	58%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	50.2%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	50%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	44.1%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	53.1%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	59.3%
Octachlorodibenzo-p-dioxin	51.5%
2,3,7,8-Tetrachlorodibenzofuran	62.5%
1,2,3,7,8-Pentachlorodibenzofuran	54.4%
2,3,4,7,8-Pentachlorodibenzofuran	57.1%
1,2,3,4,7,8-Hexachlorodibenzofuran	70.5%
1,2,3,6,7,8-Hexachlorodibenzofuran	56.5%
1,2,3,7,8,9-Hexachlorodibenzofuran	52.1%
2,3,4,6,7,8-Hexachlorodibenzofuran	53.5%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	48.9%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	66.2%
Octachlorodibenzofuran	51.8%

Recovery dl-PCBs

3,3',4,4'-Tetrachlorobiphenyl (#77)	53.8%
3,4,4',5-Tetrachlorobiphenyl (#81)	50.6%
3,3',4,4',5-Pentachlorobiphenyl (#126)	47.9%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	82.3%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	53%
2,3,4,4',5-Pentachlorobiphenyl (#114)	56.9%
2,3',4,4',5-Pentachlorobiphenyl (#118)	46.1%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	49.5%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	60.3%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	56.7%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	43.8%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	69.5%

compound out of recovery range

3,3',4,4',5-Pentachlorobiphenyl (#126)	47.9%

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: +31 20 4350 750
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org

8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
09-11-2023

Information about report
The results of examination refer exclusively to the checked samples.
All analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to Commission Regulation (EC) No 1881/2006.
For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	47209
Client identification	23TWZ-E15-MU
Sample recieved on	06-11-2023
Start of test	06-11-2023
End of test	06-11-2023
Matrix	Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	0.97	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	1.1	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	1.2	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	2.8	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	2.8	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	2.8	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	3.7	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	3.9	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	4	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.23	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.44	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.63	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	<0.2	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.6	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	2.5	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	1.2	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	0.93	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	0.97	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	0.56	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	0.62	pg / gram fat	U+/-	25%
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	0.52	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.46	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.2	pg / gram fat	U+/-	28%

Octachlorodibenzofuran	<0.2	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	42	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	3.4	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	26	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	2.6	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	580	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	27	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	1400	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	54	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	280	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	77	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	220	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	44	pg / gram fat	U+/-	37%

Results given behind the less than sign are the limit of quantification.

compound out of recovery range

3,3',4,4',5-Pentachlorobiphenyl (#126)	49%

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: +31 20 4350 750
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org

8861 CP
Harlingen
Nederland

Authorized by:
Snezana Zeljkovic
Principle analyst

Date report (dd-mm-yyyy):
09-11-2023

Information about report
The results of examination refer exclusively to the checked samples.
All analysis results comply with EU requirements as indicated in Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs. Maximal levels according to Commission Regulation (EC) No 1881/2006.
For the analyses on dioxins/furans/dl-PCBs/ndl-PCB the sample is extracted with organic solvents (hexane); the extracts are cleaned on an acid silica column/alumina/florisil/carbon. For recovery calculation all 13C labeled congeners are added. The concentrations are determined by GC-MS/MS.

Information about sample

BDS sample number	47210
Client identification	23TWH-Eggs-WH-01-5
Sample recieved on	06-11-2023
Start of test	06-11-2023
End of test	06-11-2023
Matrix	Food, egg(product)

Test results:

WHO sum parameters (accredited under RvA L401)

WHO PCDD/F TEQ lowerbound 2005	2.4	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ mediumbound 2005	2.4	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F TEQ upperbound 2005	2.4	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ lowerbound 2005	2	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ mediumbound 2005	2	pg TEQ / gram fat	U+/-	24%
WHO dl-PCBs TEQ upperbound 2005	2	pg TEQ / gram fat	U+/-	24%
WHO PCDD/F/dl-PCBs TEQ lowerbound 2005	4.4	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ mediumbound 2005	4.4	pg TEQ / gram fat	U+/-	23%
WHO PCDD/F/dl-PCBs TEQ upperbound 2005	4.4	pg TEQ / gram fat	U+/-	23%

Dioxins/furans (accredited under RvA L401)

2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.21	pg / gram fat	U+/-	44%
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.77	pg / gram fat	U+/-	31%
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.51	pg / gram fat	U+/-	44%
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.8	pg / gram fat	U+/-	46%
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.39	pg / gram fat	U+/-	41%
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	6.2	pg / gram fat	U+/-	34%
Octachlorodibenzo-p-dioxin	18	pg / gram fat	U+/-	49%
2,3,7,8-Tetrachlorodibenzofuran	1.9	pg / gram fat	U+/-	27%
1,2,3,7,8-Pentachlorodibenzofuran	1.1	pg / gram fat	U+/-	31%
2,3,4,7,8-Pentachlorodibenzofuran	1.8	pg / gram fat	U+/-	29%
1,2,3,4,7,8-Hexachlorodibenzofuran	1.1	pg / gram fat	U+/-	37%
1,2,3,6,7,8-Hexachlorodibenzofuran	0.62	pg / gram fat	U+/-	25%
1,2,3,7,8,9-Hexachlorodibenzofuran	<0.2	pg / gram fat	U+/-	41%
2,3,4,6,7,8-Hexachlorodibenzofuran	0.96	pg / gram fat	U+/-	32%
1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.8	pg / gram fat	U+/-	25%
1,2,3,4,7,8,9-Heptachlorodibenzofuran	<0.2	pg / gram fat	U+/-	28%

Octachlorodibenzofuran	0.75	pg / gram fat	U+/-	37%

dl-PCBs (accredited under RvA L401)

3,3',4,4'-Tetrachlorobiphenyl (#77)	16	pg / gram fat	U+/-	39%
3,4,4',5-Tetrachlorobiphenyl (#81)	1.7	pg / gram fat	U+/-	32%
3,3',4,4',5-Pentachlorobiphenyl (#126)	19	pg / gram fat	U+/-	26%
3,3',4,4',5,5'-Hexachlorobiphenyl (#169)	2.2	pg / gram fat	U+/-	53%
2,3,3',4,4'-Pentachlorobiphenyl (#105)	350	pg / gram fat	U+/-	51%
2,3,4,4',5-Pentachlorobiphenyl (#114)	16	pg / gram fat	U+/-	32%
2,3',4,4',5-Pentachlorobiphenyl (#118)	1100	pg / gram fat	U+/-	44%
2,3',4,4',5'-Pentachlorobiphenyl (#123)	28	pg / gram fat	U+/-	36%
2,3,3',4,4',5-Hexachlorobiphenyl (#156)	530	pg / gram fat	U+/-	36%
2,3,3',4,4',5'-Hexachlorobiphenyl (#157)	80	pg / gram fat	U+/-	37%
2,3',4,4',5,5'-Hexachlorobiphenyl (#167)	330	pg / gram fat	U+/-	35%
2,3,3',4,4',5,5'-Heptachlorobiphenyl (#189)	96	pg / gram fat	U+/-	37%

Results given behind the less than sign are the limit of quantification.

compound out of recovery range

1,2,3,7,8-Pentachlorodibenzo-p-dioxin	42%
2,3,4,7,8-Pentachlorodibenzofuran	52.5%
3,3',4,4',5-Pentachlorobiphenyl (#126)	47%

Laboratory analysis

Eggs PFAS

2021-2023

PFAS analyses eggs 2021- FITC-T4: E01-1p, E03-13A

BioDetection Systems
Science Park 406
1098XH
Amsterdam
The Netherlands

Tel: 0031 20 4350 750
Fax: 0031 20 4350 757
E-mail: info@bds.nl
Web: www.bds.nl

Analysis report

Client:
Toxicowatch
Abel Arkenbout
info@toxicowatch.org
grote ossenmarkt 18
8861 CP
Harlingen
Nederland

Authorized by:
Emiel Felzel
Head of Testing Laboratory

Date report (dd-mm-yyyy):
14-03-2022

Responsible person BDS:
Emiel Felzel
Head of Testing Laboratory

Information about report
The results of examination refer exclusively to the checked samples.
Results are given in table 1.
Sample characteristics are given in table 2.
Accredation ISO 17025 (RvA L401) is not applicable for activities described in this report

Extra Information:
Procedure blanco bijdrage aan monster bedraagt niet meer als 10%.
Date of the performance of the test: 14-03-2022

Table 1 sample analysis results

No.	Client code	Method	Parameter	Result	Unit
1	21TWZ-E01-1p	FITC-T4	Thyroid disruption	1.9	ug PFOA eq./gram product
2	21TWZ-E03-13A	FITC-T4	Thyroid disruption	1.9	ug PFOA eq./gram product
3	21TWZ-MOS-04-C1	FITC-T4	Thyroid disruption	17	ug PFOA eq./gram product
4	21TWZ-MOS-07-ZAL	FITC-T4	Thyroid disruption	4.2	ug PFOA eq./gram product

Table 2 sample characteristics

No.	Client code	BDS code	Matrix	ISO17025 (RvAL401)	Date arrival	Sealed
1	21TWZ-E01-1p	42257	Food, egg(product)	no	08-02-2022	
2	21TWZ-E03-13A	42258	Food, egg(product)	no	08-02-2022	
3	21TWZ-MOS-04-C1	42259	Not defined	no	08-02-2022	
4	21TWZ-MOS-07-ZAL	42260	Not defined	no	08-02-2022	

For the method FITC-T4 and the parameter Thyroid disruption the used method is

PFAS analyses eggs 2022: E01-1p

Ei-_22TWZ-E01-1p_C6435534_NL.pdf

Analyserapport

Normec Groen Agro Control

KLANT

Klantnaam	:	ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	:	11492
Klantlocatie*	:	ToxicoWatch Consultancy

RAPPORT

Rapportnummer	:	C6435534	Bemonsterd	: niet door GAC
Monstercode	:	BPV221019609		
Datum ontvangst	:	19-10-2022		
Startdatum analyse	:	19-10-2022		
Datum rapport	:	28-10-2022		
Gebruikte methoden	:	PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	:	Ei- 22TWZ-E01-1p

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

Analyserapport

Normec Groen Agro Control

RESULTATEN RESIDUANALYSES

Methode	Component	Eenheid	Concentratie	MRL EU	MRL EU %	ARfD PRIMO NL %
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-tetradecaanzuur	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-butaansulfonaat (PFBS)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-hexaansulfonaat (PFHxS)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-heptaansulfonaat	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-octaansulfonaat (PFOS)	µg/kg	0.35			
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-decaansulfonaat (PFDS)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-octadecaanzuur (PFODA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-dodecaansulfonaat	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-hexadecaanzuur	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-nonaansulfonaat (PFNS)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-pentaansulfonaat	µg/kg	<0.1			
PFAS LCMSMS	Perfluorhexaansulfonaat (4:2FTS)	µg/kg	<0.1			
PFAS LCMSMS	Perfluoroctaansulfonaat (6:2FTS)	µg/kg	<0.1			
PFAS LCMSMS	Perfluordecaansulfonaat (8:2FTS)	µg/kg	<0.1			
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur	µg/kg	<0.1			
Aantal componenten: 1						

* informatie verkregen van de klant

Algemeen directeur

ir. J. de Vriend

Normec Groen Agro Control | Distributieweg 1, 2645 EG Delfgauw | Nederland | T +31 (0)15 2572 511 | E info@agrocontrol.nl

PFAS analyses eggs 2023: E03-FIG

Analysecertificaat

Normec Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637899	Bemonsterd	: niet door NGAC
Monstercode	: BPV240226164		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 4-3-2024		
Datum rapport	: 5-3-2024		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWZ-E03-FIG
Variëteit	: Egg

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concen-tratie	Norm EU	Norm EU %
PFAS LCMSMS	Perfluor-1-octaansulfonzuur (PFOS)	µg/kg	**4.4**	1.0	440
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA)	µg/kg	0.16	0.3	53.3
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA)	µg/kg	0.46	0.7	65.7
PFAS LCMSMS	Perfluor-1-hexaansulfonzuur (PFHxS)	µg/kg	<0.1		
PFAS LCMSMS	Som van PFOS, PFOA, PFNA en PFHxS	µg/kg	**5.0**	1.7	294
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA)	µg/kg	<0.5		
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA)	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA)	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA)	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA)	µg/kg	0.28		
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA)	µg/kg	0.25		
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA)	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA)	µg/kg	0.19		
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA)	µg/kg	0.18		
PFAS LCMSMS	Perfluor-1-butaansulfonzuur (PFBS)	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-heptaansulfonzuur (PFHpS)	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-decaansulfonzuur (PFDS)	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-dodecaansulfonzuur (PFDoS)	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-nonaansulfonzuur (PFNS)	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-pentaansulfonzuur (PFPeS)	µg/kg	<0.1		
PFAS LCMSMS	4:2 Fluortelomeersulfonzuur (4:2FTS)	µg/kg	<0.1		
PFAS LCMSMS	6:2 Fluortelomeersulfonzuur (6:2FTS)	µg/kg	<0.1		
PFAS LCMSMS	8:2 Fluortelomeersulfonzuur (8:2FTS)	µg/kg	<0.1		
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX)	µg/kg	<0.1		

* informatie verkregen van de klant

Norm EU: Het maximumgehalte conform verordening (EG) nr. 2023/915, geconsolideerde versie.

Algemeen directeur

ir. J. de Vriend

Normec Groen Agro Control | Distributieweg 1, 2645 EG Delfgauw | Nederland | T +31 (0)15 2572 511 | E info.agro@normecgroup.com

PFAS analyses eggs 2023: E07-ZAL

Analysecertificaat

Normec Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6637383	Bemonsterd	: niet door NGAC
Monstercode	: BPV240226163		
Datum ontvangst	: 26-2-2024		
Startdatum analyse	: 4-3-2024		
Datum rapport	: 4-3-2024		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWZ-E07-ZAL
Variëteit	: Egg

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concen-tratie	Norm EU	Norm EU %
PFAS LCMSMS	Perfluor-1-octaansulfonzuur (PFOS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA) Q	µg/kg	0.11	0.7	15.7
PFAS LCMSMS	Perfluor-1-hexaansulfonzuur (PFHxS) Q	µg/kg	<0.1		
PFAS LCMSMS	Som van PFOS, PFOA, PFNA en PFHxS	µg/kg	0.11	1.7	6.5
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA) Q	µg/kg	<0.5		
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-butaansulfonzuur (PFBS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-heptaansulfonzuur (PFHpS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-decaansulfonzuur (PFDS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-dodecaansulfonzuur (PFDoS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-nonaansulfonzuur (PFNS) Q	µg/kg	<0.1		
PFAS LCMSMS	Perfluor-1-pentaansulfonzuur (PFPeS) Q	µg/kg	<0.1		
PFAS LCMSMS	4:2 Fluortelomeersulfonzuur (4:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	6:2 Fluortelomeersulfonzuur (6:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	8:2 Fluortelomeersulfonzuur (8:2FTS) Q	µg/kg	<0.1		
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX) Q	µg/kg	<0.1		

* informatie verkregen van de klant

Norm EU: Het maximumgehalte conform verordening (EG) nr. 2023/915, geconsolideerde versie.

TESTEN RvA L 335

Normec Groen Agro Control is ingeschreven in het register van de Raad voor Accreditatie voor testlaboratoria onder nr. L335 conform ISO/IEC 17025. De met 'Q' gemarkeerde parameters zijn onder accreditatie geanalyseerd. Details over de gebruikte methoden en meetonzekerheid per parameter zijn beschikbaar op aanvraag.
Dit rapport mag zonder schriftelijke toestemming niet anders dan in zijn geheel worden gereproduceerd.

Algemeen directeur

ir. J. de Vriend

PFAS analyses eggs 2022: E02-13a

Analyserapport

Normec Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6435535	Bemonsterd	: niet door GAC
Monstercode	: BPV221019610		
Datum ontvangst	: 19-10-2022		
Startdatum analyse	: 19-10-2022		
Datum rapport	: 28-10-2022		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: Ei- 21TWZ-E02-13A/22TWZ-E02-13a

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

Analyserapport

Normec Groen Agro Control

RESULTATEN RESIDUANALYSES

Methode	Component	Eenheid	Concen-tratie	MRL EU	MRL EU %	ARfD PRIMO NL %
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-tetradecaanzuur	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-butaansulfonaat (PFBS)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-hexaansulfonaat (PFHxS)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-heptaansulfonaat	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-octaansulfonaat (PFOS)	µg/kg	0.11			
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-decaansulfonaat (PFDS)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-octadecaanzuur (PFODA)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-dodecaansulfonaat	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-n-hexadecaanzuur	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-nonaansulfonaat (PFNS)	µg/kg	<0.1			
PFAS LCMSMS	Perfluor-1-pentaansulfonaat	µg/kg	<0.1			
PFAS LCMSMS	Perfluorhexaansulfonaat (4:2FTS)	µg/kg	<0.1			
PFAS LCMSMS	Perfluoroctaansulfonaat (6:2FTS)	µg/kg	<0.1			
PFAS LCMSMS	Perfluordecaansulfonaat (8:2FTS)	µg/kg	<0.1			
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur	µg/kg	<0.1			
Aantal componenten: 1						

* informatie verkregen van de klant

Algemeen directeur

ir. J. de Vriend

Normec Groen Agro Control | Distributieweg 1, 2645 EG Delfgauw | Nederland | T +31 (0)15 2572 511 | E info@agrocontrol.nl

PFAS analyses eggs 2023: E15-MU

Analysecertificaat

Normec Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6589004	Bemonsterd	: niet door NGAC
Monstercode	: BPV231024681		
Datum ontvangst	: 24-10-2023		
Startdatum analyse	: 25-10-2023		
Datum rapport	: 2-11-2023		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWZ-E15-MU (B) (68 g)
Variëteit	: Eieren eiwit + eigeel

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concen-tratie
PFAS LCMSMS	Perfluor-1-octaansulfonaat (PFOS) Q	µg/kg	4.4
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA) Q	µg/kg	0.29
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA) Q	µg/kg	0.81
PFAS LCMSMS	Perfluor-1-hexaansulfonaat (PFHxS) Q	µg/kg	<0.1
PFAS LCMSMS	Som van PFOS, PFOA, PFNA en PFHxS	µg/kg	5.5
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA) Q	µg/kg	<0.5
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA) Q	µg/kg	0.82
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA) Q	µg/kg	0.83
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA) Q	µg/kg	1.0
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA) Q	µg/kg	0.74
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA) Q	µg/kg	0.60
PFAS LCMSMS	Perfluor-1-butaansulfonaat (PFBS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-heptaansulfonaat (PFHpS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-decaansulfonaat (PFDS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-dodecaansulfonaat (PFDoS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-nonaansulfonaat (PFNS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluor-1-pentaansulfonaat (PFPeS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluorhexaansulfonaat (4:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluoroctaansulfonaat (6:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Perfluordecaansulfonaat (8:2FTS) Q	µg/kg	<0.1
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX) Q	µg/kg	<0.1

* informatie verkregen van de klant

TESTEN RvA L 335

Normec Groen Agro Control is ingeschreven in het register van de Raad voor Accreditatie voor testlaboratoria onder nr. L335 conform ISO/IEC 17025. De met 'Q' gemarkeerde parameters zijn onder accreditatie geanalyseerd. Details over de gebruikte methoden en meetonzekerheid per parameter zijn beschikbaar op aanvraag.
Dit rapport mag zonder schriftelijke toestemming niet anders dan in zijn geheel worden gereproduceerd.

Algemeen directeur

ir. J. de Vriend

Mos analyses PFAS

2022 - 2023

PFAS mosses (2022): MOS-01-C1

Analyserapport

Normec Groen Agro Control

KLANT

Klantnaam	:	ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	:	11492
Klantlocatie*	:	ToxicoWatch Consultancy

RAPPORT

Rapportnummer	:	C6435544	Bemonsterd	: niet door GAC
Monstercode	:	BPG221019612		
Datum ontvangst	:	19-10-2022		
Startdatum analyse	:	19-10-2022		
Datum rapport	:	28-10-2022		
Gebruikte methoden	:			

MONSTER*

Omschrijving : Mos- 22TWZ-MOS-01-C1b

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

Analyserapport

Normec Groen Agro Control

RESULTATEN RESIDUANALYSES

Methode	Component	Eenheid	Concen-tratie	MRL EU	MRL EU %	ARfD PRIMO NL %
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-tetradecaanzuur	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-butaansulfonaat (PFBS)	µg/kg	2.7			
PFAS LCMSMS	Perfluor-1-hexaansulfonaat (PFHxS)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-heptaansulfonaat	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-octaansulfonaat (PFOS)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-decaansulfonaat (PFDS)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-octadecaanzuur (PFODA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-dodecaansulfonaat	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-hexadecaanzuur	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-nonaansulfonaat (PFNS)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-pentaansulfonaat	µg/kg	<0.5			
PFAS LCMSMS	Perfluorhexaansulfonaat (4:2FTS)	µg/kg	<0.5			
PFAS LCMSMS	Perfluoroctaansulfonaat (6:2FTS)	µg/kg	<0.5			
PFAS LCMSMS	Perfluordecaansulfonaat (8:2FTS)	µg/kg	<0.5			
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur	µg/kg	<0.5			
Aantal componenten: 1						

* informatie verkregen van de klant

Algemeen directeur

ir. J. de Vriend

Normec Groen Agro Control | Distributieweg 1, 2645 EG Delfgauw | Nederland | T +31 (0)15 2572 511 | E info@agrocontrol.nl

PFAS mosses (2022): MOS-04-D

Analyserapport

Normec Groen Agro Control

KLANT

Klantnaam : ToxicoWatch Consultancy
Abraham Kuyperstraat 6
8862 VS HARLINGEN
Klantnummer : 11492
Klantlocatie* : ToxicoWatch Consultancy

RAPPORT

Rapportnummer : C6435545
Monstercode : BPG221019613
Datum ontvangst : 19-10-2022
Startdatum analyse : 19-10-2022
Datum rapport : 28-10-2022
Gebruikte methoden :
Bemonsterd : niet door GAC

MONSTER*

Omschrijving : Mos - 22TWZ-MOS-04-D
De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

Methode	Component	Eenheid	Concentratie	MRL EU	MRL EU %	ARfD PRIMO NL %
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-tetradecaanzuur	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-butaansulfonaat (PFBS)	µg/kg	1.7			
PFAS LCMSMS	Perfluor-1-hexaansulfonaat (PFHxS)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-heptaansulfonaat	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-octaansulfonaat (PFOS)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-decaansulfonaat (PFDS)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-octadecaanzuur (PFODA)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-dodecaansulfonaat	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-n-hexadecaanzuur	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-nonaansulfonaat (PFNS)	µg/kg	<0.5			
PFAS LCMSMS	Perfluor-1-pentaansulfonaat	µg/kg	<0.5			
PFAS LCMSMS	Perfluorhexaansulfonaat (4:2FTS)	µg/kg	<0.5			
PFAS LCMSMS	Perfluoroctaansulfonaat (6:2FTS)	µg/kg	<0.5			
PFAS LCMSMS	Perfluordecaansulfonaat (8:2FTS)	µg/kg	<0.5			
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur	µg/kg	<0.5			
Aantal componenten: 1						

* informatie verkregen van de klant

Algemeen directeur

ir. J. de Vriend

Normec Groen Agro Control | Distributieweg 1, 2645 EG Delfgauw | Nederland | T +31 (0)15 2572 511 | E info@agrocontrol.nl

PFAS Mosses (2023): MOS-01-C1

Analysecertificaat

Normec Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6588999	Bemonsterd	: niet door NGAC
Monstercode	: BPG231024672		
Datum ontvangst	: 24-10-2023		
Startdatum analyse	: 25-10-2023		
Datum rapport	: 2-11-2023		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWZ-MOS-01-C1-b (63 g)
Variëteit	: Mos

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concentratie
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA)	µg/kg DS	<0.5
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-butaansulfonaat (PFBS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-hexaansulfonaat (PFHxS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-heptaansulfonaat (PFHpS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-octaansulfonaat (PFOS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-decaansulfonaat (PFDS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-dodecaansulfonaat (PFDoS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-nonaansulfonaat (PFNS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-pentaansulfonaat (PFPeS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluorhexaansulfonaat (4:2FTS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluoroctaansulfonaat (6:2FTS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluordecaansulfonaat (8:2FTS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX) Q	µg/kg DS	<0.1

* informatie verkregen van de klant

TESTEN RvA L 335

Normec Groen Agro Control is ingeschreven in het register van de Raad voor Accreditatie voor testlaboratoria onder nr. L335 conform ISO/IEC 17025. De met 'Q' gemarkeerde parameters zijn onder accreditatie geanalyseerd. Details over de gebruikte methoden en meetonzekerheid per parameter zijn beschikbaar op aanvraag.
Dit rapport mag zonder schriftelijke toestemming niet anders dan in zijn geheel worden gereproduceerd.

Algemeen directeur

ir. J. de Vriend

PFAS Mosses (2023): MOS-04-D

Analysecertificaat

Normec Groen Agro Control

KLANT

Klantnaam	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	: 11492
Klantlocatie*	: ToxicoWatch Consultancy

RAPPORT

Rapportnummer	: C6589000	Bemonsterd	: niet door NGAC
Monstercode	: BPG231024674		
Datum ontvangst	: 24-10-2023		
Startdatum analyse	: 25-10-2023		
Datum rapport	: 2-11-2023		
Gebruikte methoden	: PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving	: 23TWZ-MOS-04-D-b (47 g)
Variëteit	: Mos

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

RESULTATEN

Methode	Component	Eenheid	Concentratie
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA)	µg/kg DS	<0.5
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-tetradecaanzuur (PFTeDA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-butaansulfonaat (PFBS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-hexaansulfonaat (PFHxS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-heptaansulfonaat (PFHpS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-octaansulfonaat (PFOS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-decaansulfonaat (PFDS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-dodecaansulfonaat (PFDoS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-nonaansulfonaat (PFNS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluor-1-pentaansulfonaat (PFPeS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluorhexaansulfonaat (4:2FTS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluoroctaansulfonaat (6:2FTS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Perfluordecaansulfonaat (8:2FTS) Q	µg/kg DS	<0.1
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur (HFPO-DA of GenX) Q	µg/kg DS	<0.1

* informatie verkregen van de klant

Algemeen directeur

ir. J. de Vriend

Normec Groen Agro Control | Distributieweg 1, 2645 EG Delfgauw | Nederland | T +31 (0)15 2572 511 | E info.agro@normecgroup.com

PAH mosses: 2023 MOS-01-C1

Analysis certificate

Normec Groen Agro Control

CUSTOMER

Customer name	:	ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Customer no.	:	11492
Customer location*	:	ToxicoWatch Consultancy

REPORT

Report code	:	C6589309	Sampled by	: not by NGAC
Sample code	:	UOD231024673		
Date of receipt	:	24-10-2023		
Analysis start date	:	25-10-2023		
Report date	:	3-11-2023		

SAMPLE*

Description	:	23TWZ-MOS-01-C1 *
Variety	:	Mos

The results in the report apply to the investigated sample as received.

PAHs 4 analysis	Results	Unit	Method
Benz(a)anthracene	4,7	µg/kg	HPLC-FLD
Chrysene	14,1	µg/kg	
Benzo(b)fluoranthene	15,7	µg/kg	
Benzo(a)pyrene	8,7	µg/kg	
Sum PAH 4	43,2	µg/kg	

* information provided by customer

Disclaimer

The analysis on this sample have been outsourced.

General manager

ir. J. de Vriend

Normec Groen Agro Control | Distributieweg 1, 2645 EG Delfgauw | Netherlands | T +31 (0)15 2572 511 | E info.agro@normecgroup.com

PAH mosses: 2023 MOS-04-D

Analysis certificate

Normec Groen Agro Control

CUSTOMER

Customer name	: ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Customer no.	: 11492
Customer location*	: ToxicoWatch Consultancy

REPORT

Report code	: C6589310	Sampled by	: not by NGAC
Sample code	: UOD231024675		
Date of receipt	: 24-10-2023		
Analysis start date	: 25-10-2023		
Report date	: 3-11-2023		

SAMPLE*

Description	: 23TWZ-MOS-04-D*
Variety	: Mos

The results in the report apply to the investigated sample as received.

PAHs 4 analysis	Results	Unit	Method
Benz(a)anthracene	<1,0	µg/kg	HPLC-FLD
Chrysene	<1,0	µg/kg	
Benzo(b)fluoranthene	1,2	µg/kg	
Benzo(a)pyrene	<1,0	µg/kg	
Sum PAH 4	1,2	µg/kg	

* information provided by customer

Disclaimer

The analysis on this sample have been outsourced.

General manager

ir. J. de Vriend

Normec Groen Agro Control | Distributieweg 1, 2645 EG Delfgauw | Netherlands | T +31 (0)15 2572 511 | E info.agro@normecgroup.com
Terms of delivery are deposited at the Chamber of Commerce Haaglanden, nr. 27294457.

PFAS analyse PAD water stream 2022

Analyserapport

Normec Groen Agro Control

KLANT

Klantnaam	:	ToxicoWatch Consultancy Abraham Kuyperstraat 6 8862 VS HARLINGEN
Klantnummer	:	11492
Klantlocatie*	:	ToxicoWatch Consultancy

RAPPORT

Rapportnummer	:	C6435536	Bemonsterd	: niet door GAC
Monstercode	:	BPW221019611		
Datum ontvangst	:	19-10-2022		
Startdatum analyse	:	19-10-2022		
Datum rapport	:	28-10-2022		
Gebruikte methoden	:	PFAS LCMSMS (A195, eigen methode)		

MONSTER*

Omschrijving : Pad/water- 22TWZ-PAD-06

De resultaten in het rapport zijn van toepassing op het onderzochte monster, zoals deze is ontvangen.

Analyserapport

Normec Groen Agro Control

RESULTATEN RESIDUANALYSES

Methode	Component	Eenheid	Concen-tratie	MRL EU	MRL EU %
PFAS LCMSMS	Perfluor-n-butaanzuur (PFBA)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-n-pentaanzuur (PFPeA)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-n-hexaanzuur (PFHxA)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-n-heptaanzuur (PFHpA)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-n-nonaanzuur (PFNA)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-n-decaanzuur (PFDA)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-n-undecaanzuur (PFUnDA)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-n-dodecaanzuur (PFDoA)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-n-tridecaanzuur (PFTrDA)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-n-tetradecaanzuur	µg/l	<0.1		
PFAS LCMSMS	Perfluor-1-butaansulfonaat (PFBS)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-1-hexaansulfonaat (PFHxS)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-1-heptaansulfonaat	µg/l	<0.1		
PFAS LCMSMS	Perfluor-1-octaansulfonaat (PFOS)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-n-octaanzuur (PFOA)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-1-decaansulfonaat (PFDS)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-n-octadecaanzuur (PFODA)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-1-dodecaansulfonaat	µg/l	<0.1		
PFAS LCMSMS	Perfluor-n-hexadecaanzuur	µg/l	<0.1		
PFAS LCMSMS	Perfluor-1-nonaansulfonaat (PFNS)	µg/l	<0.1		
PFAS LCMSMS	Perfluor-1-pentaansulfonaat	µg/l	<0.1		
PFAS LCMSMS	Perfluorhexaansulfonaat (4:2FTS)	µg/l	<0.1		
PFAS LCMSMS	Perfluoroctaansulfonaat (6:2FTS)	µg/l	<0.1		
PFAS LCMSMS	Perfluordecaansulfonaat (8:2FTS)	µg/l	<0.1		
PFAS LCMSMS	Hexafluorpropyleenoxide dimeer zuur	µg/l	<0.1		
Aantal componenten: 0					

* informatie verkregen van de klant