

PROFICIENCY TESTING

Evaluation Report

Scheduled Study**LPTP19-S1**

Study Type

RCRA_UST

Open Date

2019-01-30

Close Date

2019-03-15

Report Generated

2019-05-21

Laboratory

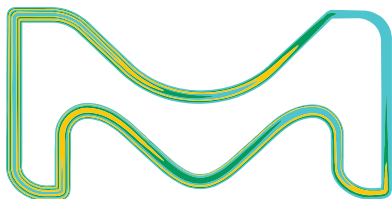
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US EPA Lab Code

MN00064



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Accreditors

Evaluations of this study will be sent to the accreditor(s) listed below. If any of the information listed below is not correct, please contact Sigma-Aldrich RTC immediately.

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**Summary Results for LPTP19-S1
SPE003-40G BNAs in Soil - PT
LRAC1365**

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 8270C (1996) 10185805				
Base/Neutrals				
1,2-Dichlorobenzene ^{1,2} 4610 Analyst: AT1 Analysis Date: 2019-02-21	2050 ug/Kg	3170 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2786, d:81.9879</i>	274 - 6060 ug/Kg	-1.2 Acceptable
1,3-Dichlorobenzene ^{1,2} 4615 Analyst: AT1 Analysis Date: 2019-02-21	1070 ug/Kg	1730 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.3292, d:69.8039</i>	0 - 3660 ug/Kg	-1.0 Acceptable
1,4-Dichlorobenzene ^{1,2} 4620 Analyst: AT1 Analysis Date: 2019-02-21	1280 ug/Kg	2100 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.3249, d:28.1719</i>	0 - 4240 ug/Kg	-1.2 Acceptable
2,2'-Oxybis(1-Chloropropane) ^{1,2} 4659 Analyst: AT1 Analysis Date: 2019-02-21	4110 µg/Kg	5930 µg/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	2370 - 9490 µg/Kg	-1.5 Acceptable
Hexachlorobutadiene ^{1,2} 4835 Analyst: AT1 Analysis Date: 2019-02-21	1900 ug/Kg	2770 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2252, d:61.2677</i>	716 - 4830 ug/Kg	-1.3 Acceptable
Hexachloroethane ^{1,2} 4840 Analyst: AT1 Analysis Date: 2019-02-21	3860 ug/Kg	6900 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.3365, d:0.7453</i>	0 - 13900 ug/Kg	-1.3 Acceptable
Naphthalene ^{1,2} 5005 Analyst: AT1 Analysis Date: 2019-02-21	4040 ug/Kg	5720 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2408, d:35.4651</i>	1480 - 9960 ug/Kg	-1.2 Acceptable
Nitrobenzene ^{1,2} 5015 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
1,2,4-Trichlorobenzene ^{1,2} 5155 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Acenaphthene ^{1,2} 5500 Analyst: AT1 Analysis Date: 2019-02-21	5520 ug/Kg	6190 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1967, d:2.4526</i>	2530 - 9850 ug/Kg	-0.5 Acceptable
Acenaphthylene ^{1,2} 5505 Analyst: AT1 Analysis Date: 2019-02-21	1470 ug/Kg	1670 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2110, d:0.8053</i>	612 - 2730 ug/Kg	-0.6 Acceptable
Anthracene ^{1,2} 5555 Analyst: AT1 Analysis Date: 2019-02-21	2440 ug/Kg	2760 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1677, d:68.9191</i>	1160 - 4360 ug/Kg	-0.6 Acceptable
Benzo(a)anthracene ^{1,2} 5575 Analyst: AT1 Analysis Date: 2019-02-21	1690 ug/Kg	2160 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1671, d:20.6877</i>	1020 - 3310 ug/Kg	-1.2 Acceptable
Benzo(a)pyrene ^{1,2} 5580 Analyst: AT1 Analysis Date: 2019-02-21	3640 ug/Kg	4590 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1801, d:66.9233</i>	1910 - 7270 ug/Kg	-1.1 Acceptable
Benzo(b)fluoranthene ^{1,2} 5585 Analyst: AT1 Analysis Date: 2019-02-21	3230 ug/Kg	4000 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1929, d:23.6955</i>	1610 - 6390 ug/Kg	-1.0 Acceptable
Benzo(g,h,i)perylene ^{1,2} 5590 Analyst: AT1 Analysis Date: 2019-02-21	1530 ug/Kg	1970 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1958, d:26.7399</i>	733 - 3210 ug/Kg	-1.1 Acceptable
Benzo(k)fluoranthene ^{1,2} 5600 Analyst: AT1 Analysis Date: 2019-02-21	1270 ug/Kg	1410 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1966, d:5.3583</i>	560 - 2250 ug/Kg	-0.5 Acceptable
4-Bromophenyl phenyl ether ^{1,2} 5660 Analyst: AT1 Analysis Date: 2019-02-21	3830 ug/Kg	4220 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1949, d:25.3431</i>	1680 - 6760 ug/Kg	-0.5 Acceptable
Butyl benzyl phthalate ^{1,2} 5670 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
4-Chloro-3-methylphenol ^{1,2} 5700 Analyst: AT1 Analysis Date: 2019-02-21	4370 ug/Kg	4730 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1989, d:52.6198</i>	1750 - 7700 ug/Kg	-0.4 Acceptable
bis(2-Chloroethoxy)methane ^{1,2} 5760 Analyst: AT1 Analysis Date: 2019-02-21	2170 ug/Kg	2990 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1953, d:88.5249</i>	974 - 5010 ug/Kg	-1.2 Acceptable
bis(2-Chloroethyl) ether ^{1,2} 5765 Analyst: AT1 Analysis Date: 2019-02-21	3890 ug/Kg	5570 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2158, d:173.8570</i>	1440 - 9690 ug/Kg	-1.2 Acceptable
2-Chloronaphthalene ^{1,2} 5795 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
2-Chlorophenol ^{1,2} 5800 Analyst: AT1 Analysis Date: 2019-02-21	3920 ug/Kg	6320 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2418, d:15.4376</i>	1690 - 10900 ug/Kg	-1.6 Acceptable
4-Chlorophenyl phenylether ^{1,2} 5825 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Chrysene ^{1,2} 5855 Analyst: AT1 Analysis Date: 2019-02-21	4410 ug/Kg	5510 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1626, d:29.1501</i>	2730 - 8280 ug/Kg	-1.2 Acceptable
Dibenzo(a,h)anthracene ^{1,2} 5895 Analyst: AT1 Analysis Date: 2019-02-21	1530 ug/Kg	1920 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1868, d:81.9994</i>	596 - 3240 ug/Kg	-0.9 Acceptable
Dibenzofuran ^{1,2} 5905 Analyst: AT1 Analysis Date: 2019-02-21	4240 ug/Kg	4630 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1772, d:34.8698</i>	2060 - 7190 ug/Kg	-0.5 Acceptable
Di-n-butyl phthalate ^{1,2} 5925 Analyst: AT1 Analysis Date: 2019-02-21	1600 ug/Kg	1770 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2232, d:24.5306</i>	510 - 3020 ug/Kg	-0.4 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,4-Dichlorophenol ^{1,2} 6000 Analyst: AT1 Analysis Date: 2019-02-21	2300 ug/Kg	3020 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2092, d:70.7176</i>	912 - 5120 ug/Kg	-1.0 Acceptable
bis(2-Ethylhexyl) phthalate (DEHP) ^{1,2} 6065 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Diethyl phthalate ^{1,2} 6070 Analyst: AT1 Analysis Date: 2019-02-21	5040 ug/Kg	5200 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1952, d:14.2186</i>	2110 - 8290 ug/Kg	-0.2 Acceptable
Dimethyl phthalate ^{1,2} 6135 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
2,4-Dinitrotoluene (2,4-DNT) ^{1,2} 6185 Analyst: AT1 Analysis Date: 2019-02-21	2170 ug/Kg	2520 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1901, d:59.3569</i>	904 - 4130 ug/Kg	-0.6 Acceptable
2,6-Dinitrotoluene (2,6-DNT) ^{1,2} 6190 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Di-n-octyl phthalate ^{1,2} 6200 Analyst: AT1 Analysis Date: 2019-02-21	2330 ug/Kg	3010 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2306, d:52.0201</i>	773 - 5250 ug/Kg	-0.9 Acceptable
Fluoranthene ^{1,2} 6265 Analyst: AT1 Analysis Date: 2019-02-21	5560 ug/Kg	6360 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1909, d:27.4902</i>	2630 - 10100 ug/Kg	-0.6 Acceptable
Fluorene ^{1,2} 6270 Analyst: AT1 Analysis Date: 2019-02-21	4730 ug/Kg	5000 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1714, d:57.1721</i>	2260 - 7750 ug/Kg	-0.3 Acceptable
Hexachlorobenzene ^{1,2} 6275 Analyst: AT1 Analysis Date: 2019-02-21	1790 ug/Kg	2070 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1713, d:4.7899</i>	992 - 3150 ug/Kg	-0.8 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Indeno(1,2,3-cd) pyrene ^{1,2} 6315 Analyst: AT1 Analysis Date: 2019-02-21	1170 ug/Kg	1490 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2577, d:6.0686</i>	320 - 2660 ug/Kg	-0.8 Acceptable
Isophorone ^{1,2} 6320 Analyst: AT1 Analysis Date: 2019-02-21	2230 ug/Kg	2670 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2107, d:52.3126</i>	825 - 4510 ug/Kg	-0.7 Acceptable
2-Methylnaphthalene ^{1,2} 6385 Analyst: AT1 Analysis Date: 2019-02-21	4400 ug/Kg	5280 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2027, d:28.7219</i>	1980 - 8580 ug/Kg	-0.8 Acceptable
2-Methylphenol (o-Cresol) ^{1,2} 6400 Analyst: AT1 Analysis Date: 2019-02-21	2970 ug/Kg	3940 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2419, d:113.6401</i>	741 - 7150 ug/Kg	-0.9 Acceptable
2-Nitrophenol ^{1,2} 6490 Analyst: AT1 Analysis Date: 2019-02-21	1740 ug/Kg	2790 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2513, d:18.3228</i>	632 - 4950 ug/Kg	-1.5 Acceptable
4-Nitrophenol ^{1,2} 6500 Analyst: AT1 Analysis Date: 2019-02-21	3500 ug/Kg	4160 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.3639, d:171.2300</i>	0 - 9220 ug/Kg	-0.4 Acceptable
n-Nitroso-di-n-propylamine ^{1,2} 6545 Analyst: AT1 Analysis Date: 2019-02-21	3610 ug/Kg	4270 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2463, d:5.3389</i>	1100 - 7450 ug/Kg	-0.6 Acceptable
Pentachlorophenol ^{1,2} 6605 Analyst: AT1 Analysis Date: 2019-02-21	2270 ug/Kg	2360 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2714, d:282.8578</i>	0 - 5130 ug/Kg	-0.1 Acceptable
Phenanthrene ^{1,2} 6615 Analyst: AT1 Analysis Date: 2019-02-21	3140 ug/Kg	3370 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1801, d:5.2498</i>	1530 - 5210 ug/Kg	-0.4 Acceptable
Phenol ^{1,2} 6625 Analyst: AT1 Analysis Date: 2019-02-21	1600 ug/Kg	2510 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2381, d:26.3795</i>	637 - 4380 ug/Kg	-1.5 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Pyrene ^{1,2} 6665 Analyst: AT1 Analysis Date: 2019-02-21	5370 ug/Kg	6580 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2025, d:15.1287</i>	2540 - 10600 ug/Kg	-0.9 Acceptable
2,4,5-Trichlorophenol ^{1,2} 6835 Analyst: AT1 Analysis Date: 2019-02-21	1870 ug/Kg	2360 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2309, d:17.6405</i>	674 - 4060 ug/Kg	-0.9 Acceptable
2,4,6-Trichlorophenol ^{1,2} 6840 Analyst: AT1 Analysis Date: 2019-02-21	3420 ug/Kg	4380 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2031, d:72.3886</i>	1500 - 7270 ug/Kg	-1.0 Acceptable
Group Analysis Summary		Acceptable: 52/52	Score: 100% - Acceptable	
BNAs - Solids				
Pyridine ² 5095 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Benzidine ² 5595 Analyst: AT1 Analysis Date: 2019-02-21	<4740 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Benzoic acid ² 5610 Analyst: AT1 Analysis Date: 2019-02-21	<5040 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Benzyl alcohol ² 5630 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Carbazole ² 5680 Analyst: AT1 Analysis Date: 2019-02-21	2910 ug/Kg	3220 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	2650 - 3790 ug/Kg	-1.6 Acceptable
4-Chloroaniline ² 5745 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
3,3'-Dichlorobenzidine ² 5945 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable

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2,4-Dimethylphenol ² 6130 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
2,4-Dinitrophenol ² 6175 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	3350 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	1340 - 5360 ug/Kg	Not Acceptable
Hexachlorocyclopentadiene ² 6285 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	1050 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	419 - 1680 ug/Kg	Not Acceptable
2-Methyl-4,6-dinitrophenol ² 6360 Analyst: AT1 Analysis Date: 2019-02-21	<5040 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
3+4-Methylphenol (m+p-Cresol) ² 6412 Analyst: AT1 Analysis Date: 2019-02-21	2950 ug/Kg	3530 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	2080 - 4980 ug/Kg	-1.2 Acceptable
2-Nitroaniline ² 6460 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
3-Nitroaniline ² 6465 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
4-Nitroaniline ² 6470 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
n-Nitrosodimethylamine ² 6530 Analyst: AT1 Analysis Date: 2019-02-21	2020 ug/Kg	2500 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	0 - 5070 ug/Kg	-0.6 Acceptable
n-Nitrosodiphenylamine ² 6535 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Group Analysis Summary		Acceptable: 15/17		Score: 88% - Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 8270D (2014) 990001451				
Base/Neutrals				
1,2-Dichlorobenzene ^{1,2} 4610 Analyst: AT1 Analysis Date: 2019-02-21	2050 ug/Kg	3170 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2786, d:81.9879</i>	274 - 6060 ug/Kg	-1.2 Acceptable
1,3-Dichlorobenzene ^{1,2} 4615 Analyst: AT1 Analysis Date: 2019-02-21	1070 ug/Kg	1730 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.3292, d:69.8039</i>	0 - 3660 ug/Kg	-1.0 Acceptable
1,4-Dichlorobenzene ^{1,2} 4620 Analyst: AT1 Analysis Date: 2019-02-21	1280 ug/Kg	2100 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.3249, d:28.1719</i>	0 - 4240 ug/Kg	-1.2 Acceptable
2,2'-Oxybis(1-Chloropropane) ^{1,2} 4659 Analyst: AT1 Analysis Date: 2019-02-21	4110 µg/Kg	5930 µg/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	2370 - 9490 µg/Kg	-1.5 Acceptable
Hexachlorobutadiene ^{1,2} 4835 Analyst: AT1 Analysis Date: 2019-02-21	1900 ug/Kg	2770 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2252, d:61.2677</i>	716 - 4830 ug/Kg	-1.3 Acceptable
Hexachloroethane ^{1,2} 4840 Analyst: AT1 Analysis Date: 2019-02-21	3860 ug/Kg	6900 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.3365, d:0.7453</i>	0 - 13900 ug/Kg	-1.3 Acceptable
Naphthalene ^{1,2} 5005 Analyst: AT1 Analysis Date: 2019-02-21	4040 ug/Kg	5720 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2408, d:35.4651</i>	1480 - 9960 ug/Kg	-1.2 Acceptable
Nitrobenzene ^{1,2} 5015 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
1,2,4-Trichlorobenzene ^{1,2} 5155 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Acenaphthene ^{1,2} 5500 Analyst: AT1 Analysis Date: 2019-02-21	5520 ug/Kg	6190 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1967, d:2.4526</i>	2530 - 9850 ug/Kg	-0.5 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Acenaphthylene ^{1,2} 5505 Analyst: AT1 Analysis Date: 2019-02-21	1470 ug/Kg	1670 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2110, d:0.8053</i>	612 - 2730 ug/Kg	-0.6 Acceptable
Anthracene ^{1,2} 5555 Analyst: AT1 Analysis Date: 2019-02-21	2440 ug/Kg	2760 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1677, d:68.9191</i>	1160 - 4360 ug/Kg	-0.6 Acceptable
Benzo(a)anthracene ^{1,2} 5575 Analyst: AT1 Analysis Date: 2019-02-21	1690 ug/Kg	2160 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1671, d:20.6877</i>	1020 - 3310 ug/Kg	-1.2 Acceptable
Benzo(a)pyrene ^{1,2} 5580 Analyst: AT1 Analysis Date: 2019-02-21	3640 ug/Kg	4590 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1801, d:66.9233</i>	1910 - 7270 ug/Kg	-1.1 Acceptable
Benzo(b)fluoranthene ^{1,2} 5585 Analyst: AT1 Analysis Date: 2019-02-21	3230 ug/Kg	4000 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1929, d:23.6955</i>	1610 - 6390 ug/Kg	-1.0 Acceptable
Benzo(g,h,i)perylene ^{1,2} 5590 Analyst: AT1 Analysis Date: 2019-02-21	1530 ug/Kg	1970 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1958, d:26.7399</i>	733 - 3210 ug/Kg	-1.1 Acceptable
Benzo(k)fluoranthene ^{1,2} 5600 Analyst: AT1 Analysis Date: 2019-02-21	1270 ug/Kg	1410 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1966, d:5.3583</i>	560 - 2250 ug/Kg	-0.5 Acceptable
4-Bromophenyl phenyl ether ^{1,2} 5660 Analyst: AT1 Analysis Date: 2019-02-21	3830 ug/Kg	4220 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1949, d:25.3431</i>	1680 - 6760 ug/Kg	-0.5 Acceptable
Butyl benzyl phthalate ^{1,2} 5670 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
4-Chloro-3-methylphenol ^{1,2} 5700 Analyst: AT1 Analysis Date: 2019-02-21	4370 ug/Kg	4730 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1989, d:52.6198</i>	1750 - 7700 ug/Kg	-0.4 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
bis(2-Chloroethoxy)methane ^{1,2} 5760 Analyst: AT1 Analysis Date: 2019-02-21	2170 ug/Kg	2990 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1953, d:88.5249</i>	974 - 5010 ug/Kg	-1.2 Acceptable
bis(2-Chloroethyl) ether ^{1,2} 5765 Analyst: AT1 Analysis Date: 2019-02-21	3890 ug/Kg	5570 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2158, d:173.8570</i>	1440 - 9690 ug/Kg	-1.2 Acceptable
2-Chloronaphthalene ^{1,2} 5795 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
2-Chlorophenol ^{1,2} 5800 Analyst: AT1 Analysis Date: 2019-02-21	3920 ug/Kg	6320 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2418, d:15.4376</i>	1690 - 10900 ug/Kg	-1.6 Acceptable
4-Chlorophenyl phenylether ^{1,2} 5825 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Chrysene ^{1,2} 5855 Analyst: AT1 Analysis Date: 2019-02-21	4410 ug/Kg	5510 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1626, d:29.1501</i>	2730 - 8280 ug/Kg	-1.2 Acceptable
Dibenzo(a,h)anthracene ^{1,2} 5895 Analyst: AT1 Analysis Date: 2019-02-21	1530 ug/Kg	1920 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1868, d:81.9994</i>	596 - 3240 ug/Kg	-0.9 Acceptable
Dibenzofuran ^{1,2} 5905 Analyst: AT1 Analysis Date: 2019-02-21	4240 ug/Kg	4630 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1772, d:34.8698</i>	2060 - 7190 ug/Kg	-0.5 Acceptable
Di-n-butyl phthalate ^{1,2} 5925 Analyst: AT1 Analysis Date: 2019-02-21	1600 ug/Kg	1770 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2232, d:24.5306</i>	510 - 3020 ug/Kg	-0.4 Acceptable
2,4-Dichlorophenol ^{1,2} 6000 Analyst: AT1 Analysis Date: 2019-02-21	2300 ug/Kg	3020 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2092, d:70.7176</i>	912 - 5120 ug/Kg	-1.0 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
bis(2-Ethylhexyl) phthalate (DEHP) ^{1,2} 6065 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Diethyl phthalate ^{1,2} 6070 Analyst: AT1 Analysis Date: 2019-02-21	5040 ug/Kg	5200 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1952, d:14.2186</i>	2110 - 8290 ug/Kg	-0.2 Acceptable
Dimethyl phthalate ^{1,2} 6135 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
2,4-Dinitrotoluene (2,4-DNT) ^{1,2} 6185 Analyst: AT1 Analysis Date: 2019-02-21	2170 ug/Kg	2520 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1901, d:59.3569</i>	904 - 4130 ug/Kg	-0.6 Acceptable
2,6-Dinitrotoluene (2,6-DNT) ^{1,2} 6190 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Di-n-octyl phthalate ^{1,2} 6200 Analyst: AT1 Analysis Date: 2019-02-21	2330 ug/Kg	3010 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2306, d:52.0201</i>	773 - 5250 ug/Kg	-0.9 Acceptable
Fluoranthene ^{1,2} 6265 Analyst: AT1 Analysis Date: 2019-02-21	5560 ug/Kg	6360 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1909, d:27.4902</i>	2630 - 10100 ug/Kg	-0.6 Acceptable
Fluorene ^{1,2} 6270 Analyst: AT1 Analysis Date: 2019-02-21	4730 ug/Kg	5000 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1714, d:57.1721</i>	2260 - 7750 ug/Kg	-0.3 Acceptable
Hexachlorobenzene ^{1,2} 6275 Analyst: AT1 Analysis Date: 2019-02-21	1790 ug/Kg	2070 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1713, d:4.7899</i>	992 - 3150 ug/Kg	-0.8 Acceptable
Indeno(1,2,3-cd) pyrene ^{1,2} 6315 Analyst: AT1 Analysis Date: 2019-02-21	1170 ug/Kg	1490 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2577, d:6.0686</i>	320 - 2660 ug/Kg	-0.8 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Isophorone ^{1,2} 6320 Analyst: AT1 Analysis Date: 2019-02-21	2230 ug/Kg	2670 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2107, d:52.3126</i>	825 - 4510 ug/Kg	-0.7 Acceptable
2-Methylnaphthalene ^{1,2} 6385 Analyst: AT1 Analysis Date: 2019-02-21	4400 ug/Kg	5280 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2027, d:28.7219</i>	1980 - 8580 ug/Kg	-0.8 Acceptable
2-Methylphenol (o-Cresol) ^{1,2} 6400 Analyst: AT1 Analysis Date: 2019-02-21	2970 ug/Kg	3940 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2419, d:113.6401</i>	741 - 7150 ug/Kg	-0.9 Acceptable
2-Nitrophenol ^{1,2} 6490 Analyst: AT1 Analysis Date: 2019-02-21	1740 ug/Kg	2790 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2513, d:18.3228</i>	632 - 4950 ug/Kg	-1.5 Acceptable
4-Nitrophenol ^{1,2} 6500 Analyst: AT1 Analysis Date: 2019-02-21	3500 ug/Kg	4160 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.3639, d:171.2300</i>	0 - 9220 ug/Kg	-0.4 Acceptable
n-Nitroso-di-n-propylamine ^{1,2} 6545 Analyst: AT1 Analysis Date: 2019-02-21	3610 ug/Kg	4270 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2463, d:5.3389</i>	1100 - 7450 ug/Kg	-0.6 Acceptable
Pentachlorophenol ^{1,2} 6605 Analyst: AT1 Analysis Date: 2019-02-21	2270 ug/Kg	2360 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2714, d:282.8578</i>	0 - 5130 ug/Kg	-0.1 Acceptable
Phenanthrene ^{1,2} 6615 Analyst: AT1 Analysis Date: 2019-02-21	3140 ug/Kg	3370 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1801, d:5.2498</i>	1530 - 5210 ug/Kg	-0.4 Acceptable
Phenol ^{1,2} 6625 Analyst: AT1 Analysis Date: 2019-02-21	1600 ug/Kg	2510 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2381, d:26.3795</i>	637 - 4380 ug/Kg	-1.5 Acceptable
Pyrene ^{1,2} 6665 Analyst: AT1 Analysis Date: 2019-02-21	5370 ug/Kg	6580 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2025, d:15.1287</i>	2540 - 10600 ug/Kg	-0.9 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,4,5-Trichlorophenol ^{1,2} 6835 Analyst: AT1 Analysis Date: 2019-02-21	1870 ug/Kg	2360 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2309, d:17.6405</i>	674 - 4060 ug/Kg	-0.9 Acceptable
2,4,6-Trichlorophenol ^{1,2} 6840 Analyst: AT1 Analysis Date: 2019-02-21	3420 ug/Kg	4380 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2031, d:72.3886</i>	1500 - 7270 ug/Kg	-1.0 Acceptable
Group Analysis Summary		Acceptable: 52/52	Score: 100% - Acceptable	
BNAs - Solids				
Pyridine ² 5095 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Benzidine ² 5595 Analyst: AT1 Analysis Date: 2019-02-21	<4740 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Benzoic acid ² 5610 Analyst: AT1 Analysis Date: 2019-02-21	<5040 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Benzyl alcohol ² 5630 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Carbazole ² 5680 Analyst: AT1 Analysis Date: 2019-02-21	2910 ug/Kg	3220 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	2650 - 3790 ug/Kg	-1.6 Acceptable
4-Chloroaniline ² 5745 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
3,3'-Dichlorobenzidine ² 5945 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
2,4-Dimethylphenol ² 6130 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,4-Dinitrophenol ² 6175 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	3350 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	1340 - 5360 ug/Kg	Not Acceptable
Hexachlorocyclopentadiene ² 6285 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	1050 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	419 - 1680 ug/Kg	Not Acceptable
2-Methyl-4,6-dinitrophenol ² 6360 Analyst: AT1 Analysis Date: 2019-02-21	<5040 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
3+4-Methylphenol (m+p-Cresol) ² 6412 Analyst: AT1 Analysis Date: 2019-02-21	2950 ug/Kg	3530 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	2080 - 4980 ug/Kg	-1.2 Acceptable
2-Nitroaniline ² 6460 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
3-Nitroaniline ² 6465 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
4-Nitroaniline ² 6470 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
n-Nitrosodimethylamine ² 6530 Analyst: AT1 Analysis Date: 2019-02-21	2020 ug/Kg	2500 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	0 - 5070 ug/Kg	-0.6 Acceptable
n-Nitrosodiphenylamine ² 6535 Analyst: AT1 Analysis Date: 2019-02-21	<978 ug/Kg	0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Group Analysis Summary		Acceptable: 15/17	Score: 88% - Acceptable	

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**Summary Results for LPTP19-S1
SPE016-10G Dioxin and Furans in Soil - PT
LRAC0625**

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 1613B 10120602				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: SMT Analysis Date: 2019-02-20	757 pg/g	802 pg/g <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	581 - 1020 pg/g	-0.6 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: SMT Analysis Date: 2019-02-20	647 pg/g	658 pg/g <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	570 - 747 pg/g	-0.4 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: SMT Analysis Date: 2019-02-20	341 pg/g	363 pg/g <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	232 - 495 pg/g	-0.5 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: SMT Analysis Date: 2019-02-20	341 pg/g	374 pg/g <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	189 - 558 pg/g	-0.5 Acceptable
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: SMT Analysis Date: 2019-02-20	1400 pg/g	1460 pg/g <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	1130 - 1790 pg/g	-0.5 Acceptable
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: SMT Analysis Date: 2019-02-20	503 pg/g	489 pg/g <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	391 - 587 pg/g	0.4 Acceptable
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: SMT Analysis Date: 2019-02-20	1030 pg/g	983 pg/g <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	768 - 1200 pg/g	0.7 Acceptable
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: SMT Analysis Date: 2019-02-20	1010 pg/g	1060 pg/g <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	734 - 1390 pg/g	-0.5 Acceptable
Hxcdd, total ² 9468 Analyst: SMT Analysis Date: 2019-02-20	2540 pg/g	2520 pg/g <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	2050 - 2990 pg/g	0.1 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: SMT Analysis Date: 2019-02-20	313 pg/g	300 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	230 - 371 pg/g	0.5 Acceptable
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: SMT Analysis Date: 2019-02-20	210 pg/g	209 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	147 - 271 pg/g	0.0 Acceptable
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: SMT Analysis Date: 2019-02-20	595 pg/g	603 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	429 - 777 pg/g	-0.1 Acceptable
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: SMT Analysis Date: 2019-02-20	676 pg/g	703 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	545 - 861 pg/g	-0.5 Acceptable
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: SMT Analysis Date: 2019-02-20	1790 pg/g	1820 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1350 - 2290 pg/g	-0.2 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: SMT Analysis Date: 2019-02-20	108 pg/g	128 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	74.3 - 182 pg/g	-1.1 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: SMT Analysis Date: 2019-02-20	963 pg/g	979 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	589 - 1370 pg/g	-0.1 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: SMT Analysis Date: 2019-02-20	515 pg/g	552 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	415 - 690 pg/g	-0.8 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: SMT Analysis Date: 2019-02-20	411 pg/g	400 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	307 - 494 pg/g	0.3 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: SMT Analysis Date: 2019-02-20	421 pg/g	443 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	338 - 548 pg/g	-0.6 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Pecdf, total ² 9552 Analyst: SMT Analysis Date: 2019-02-20	832 pg/g	850 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	715 - 984 pg/g	-0.4 Acceptable
Pecdd, total ² 9555 Analyst: SMT Analysis Date: 2019-02-20	515 pg/g	553 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	414 - 691 pg/g	-0.8 Acceptable
TCDD, total ² 9609 Analyst: SMT Analysis Date: 2019-02-20	721 pg/g	706 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	468 - 944 pg/g	0.2 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: SMT Analysis Date: 2019-02-20	862 pg/g	823 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	571 - 1080 pg/g	0.5 Acceptable
TCDF, total ² 9615 Analyst: SMT Analysis Date: 2019-02-20	862 pg/g	836 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	631 - 1040 pg/g	0.4 Acceptable
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: SMT Analysis Date: 2019-02-20	721 pg/g	703 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	470 - 936 pg/g	0.2 Acceptable
PCDF, total ² 9657 Analyst: SMT Analysis Date: 2019-02-20	4990 pg/g	5010 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	4120 - 5910 pg/g	-0.1 Acceptable
PCDD, total ² 9660 Analyst: SMT Analysis Date: 2019-02-20	5080 pg/g	4950 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	3540 - 6370 pg/g	0.3 Acceptable
Group Analysis Summary		Acceptable: 27/27		
Score: 100% - Acceptable				
EPA 8280A 10186808				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: SMT Analysis Date: 2019-02-20	642 pg/g	802 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	581 - 1020 pg/g	-2.2 Questionable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: SMT Analysis Date: 2019-02-20	669 pg/g	658 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	570 - 747 pg/g	0.4 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: SMT Analysis Date: 2019-02-20	371 pg/g	363 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	232 - 495 pg/g	0.2 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: SMT Analysis Date: 2019-02-20	371 pg/g	374 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	189 - 558 pg/g	0.0 Acceptable
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: SMT Analysis Date: 2019-02-20	1310 pg/g	1460 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1130 - 1790 pg/g	-1.3 Acceptable
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: SMT Analysis Date: 2019-02-20	521 pg/g	489 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	391 - 587 pg/g	1.0 Acceptable
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: SMT Analysis Date: 2019-02-20	1060 pg/g	983 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	768 - 1200 pg/g	1.1 Acceptable
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: SMT Analysis Date: 2019-02-20	922 pg/g	1060 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	734 - 1390 pg/g	-1.3 Acceptable
Hxcdd, total ² 9468 Analyst: SMT Analysis Date: 2019-02-20	2500 pg/g	2520 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	2050 - 2990 pg/g	-0.1 Acceptable
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: SMT Analysis Date: 2019-02-20	347 pg/g	300 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	230 - 371 pg/g	2.0 Acceptable
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: SMT Analysis Date: 2019-02-20	259 pg/g	209 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	147 - 271 pg/g	2.4 Questionable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: SMT Analysis Date: 2019-02-20	620 pg/g	603 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	429 - 777 pg/g	0.3 Acceptable
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: SMT Analysis Date: 2019-02-20	712 pg/g	703 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	545 - 861 pg/g	0.2 Acceptable
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: SMT Analysis Date: 2019-02-20	2000 pg/g	1820 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1350 - 2290 pg/g	1.2 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: SMT Analysis Date: 2019-02-20	<100 pg/g	128 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	74.3 - 182 pg/g	Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: SMT Analysis Date: 2019-02-20	1000 pg/g	979 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	589 - 1370 pg/g	0.2 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: SMT Analysis Date: 2019-02-20	543 pg/g	552 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	415 - 690 pg/g	-0.2 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: SMT Analysis Date: 2019-02-20	437 pg/g	400 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	307 - 494 pg/g	1.2 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: SMT Analysis Date: 2019-02-20	445 pg/g	443 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	338 - 548 pg/g	0.1 Acceptable
Pecdf, total ² 9552 Analyst: SMT Analysis Date: 2019-02-20	881 pg/g	850 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	715 - 984 pg/g	0.7 Acceptable
Pecdd, total ² 9555 Analyst: SMT Analysis Date: 2019-02-20	543 pg/g	553 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	414 - 691 pg/g	-0.2 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
TCDD, total ² 9609 Analyst: SMT Analysis Date: 2019-02-20	756 pg/g	706 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	468 - 944 pg/g	0.6 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: SMT Analysis Date: 2019-02-20	909 pg/g	823 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	571 - 1080 pg/g	1.0 Acceptable
TCDF, total ² 9615 Analyst: SMT Analysis Date: 2019-02-20	909 pg/g	836 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	631 - 1040 pg/g	1.1 Acceptable
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: SMT Analysis Date: 2019-02-20	756 pg/g	703 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	470 - 936 pg/g	0.7 Acceptable
PCDF, total ² 9657 Analyst: SMT Analysis Date: 2019-02-20	5100 pg/g	5010 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	4120 - 5910 pg/g	0.3 Acceptable
PCDD, total ² 9660 Analyst: SMT Analysis Date: 2019-02-20	5170 pg/g	4950 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	3540 - 6370 pg/g	0.5 Acceptable
Group Analysis Summary		Acceptable: 27/27		
Score: 100% - Acceptable				
EPA 8280B (1998) 10187005				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: SMT Analysis Date: 2019-02-20	642 pg/g	802 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	581 - 1020 pg/g	-2.2 Questionable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: SMT Analysis Date: 2019-02-20	669 pg/g	658 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	570 - 747 pg/g	0.4 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: SMT Analysis Date: 2019-02-20	371 pg/g	363 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	232 - 495 pg/g	0.2 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: SMT Analysis Date: 2019-02-20	371 pg/g	374 pg/g	189 - 558 pg/g	0.0 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: SMT Analysis Date: 2019-02-20	1310 pg/g	1460 pg/g	1130 - 1790 pg/g	-1.3 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: SMT Analysis Date: 2019-02-20	521 pg/g	489 pg/g	391 - 587 pg/g	1.0 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: SMT Analysis Date: 2019-02-20	1060 pg/g	983 pg/g	768 - 1200 pg/g	1.1 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: SMT Analysis Date: 2019-02-20	922 pg/g	1060 pg/g	734 - 1390 pg/g	-1.3 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
Hxcdd, total ² 9468 Analyst: SMT Analysis Date: 2019-02-20	2500 pg/g	2520 pg/g	2050 - 2990 pg/g	-0.1 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: SMT Analysis Date: 2019-02-20	347 pg/g	300 pg/g	230 - 371 pg/g	2.0 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: SMT Analysis Date: 2019-02-20	259 pg/g	209 pg/g	147 - 271 pg/g	2.4 Questionable
Evaluation Criteria – 5* Parameters*: deviations:3				
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: SMT Analysis Date: 2019-02-20	620 pg/g	603 pg/g	429 - 777 pg/g	0.3 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: SMT Analysis Date: 2019-02-20	712 pg/g	703 pg/g	545 - 861 pg/g	0.2 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: SMT Analysis Date: 2019-02-20	2000 pg/g	1820 pg/g	1350 - 2290 pg/g	1.2 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: SMT Analysis Date: 2019-02-20	<100 pg/g	128 pg/g	74.3 - 182 pg/g	Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: SMT Analysis Date: 2019-02-20	1000 pg/g	979 pg/g	589 - 1370 pg/g	0.2 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: SMT Analysis Date: 2019-02-20	543 pg/g	552 pg/g	415 - 690 pg/g	-0.2 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: SMT Analysis Date: 2019-02-20	437 pg/g	400 pg/g	307 - 494 pg/g	1.2 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: SMT Analysis Date: 2019-02-20	445 pg/g	443 pg/g	338 - 548 pg/g	0.1 Acceptable
Pecdf, total ² 9552 Analyst: SMT Analysis Date: 2019-02-20	881 pg/g	850 pg/g	715 - 984 pg/g	0.7 Acceptable
Pecdd, total ² 9555 Analyst: SMT Analysis Date: 2019-02-20	543 pg/g	553 pg/g	414 - 691 pg/g	-0.2 Acceptable
TCDD, total ² 9609 Analyst: SMT Analysis Date: 2019-02-20	756 pg/g	706 pg/g	468 - 944 pg/g	0.6 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: SMT Analysis Date: 2019-02-20	909 pg/g	823 pg/g	571 - 1080 pg/g	1.0 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
TCDF, total ² 9615 Analyst: SMT Analysis Date: 2019-02-20	909 pg/g	836 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	631 - 1040 pg/g	1.1 Acceptable
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: SMT Analysis Date: 2019-02-20	756 pg/g	703 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	470 - 936 pg/g	0.7 Acceptable
PCDF, total ² 9657 Analyst: SMT Analysis Date: 2019-02-20	5100 pg/g	5010 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	4120 - 5910 pg/g	0.3 Acceptable
PCDD, total ² 9660 Analyst: SMT Analysis Date: 2019-02-20	5170 pg/g	4950 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	3540 - 6370 pg/g	0.5 Acceptable
Group Analysis Summary		Acceptable: 27/27	Score: 100% - Acceptable	
EPA 8290 (1994) 10187209				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: SMT Analysis Date: 2019-02-20	757 pg/g	802 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	581 - 1020 pg/g	-0.6 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: SMT Analysis Date: 2019-02-20	647 pg/g	658 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	570 - 747 pg/g	-0.4 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: SMT Analysis Date: 2019-02-20	341 pg/g	363 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	232 - 495 pg/g	-0.5 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: SMT Analysis Date: 2019-02-20	341 pg/g	374 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	189 - 558 pg/g	-0.5 Acceptable
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: SMT Analysis Date: 2019-02-20	1400 pg/g	1460 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1130 - 1790 pg/g	-0.5 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: SMT Analysis Date: 2019-02-20	503 pg/g	489 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	391 - 587 pg/g	0.4 Acceptable
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: SMT Analysis Date: 2019-02-20	1030 pg/g	983 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	768 - 1200 pg/g	0.7 Acceptable
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: SMT Analysis Date: 2019-02-20	1010 pg/g	1060 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	734 - 1390 pg/g	-0.5 Acceptable
Hxcdd, total ² 9468 Analyst: SMT Analysis Date: 2019-02-20	2540 pg/g	2520 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	2050 - 2990 pg/g	0.1 Acceptable
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: SMT Analysis Date: 2019-02-20	313 pg/g	300 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	230 - 371 pg/g	0.5 Acceptable
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: SMT Analysis Date: 2019-02-20	210 pg/g	209 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	147 - 271 pg/g	0.0 Acceptable
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: SMT Analysis Date: 2019-02-20	595 pg/g	603 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	429 - 777 pg/g	-0.1 Acceptable
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: SMT Analysis Date: 2019-02-20	676 pg/g	703 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	545 - 861 pg/g	-0.5 Acceptable
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: SMT Analysis Date: 2019-02-20	1790 pg/g	1820 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1350 - 2290 pg/g	-0.2 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: SMT Analysis Date: 2019-02-20	108 pg/g	128 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	74.3 - 182 pg/g	-1.1 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: SMT Analysis Date: 2019-02-20	963 pg/g	979 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	589 - 1370 pg/g	-0.1 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: SMT Analysis Date: 2019-02-20	515 pg/g	552 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	415 - 690 pg/g	-0.8 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: SMT Analysis Date: 2019-02-20	411 pg/g	400 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	307 - 494 pg/g	0.3 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: SMT Analysis Date: 2019-02-20	421 pg/g	443 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	338 - 548 pg/g	-0.6 Acceptable
Pecdf, total ² 9552 Analyst: SMT Analysis Date: 2019-02-20	832 pg/g	850 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	715 - 984 pg/g	-0.4 Acceptable
Pecdd, total ² 9555 Analyst: SMT Analysis Date: 2019-02-20	515 pg/g	553 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	414 - 691 pg/g	-0.8 Acceptable
TCDD, total ² 9609 Analyst: SMT Analysis Date: 2019-02-20	721 pg/g	706 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	468 - 944 pg/g	0.2 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: SMT Analysis Date: 2019-02-20	862 pg/g	823 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	571 - 1080 pg/g	0.5 Acceptable
TCDF, total ² 9615 Analyst: SMT Analysis Date: 2019-02-20	862 pg/g	836 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	631 - 1040 pg/g	0.4 Acceptable
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: SMT Analysis Date: 2019-02-20	721 pg/g	703 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	470 - 936 pg/g	0.2 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
PCDF, total ² 9657 Analyst: SMT Analysis Date: 2019-02-20	4990 pg/g	5010 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	4120 - 5910 pg/g	-0.1 Acceptable
PCDD, total ² 9660 Analyst: SMT Analysis Date: 2019-02-20	5080 pg/g	4950 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	3540 - 6370 pg/g	0.3 Acceptable
Group Analysis Summary		Acceptable: 27/27	Score: 100% - Acceptable	
EPA 8290A (2007) 10187403				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: SMT Analysis Date: 2019-02-20	757 pg/g	802 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	581 - 1020 pg/g	-0.6 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: SMT Analysis Date: 2019-02-20	647 pg/g	658 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	570 - 747 pg/g	-0.4 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: SMT Analysis Date: 2019-02-20	341 pg/g	363 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	232 - 495 pg/g	-0.5 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: SMT Analysis Date: 2019-02-20	341 pg/g	374 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	189 - 558 pg/g	-0.5 Acceptable
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: SMT Analysis Date: 2019-02-20	1400 pg/g	1460 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1130 - 1790 pg/g	-0.5 Acceptable
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: SMT Analysis Date: 2019-02-20	503 pg/g	489 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	391 - 587 pg/g	0.4 Acceptable
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: SMT Analysis Date: 2019-02-20	1030 pg/g	983 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	768 - 1200 pg/g	0.7 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: SMT Analysis Date: 2019-02-20	1010 pg/g	1060 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	734 - 1390 pg/g	-0.5 Acceptable
Hxcdd, total ² 9468 Analyst: SMT Analysis Date: 2019-02-20	2540 pg/g	2520 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	2050 - 2990 pg/g	0.1 Acceptable
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: SMT Analysis Date: 2019-02-20	313 pg/g	300 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	230 - 371 pg/g	0.5 Acceptable
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: SMT Analysis Date: 2019-02-20	210 pg/g	209 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	147 - 271 pg/g	0.0 Acceptable
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: SMT Analysis Date: 2019-02-20	595 pg/g	603 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	429 - 777 pg/g	-0.1 Acceptable
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: SMT Analysis Date: 2019-02-20	676 pg/g	703 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	545 - 861 pg/g	-0.5 Acceptable
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: SMT Analysis Date: 2019-02-20	1790 pg/g	1820 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1350 - 2290 pg/g	-0.2 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: SMT Analysis Date: 2019-02-20	108 pg/g	128 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	74.3 - 182 pg/g	-1.1 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: SMT Analysis Date: 2019-02-20	963 pg/g	979 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	589 - 1370 pg/g	-0.1 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: SMT Analysis Date: 2019-02-20	515 pg/g	552 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	415 - 690 pg/g	-0.8 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,7,8-Pecdf ² 9543 Analyst: SMT Analysis Date: 2019-02-20	411 pg/g	400 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	307 - 494 pg/g	0.3 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: SMT Analysis Date: 2019-02-20	421 pg/g	443 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	338 - 548 pg/g	-0.6 Acceptable
Pecdf, total ² 9552 Analyst: SMT Analysis Date: 2019-02-20	832 pg/g	850 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	715 - 984 pg/g	-0.4 Acceptable
Pecdd, total ² 9555 Analyst: SMT Analysis Date: 2019-02-20	515 pg/g	553 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	414 - 691 pg/g	-0.8 Acceptable
TCDD, total ² 9609 Analyst: SMT Analysis Date: 2019-02-20	721 pg/g	706 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	468 - 944 pg/g	0.2 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: SMT Analysis Date: 2019-02-20	862 pg/g	823 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	571 - 1080 pg/g	0.5 Acceptable
TCDF, total ² 9615 Analyst: SMT Analysis Date: 2019-02-20	862 pg/g	836 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	631 - 1040 pg/g	0.4 Acceptable
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: SMT Analysis Date: 2019-02-20	721 pg/g	703 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	470 - 936 pg/g	0.2 Acceptable
PCDF, total ² 9657 Analyst: SMT Analysis Date: 2019-02-20	4990 pg/g	5010 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	4120 - 5910 pg/g	-0.1 Acceptable
PCDD, total ² 9660 Analyst: SMT Analysis Date: 2019-02-20	5080 pg/g	4950 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	3540 - 6370 pg/g	0.3 Acceptable
Group Analysis Summary	Acceptable: 27/27		Score: 100% - Acceptable	

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**Summary Results for LPTP19-S1
SPE068-50G PCB Congeners in Soil - PT
LRAC1564**

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 1668A 10129405				
PCBs in Soil				
PCBs, total ² 8870 Analyst: BAL Analysis Date: 2019-02-24	2140 ug/Kg	2270 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	910 - 3640 ug/Kg	-0.3 Acceptable
PCB (20)+(28) ² 8936 Analyst: BAL Analysis Date: 2019-02-24	67.0 ug/Kg	89.6 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	35.8 - 143 ug/Kg	-1.3 Acceptable
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) ² 8955 Analyst: BAL Analysis Date: 2019-02-24	40.8 ug/Kg	43.8 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	17.4 - 70.2 ug/Kg	-0.3 Acceptable
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) ² 8965 Analyst: BAL Analysis Date: 2019-02-24	152 ug/Kg	183 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	96.9 - 269 ug/Kg	-1.1 Acceptable
3,4,4',5-Tetrachlorobiphenyl (PCB 81) ² 8970 Analyst: BAL Analysis Date: 2019-02-24	67.4 ug/Kg	79.6 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	51.2 - 108 ug/Kg	-1.3 Acceptable
PCB (90)+(101)+(113) ² 8982 Analyst: BAL Analysis Date: 2019-02-24	74.1 ug/Kg	77.7 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	31.1 - 124 ug/Kg	-0.2 Acceptable
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) ² 8985 Analyst: BAL Analysis Date: 2019-02-24	63.1 ug/Kg	66.5 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	44.5 - 88.5 ug/Kg	-0.5 Acceptable
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) ² 8995 Analyst: BAL Analysis Date: 2019-02-24	296 ug/Kg	323 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	182 - 463 ug/Kg	-0.6 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) ² 9000 Analyst: BAL Analysis Date: 2019-02-24	81.5 ug/Kg	90.4 ug/Kg	72.0 - 109 ug/Kg	-1.5 Acceptable
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) ² 9005 Analyst: BAL Analysis Date: 2019-02-24	71.6 ug/Kg	79.2 ug/Kg	47.7 - 111 ug/Kg	-0.7 Acceptable
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) ² 9015 Analyst: BAL Analysis Date: 2019-02-24	109 ug/Kg	119 ug/Kg	56.3 - 182 ug/Kg	-0.5 Acceptable
PCB (129)+(138)+(163) ² 9026 Analyst: BAL Analysis Date: 2019-02-24	50.2 ug/Kg	53.0 ug/Kg	21.2 - 84.8 ug/Kg	-0.3 Acceptable
PCB (153)+(168) ² 9041 Analyst: BAL Analysis Date: 2019-02-24	297 ug/Kg	329 ug/Kg	132 - 527 ug/Kg	-0.5 Acceptable
PCB (156)+(157) ² 9046 Analyst: BAL Analysis Date: 2019-02-24	307 ug/Kg	360 ug/Kg	144 - 575 ug/Kg	-0.7 Acceptable
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) ² 9055 Analyst: BAL Analysis Date: 2019-02-24	79.5 ug/Kg	89.3 ug/Kg	59.2 - 119 ug/Kg	-1.0 Acceptable
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) ² 9060 Analyst: BAL Analysis Date: 2019-02-24	182 ug/Kg	195 ug/Kg	127 - 262 ug/Kg	-0.6 Acceptable
PCB (180)+(193) ² 9070 Analyst: BAL Analysis Date: 2019-02-24	113 ug/Kg	122 ug/Kg	49.0 - 196 ug/Kg	-0.4 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) ² 9085 Analyst: BAL Analysis Date: 2019-02-24	80.9 ug/Kg	90.5 ug/Kg	59.7 - 121 ug/Kg	-0.9 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
Group Analysis Summary	Acceptable: 18/18		Score: 100% - Acceptable	
EPA 1668C (2010) 10262109				
PCBs in Soil				
PCBs, total ² 8870 Analyst: BAL Analysis Date: 2019-02-24	2140 ug/Kg	2270 ug/Kg	910 - 3640 ug/Kg	-0.3 Acceptable
Evaluation Criteria – 2* Parameters*: c:0.2, d:0				
PCB (20)+(28) ² 8936 Analyst: BAL Analysis Date: 2019-02-24	67.0 ug/Kg	89.6 ug/Kg	35.8 - 143 ug/Kg	-1.3 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) ² 8955 Analyst: BAL Analysis Date: 2019-02-24	40.8 ug/Kg	43.8 ug/Kg	17.4 - 70.2 ug/Kg	-0.3 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) ² 8965 Analyst: BAL Analysis Date: 2019-02-24	152 ug/Kg	183 ug/Kg	96.9 - 269 ug/Kg	-1.1 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
3,4,4',5-Tetrachlorobiphenyl (PCB 81) ² 8970 Analyst: BAL Analysis Date: 2019-02-24	67.4 ug/Kg	79.6 ug/Kg	51.2 - 108 ug/Kg	-1.3 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
PCB (90)+(101)+(113) ² 8982 Analyst: BAL Analysis Date: 2019-02-24	74.1 ug/Kg	77.7 ug/Kg	31.1 - 124 ug/Kg	-0.2 Acceptable
Evaluation Criteria – 2* Parameters*: c:0.2, d:0				
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) ² 8985 Analyst: BAL Analysis Date: 2019-02-24	63.1 ug/Kg	66.5 ug/Kg	44.5 - 88.5 ug/Kg	-0.5 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) ² 8995 Analyst: BAL Analysis Date: 2019-02-24	296 ug/Kg	323 ug/Kg	182 - 463 ug/Kg	-0.6 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) ² 9000 Analyst: BAL Analysis Date: 2019-02-24	81.5 ug/Kg	90.4 ug/Kg	72.0 - 109 ug/Kg	-1.5 Acceptable
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) ² 9005 Analyst: BAL Analysis Date: 2019-02-24	71.6 ug/Kg	79.2 ug/Kg	47.7 - 111 ug/Kg	-0.7 Acceptable
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) ² 9015 Analyst: BAL Analysis Date: 2019-02-24	109 ug/Kg	119 ug/Kg	56.3 - 182 ug/Kg	-0.5 Acceptable
PCB (129)+(138)+(163) ² 9026 Analyst: BAL Analysis Date: 2019-02-24	50.2 ug/Kg	53.0 ug/Kg	21.2 - 84.8 ug/Kg	-0.3 Acceptable
PCB (153)+(168) ² 9041 Analyst: BAL Analysis Date: 2019-02-24	297 ug/Kg	329 ug/Kg	132 - 527 ug/Kg	-0.5 Acceptable
PCB (156)+(157) ² 9046 Analyst: BAL Analysis Date: 2019-02-24	307 ug/Kg	360 ug/Kg	144 - 575 ug/Kg	-0.7 Acceptable
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) ² 9055 Analyst: BAL Analysis Date: 2019-02-24	79.5 ug/Kg	89.3 ug/Kg	59.2 - 119 ug/Kg	-1.0 Acceptable
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) ² 9060 Analyst: BAL Analysis Date: 2019-02-24	182 ug/Kg	195 ug/Kg	127 - 262 ug/Kg	-0.6 Acceptable
PCB (180)+(193) ² 9070 Analyst: BAL Analysis Date: 2019-02-24	113 ug/Kg	122 ug/Kg	49.0 - 196 ug/Kg	-0.4 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) ² 9085 Analyst: BAL Analysis Date: 2019-02-24	80.9 ug/Kg	90.5 ug/Kg	59.7 - 121 ug/Kg	-0.9 Acceptable
Group Analysis Summary		Acceptable: 18/18	Score: 100% - Acceptable	

Evaluation Criteria – 5*
Parameters*: deviations:3

* Study mean from the latest scheduled study within this scheme. If no study mean is available, this is indicated by "---".

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**Summary Results for LPTP19-S1
SPE006-225G TCLP Metals CA - WET in Soil - PT
LRAB5592**

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
CA WET 990000399				
TCLP - CA WET				
Antimony, Sb ² 1005 Analyst: IP Analysis Date: 2019-02-26	<0.20 mg/L	0.450 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	0 - 1.67 mg/L	Acceptable
Arsenic, As ² 1010 Analyst: IP Analysis Date: 2019-02-26	93.6 mg/L	91.2 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	66.9 - 116 mg/L	0.3 Acceptable
Barium, Ba ² 1015 Analyst: IP Analysis Date: 2019-02-26	54.4 mg/L	54.8 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	42.4 - 67.2 mg/L	-0.1 Acceptable
Beryllium, Be ² 1020 Analyst: IP Analysis Date: 2019-02-26	<0.050 mg/L	0 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>		Acceptable
Cadmium, Cd ² 1030 Analyst: IP Analysis Date: 2019-02-26	102 mg/L	99.3 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	69.6 - 129 mg/L	0.3 Acceptable
Chromium, Cr (total) ² 1040 Analyst: IP Analysis Date: 2019-02-26	21.1 mg/L	20.2 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	12.6 - 27.8 mg/L	0.4 Acceptable
Cobalt, Co ² 1050 Analyst: IP Analysis Date: 2019-02-26	11.9 mg/L	12.1 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	9.52 - 14.7 mg/L	-0.2 Acceptable
Copper, Cu ² 1055 Analyst: IP Analysis Date: 2019-02-26	0.324 mg/L	0.400 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	0 - 1.60 mg/L	-0.2 Acceptable
Lead, Pb ² 1075 Analyst: IP Analysis Date: 2019-02-26	115 mg/L	113 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	71.5 - 155 mg/L	0.1 Acceptable

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² ISO 17043 Accredited, covered by Sigma-Aldrich RTC's ANAB Proficiency Testing Provider accreditation, Cert AP-1469

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Molybdenum, Mo ² 1100 Analyst: IP Analysis Date: 2019-02-26	<0.15 mg/L	0.150 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	0 - 1.24 mg/L	Acceptable
Nickel, Ni ² 1105 Analyst: IP Analysis Date: 2019-02-26	<0.20 mg/L	0.250 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	0 - 1.38 mg/L	Acceptable
Selenium, Se ² 1140 Analyst: IP Analysis Date: 2019-02-26	81.6 mg/L	74.0 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	43.0 - 105 mg/L	0.7 Acceptable
Silver, Ag ² 1150 Analyst: IP Analysis Date: 2019-02-26	0.115 mg/L	0.108 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	0 - 1.18 mg/L	0.0 Acceptable
Thallium, Tl ² 1165 Analyst: IP Analysis Date: 2019-02-26	52.5 mg/L	51.3 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	37.4 - 65.1 mg/L	0.3 Acceptable
Vanadium, V ² 1185 Analyst: IP Analysis Date: 2019-02-26	46.2 mg/L	45.5 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	33.2 - 57.8 mg/L	0.2 Acceptable
Zinc, Zn ² 1190 Analyst: IP Analysis Date: 2019-02-26	<0.20 mg/L	0.0500 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	0 - 1.09 mg/L	Acceptable
Group Analysis Summary	Acceptable: 16/16		Score: 100% - Acceptable	

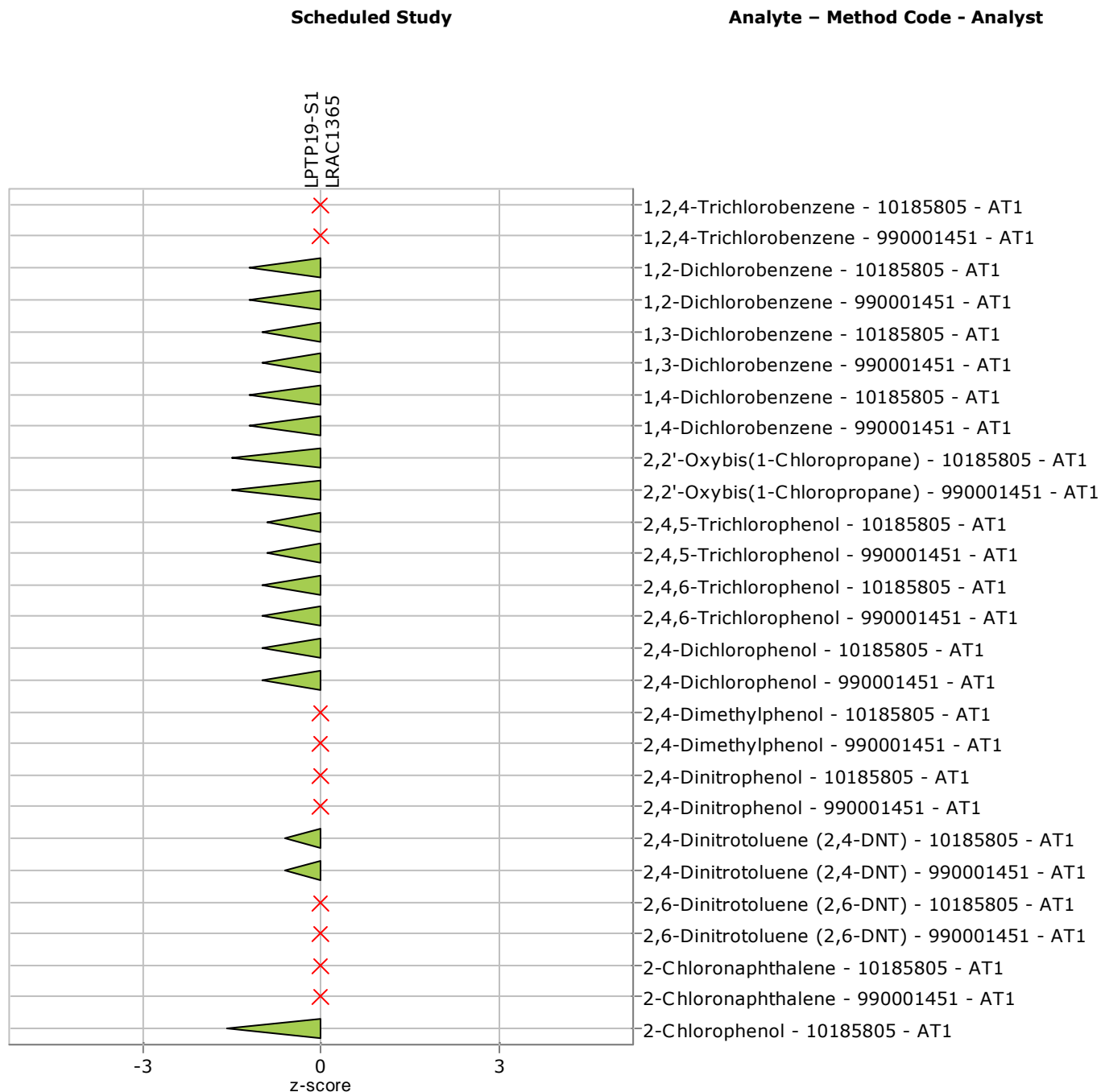
* Study mean from the latest scheduled study within this scheme. If no study mean is available, this is indicated by "---".

** Due to the size of this data set and lack of verified gravimetric value, this evaluation is provided for informational purposes only.

¹ NELAC Compliant, covered by Sigma-Aldrich RTC's ANAB Proficiency Testing Provider accreditation, Cert. AP-1469² ISO 17043 Accredited, covered by Sigma-Aldrich RTC's ANAB Proficiency Testing Provider accreditation, Cert AP-1469

Graphical z-score Overview for LPTP19-S1 SPE003-40G BNAs in Soil - PT

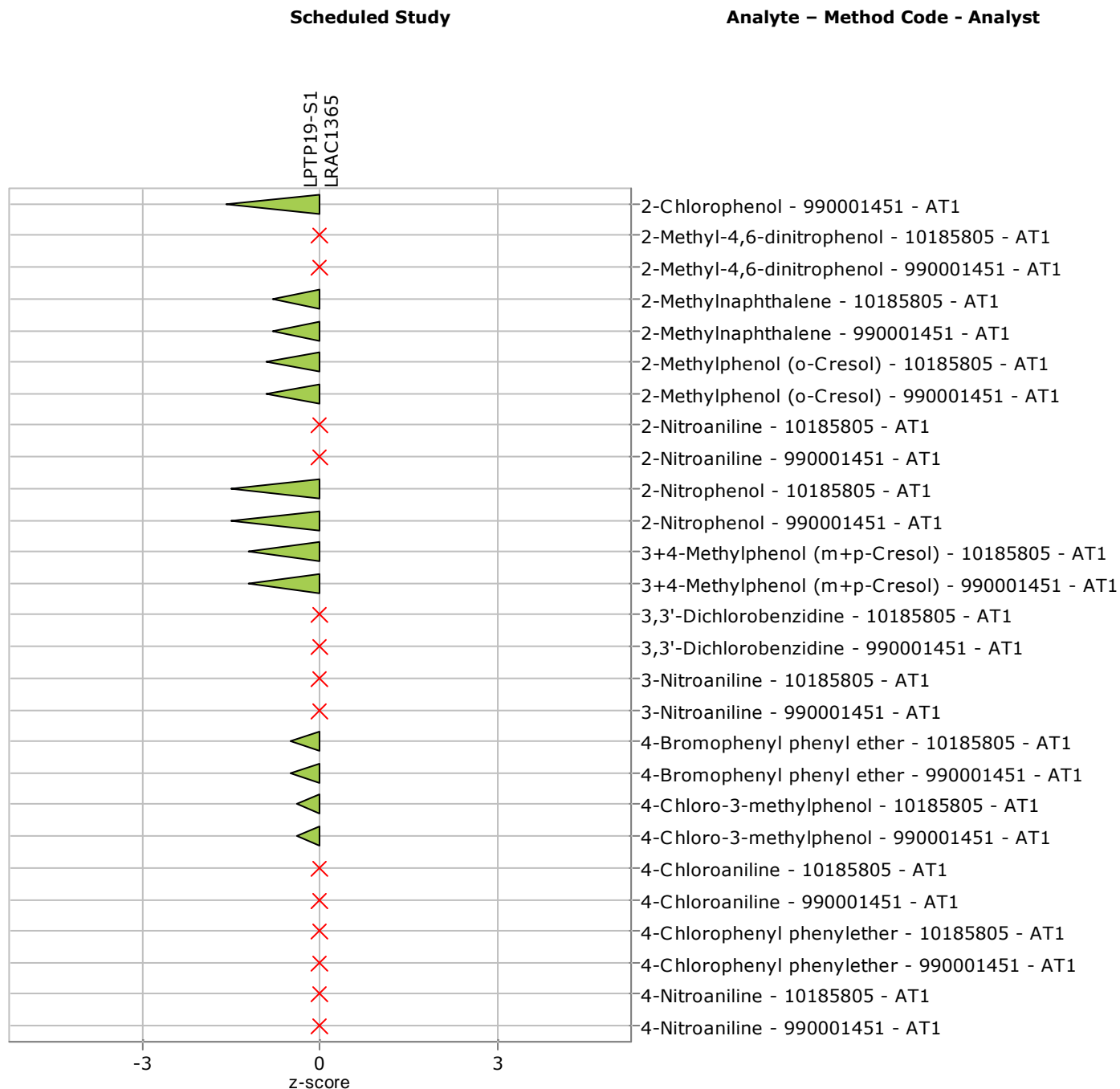
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE003-40G BNAs in Soil - PT [Continuation]

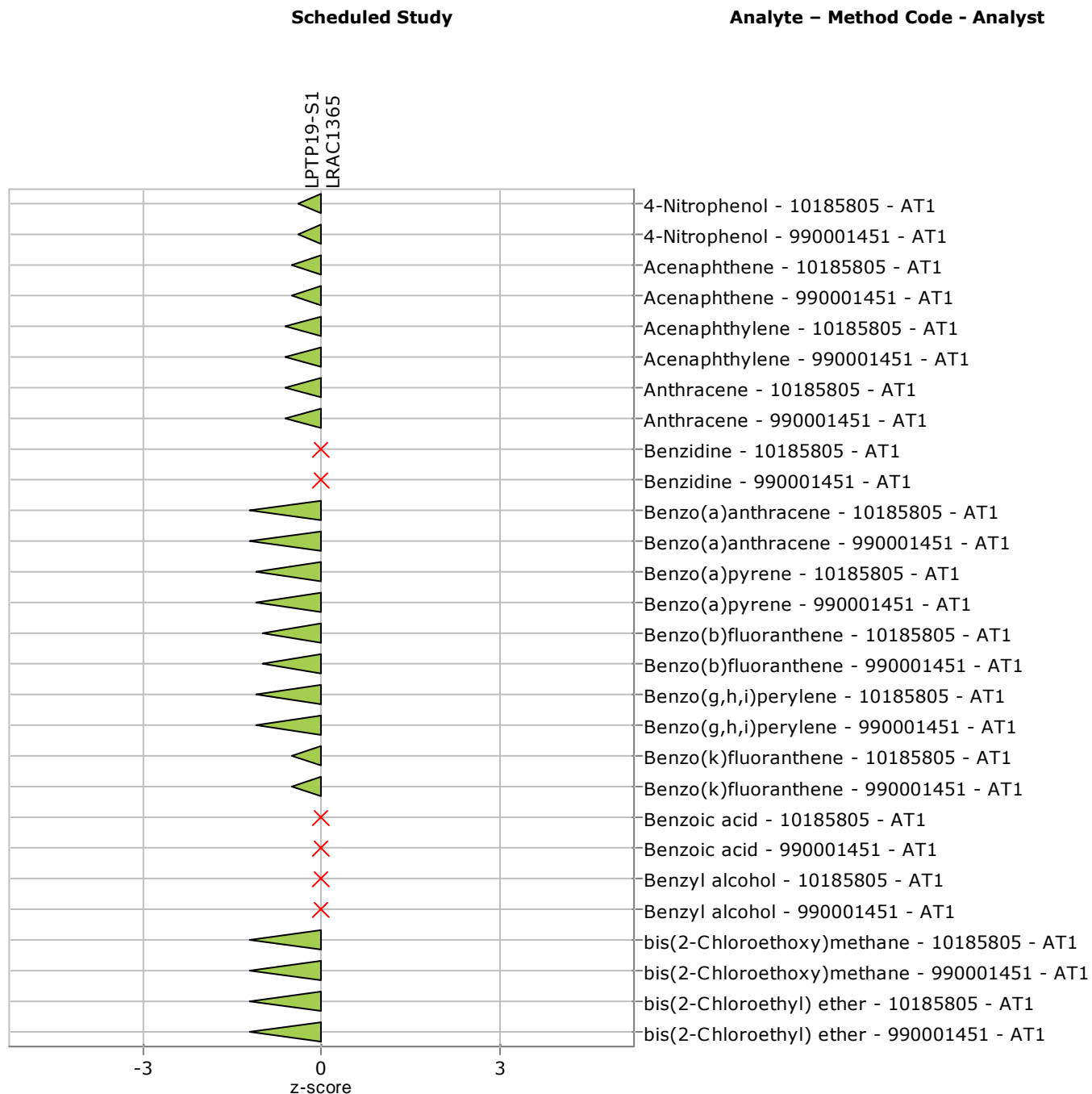
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE003-40G BNAs in Soil - PT [Continuation]

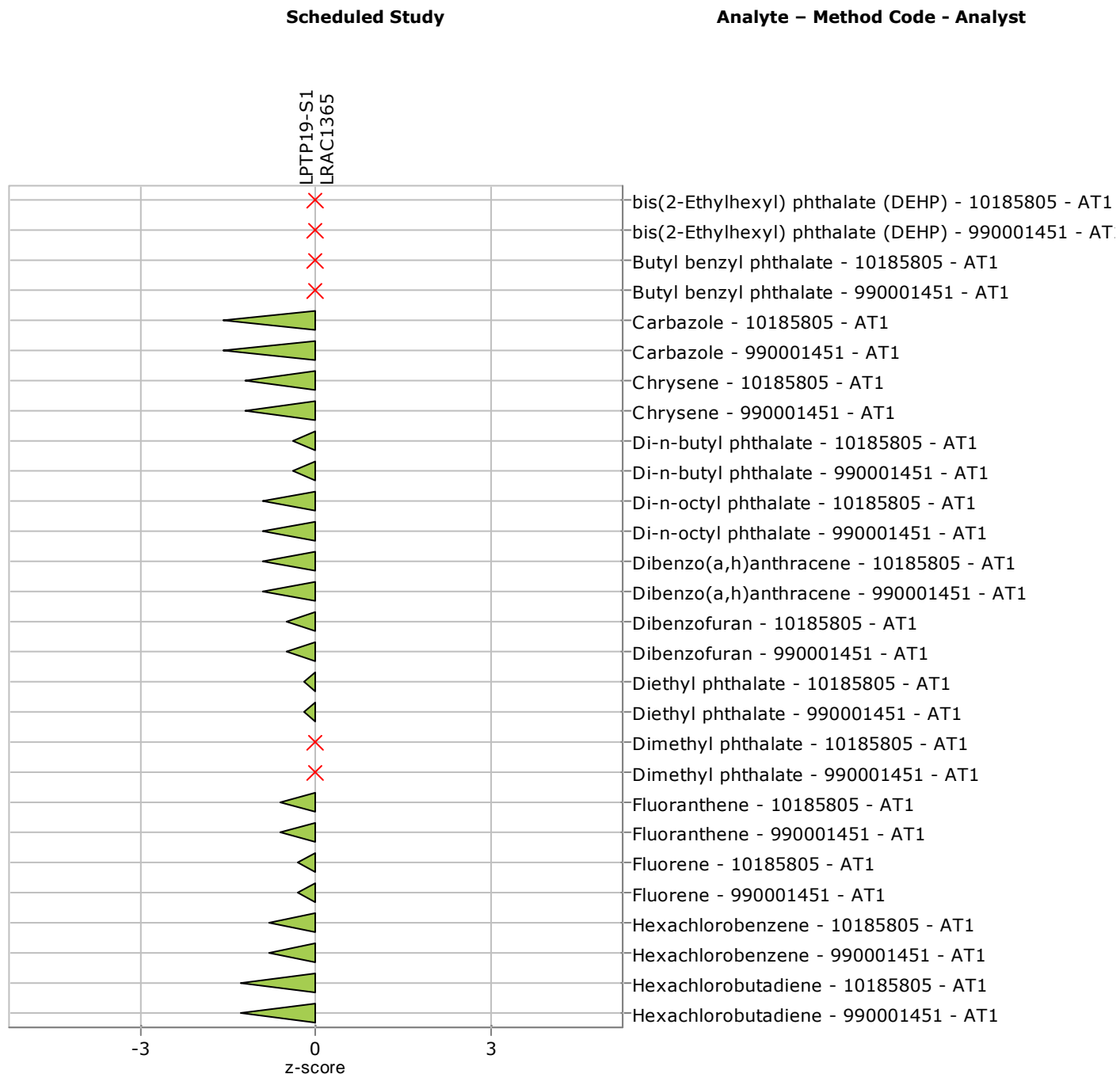
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE003-40G BNAs in Soil - PT [Continuation]

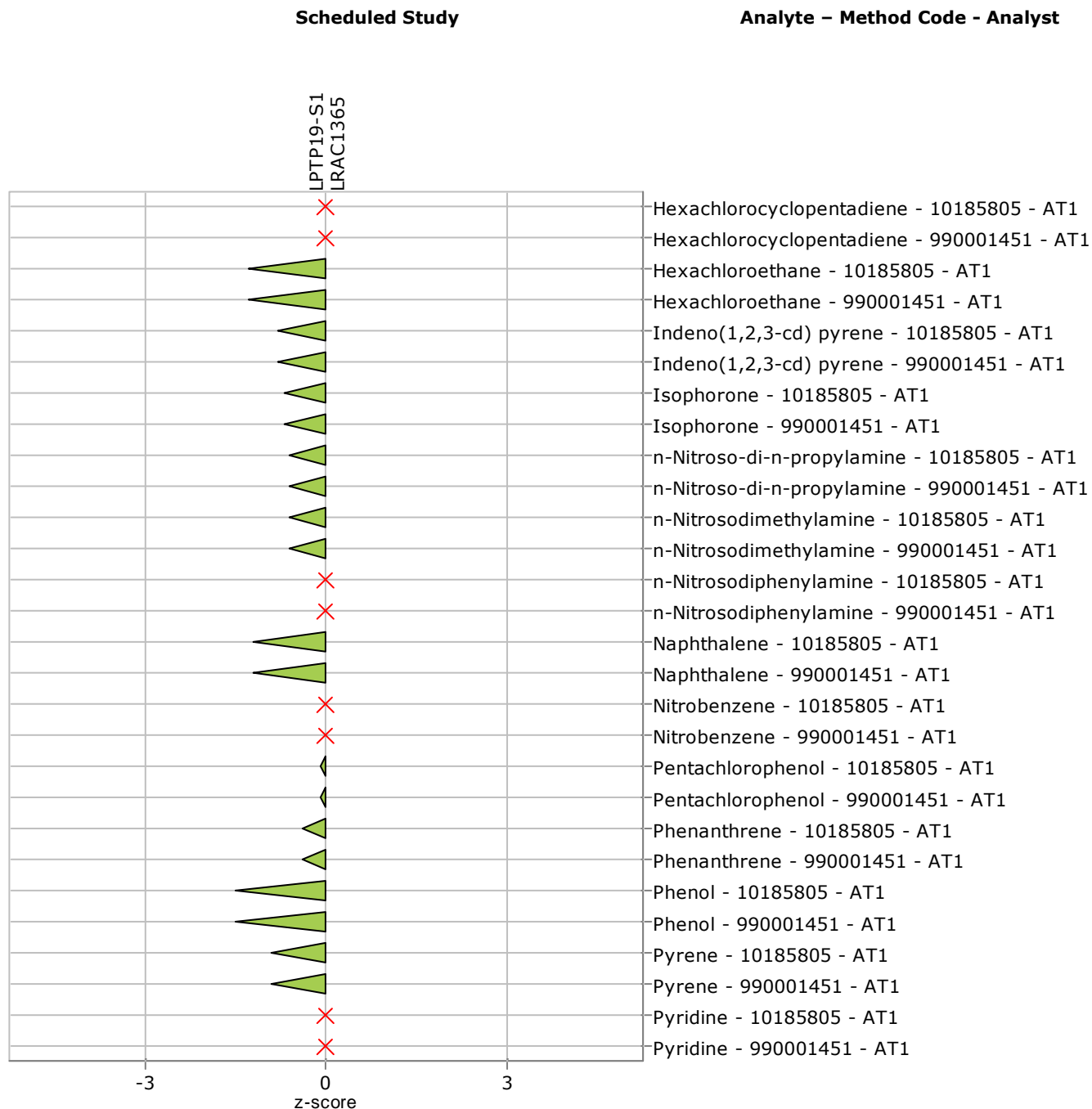
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE003-40G BNAs in Soil - PT [Continuation]

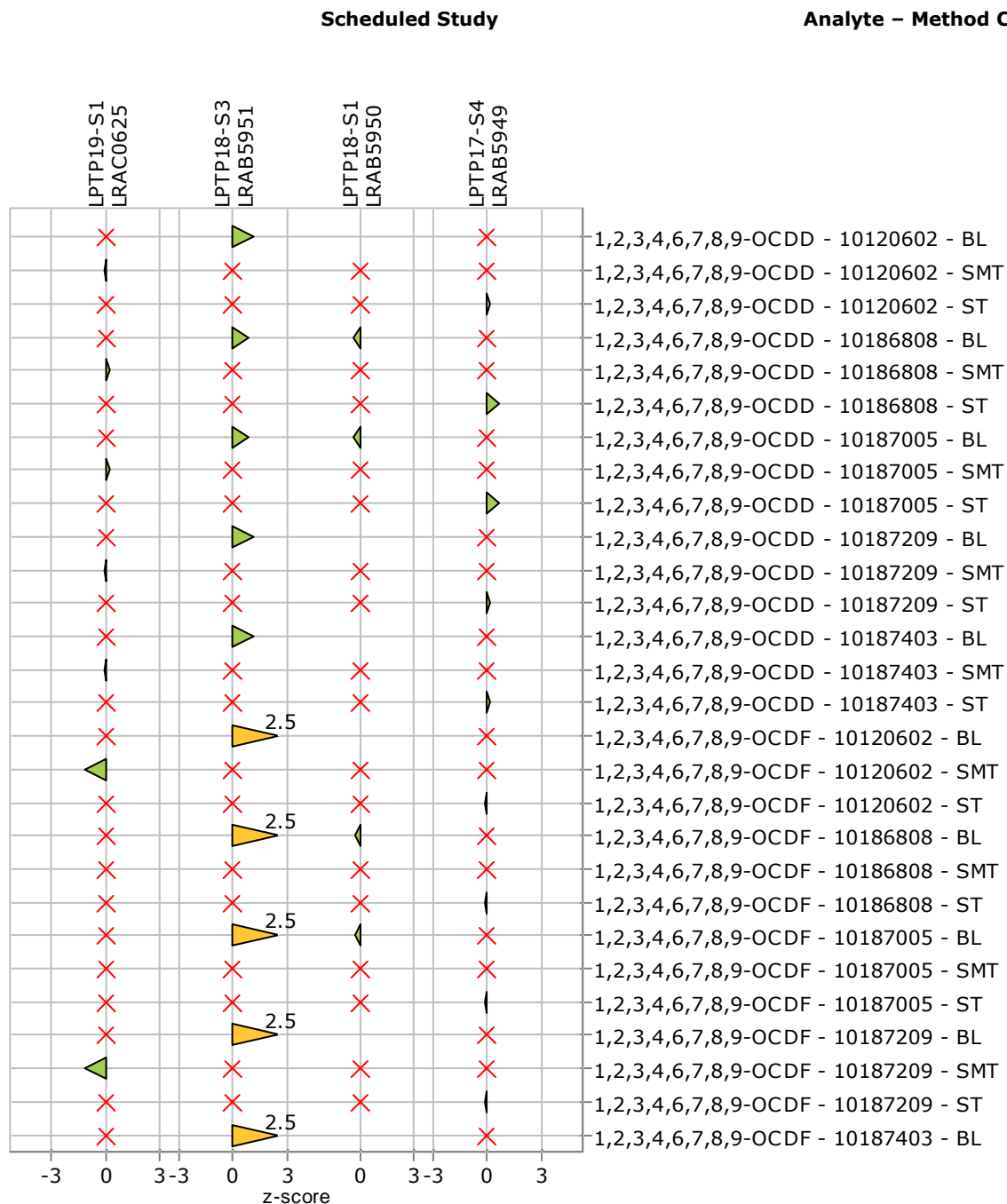
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE016-10G Dioxin and Furans in Soil - PT

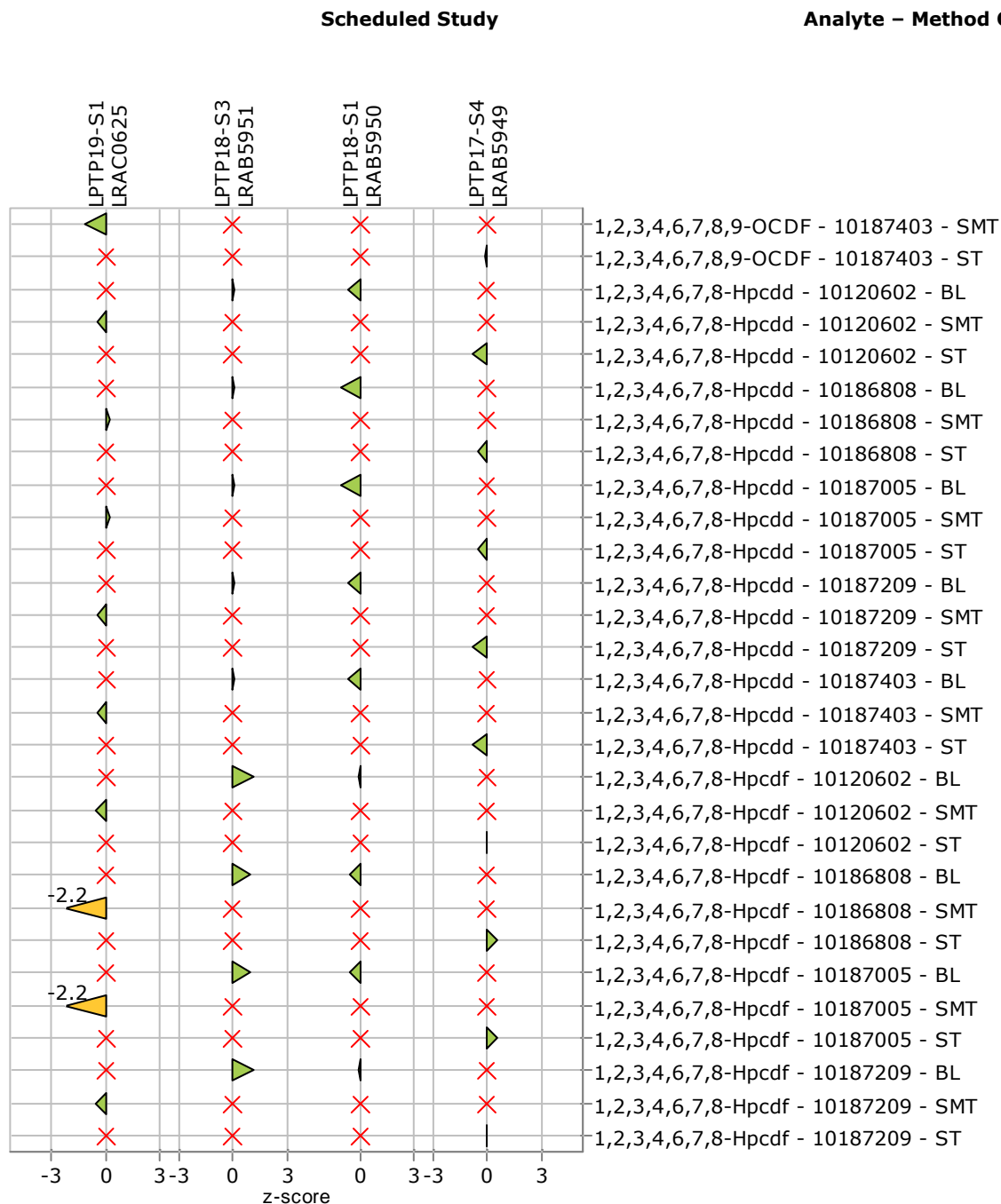
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

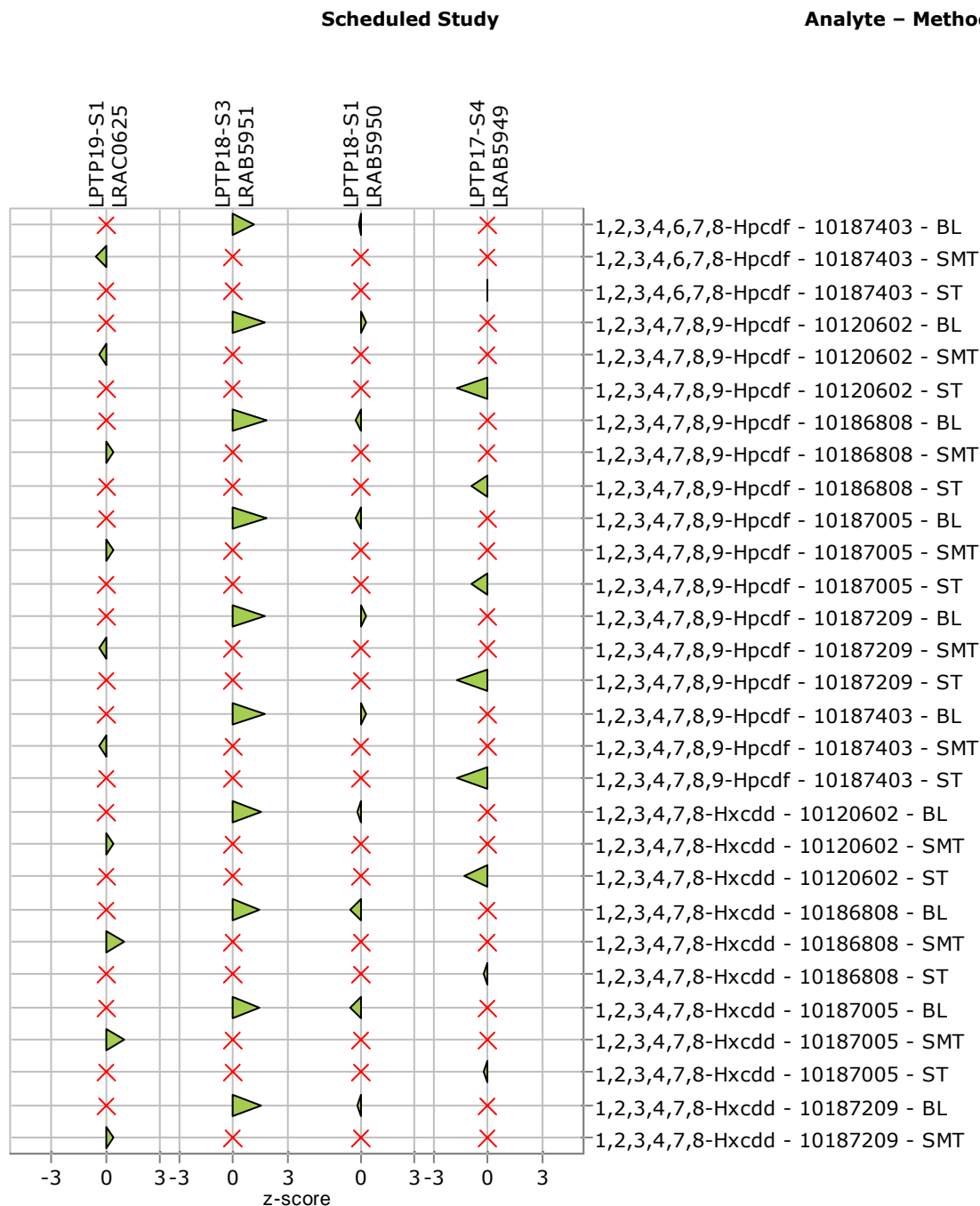
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

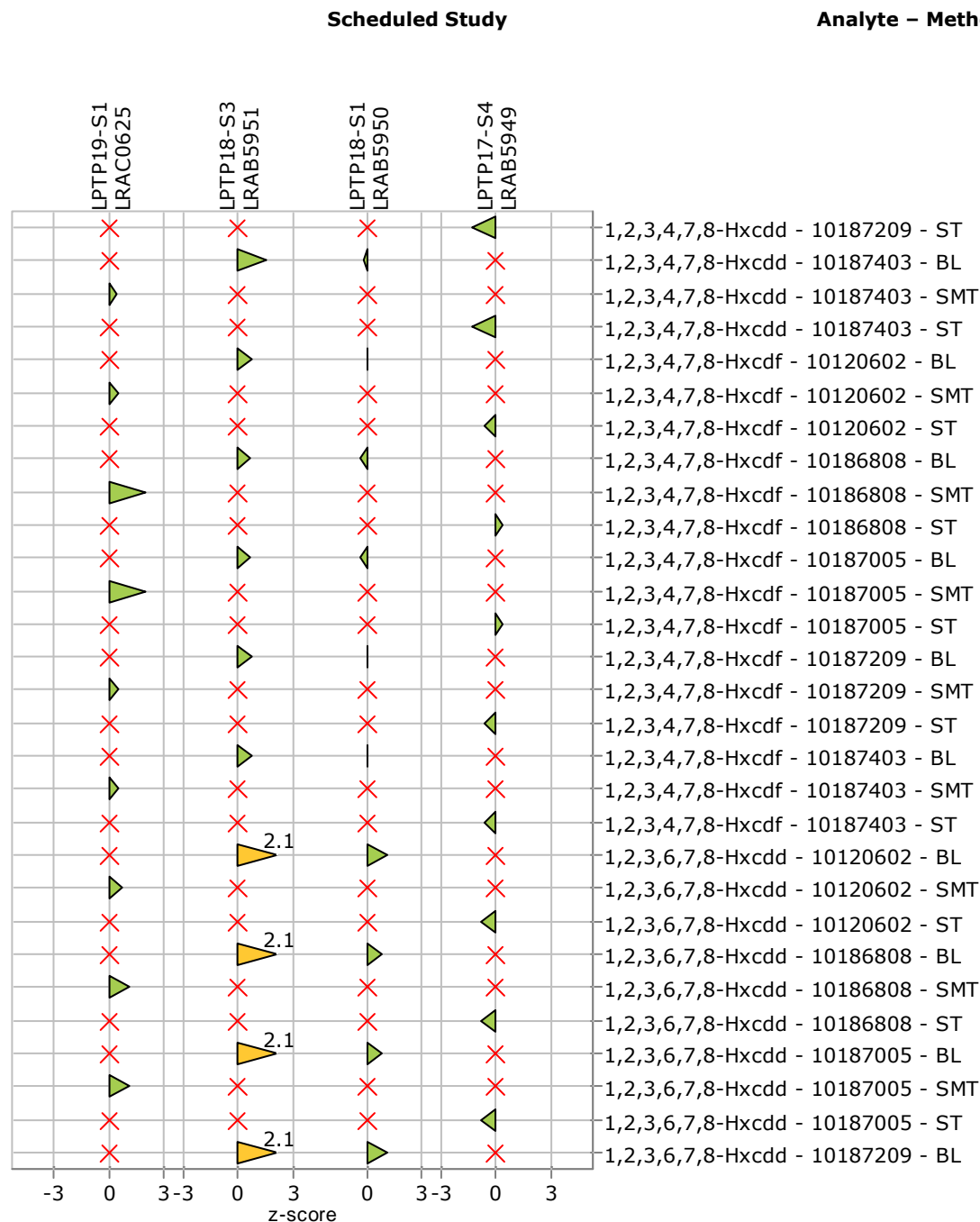
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

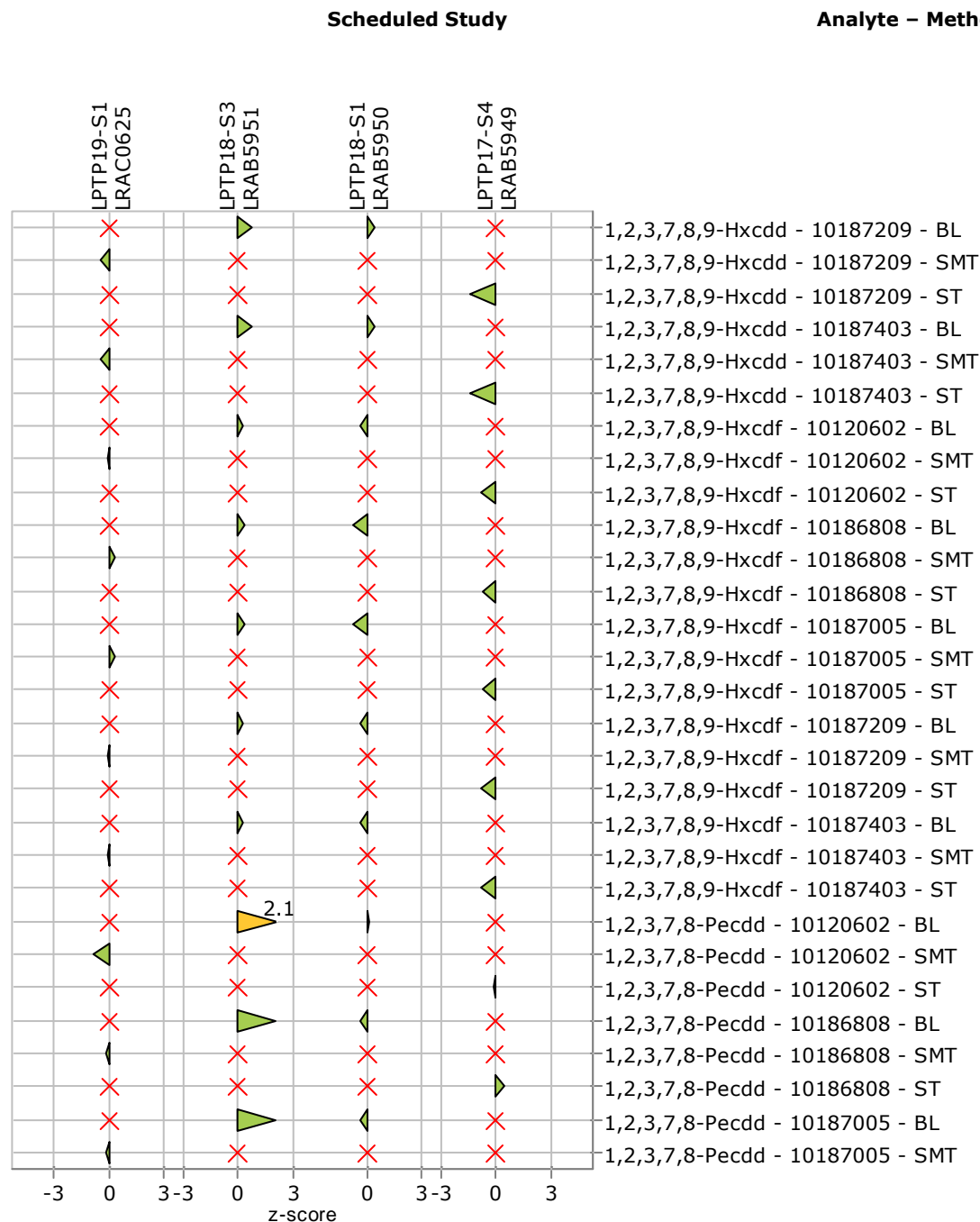
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

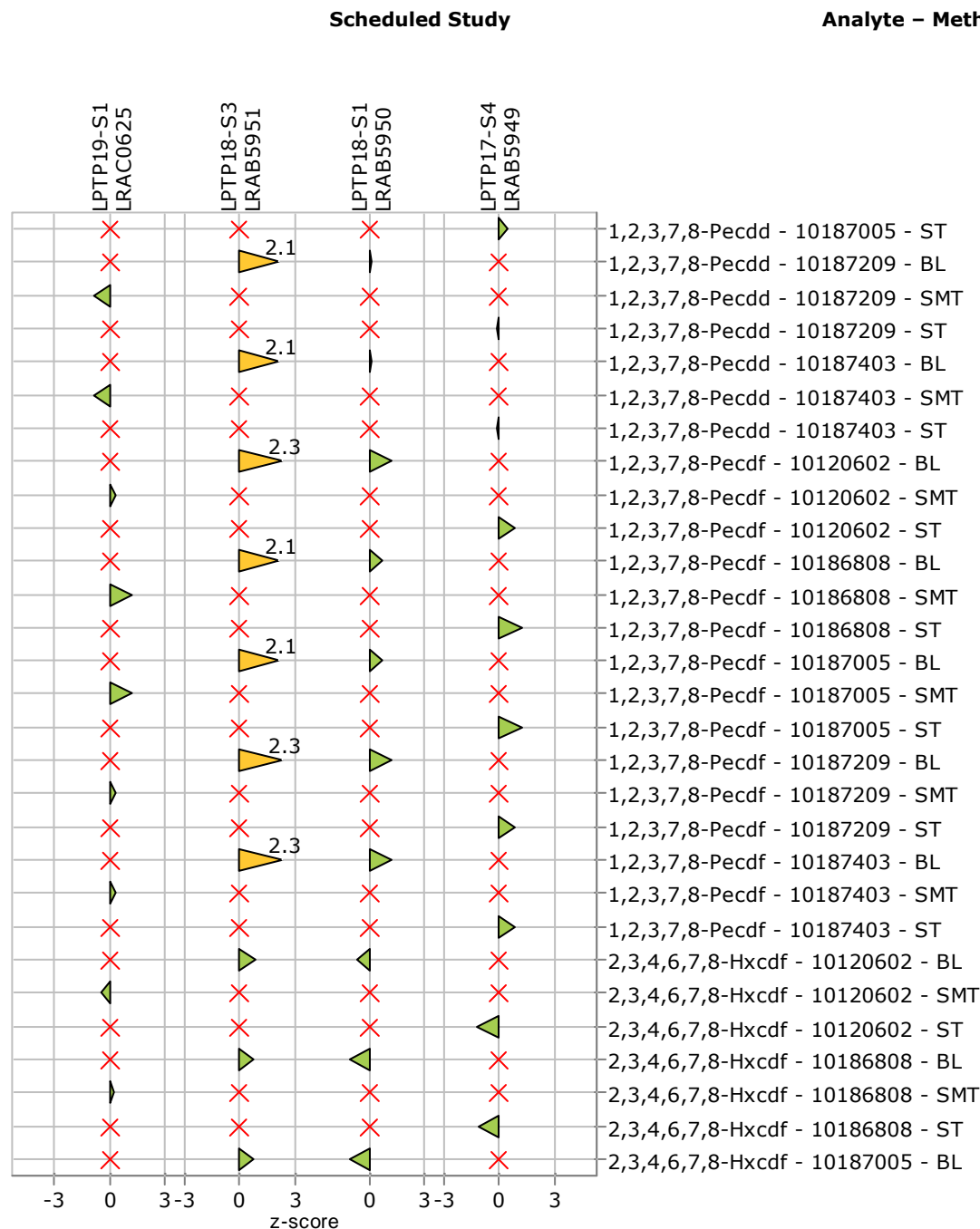
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

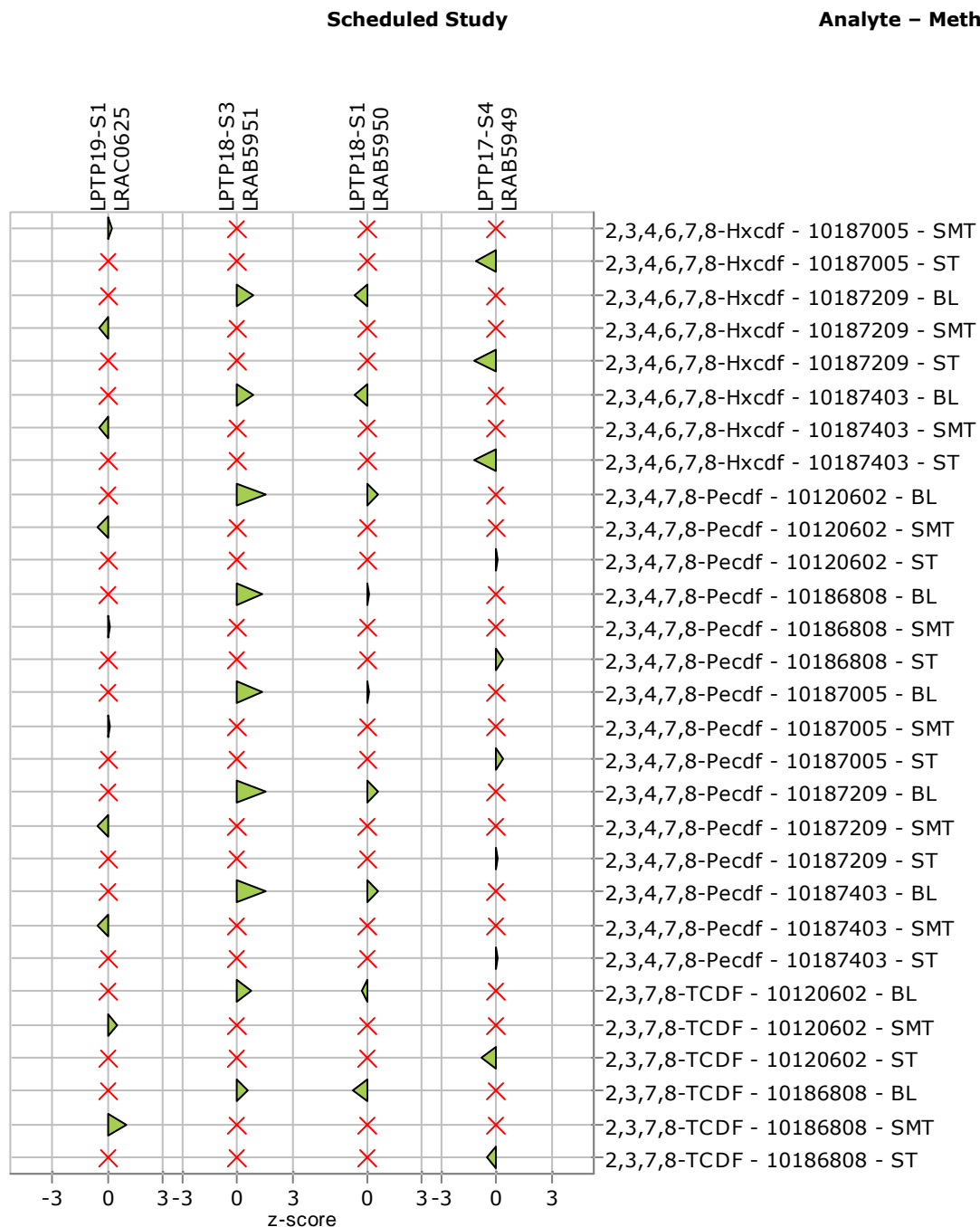
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

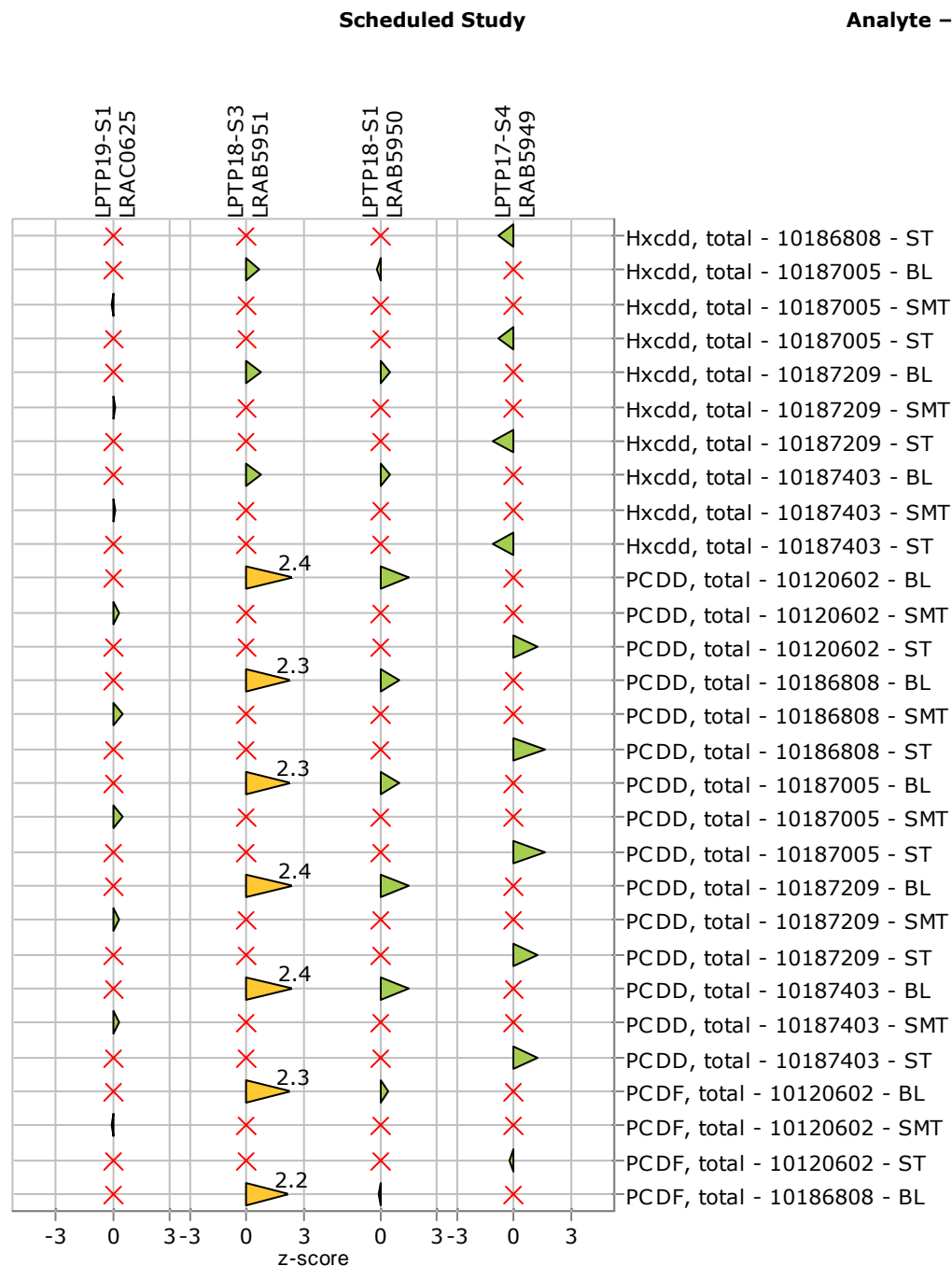
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

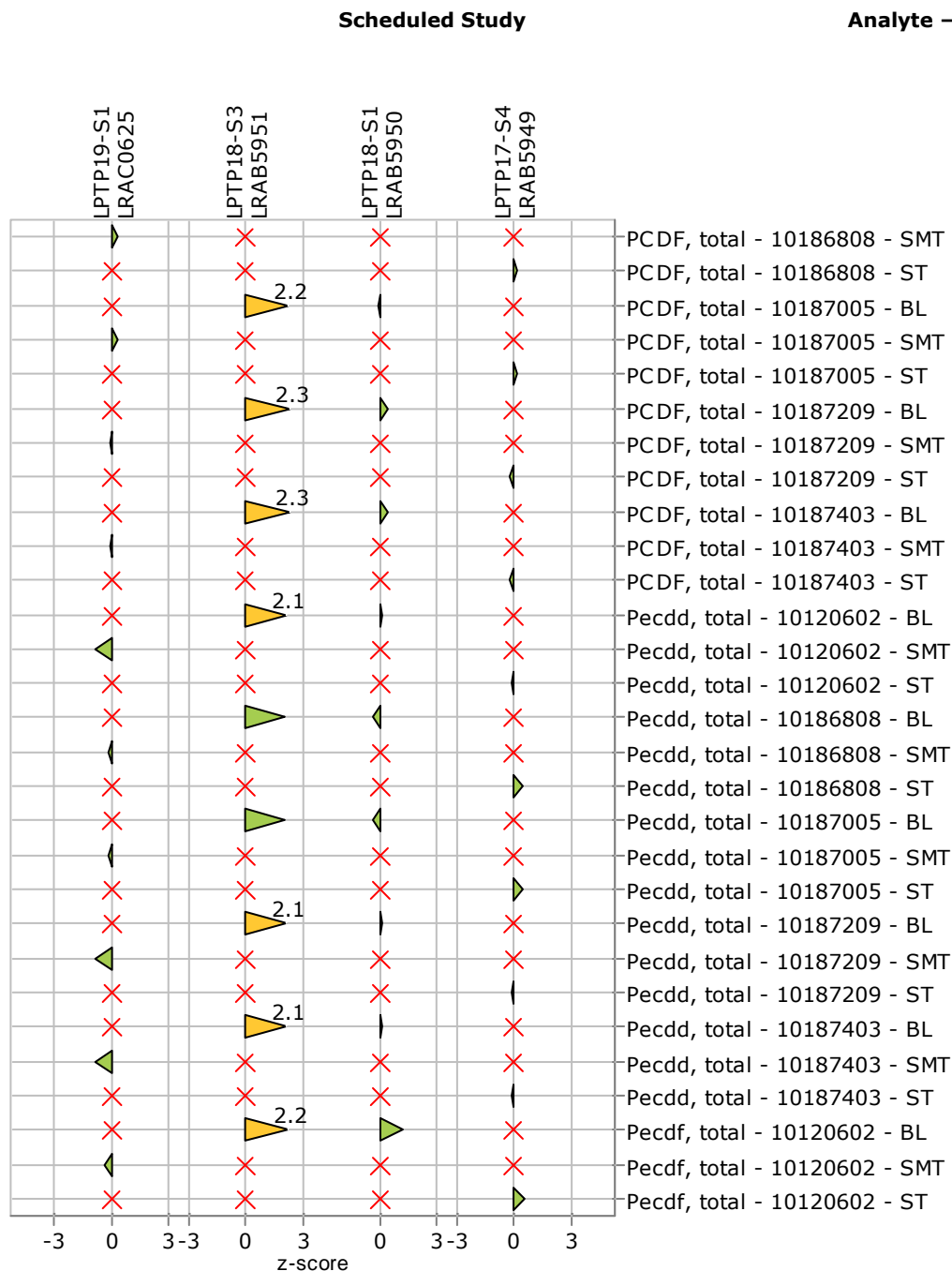
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

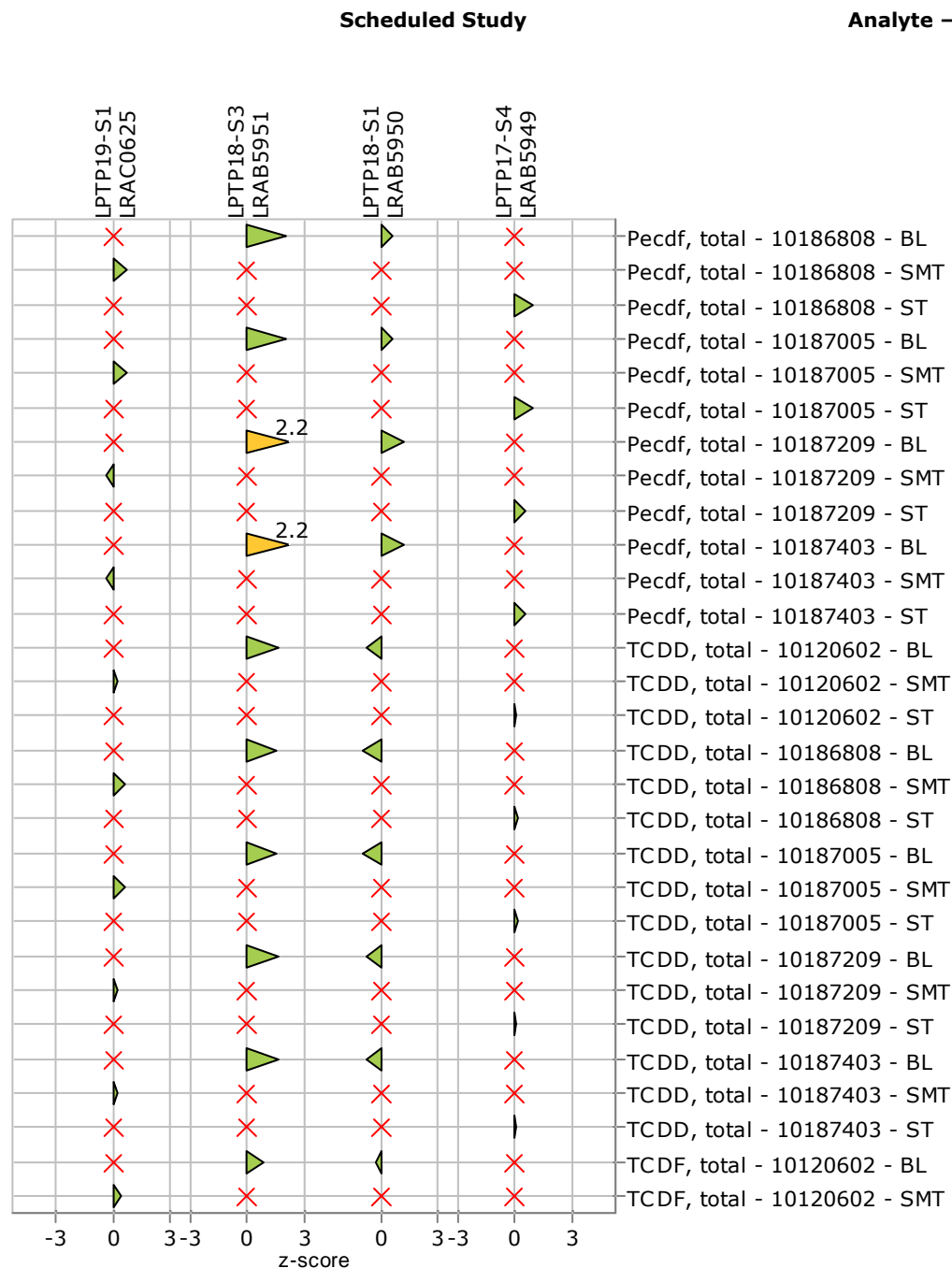
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

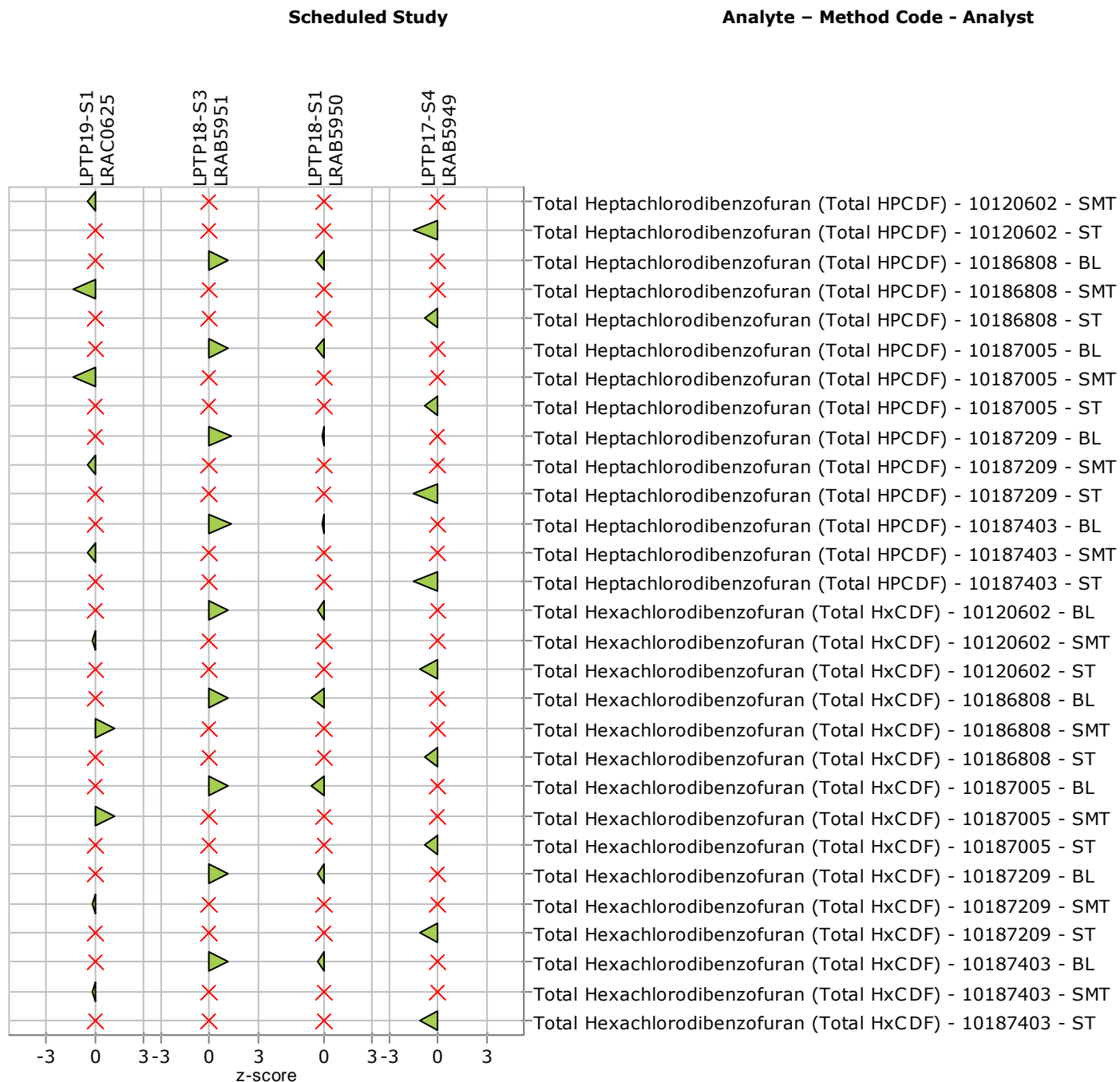
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

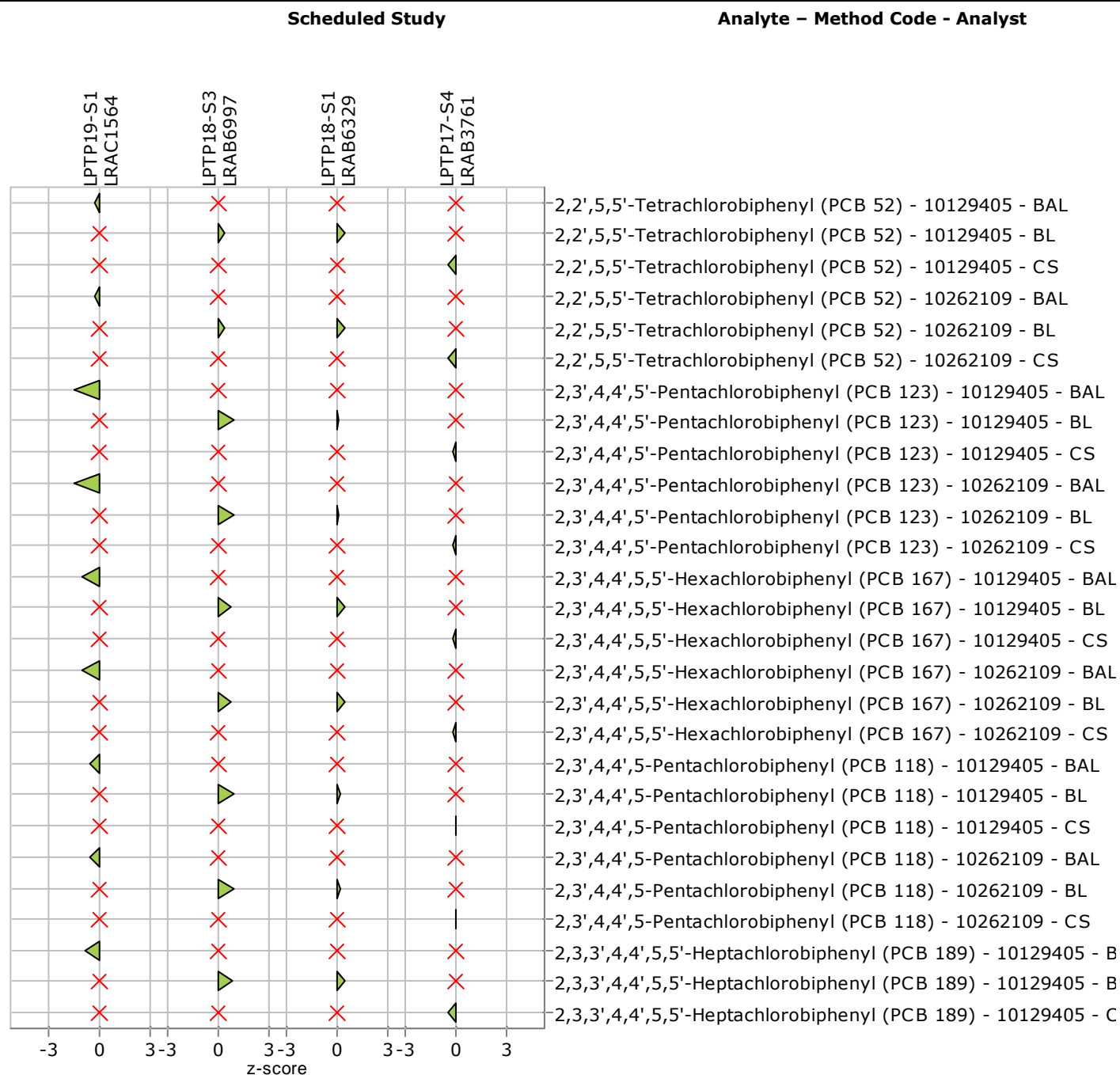
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE068-50G PCB Congeners in Soil - PT

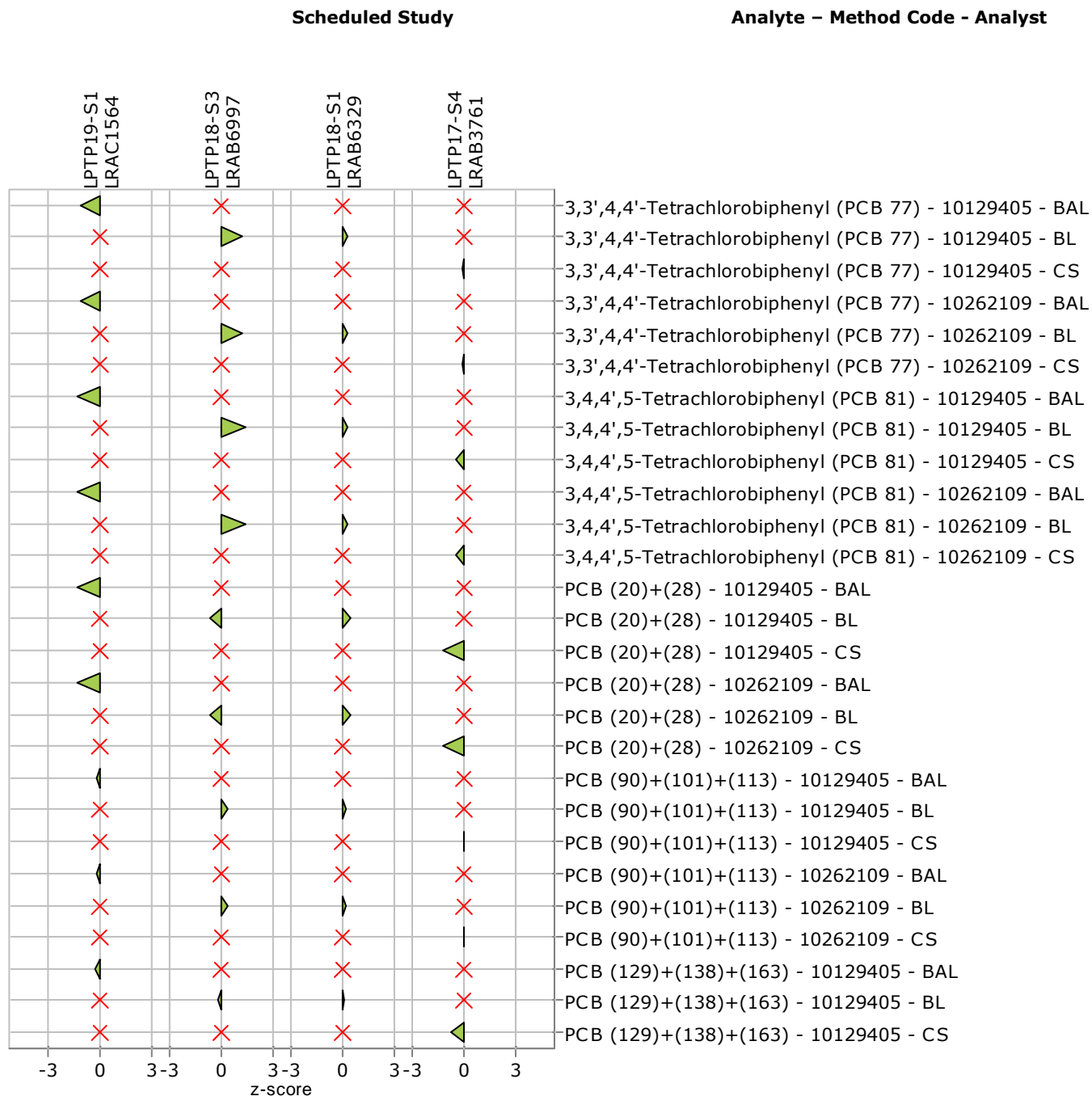
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE068-50G PCB Congeners in Soil - PT [Continuation]

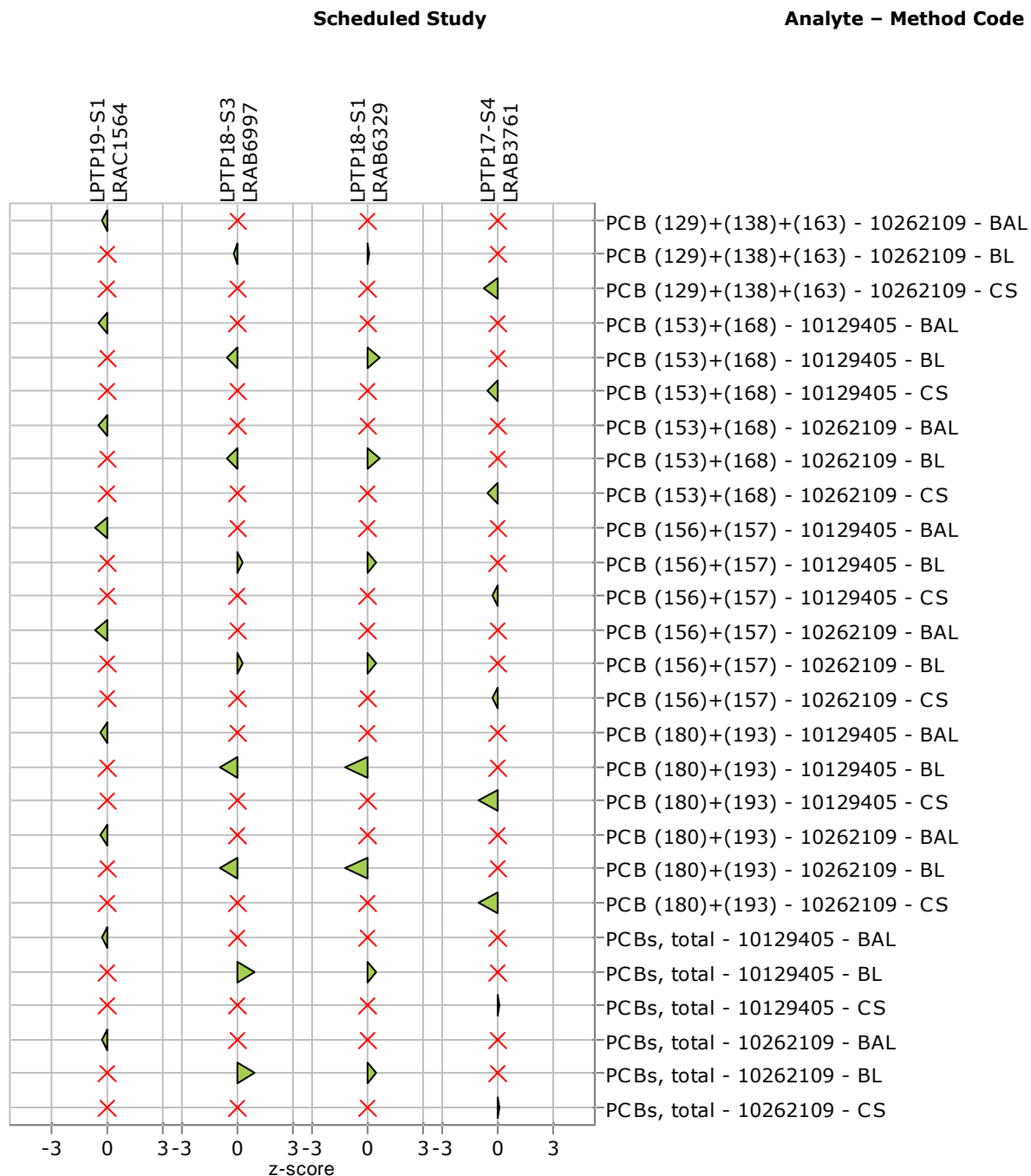
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE068-50G PCB Congeners in Soil - PT [Continuation]

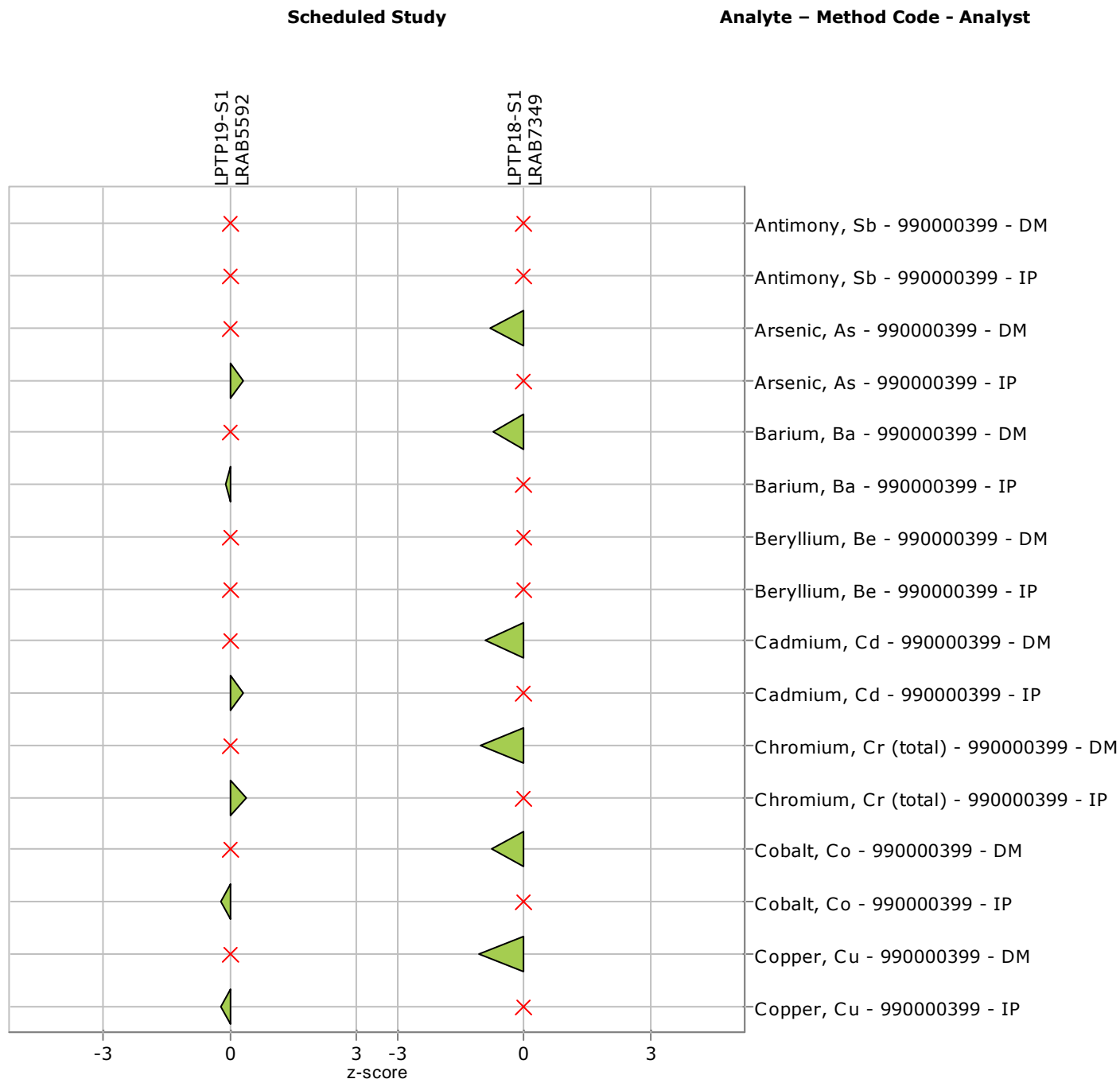
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE006-225G TCLP Metals CA - WET in Soil - PT

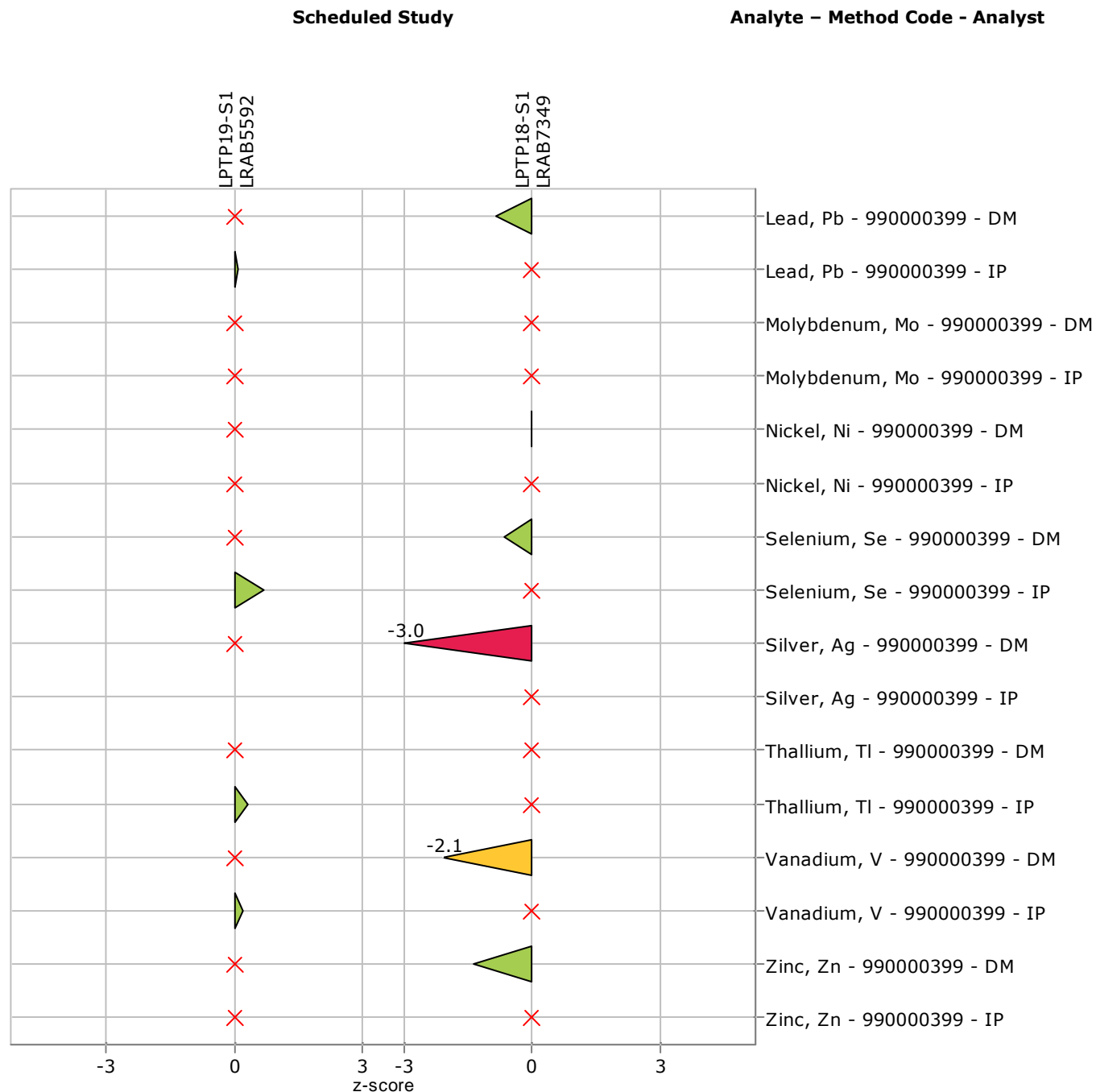
z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S1 SPE006-225G TCLP Metals CA - WET in Soil - PT [Continuation]

z-score Overview* for LPTP19-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

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1 Aim of the Proficiency Test

This interlaboratory study is a proficiency test for the assessment of laboratory performance. It was conducted in the framework of external quality assurance and the report provides an external appraisal of the participant laboratories' competence in the particular testing field.

2 Sample Information

SPE003-40G BNAs in Soil - PT LRAC1365

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
1,2-Dichlorobenzene 4610	ug/Kg	5220 ± 51.0	300	3170	802
1,3-Dichlorobenzene 4615	ug/Kg	3020 ± 29.0	300	1730	479
1,4-Dichlorobenzene 4620	ug/Kg	3550 ± 34.0	300	2100	630
2,2'-Oxybis(1-Chloropropane) 4659	µg/Kg	8960 ± 87.0	150	5930	1580
Hexachlorobutadiene 4835	ug/Kg	4550 ± 44.0	300	2770	784
Hexachloroethane 4840	ug/Kg	11800 ± 114	300	6900	2020
Naphthalene 5005	ug/Kg	8500 ± 82.0	200	5720	926
Nitrobenzene 5015	ug/Kg	0 ± 0	300	---	---
Pyridine 5095	ug/Kg	0 ± 0	300	---	---
1,2,4-Trichlorobenzene 5155	ug/Kg	0 ± 0	300	---	---
Acenaphthene 5500	ug/Kg	8260 ± 80.0	200	6190	690
Acenaphthylene 5505	ug/Kg	2160 ± 21.0	200	1670	207
Anthracene 5555	ug/Kg	3520 ± 34.0	200	2760	370
Benzo(a)anthracene 5575	ug/Kg	2510 ± 24.0	200	2160	354
Benzo(a)pyrene 5580	ug/Kg	5980 ± 58.0	200	4590	822
Benzo(b)fluoranthene 5585	ug/Kg	4560 ± 44.0	200	4000	867
Benzo(g,h,i)perylene 5590	ug/Kg	2570 ± 25.0	200	1970	350
Benzidine 5595	ug/Kg	0 ± 0	300	---	---
Benzo(k)fluoranthene 5600	ug/Kg	1680 ± 16.0	200	1410	172
Benzoic acid 5610	ug/Kg	0 ± 0	300	---	---

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
Benzyl alcohol 5630	ug/Kg	0 ± 0	300	---	---
4-Bromophenyl phenyl ether 5660	ug/Kg	5260 ± 51.0	300	4220	538
Butyl benzyl phthalate 5670	ug/Kg	0 ± 0	100	---	---
Carbazole 5680	ug/Kg	3860 ± 37.0	300	3220	189
4-Chloro-3-methylphenol 5700	ug/Kg	5980 ± 58.0	300	4730	625
4-Chloroaniline 5745	ug/Kg	0 ± 0	300	---	---
bis(2-Chloroethoxy)methane 5760	ug/Kg	4170 ± 40.0	100	2990	602
bis(2-Chloroethyl) ether 5765	ug/Kg	8960 ± 87.0	300	5570	1210
2-Chloronaphthalene 5795	ug/Kg	0 ± 0	200	---	---
2-Chlorophenol 5800	ug/Kg	9280 ± 90.0	300	6320	1570
4-Chlorophenyl phenylether 5825	ug/Kg	0 ± 0	100	---	---
Chrysene 5855	ug/Kg	6520 ± 63.0	200	5510	679
Dibenzo(a,h)anthracene 5895	ug/Kg	2380 ± 23.0	200	1920	354
Dibenzofuran 5905	ug/Kg	6750 ± 66.0	300	4630	356
Di-n-butyl phthalate 5925	ug/Kg	2080 ± 20.0	100	1770	321
3,3'-Dichlorobenzidine 5945	ug/Kg	0 ± 0	300	---	---
2,4-Dichlorophenol 6000	ug/Kg	4220 ± 41.0	300	3020	577
bis(2-Ethylhexyl) phthalate (DEHP) 6065	ug/Kg	0 ± 0	300	---	---
Diethyl phthalate 6070	ug/Kg	6870 ± 67.0	100	5200	665
2,4-Dimethylphenol 6130	ug/Kg	0 ± 0	300	---	---
Dimethyl phthalate 6135	ug/Kg	0 ± 0	100	---	---
2,4-Dinitrophenol 6175	ug/Kg	3350 ± 57.0	300	---	---

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
2,4-Dinitrotoluene (2,4-DNT) 6185	ug/Kg	3170 ± 31.0	300	2520	501
2,6-Dinitrotoluene (2,6-DNT) 6190	ug/Kg	0 ± 0	300	---	---
Di-n-octyl phthalate 6200	ug/Kg	3270 ± 32.0	100	3010	513
Fluoranthene 6265	ug/Kg	7530 ± 73.0	200	6360	733
Fluorene 6270	ug/Kg	6350 ± 62.0	200	5000	377
Hexachlorobenzene 6275	ug/Kg	2570 ± 25.0	300	2070	318
Hexachlorocyclopentadiene 6285	ug/Kg	1050 ± 19.0	300	---	---
Indeno(1,2,3-cd) pyrene 6315	ug/Kg	1860 ± 18.0	200	1490	276
Isophorone 6320	ug/Kg	3600 ± 35.0	300	2670	496
2-Methyl-4,6-dinitrophenol 6360	ug/Kg	0 ± 0	300	---	---
2-Methylnaphthalene 6385	ug/Kg	7560 ± 73.0	300	5280	723
2-Methylphenol (o-Cresol) 6400	ug/Kg	5620 ± 55.0	600	3940	666
3+4-Methylphenol (m+p-Cresol) 6412	ug/Kg	4580 ± 44.0	300	3530	482
2-Nitroaniline 6460	ug/Kg	0 ± 0	300	---	---
3-Nitroaniline 6465	ug/Kg	0 ± 0	300	---	---
4-Nitroaniline 6470	ug/Kg	0 ± 0	300	---	---
2-Nitrophenol 6490	ug/Kg	4200 ± 41.0	600	2790	867
4-Nitrophenol 6500	ug/Kg	5440 ± 53.0	600	4160	1200
n-Nitrosodimethylamine 6530	ug/Kg	5000 ± 48.0	300	2500	858
n-Nitrosodiphenylamine 6535	ug/Kg	0 ± 0	300	---	---
n-Nitroso-di-n-propylamine 6545	ug/Kg	6440 ± 62.0	300	4270	636
Pentachlorophenol 6605	ug/Kg	3300 ± 32.0	600	2360	607
Phenanthrene 6615	ug/Kg	4100 ± 40.0	200	3370	403

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
Phenol 6625	ug/Kg	3520 ± 34.0	300	2510	601
Pyrene 6665	ug/Kg	7480 ± 73.0	200	6580	865
2,4,5-Trichlorophenol 6835	ug/Kg	2970 ± 29.0	300	2360	355
2,4,6-Trichlorophenol 6840	ug/Kg	5640 ± 55.0	300	4380	705

SPE016-10G Dioxin and Furans in Soil - PT LRAC0625

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
1,2,3,4,6,7,8-Hpcdf 9420	pg/g	780 ± 23.4	---	802	73.5
1,2,3,4,7,8,9-Hpcdf 9423	pg/g	591 ± 17.7	---	658	29.5
1,2,3,4,6,7,8-Hpcdd 9426	pg/g	349 ± 10.5	---	363	43.9
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) 9438	pg/g	349 ± 10.5	---	374	61.5
Total Heptachlorodibenzofuran (Total HPCDF) 9444	pg/g	1370 ± 41.1	---	1460	110
1,2,3,4,7,8-Hxcdd 9453	pg/g	538 ± 16.1	---	489	32.7
1,2,3,6,7,8-Hxcdd 9456	pg/g	887 ± 26.6	---	983	71.6
1,2,3,7,8,9-Hxcdd 9459	pg/g	403 ± 12.1	---	1060	109
Hxcdd, total 9468	pg/g	1830 ± 54.8	---	2520	156
1,2,3,4,7,8-Hxcdf 9471	pg/g	323 ± 9.70	---	300	23.5
1,2,3,6,7,8-Hxcdf 9474	pg/g	220 ± 6.60	---	209	20.7
1,2,3,7,8,9-Hxcdf 9477	pg/g	672 ± 20.2	---	603	58.0
2,3,4,6,7,8-Hxcdf 9480	pg/g	753 ± 22.6	---	703	52.7
Total Hexachlorodibenzofuran (Total HxCDF) 9483	pg/g	1970 ± 59.0	---	1820	155
1,2,3,4,6,7,8,9-OCDF 9516	pg/g	113 ± 3.40	---	128	18.0

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
1,2,3,4,6,7,8,9-OCDD 9519	pg/g	591 ± 17.7	---	979	130
1,2,3,7,8-Pecdd 9540	pg/g	457 ± 13.7	---	552	45.9
1,2,3,7,8-Pecdf 9543	pg/g	323 ± 9.70	---	400	31.2
2,3,4,7,8-Pecdf 9549	pg/g	376 ± 11.3	---	443	34.9
Pecdf, total 9552	pg/g	699 ± 21.0	---	850	44.9
Pecdd, total 9555	pg/g	457 ± 13.7	---	553	46.1
TCDD, total 9609	pg/g	3950 ± 119	---	706	79.2
2,3,7,8-TCDF 9612	pg/g	887 ± 26.6	---	823	84.0
TCDF, total 9615	pg/g	887 ± 26.6	---	836	68.4
2,3,7,8-Tetrachloro dibenzo- p- dioxin (TCDD) 9618	pg/g	726 ± 21.8	---	703	77.7
PCDF, total 9657	pg/g	4920 ± 148	---	5010	298
PCDD, total 9660	pg/g	3950 ± 118	---	4950	471

SPE068-50G PCB Congeners in Soil - PT LRAC1564

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
PCBs, total 8870	ug/Kg	2530 ± 75.8	---	2270	136
PCB (20)+(28) 8936	ug/Kg	89.6 ± 2.69	---	87.3	11.6
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) 8955	ug/Kg	49.1 ± 1.47	---	43.8	8.79
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) 8965	ug/Kg	202 ± 6.05	---	183	28.7
3,4,4',5-Tetrachlorobiphenyl (PCB 81) 8970	ug/Kg	86.7 ± 2.60	---	79.6	9.46
PCB (90)+(101)+(113) 8982	ug/Kg	85.0 ± 2.55	---	77.7	4.44

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) 8985	ug/Kg	68.8 ± 2.06	---	66.5	7.33
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) 8995	ug/Kg	363 ± 10.9	---	323	46.9
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) 9000	ug/Kg	116 ± 3.47	---	90.4	6.13
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) 9005	ug/Kg	77.0 ± 2.31	---	79.2	10.5
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) 9015	ug/Kg	115 ± 3.46	---	119	20.9
PCB (129)+(138)+(163) 9026	ug/Kg	53.0 ± 1.59	---	47.7	6.72
PCB (153)+(168) 9041	ug/Kg	329 ± 9.87	---	308	84.6
PCB (156)+(157) 9046	ug/Kg	360 ± 10.8	---	340	50.5
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) 9055	ug/Kg	74.5 ± 2.23	---	89.3	10.0
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) 9060	ug/Kg	226 ± 6.77	---	195	22.6
PCB (180)+(193) 9070	ug/Kg	145 ± 4.36	---	122	13.8
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) 9085	ug/Kg	88.0 ± 2.64	---	90.5	10.3

SPE006-225G TCLP Metals CA - WET in Soil - PT LRA5592

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
Antimony, Sb 1005	mg/L	0.450 ± 0.0450	1.00	---	---
Arsenic, As 1010	mg/L	56.3 ± 0.546	1.00	91.2	8.10
Barium, Ba 1015	mg/L	30.5 ± 0.296	1.00	54.8	4.14
Beryllium, Be 1020	mg/L	0	1.00	---	---

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
Cadmium, Cd 1030	mg/L	101 ± 0.488	1.00	99.3	9.92
Chromium, Cr (total) 1040	mg/L	2.50 ± 0.0243	1.00	20.2	2.52
Cobalt, Co 1050	mg/L	6.32 ± 0.0613	1.00	12.1	0.856
Copper, Cu 1055	mg/L	0.400	1.00	---	---
Lead, Pb 1075	mg/L	140 ± 0.0168	1.00	113	14.0
Molybdenum, Mo 1100	mg/L	0.150 ± 0.0150	1.00	---	---
Nickel, Ni 1105	mg/L	0.250	1.00	---	---
Selenium, Se 1140	mg/L	42.3 ± 0.410	0.250	74.0	10.3
Silver, Ag 1150	mg/L	0.108 ± 0.00105	1.00	---	---
Thallium, Tl 1165	mg/L	35.5 ± 0.344	1.00	51.3	4.61
Vanadium, V 1185	mg/L	12.4 ± 0.120	1.00	45.5	4.11
Zinc, Zn 1190	mg/L	0.0500	1.00	---	---

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

3 Data Availability

SPE003-40G BNAs in Soil - PT LRAC1365

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
1,2-Dichlorobenzene 4610	13	13	15	15
1,3-Dichlorobenzene 4615	12	12	14	14
1,4-Dichlorobenzene 4620	13	13	15	15
2,2'-Oxybis(1-Chloropropane) 4659	7	7	11	11
Hexachlorobutadiene 4835	14	14	16	16
Hexachloroethane 4840	15	15	18	18
Naphthalene 5005	13	13	17	17
Nitrobenzene 5015	13	3	15	3
Pyridine 5095	7	0	9	0
1,2,4-Trichlorobenzene 5155	14	2	16	2
Acenaphthene 5500	12	12	14	14
Acenaphthylene 5505	12	12	14	14
Anthracene 5555	13	13	17	17
Benzo(a)anthracene 5575	13	13	17	17
Benzo(a)pyrene 5580	12	12	14	14
Benzo(b)fluoranthene 5585	14	14	18	18
Benzo(g,h,i)perylene 5590	12	12	14	14
Benzidine 5595	9	1	12	1
Benzo(k)fluoranthene 5600	12	12	14	14

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
Benzoic acid 5610	7	1	9	1
Benzyl alcohol 5630	10	1	12	1
4-Bromophenyl phenyl ether 5660	14	14	16	16
Butyl benzyl phthalate 5670	14	3	17	4
Carbazole 5680	9	9	11	11
4-Chloro-3-methylphenol 5700	14	14	16	16
4-Chloroaniline 5745	12	2	14	2
bis(2-Chloroethoxy)methane 5760	15	15	19	19
bis(2-Chloroethyl) ether 5765	16	16	20	20
2-Chloronaphthalene 5795	14	3	16	3
2-Chlorophenol 5800	15	15	17	17
4-Chlorophenyl phenylether 5825	14	3	16	3
Chrysene 5855	13	13	17	17
Dibenzo(a,h)anthracene 5895	12	12	14	14
Dibenzofuran 5905	12	12	14	14
Di-n-butyl phthalate 5925	15	15	18	18
3,3'-Dichlorobenzidine 5945	12	1	14	1
2,4-Dichlorophenol 6000	14	14	16	16
bis(2-Ethylhexyl) phthalate (DEHP) 6065	14	2	16	2
Diethyl phthalate 6070	15	15	18	18
2,4-Dimethylphenol 6130	15	2	18	3
Dimethyl phthalate 6135	15	3	18	4

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
2,4-Dinitrophenol 6175	14	7	16	8
2,4-Dinitrotoluene (2,4-DNT) 6185	14	14	16	16
2,6-Dinitrotoluene (2,6-DNT) 6190	14	2	16	2
Di-n-octyl phthalate 6200	14	14	16	16
Fluoranthene 6265	12	12	14	14
Fluorene 6270	12	12	14	14
Hexachlorobenzene 6275	16	16	20	20
Hexachlorocyclopentadiene 6285	13	8	15	9
Indeno(1,2,3-cd) pyrene 6315	12	12	14	14
Isophorone 6320	14	14	16	16
2-Methyl-4,6-dinitrophenol 6360	12	1	14	1
2-Methylnaphthalene 6385	14	14	16	16
2-Methylphenol (o-Cresol) 6400	14	14	17	17
3+4-Methylphenol (m+p-Cresol) 6412	12	12	14	14
2-Nitroaniline 6460	11	2	13	2
3-Nitroaniline 6465	11	2	13	2
4-Nitroaniline 6470	10	1	12	1
2-Nitrophenol 6490	13	13	15	15
4-Nitrophenol 6500	13	11	17	15
n-Nitrosodimethylamine 6530	10	10	12	12
n-Nitrosodiphenylamine 6535	11	1	13	1
n-Nitroso-di-n-propylamine 6545	12	12	14	14

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
Pentachlorophenol 6605	13	13	15	15
Phenanthrene 6615	12	12	14	14
Phenol 6625	15	15	18	18
Pyrene 6665	12	12	14	14
2,4,5-Trichlorophenol 6835	15	15	17	17
2,4,6-Trichlorophenol 6840	15	15	17	17

SPE016-10G Dioxin and Furans in Soil - PT LRAC0625

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
1,2,3,4,6,7,8-Hpcdf 9420	12	12	31	31
1,2,3,4,7,8,9-Hpcdf 9423	12	12	31	31
1,2,3,4,6,7,8-Hpcdd 9426	12	12	31	31
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) 9438	12	12	31	31
Total Heptachlorodibenzofuran (Total HPCDF) 9444	12	12	31	31
1,2,3,4,7,8-Hxcdd 9453	12	12	31	31
1,2,3,6,7,8-Hxcdd 9456	12	12	31	31
1,2,3,7,8,9-Hxcdd 9459	12	12	31	31
Hxcdd, total 9468	12	12	31	31
1,2,3,4,7,8-Hxcdf 9471	12	12	31	31
1,2,3,6,7,8-Hxcdf 9474	12	12	31	31

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
1,2,3,7,8,9-Hxcdf 9477	12	12	31	31
2,3,4,6,7,8-Hxcdf 9480	12	12	31	31
Total Hexachlorodibenzofuran (Total HxCDF) 9483	12	12	31	31
1,2,3,4,6,7,8,9-OCDF 9516	12	12	31	29
1,2,3,4,6,7,8,9-OCDD 9519	12	12	31	31
1,2,3,7,8-Pecdd 9540	12	12	31	31
1,2,3,7,8-Pecdf 9543	12	12	31	31
2,3,4,7,8-Pecdf 9549	12	12	31	31
Pecdf, total 9552	12	12	31	31
Pecdd, total 9555	12	12	31	31
TCDD, total 9609	12	12	31	31
2,3,7,8-TCDF 9612	12	12	31	31
TCDF, total 9615	12	12	31	31
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) 9618	12	12	31	31
PCDF, total 9657	9	9	22	22
PCDD, total 9660	9	9	22	22

SPE068-50G PCB Congeners in Soil - PT LRAC1564

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
PCBs, total 8870	6	6	12	12

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
PCB (20)+(28) 8936	5	5	11	11
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) 8955	9	9	17	17
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) 8965	9	9	17	17
3,4,4',5-Tetrachlorobiphenyl (PCB 81) 8970	9	9	16	16
PCB (90)+(101)+(113) 8982	6	6	13	13
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) 8985	9	9	17	17
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) 8995	10	10	18	18
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) 9000	9	9	16	16
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) 9005	9	9	16	16
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) 9015	9	9	17	17
PCB (129)+(138)+(163) 9026	6	6	13	13
PCB (153)+(168) 9041	5	5	11	11
PCB (156)+(157) 9046	5	5	11	11
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) 9055	9	9	16	16
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) 9060	9	9	17	17
PCB (180)+(193) 9070	5	5	11	11
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) 9085	9	9	16	16

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

**SPE006-225G TCLP Metals CA - WET in Soil - PT
LRAB5592**

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
Antimony, Sb 1005	9	5	10	5
Arsenic, As 1010	9	9	10	10
Barium, Ba 1015	10	10	11	11
Beryllium, Be 1020	9	2	10	2
Cadmium, Cd 1030	10	10	11	11
Chromium, Cr (total) 1040	9	9	10	10
Cobalt, Co 1050	9	9	10	10
Copper, Cu 1055	9	5	10	5
Lead, Pb 1075	11	11	12	12
Molybdenum, Mo 1100	10	2	11	2
Nickel, Ni 1105	9	3	10	3
Selenium, Se 1140	9	9	10	10
Silver, Ag 1150	9	4	10	4
Thallium, Tl 1165	9	9	10	10
Vanadium, V 1185	9	9	10	10
Zinc, Zn 1190	9	3	10	3

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

4 Results

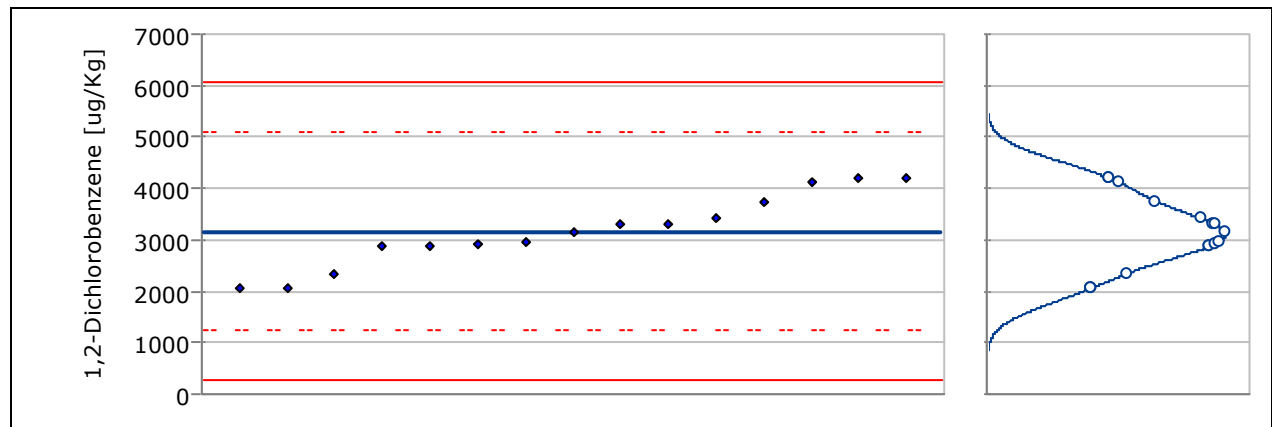
4.1 SPE003-40G BNAs in Soil - PT / LRAC1365

4.1.1 1,2,4-Trichlorobenzene

No. of participating laboratories (in total / with quant. data points only)	14 / 2
No. of data points (in total / quantitative)	16 / 2
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

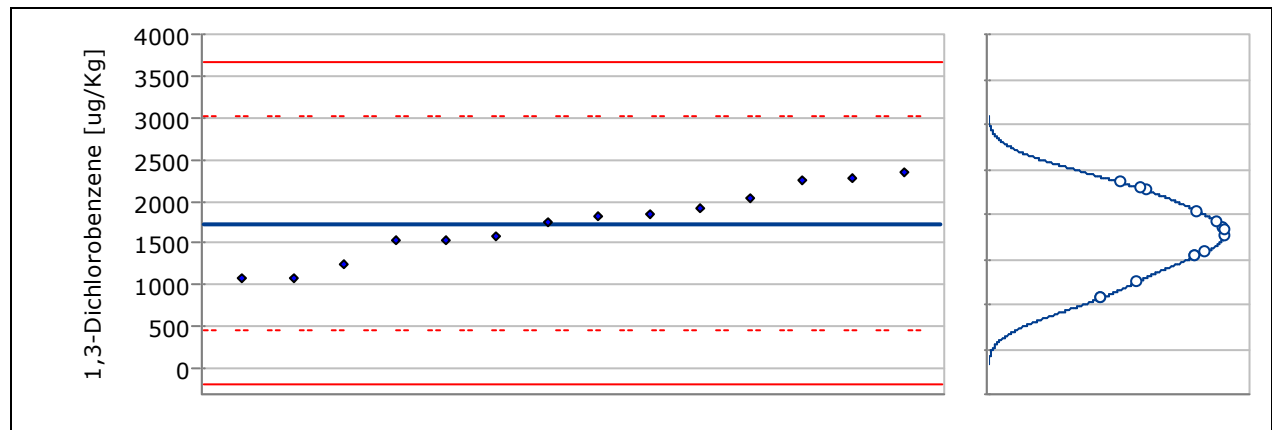
4.1.2 1,2-Dichlorobenzene

No. of participating laboratories (in total / with quant. data points only)	13 / 13
No. of data points (in total / quantitative)	15 / 15
Assigned value	3170 ug/Kg
Proficiency std. dev.	964 ug/Kg
Acceptance window	274 - 6060 ug/Kg

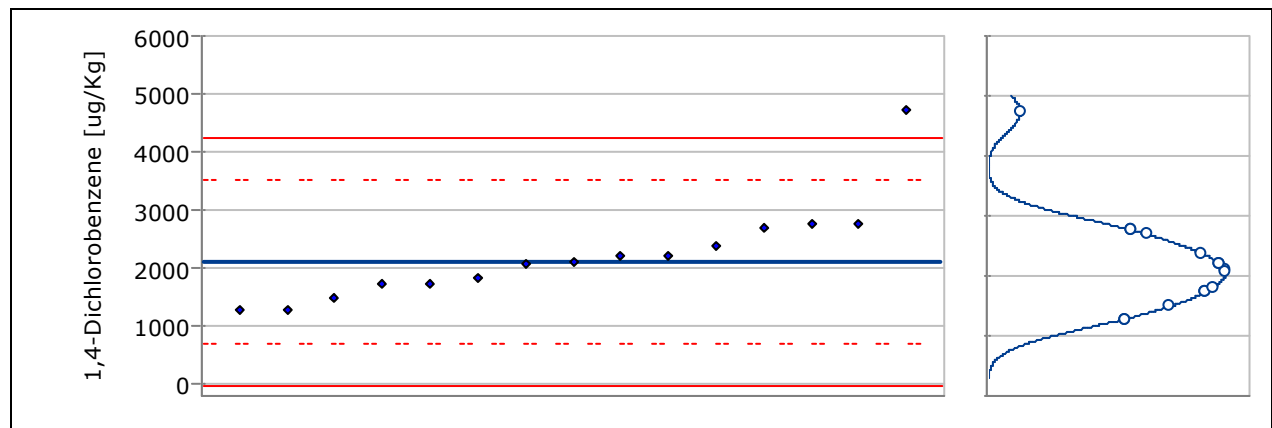


4.1.3 1,3-Dichlorobenzene

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	1730 ug/Kg
Proficiency std. dev.	641 ug/Kg
Acceptance window	0 - 3660 ug/Kg

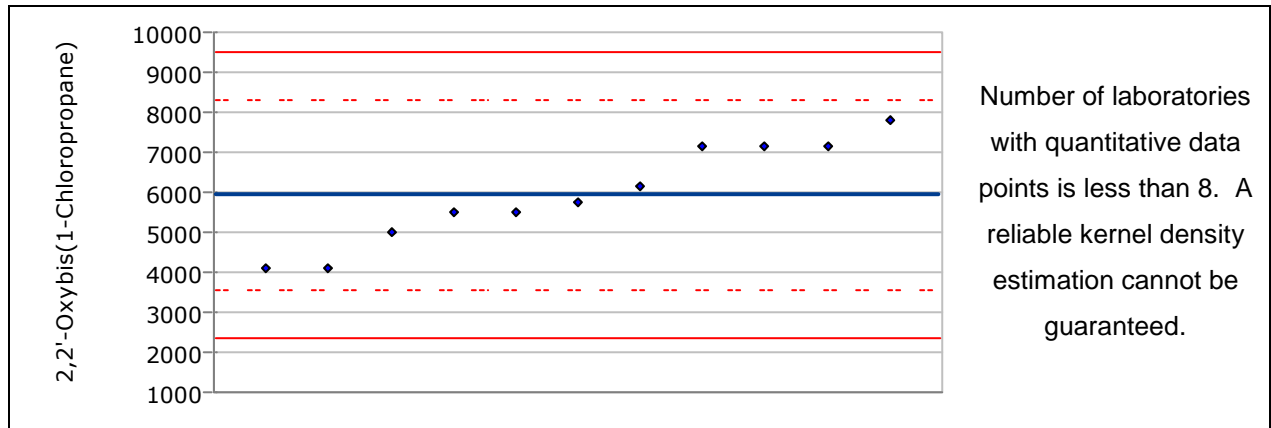
**4.1.4 1,4-Dichlorobenzene**

No. of participating laboratories (in total / with quant. data points only)	13 / 13
No. of data points (in total / quantitative)	15 / 15
Assigned value	2100 ug/Kg
Proficiency std. dev.	711 ug/Kg
Acceptance window	0 - 4240 ug/Kg

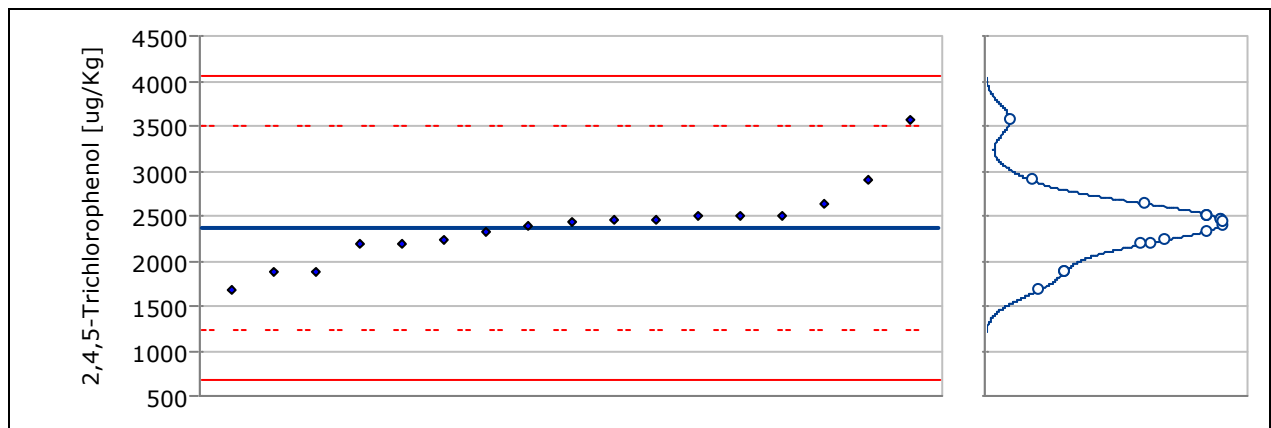


4.1.5 2,2'-Oxybis(1-Chloropropane)

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	11 / 11
Assigned value	5930 µg/Kg
Proficiency std. dev.	1190 µg/Kg
Acceptance window	2370 - 9490 µg/Kg

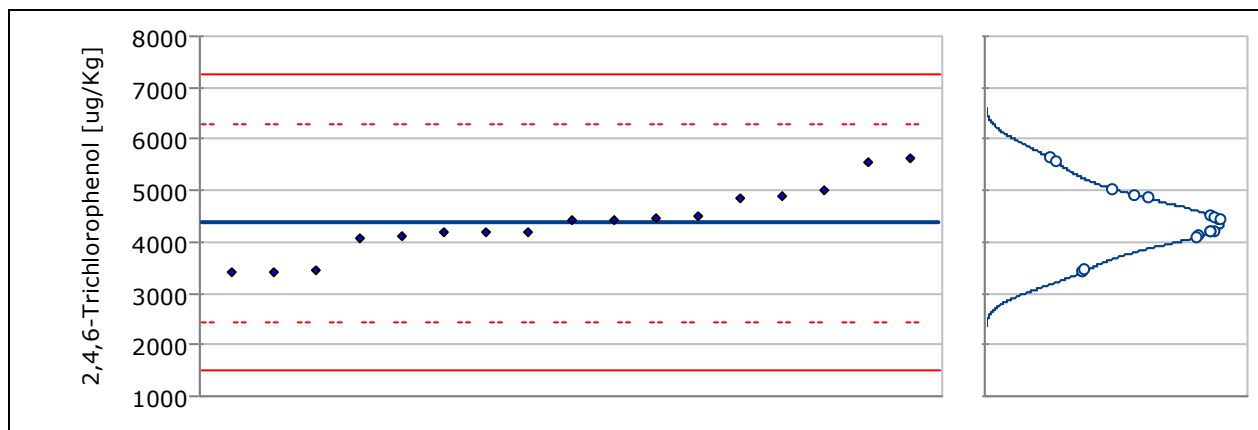
**4.1.6 2,4,5-Trichlorophenol**

No. of participating laboratories (in total / with quant. data points only)	15 / 15
No. of data points (in total / quantitative)	17 / 17
Assigned value	2360 µg/Kg
Proficiency std. dev.	564 µg/Kg
Acceptance window	674 - 4060 µg/Kg

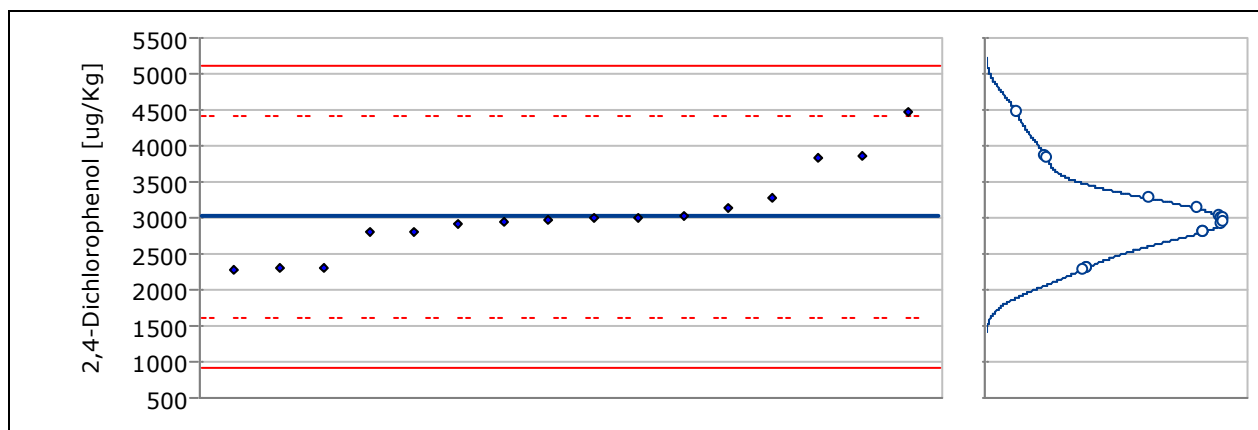


4.1.7 2,4,6-Trichlorophenol

No. of participating laboratories (in total / with quant. data points only)	15 / 15
No. of data points (in total / quantitative)	17 / 17
Assigned value	4380 ug/Kg
Proficiency std. dev.	963 ug/Kg
Acceptance window	1500 - 7270 ug/Kg

**4.1.8 2,4-Dichlorophenol**

No. of participating laboratories (in total / with quant. data points only)	14 / 14
No. of data points (in total / quantitative)	16 / 16
Assigned value	3020 ug/Kg
Proficiency std. dev.	702 ug/Kg
Acceptance window	912 - 5120 ug/Kg

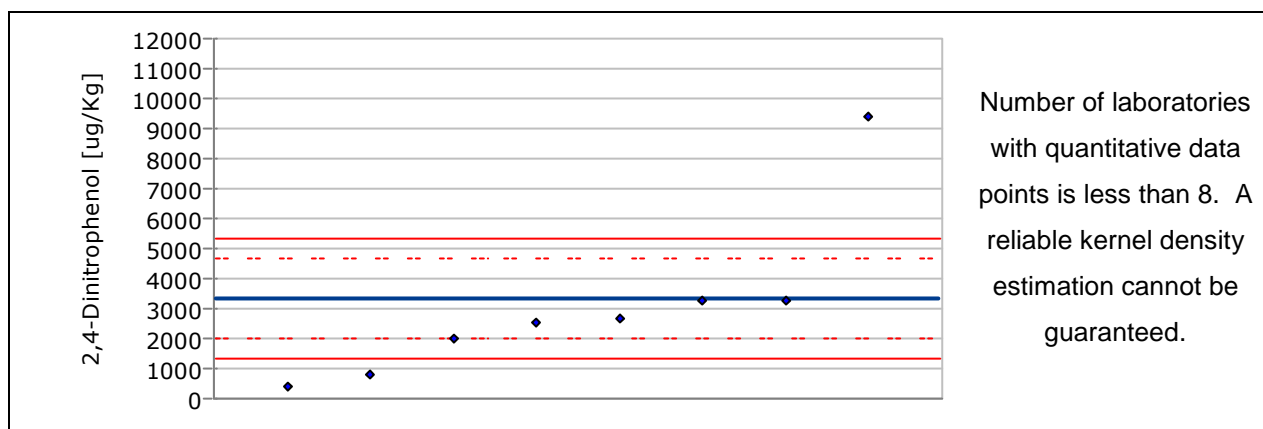


4.1.9 2,4-Dimethylphenol

No. of participating laboratories (in total / with quant. data points only)	15 / 2
No. of data points (in total / quantitative)	18 / 3
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

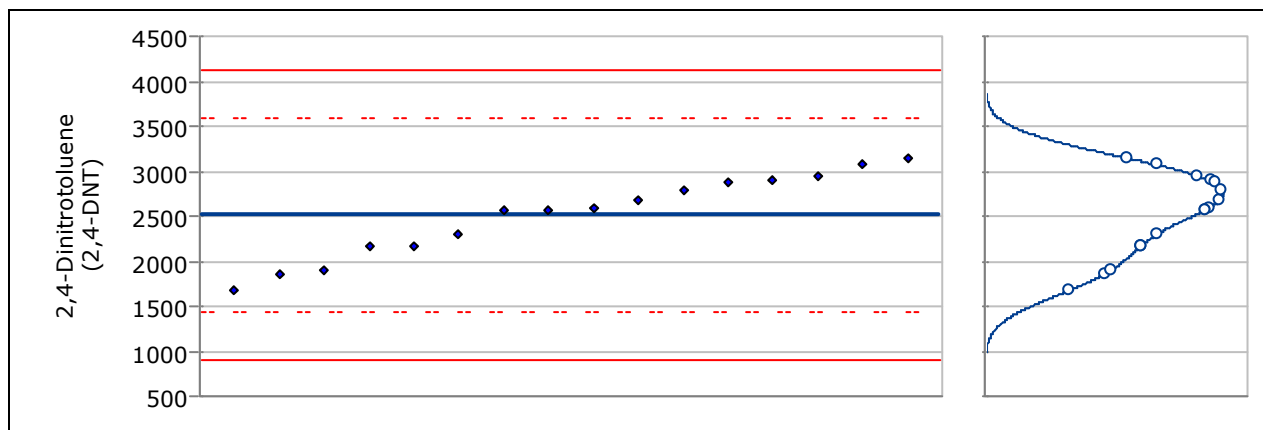
4.1.10 2,4-Dinitrophenol

No. of participating laboratories (in total / with quant. data points only)	14 / 7
No. of data points (in total / quantitative)	16 / 8
Assigned value	3350 ug/Kg
Proficiency std. dev.	671 ug/Kg
Acceptance window	1340 - 5360 ug/Kg



4.1.11 2,4-Dinitrotoluene (2,4-DNT)

No. of participating laboratories (in total / with quant. data points only)	14 / 14
No. of data points (in total / quantitative)	16 / 16
Assigned value	2520 ug/Kg
Proficiency std. dev.	538 ug/Kg
Acceptance window	904 - 4130 ug/Kg

**4.1.12 2,6-Dinitrotoluene (2,6-DNT)**

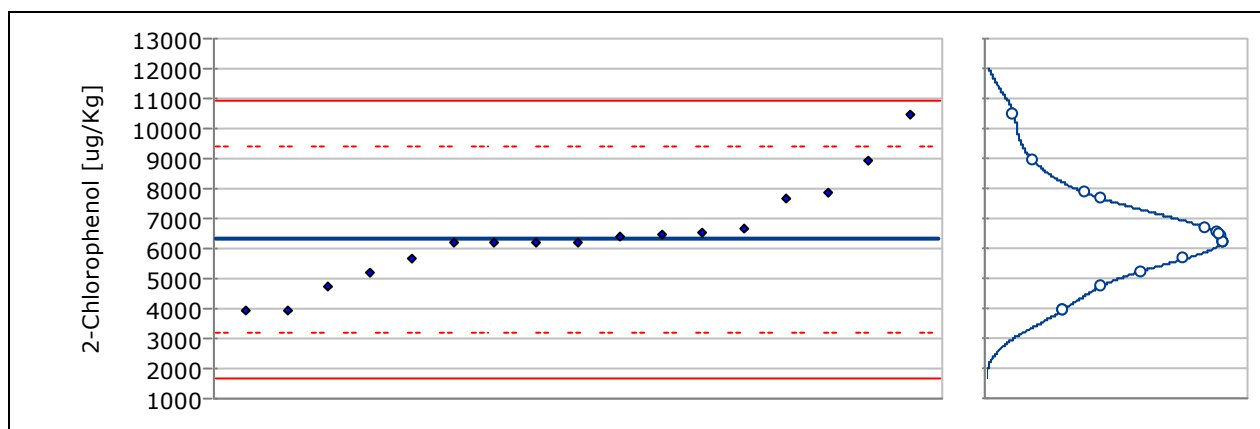
No. of participating laboratories (in total / with quant. data points only)	14 / 2
No. of data points (in total / quantitative)	16 / 2
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

4.1.13 2-Chloronaphthalene

No. of participating laboratories (in total / with quant. data points only)	14 / 3
No. of data points (in total / quantitative)	16 / 3
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

4.1.14 2-Chlorophenol

No. of participating laboratories (in total / with quant. data points only)	15 / 15
No. of data points (in total / quantitative)	17 / 17
Assigned value	6320 ug/Kg
Proficiency std. dev.	1540 ug/Kg
Acceptance window	1690 - 10900 ug/Kg

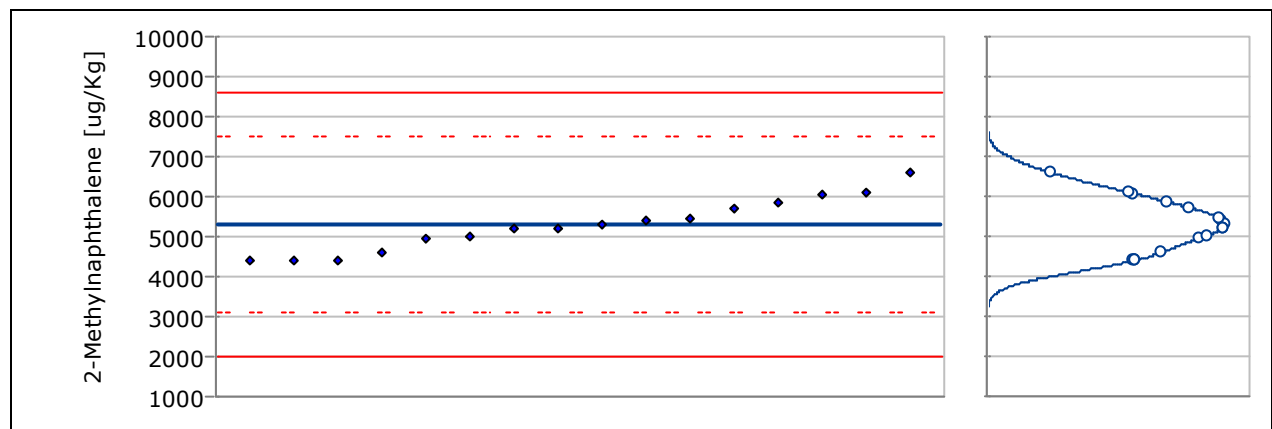


4.1.15 2-Methyl-4,6-dinitrophenol

No. of participating laboratories (in total / with quant. data points only)	12 / 1
No. of data points (in total / quantitative)	14 / 1
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

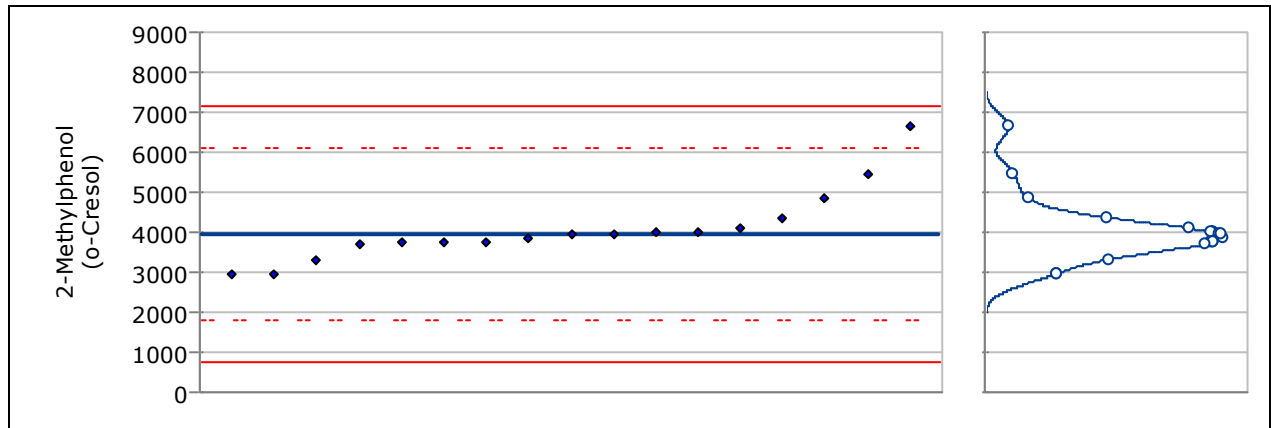
4.1.16 2-Methylnaphthalene

No. of participating laboratories (in total / with quant. data points only)	14 / 14
No. of data points (in total / quantitative)	16 / 16
Assigned value	5280 ug/Kg
Proficiency std. dev.	1100 ug/Kg
Acceptance window	1980 - 8580 ug/Kg



4.1.17 2-Methylphenol (o-Cresol)

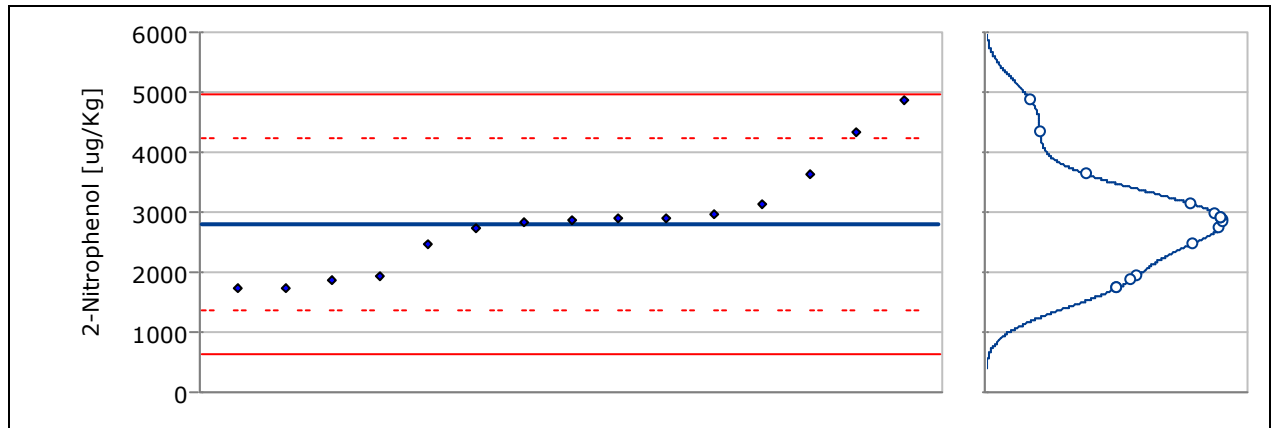
No. of participating laboratories (in total / with quant. data points only)	14 / 14
No. of data points (in total / quantitative)	17 / 17
Assigned value	3940 ug/Kg
Proficiency std. dev.	1070 ug/Kg
Acceptance window	741 - 7150 ug/Kg

**4.1.18 2-Nitroaniline**

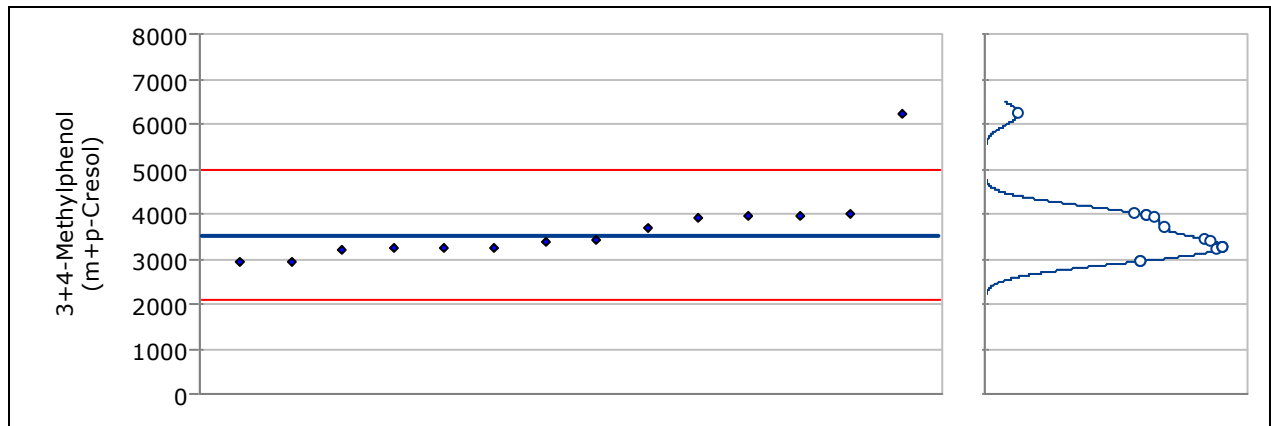
No. of participating laboratories (in total / with quant. data points only)	11 / 2
No. of data points (in total / quantitative)	13 / 2
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

4.1.19 2-Nitrophenol

No. of participating laboratories (in total / with quant. data points only)	13 / 13
No. of data points (in total / quantitative)	15 / 15
Assigned value	2790 ug/Kg
Proficiency std. dev.	720 ug/Kg
Acceptance window	632 - 4950 ug/Kg

**4.1.20 3+4-Methylphenol (m+p-Cresol)**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	3530 ug/Kg
Proficiency std. dev.	482 ug/Kg
Acceptance window	2080 - 4980 ug/Kg



4.1.21 3,3'-Dichlorobenzidine

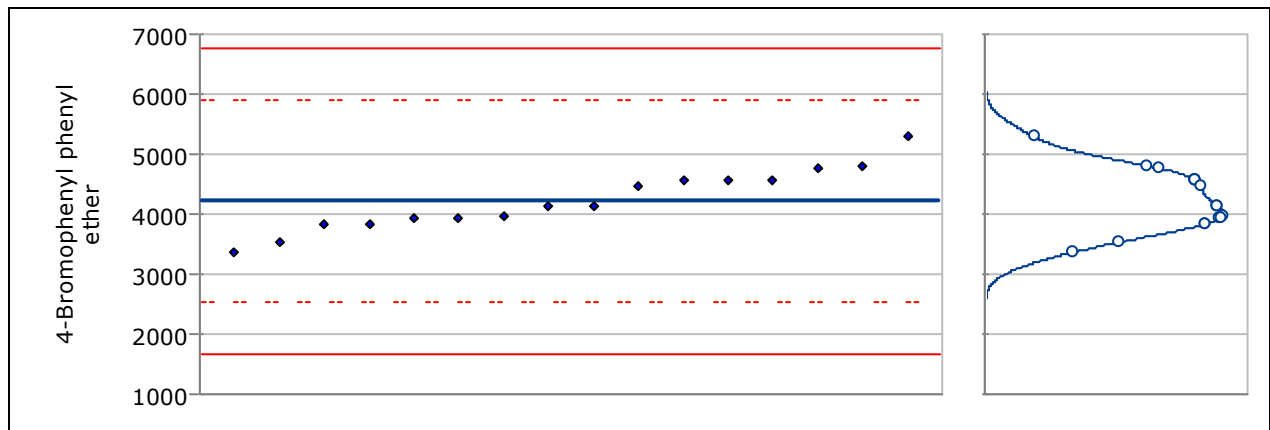
No. of participating laboratories (in total / with quant. data points only)	12 / 1
No. of data points (in total / quantitative)	14 / 1
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

4.1.22 3-Nitroaniline

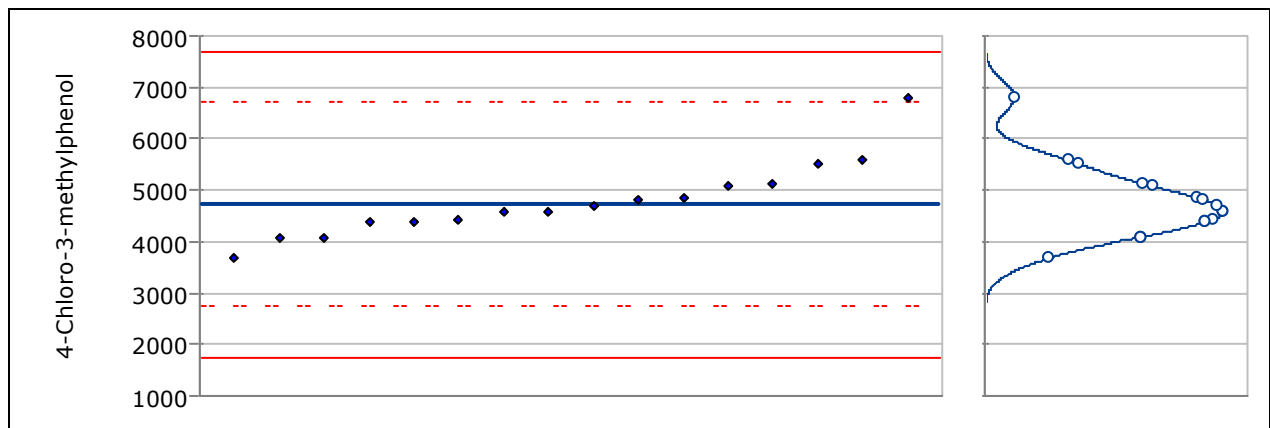
No. of participating laboratories (in total / with quant. data points only)	11 / 2
No. of data points (in total / quantitative)	13 / 2
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

4.1.23 4-Bromophenyl phenyl ether

No. of participating laboratories (in total / with quant. data points only)	14 / 14
No. of data points (in total / quantitative)	16 / 16
Assigned value	4220 ug/Kg
Proficiency std. dev.	848 ug/Kg
Acceptance window	1680 - 6760 ug/Kg

**4.1.24 4-Chloro-3-methylphenol**

No. of participating laboratories (in total / with quant. data points only)	14 / 14
No. of data points (in total / quantitative)	16 / 16
Assigned value	4730 ug/Kg
Proficiency std. dev.	993 ug/Kg
Acceptance window	1750 - 7700 ug/Kg



4.1.25 4-Chloroaniline

No. of participating laboratories (in total / with quant. data points only)	12 / 2
No. of data points (in total / quantitative)	14 / 2
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

4.1.26 4-Chlorophenyl phenylether

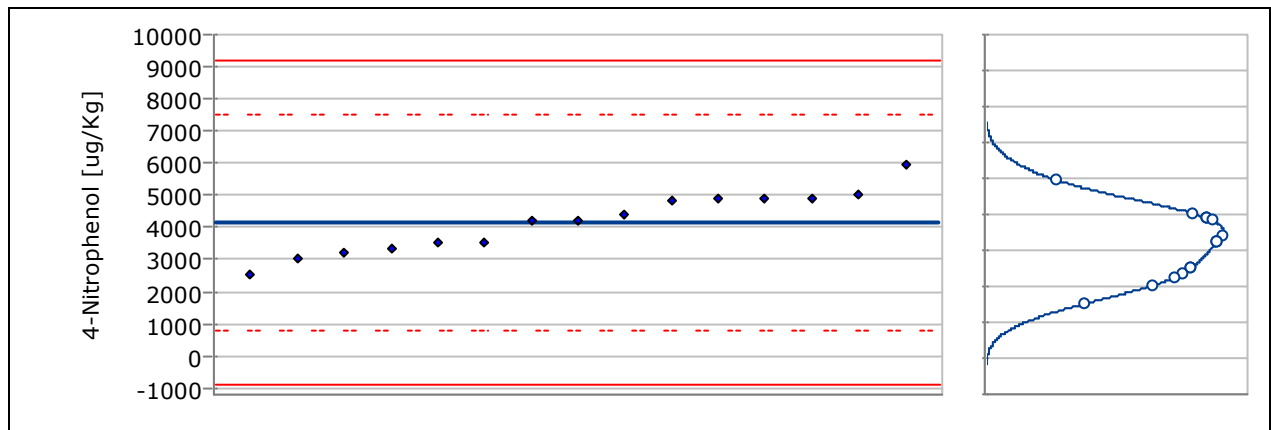
No. of participating laboratories (in total / with quant. data points only)	14 / 3
No. of data points (in total / quantitative)	16 / 3
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

4.1.27 4-Nitroaniline

No. of participating laboratories (in total / with quant. data points only)	10 / 1
No. of data points (in total / quantitative)	12 / 1
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

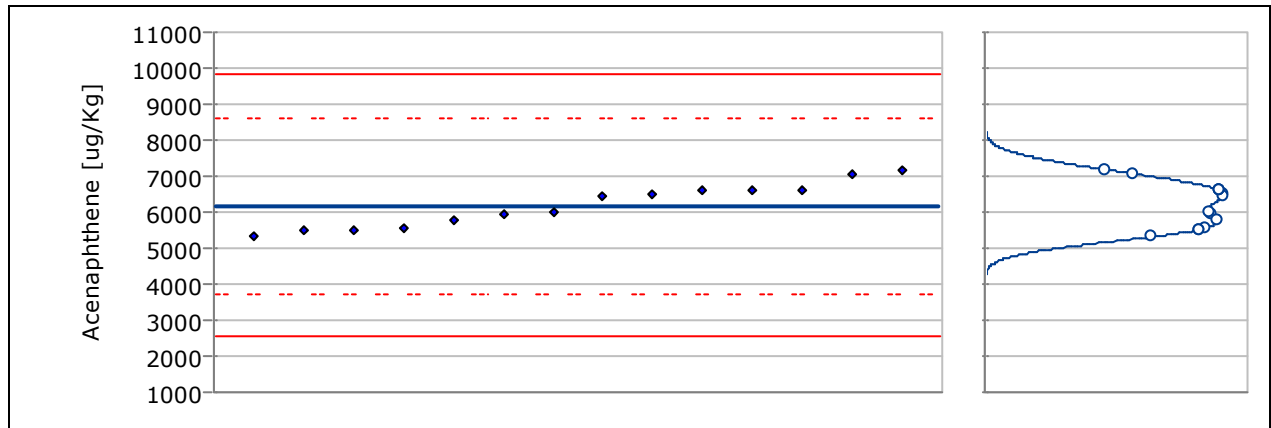
4.1.28 4-Nitrophenol

No. of participating laboratories (in total / with quant. data points only)	13 / 11
No. of data points (in total / quantitative)	17 / 15
Assigned value	4160 ug/Kg
Proficiency std. dev.	1690 ug/Kg
Acceptance window	0 - 9220 ug/Kg

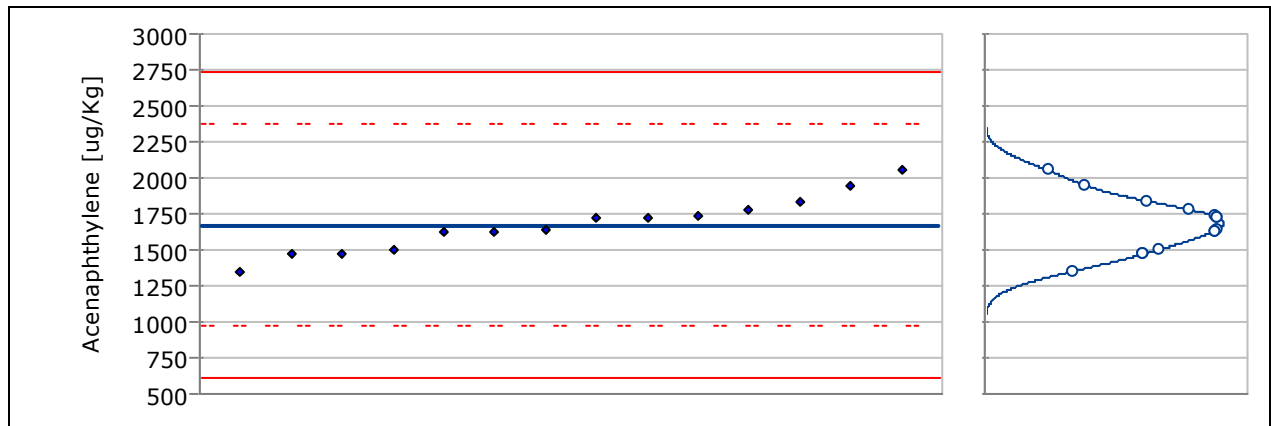


4.1.29 Acenaphthene

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	6190 ug/Kg
Proficiency std. dev.	1220 ug/Kg
Acceptance window	2530 - 9850 ug/Kg

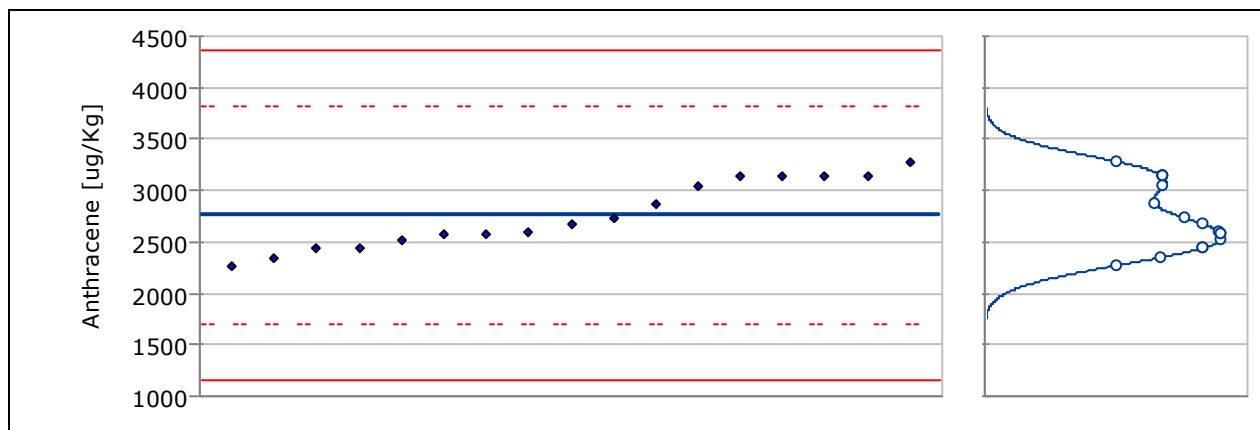
**4.1.30 Acenaphthylene**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	1670 ug/Kg
Proficiency std. dev.	354 ug/Kg
Acceptance window	612 - 2730 ug/Kg



4.1.31 Anthracene

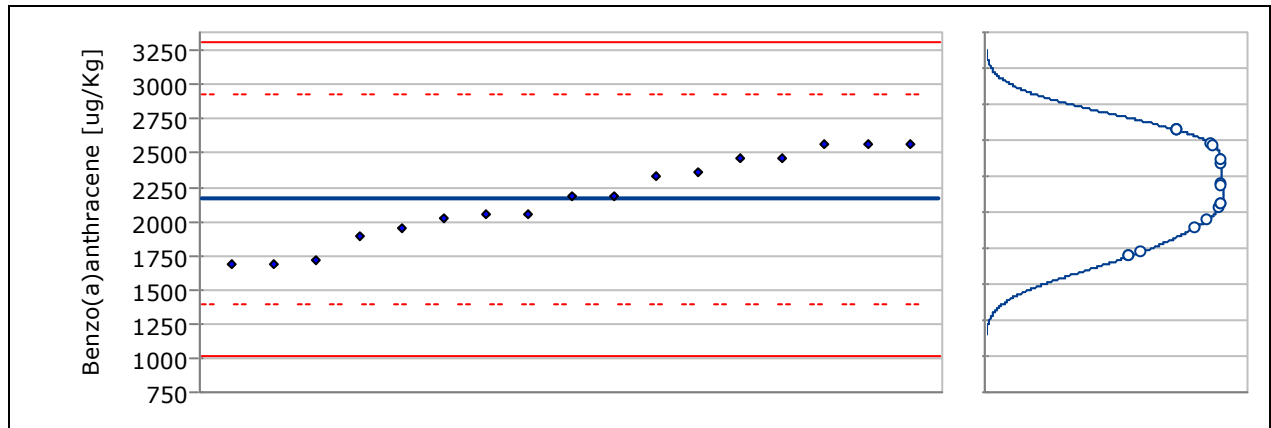
No. of participating laboratories (in total / with quant. data points only)	13 / 13
No. of data points (in total / quantitative)	17 / 17
Assigned value	2760 ug/Kg
Proficiency std. dev.	532 ug/Kg
Acceptance window	1160 - 4360 ug/Kg

**4.1.32 Benzidine**

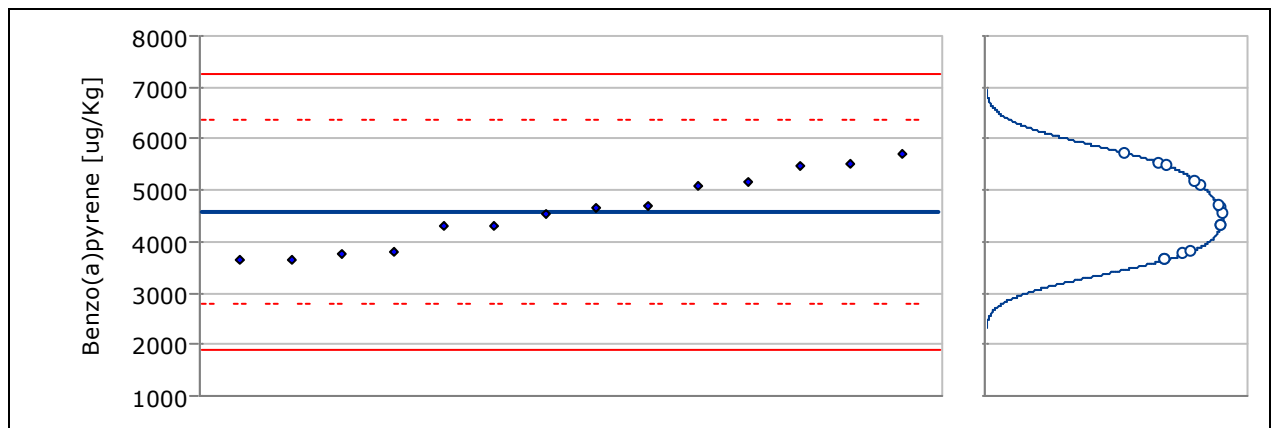
No. of participating laboratories (in total / with quant. data points only)	9 / 1
No. of data points (in total / quantitative)	12 / 1
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

4.1.33 Benzo(a)anthracene

No. of participating laboratories (in total / with quant. data points only)	13 / 13
No. of data points (in total / quantitative)	17 / 17
Assigned value	2160 ug/Kg
Proficiency std. dev.	382 ug/Kg
Acceptance window	1020 - 3310 ug/Kg

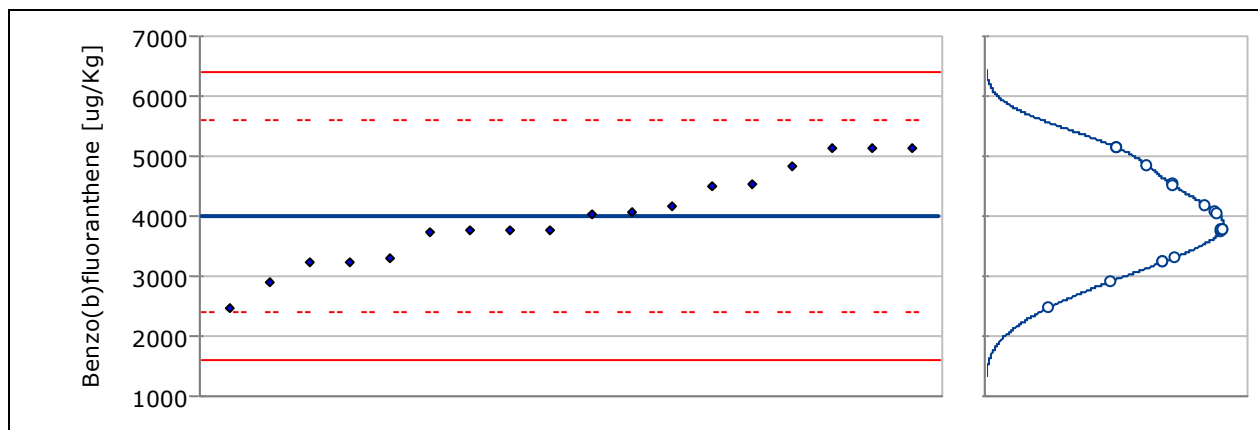
**4.1.34 Benzo(a)pyrene**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	4590 ug/Kg
Proficiency std. dev.	894 ug/Kg
Acceptance window	1910 - 7270 ug/Kg

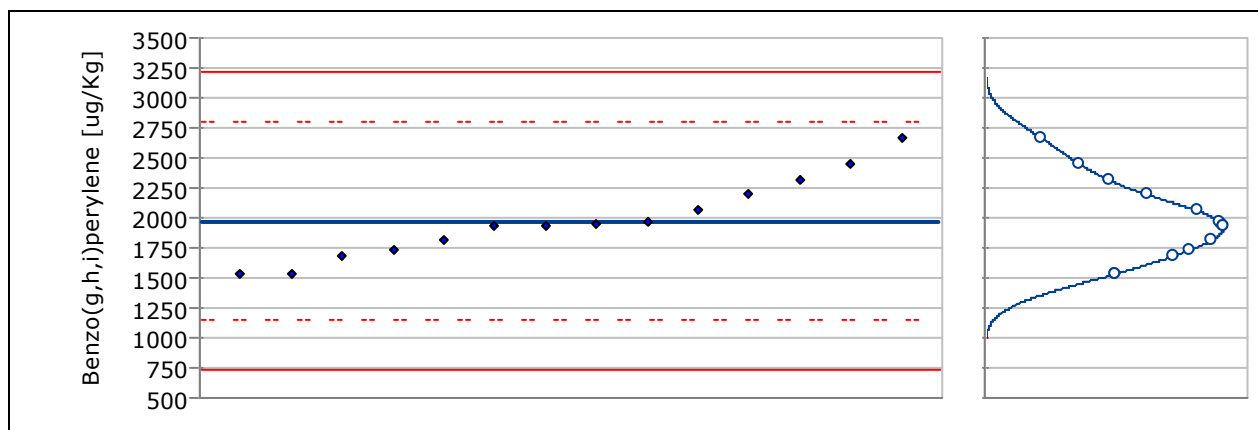


4.1.35 Benzo(b)fluoranthene

No. of participating laboratories (in total / with quant. data points only)	14 / 14
No. of data points (in total / quantitative)	18 / 18
Assigned value	4000 ug/Kg
Proficiency std. dev.	796 ug/Kg
Acceptance window	1610 - 6390 ug/Kg

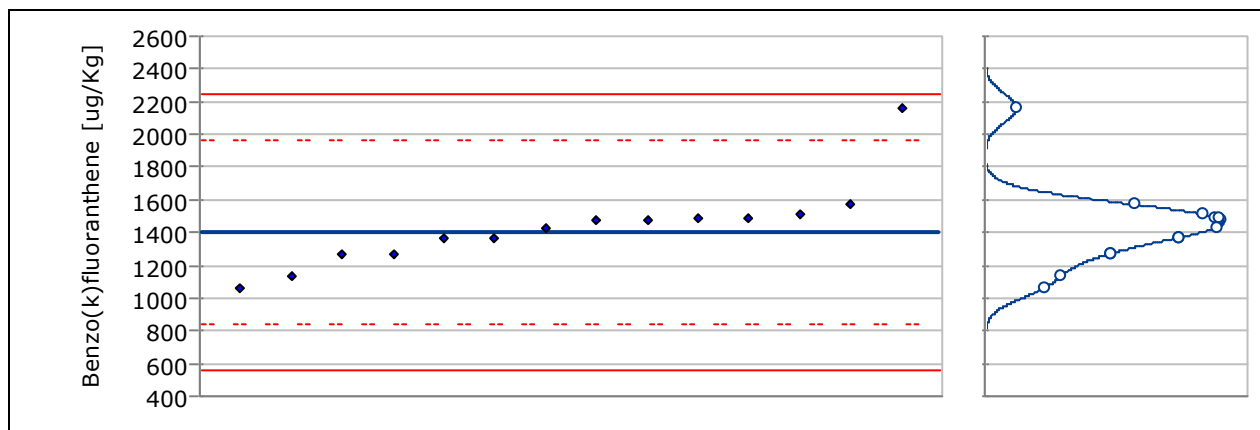
**4.1.36 Benzo(g,h,i)perylene**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	1970 ug/Kg
Proficiency std. dev.	413 ug/Kg
Acceptance window	733 - 3210 ug/Kg



4.1.37 Benzo(k)fluoranthene

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	1410 ug/Kg
Proficiency std. dev.	282 ug/Kg
Acceptance window	560 - 2250 ug/Kg

**4.1.38 Benzoic acid**

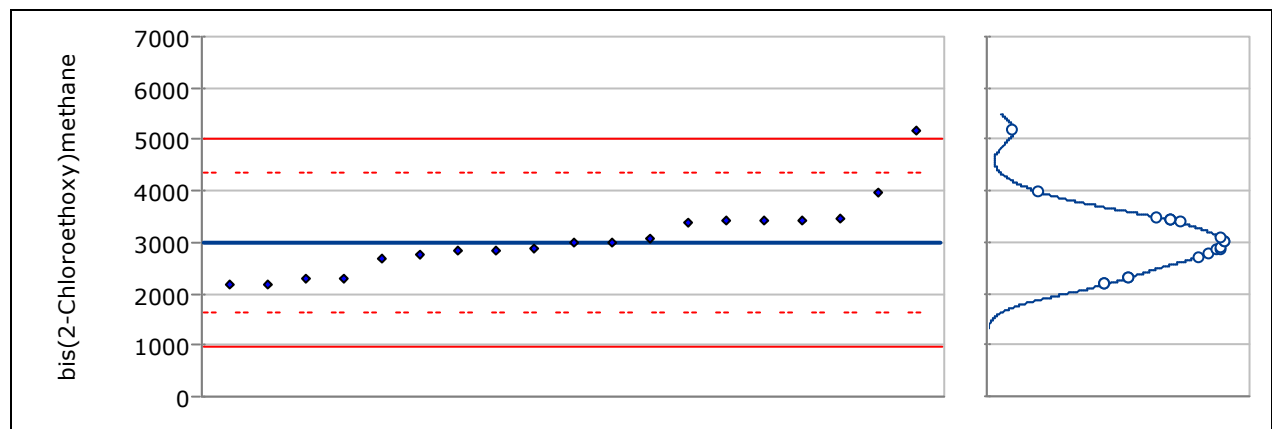
No. of participating laboratories (in total / with quant. data points only)	7 / 1
No. of data points (in total / quantitative)	9 / 1
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

4.1.39 Benzyl alcohol

No. of participating laboratories (in total / with quant. data points only)	10 / 1
No. of data points (in total / quantitative)	12 / 1
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

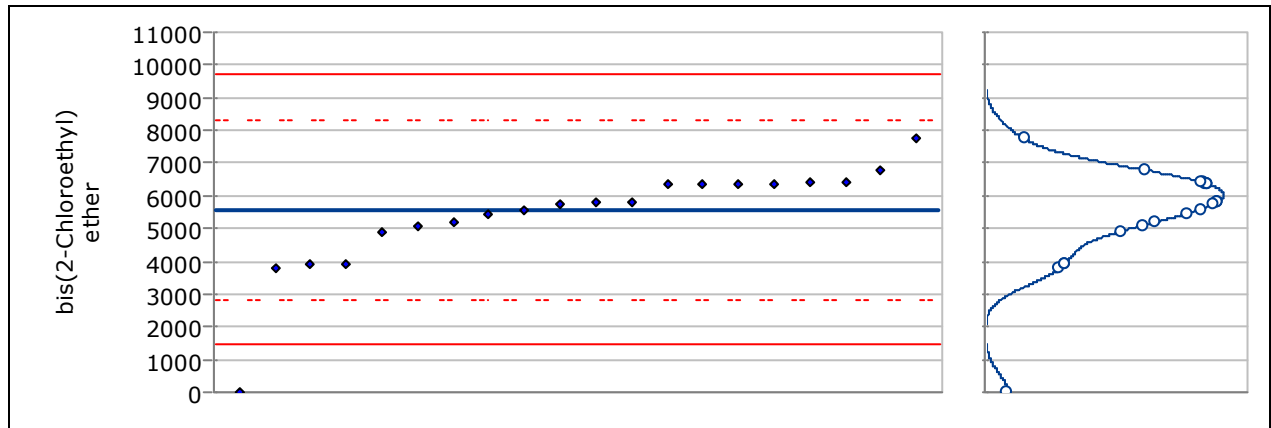
4.1.40 bis(2-Chloroethoxy)methane

No. of participating laboratories (in total / with quant. data points only)	15 / 15
No. of data points (in total / quantitative)	19 / 19
Assigned value	2990 ug/Kg
Proficiency std. dev.	673 ug/Kg
Acceptance window	974 - 5010 ug/Kg



4.1.41 bis(2-Chloroethyl) ether

No. of participating laboratories (in total / with quant. data points only)	16 / 16
No. of data points (in total / quantitative)	20 / 20
Assigned value	5570 ug/Kg
Proficiency std. dev.	1380 ug/Kg
Acceptance window	1440 - 9690 ug/Kg

**4.1.42 bis(2-Ethylhexyl) phthalate (DEHP)**

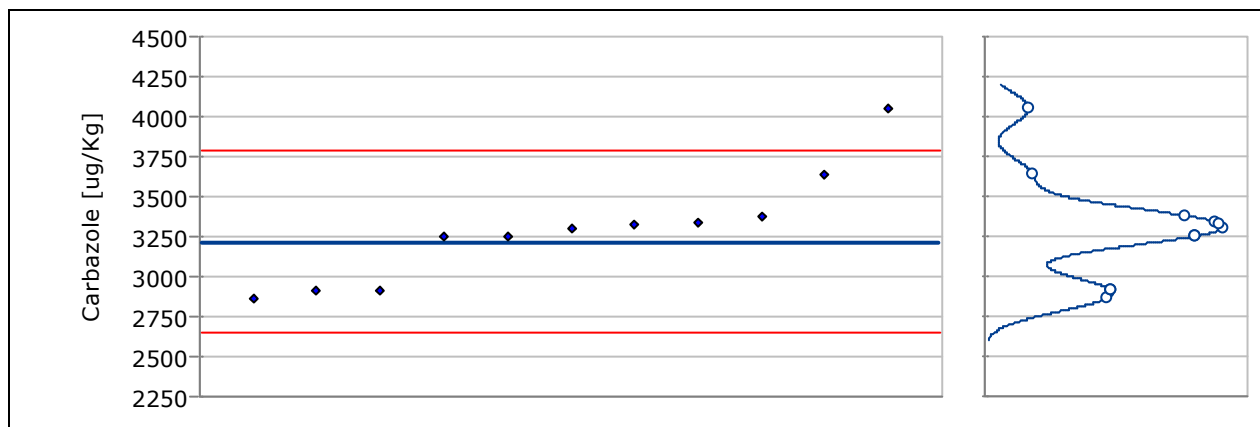
No. of participating laboratories (in total / with quant. data points only)	14 / 2
No. of data points (in total / quantitative)	16 / 2
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

4.1.43 Butyl benzyl phthalate

No. of participating laboratories (in total / with quant. data points only)	14 / 3
No. of data points (in total / quantitative)	17 / 4
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

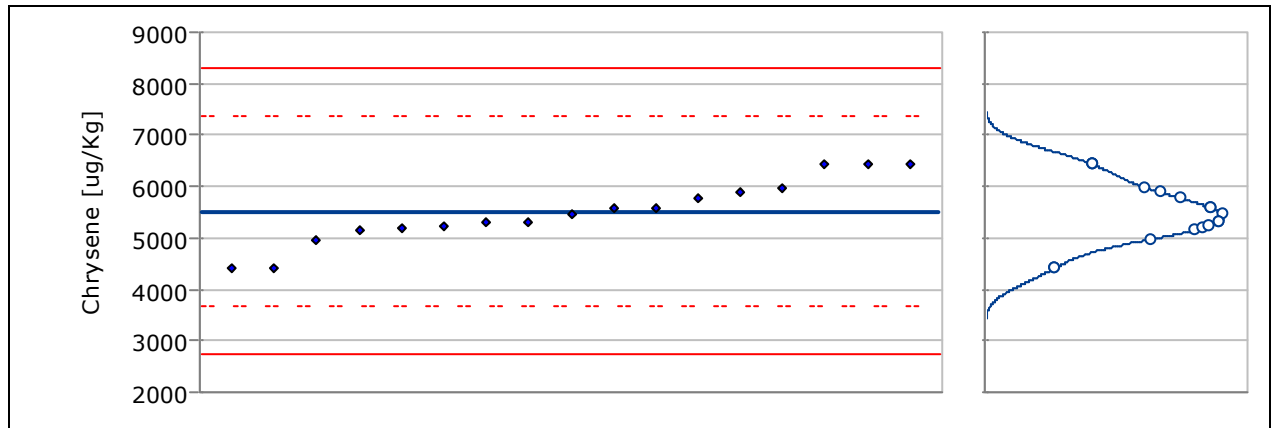
4.1.44 Carbazole

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	11 / 11
Assigned value	3220 ug/Kg
Proficiency std. dev.	189 ug/Kg
Acceptance window	2650 - 3790 ug/Kg

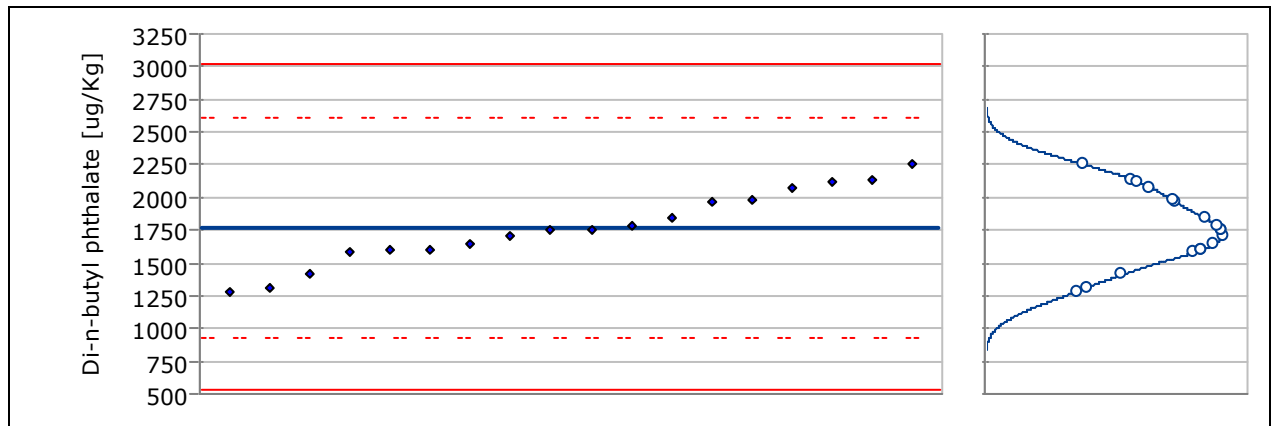


4.1.45 Chrysene

No. of participating laboratories (in total / with quant. data points only)	13 / 13
No. of data points (in total / quantitative)	17 / 17
Assigned value	5510 ug/Kg
Proficiency std. dev.	925 ug/Kg
Acceptance window	2730 - 8280 ug/Kg

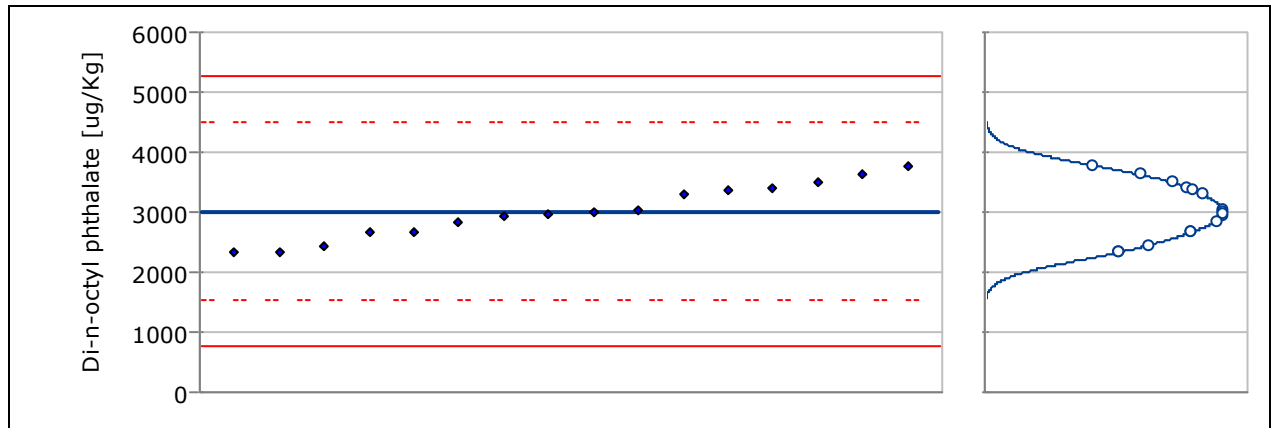
**4.1.46 Di-n-butyl phthalate**

No. of participating laboratories (in total / with quant. data points only)	15 / 15
No. of data points (in total / quantitative)	18 / 18
Assigned value	1770 ug/Kg
Proficiency std. dev.	419 ug/Kg
Acceptance window	510 - 3020 ug/Kg

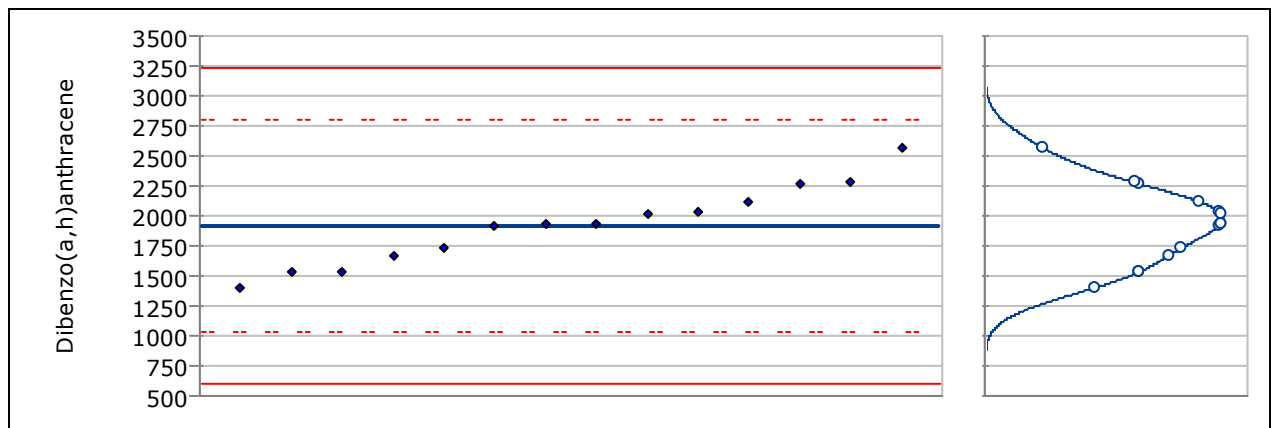


4.1.47 Di-n-octyl phthalate

No. of participating laboratories (in total / with quant. data points only)	14 / 14
No. of data points (in total / quantitative)	16 / 16
Assigned value	3010 ug/Kg
Proficiency std. dev.	747 ug/Kg
Acceptance window	773 - 5250 ug/Kg

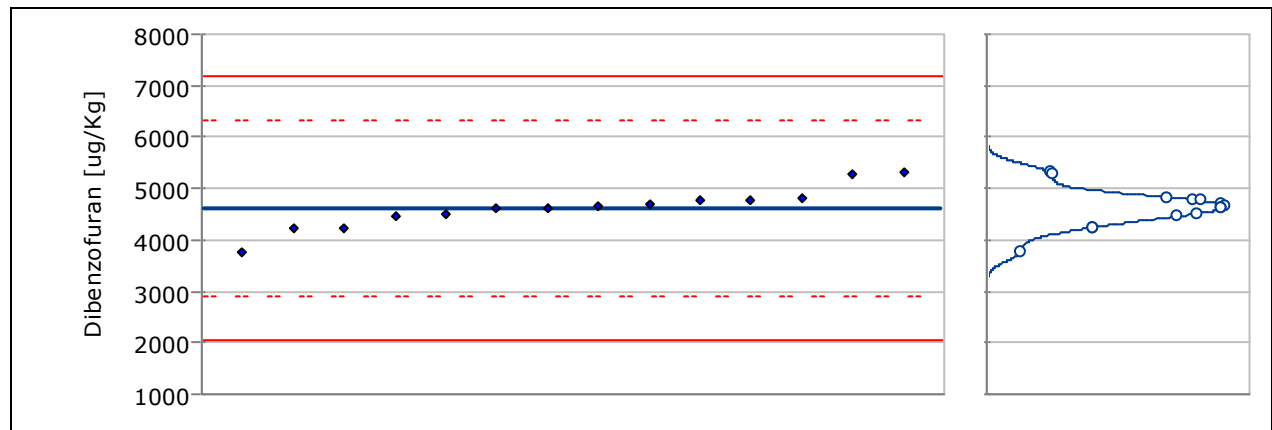
**4.1.48 Dibenzo(a,h)anthracene**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	1920 ug/Kg
Proficiency std. dev.	440 ug/Kg
Acceptance window	596 - 3240 ug/Kg

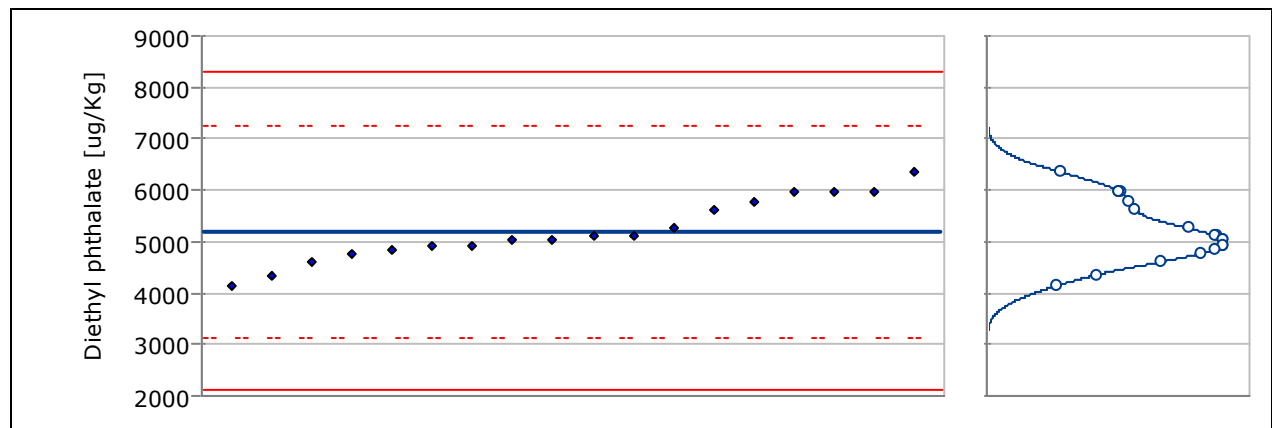


4.1.49 Dibenzofuran

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	4630 ug/Kg
Proficiency std. dev.	855 ug/Kg
Acceptance window	2060 - 7190 ug/Kg

**4.1.50 Diethyl phthalate**

No. of participating laboratories (in total / with quant. data points only)	15 / 15
No. of data points (in total / quantitative)	18 / 18
Assigned value	5200 ug/Kg
Proficiency std. dev.	1030 ug/Kg
Acceptance window	2110 - 8290 ug/Kg

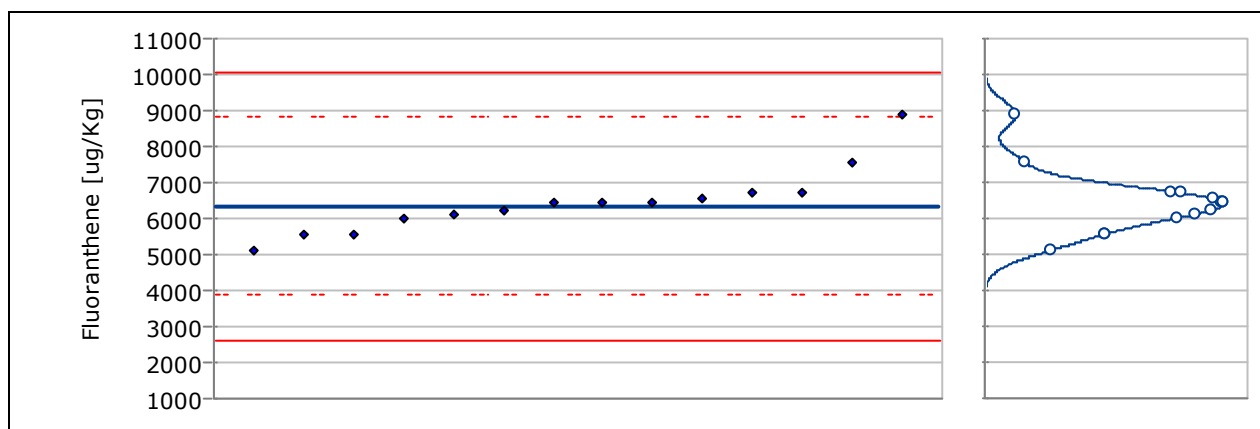


4.1.51 Dimethyl phthalate

No. of participating laboratories (in total / with quant. data points only)	15 / 3
No. of data points (in total / quantitative)	18 / 4
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

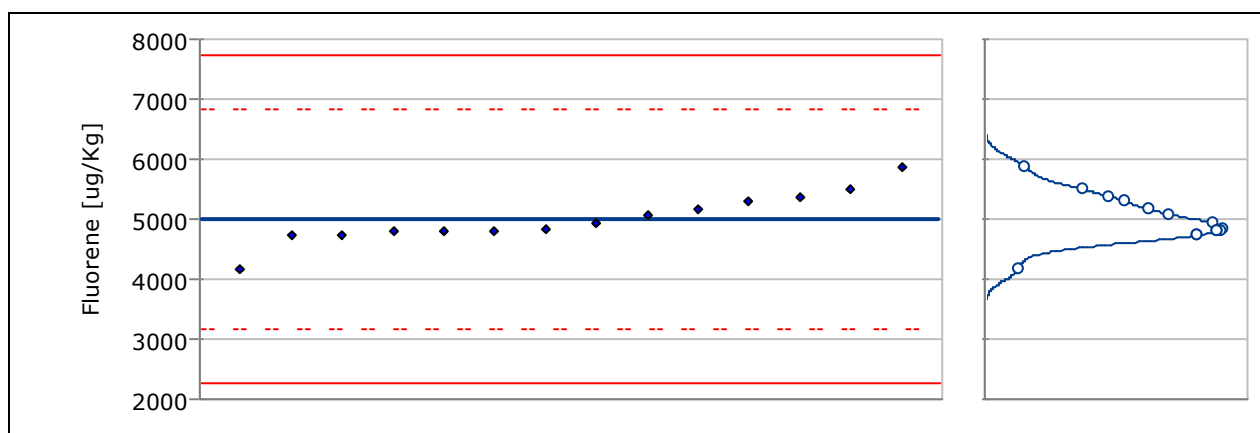
4.1.52 Fluoranthene

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	6360 ug/Kg
Proficiency std. dev.	1240 ug/Kg
Acceptance window	2630 - 10100 ug/Kg

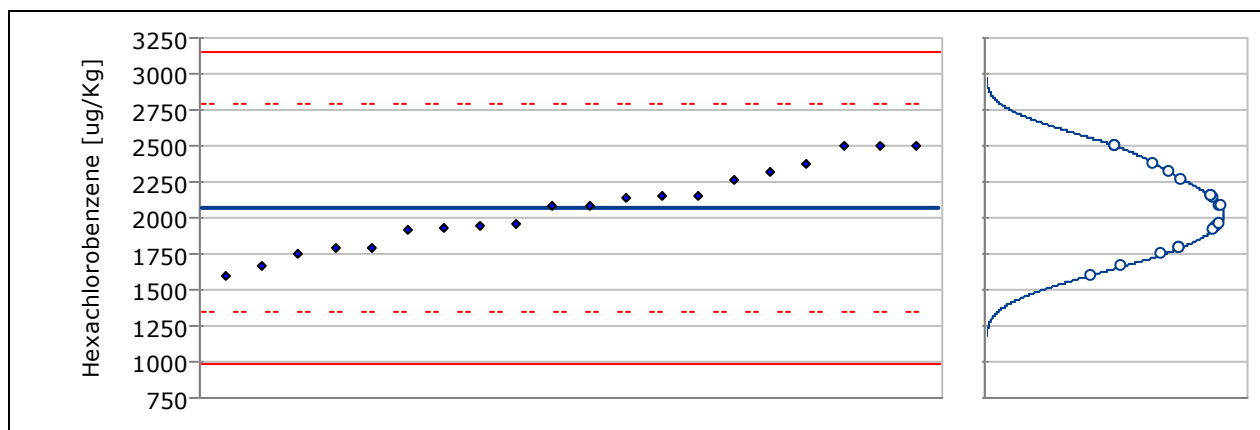


4.1.53 Fluorene

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	5000 ug/Kg
Proficiency std. dev.	915 ug/Kg
Acceptance window	2260 - 7750 ug/Kg

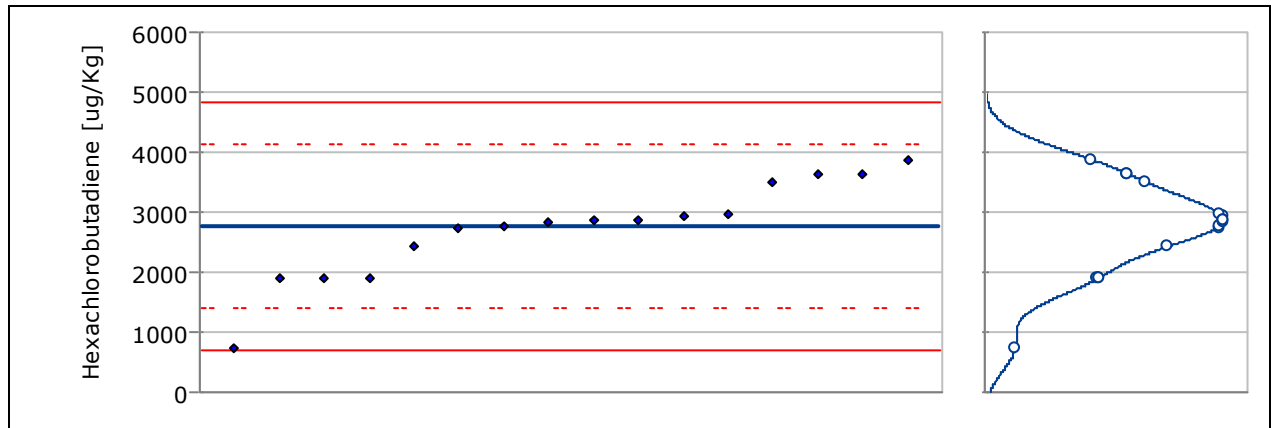
**4.1.54 Hexachlorobenzene**

No. of participating laboratories (in total / with quant. data points only)	16 / 16
No. of data points (in total / quantitative)	20 / 20
Assigned value	2070 ug/Kg
Proficiency std. dev.	359 ug/Kg
Acceptance window	992 - 3150 ug/Kg

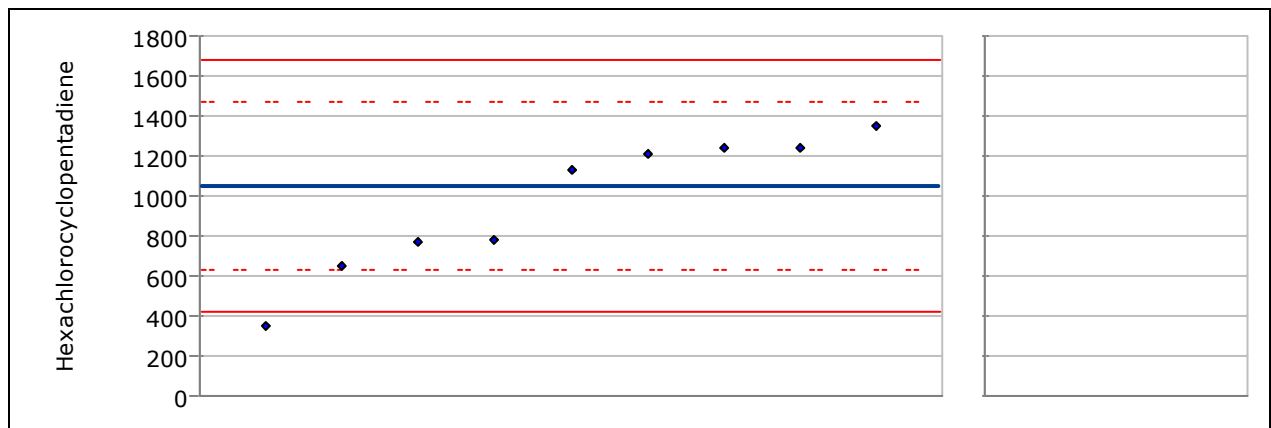


4.1.55 Hexachlorobutadiene

No. of participating laboratories (in total / with quant. data points only)	14 / 14
No. of data points (in total / quantitative)	16 / 16
Assigned value	2770 ug/Kg
Proficiency std. dev.	686 ug/Kg
Acceptance window	716 - 4830 ug/Kg

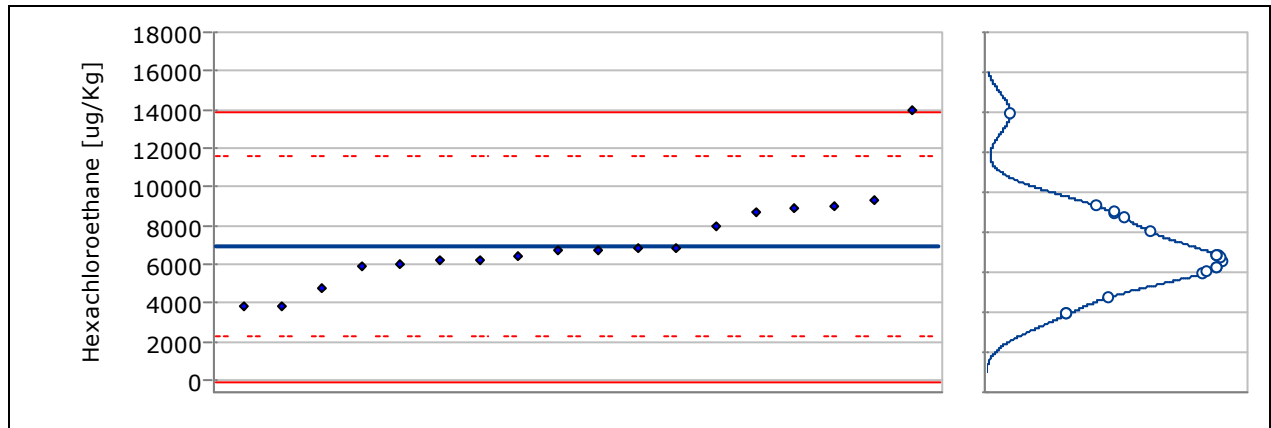
**4.1.56 Hexachlorocyclopentadiene**

No. of participating laboratories (in total / with quant. data points only)	13 / 8
No. of data points (in total / quantitative)	15 / 9
Assigned value	1050 ug/Kg
Proficiency std. dev.	210 ug/Kg
Acceptance window	419 - 1680 ug/Kg

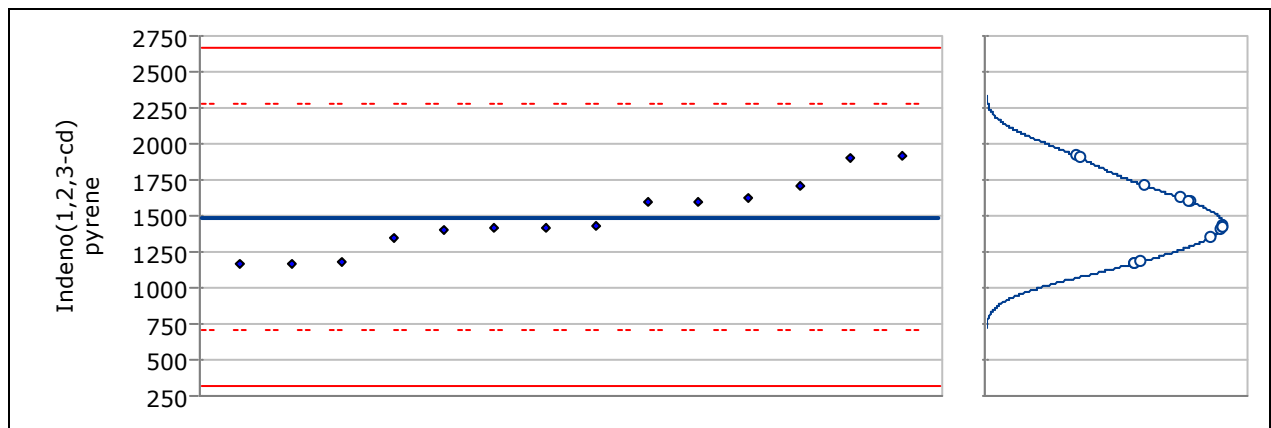


4.1.57 Hexachloroethane

No. of participating laboratories (in total / with quant. data points only)	15 / 15
No. of data points (in total / quantitative)	18 / 18
Assigned value	6900 ug/Kg
Proficiency std. dev.	2320 ug/Kg
Acceptance window	0 - 13900 ug/Kg

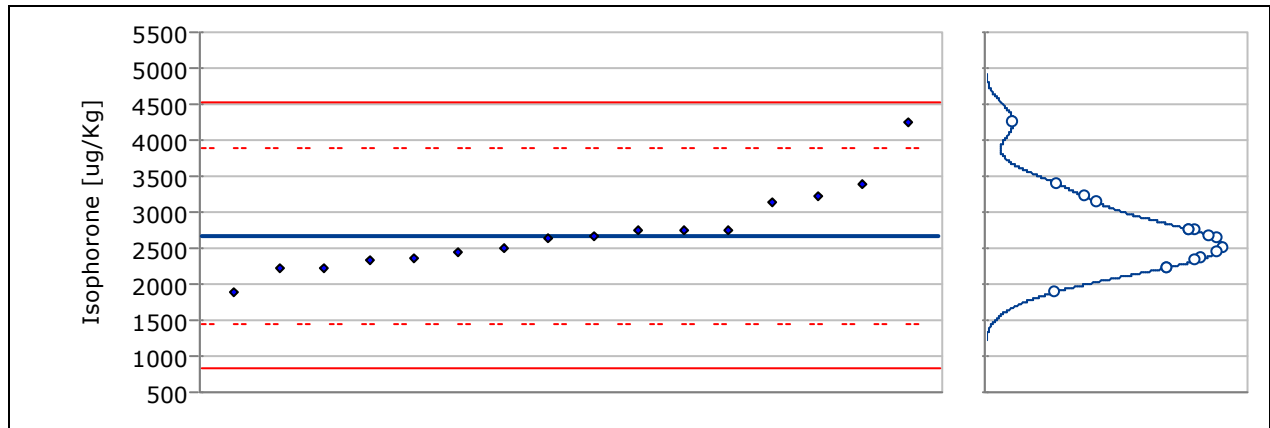
**4.1.58 Indeno(1,2,3-cd) pyrene**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	1490 ug/Kg
Proficiency std. dev.	390 ug/Kg
Acceptance window	320 - 2660 ug/Kg

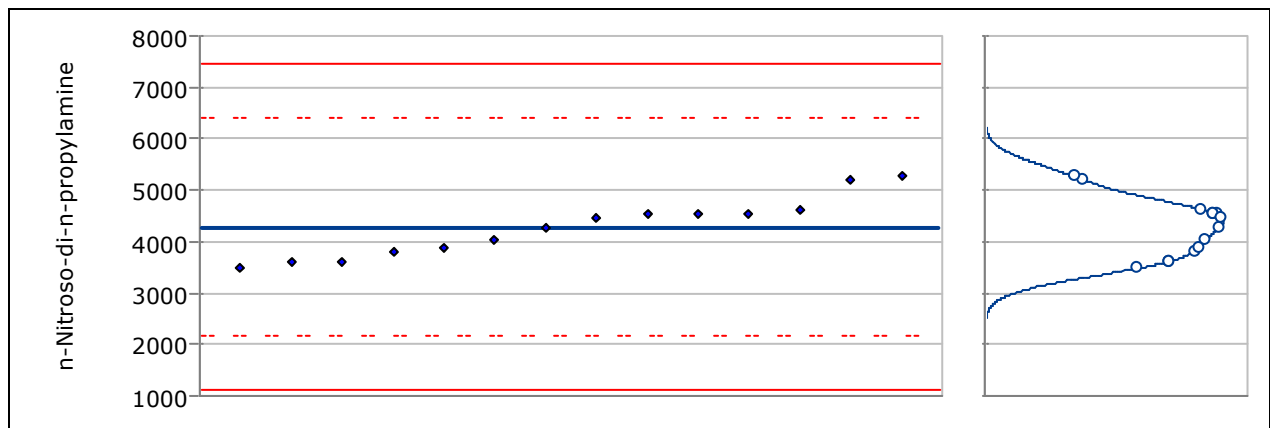


4.1.59 Isophorone

No. of participating laboratories (in total / with quant. data points only)	14 / 14
No. of data points (in total / quantitative)	16 / 16
Assigned value	2670 ug/Kg
Proficiency std. dev.	615 ug/Kg
Acceptance window	825 - 4510 ug/Kg

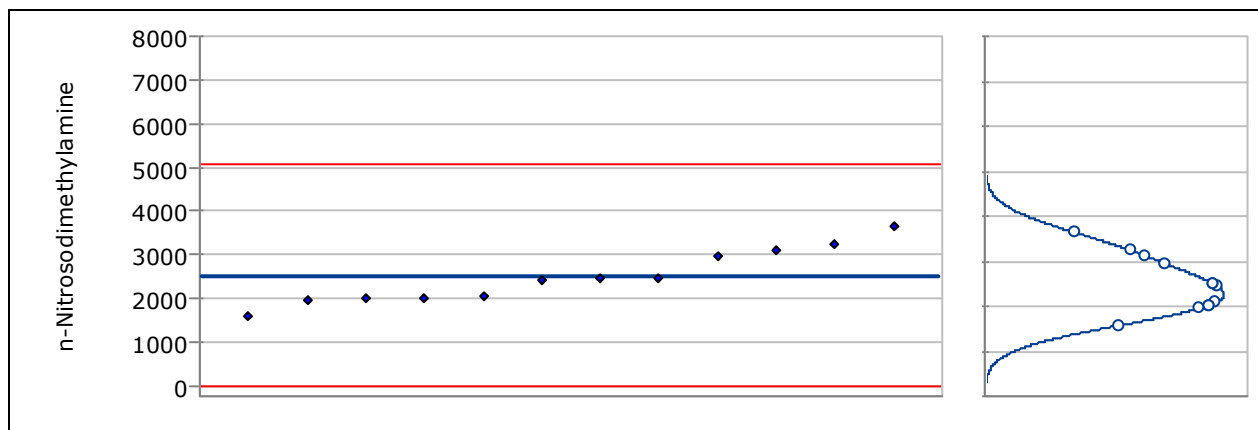
**4.1.60 n-Nitroso-di-n-propylamine**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	4270 ug/Kg
Proficiency std. dev.	1060 ug/Kg
Acceptance window	1100 - 7450 ug/Kg



4.1.61 n-Nitrosodimethylamine

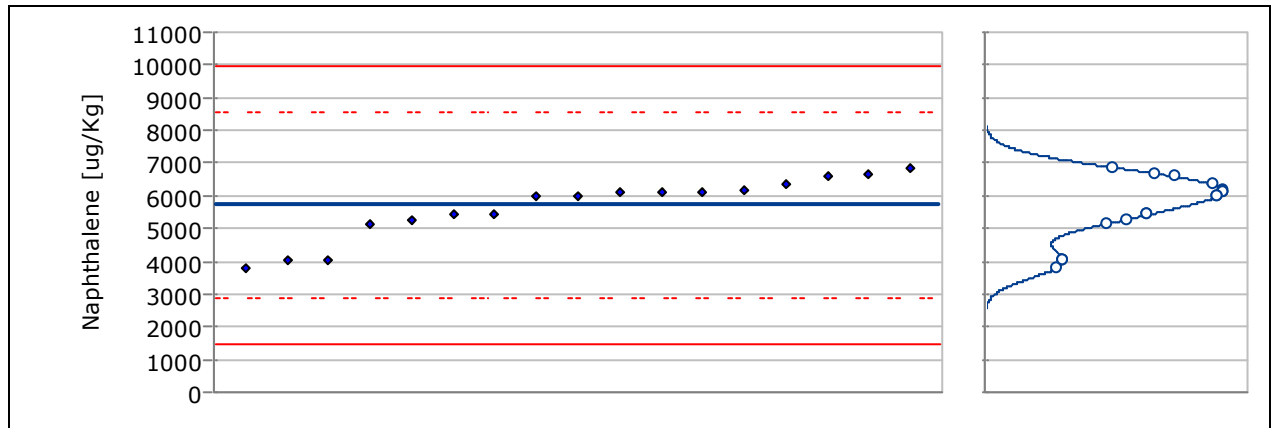
No. of participating laboratories (in total / with quant. data points only)	10 / 10
No. of data points (in total / quantitative)	12 / 12
Assigned value	2500 ug/Kg
Proficiency std. dev.	858 ug/Kg
Acceptance window	0 - 5070 ug/Kg

**4.1.62 n-Nitrosodiphenylamine**

No. of participating laboratories (in total / with quant. data points only)	11 / 1
No. of data points (in total / quantitative)	13 / 1
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

4.1.63 Naphthalene

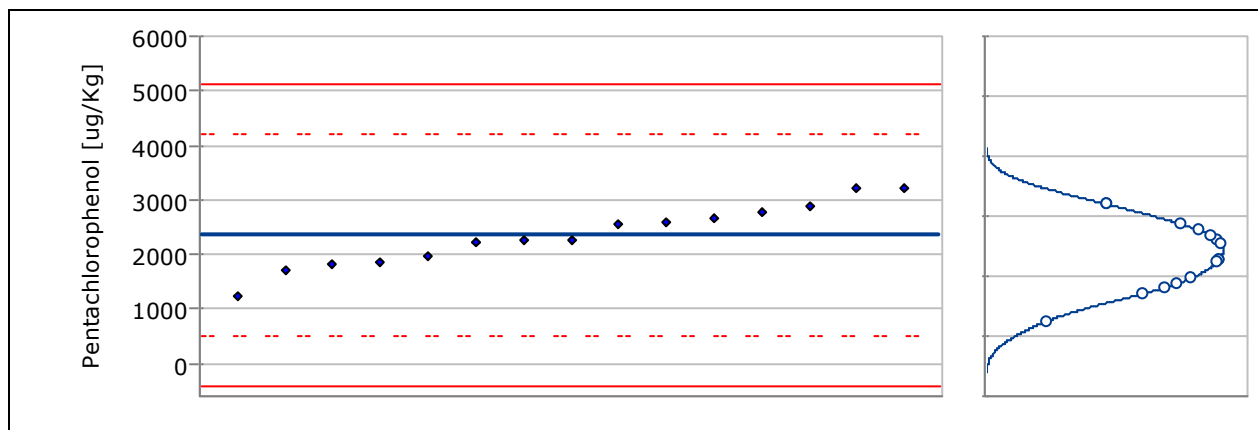
No. of participating laboratories (in total / with quant. data points only)	13 / 13
No. of data points (in total / quantitative)	17 / 17
Assigned value	5720 ug/Kg
Proficiency std. dev.	1410 ug/Kg
Acceptance window	1480 - 9960 ug/Kg

**4.1.64 Nitrobenzene**

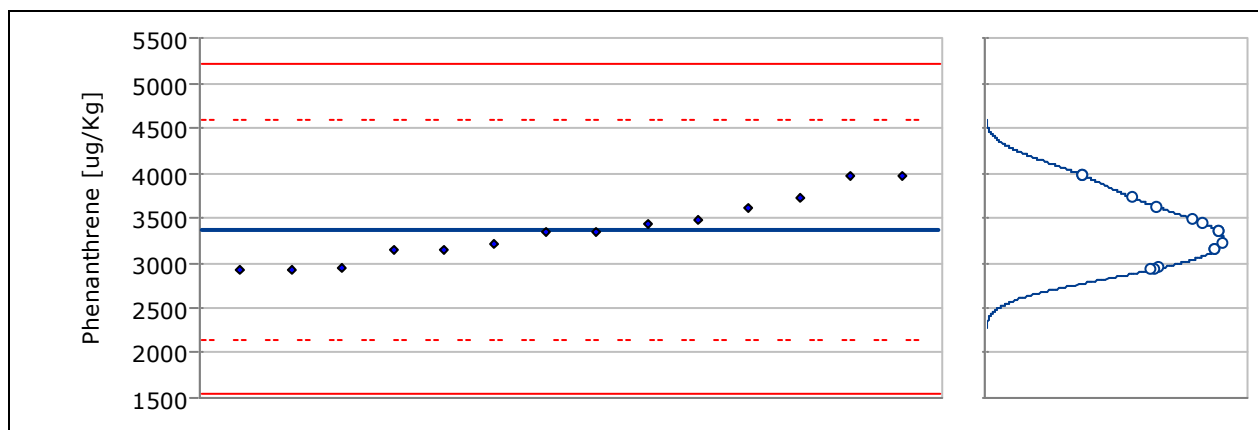
No. of participating laboratories (in total / with quant. data points only)	13 / 3
No. of data points (in total / quantitative)	15 / 3
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

4.1.65 Pentachlorophenol

No. of participating laboratories (in total / with quant. data points only)	13 / 13
No. of data points (in total / quantitative)	15 / 15
Assigned value	2360 ug/Kg
Proficiency std. dev.	924 ug/Kg
Acceptance window	0 - 5130 ug/Kg

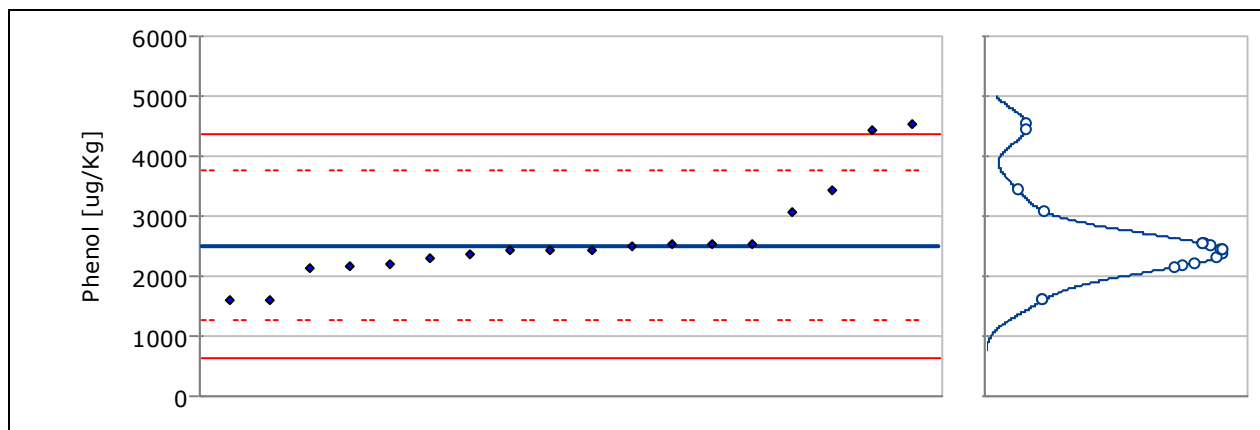
**4.1.66 Phenanthrene**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	3370 ug/Kg
Proficiency std. dev.	612 ug/Kg
Acceptance window	1530 - 5210 ug/Kg

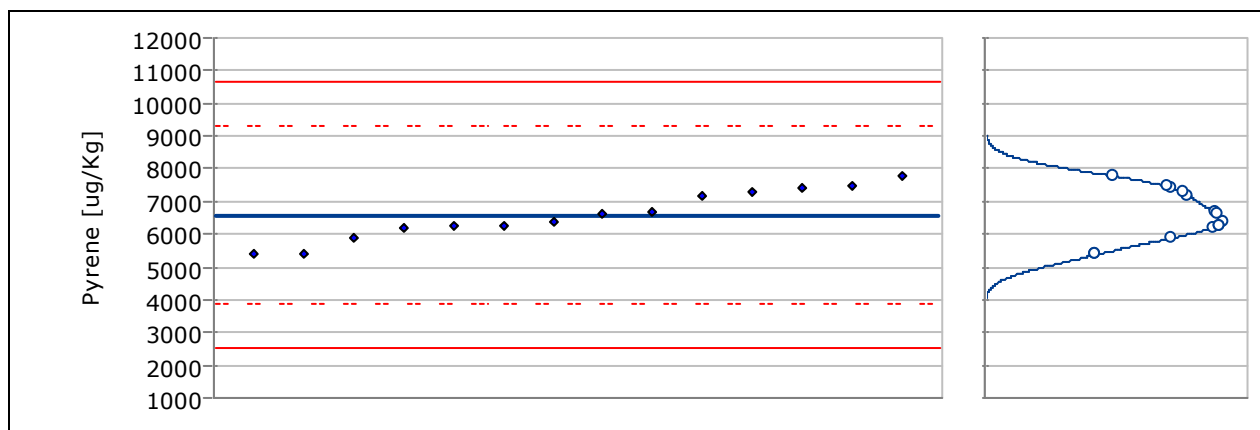


4.1.67 Phenol

No. of participating laboratories (in total / with quant. data points only)	15 / 15
No. of data points (in total / quantitative)	18 / 18
Assigned value	2510 ug/Kg
Proficiency std. dev.	623 ug/Kg
Acceptance window	637 - 4380 ug/Kg

**4.1.68 Pyrene**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	14 / 14
Assigned value	6580 ug/Kg
Proficiency std. dev.	1350 ug/Kg
Acceptance window	2540 - 10600 ug/Kg



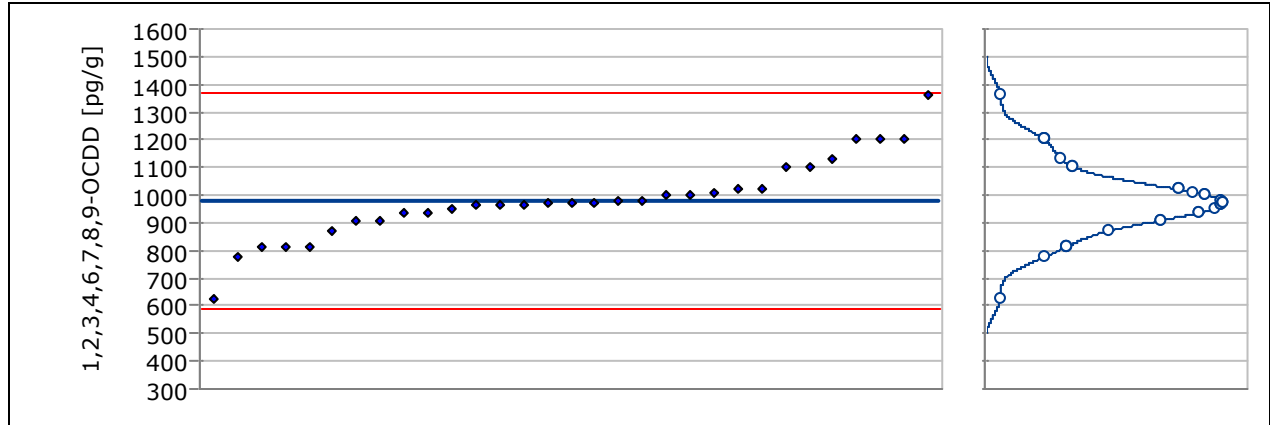
4.1.69 Pyridine

No. of participating laboratories (in total / with quant. data points only)	7 / 0
No. of data points (in total / quantitative)	9 / 0
Assigned value	0 ug/Kg
Proficiency std. dev.	0 ug/Kg
Acceptance window	--- ug/Kg

4.2 SPE016-10G Dioxin and Furans in Soil - PT / LRAC0625

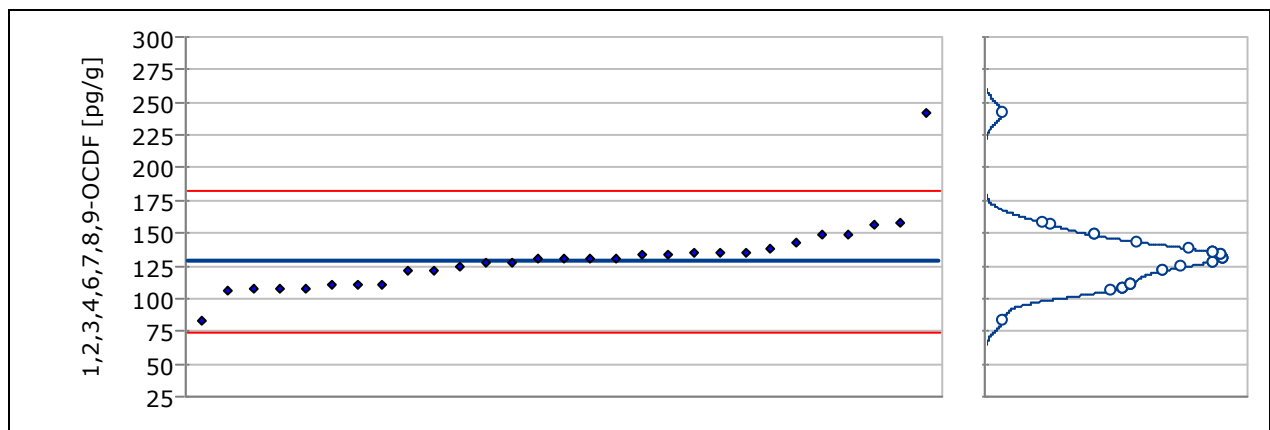
4.2.1 1,2,3,4,6,7,8,9-OCDD

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	979 pg/g
Proficiency std. dev.	130 pg/g
Acceptance window	589 - 1370 pg/g



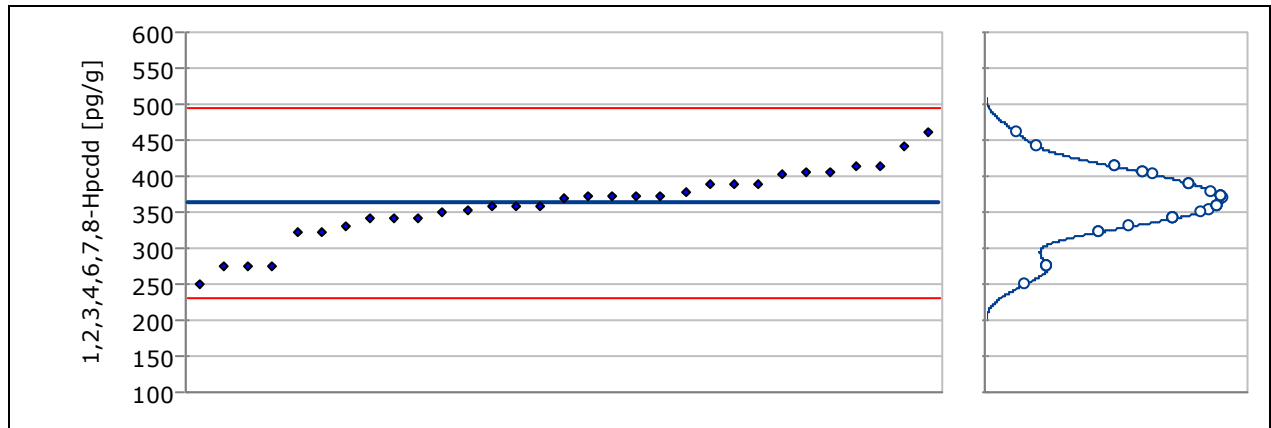
4.2.2 1,2,3,4,6,7,8,9-OCDF

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 29
Assigned value	128 pg/g
Proficiency std. dev.	18.0 pg/g
Acceptance window	74.3 - 182 pg/g

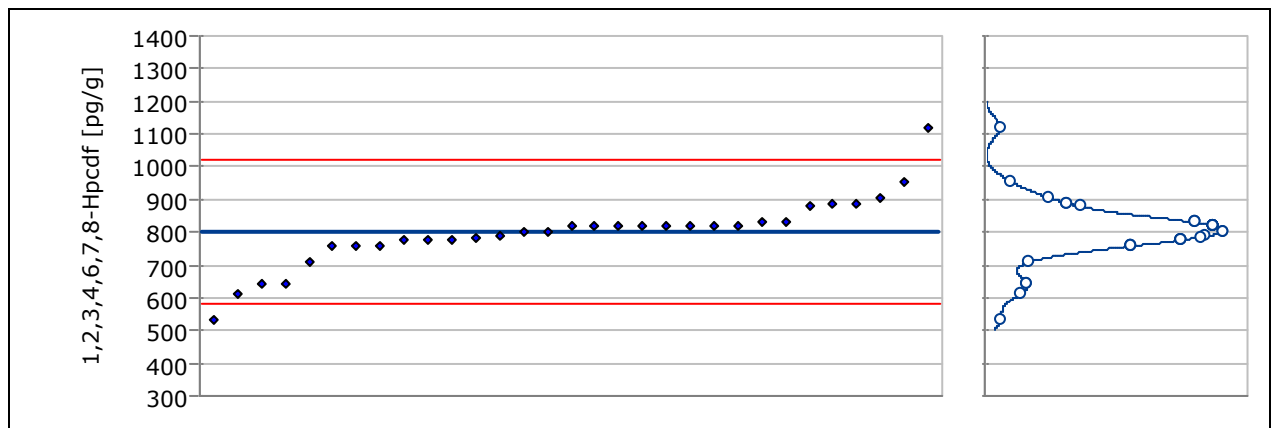


4.2.3 1,2,3,4,6,7,8-Hpcdd

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	363 pg/g
Proficiency std. dev.	43.9 pg/g
Acceptance window	232 - 495 pg/g

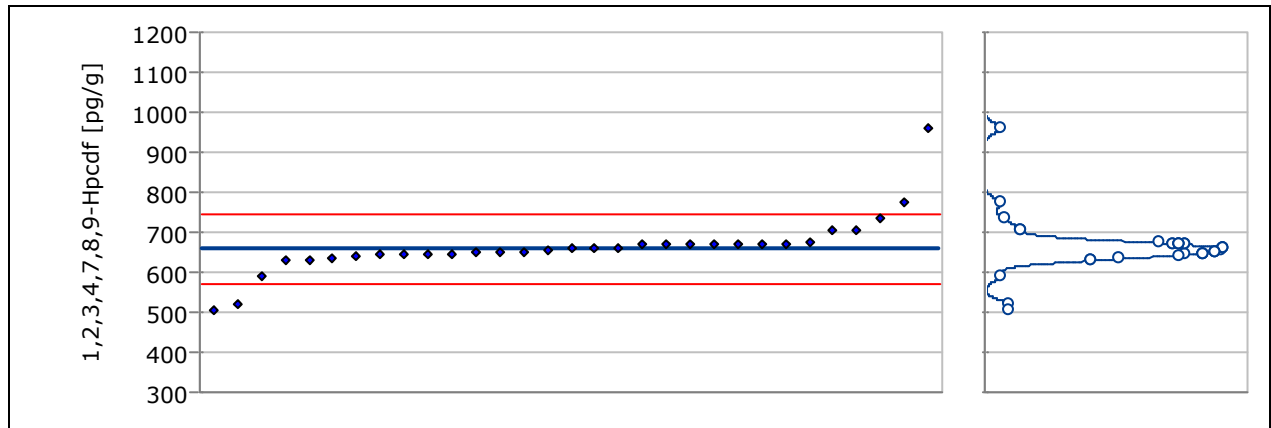
**4.2.4 1,2,3,4,6,7,8-Hpcdf**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	802 pg/g
Proficiency std. dev.	73.5 pg/g
Acceptance window	581 - 1020 pg/g

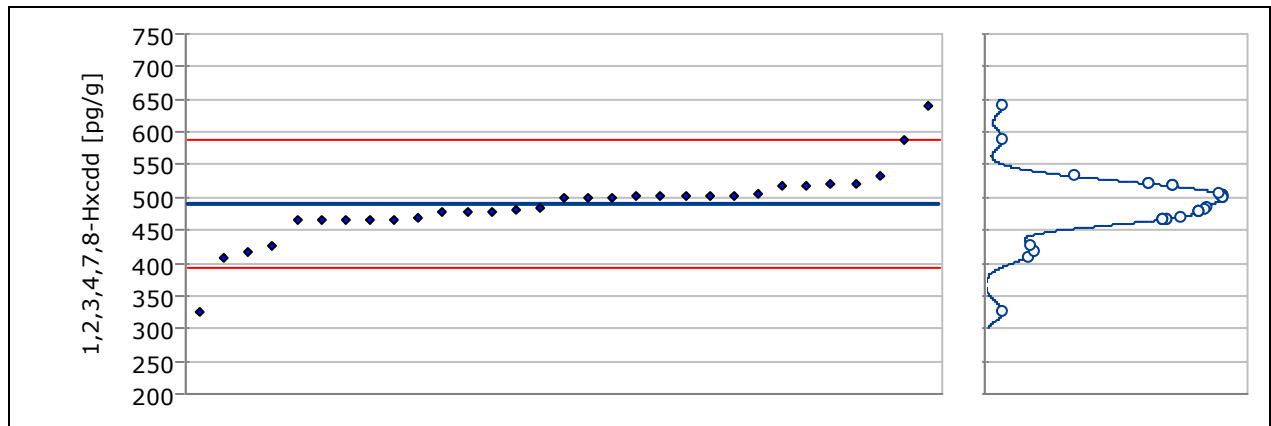


4.2.5 1,2,3,4,7,8,9-Hpcdf

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	658 pg/g
Proficiency std. dev.	29.5 pg/g
Acceptance window	570 - 747 pg/g

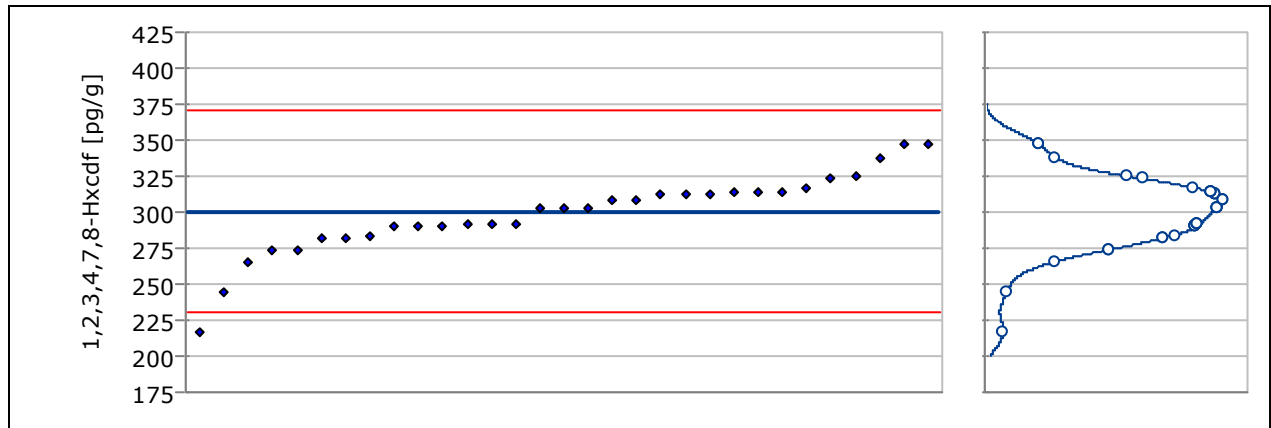
**4.2.6 1,2,3,4,7,8-Hxcdd**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	489 pg/g
Proficiency std. dev.	32.7 pg/g
Acceptance window	391 - 587 pg/g

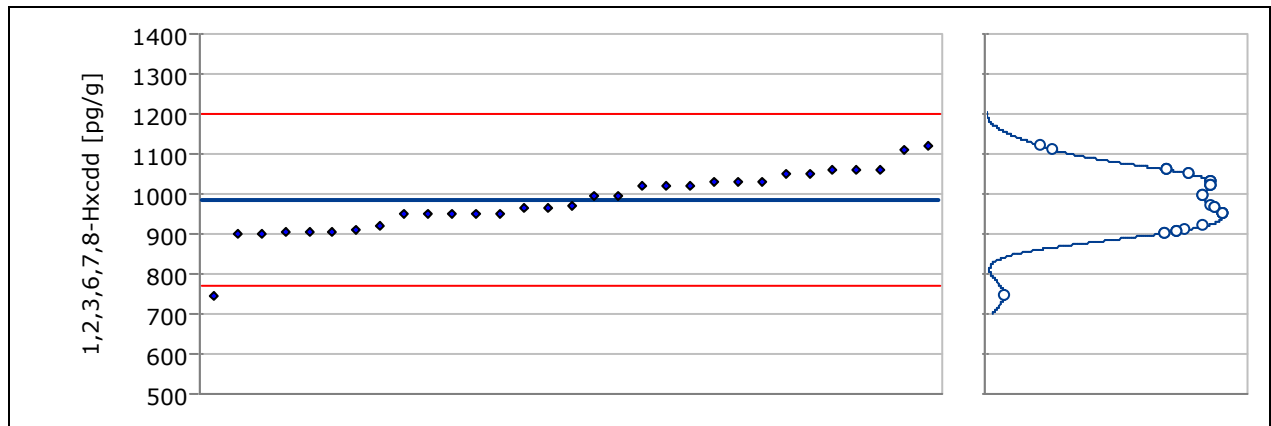


4.2.7 1,2,3,4,7,8-Hxcdf

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	300 pg/g
Proficiency std. dev.	23.5 pg/g
Acceptance window	230 - 371 pg/g

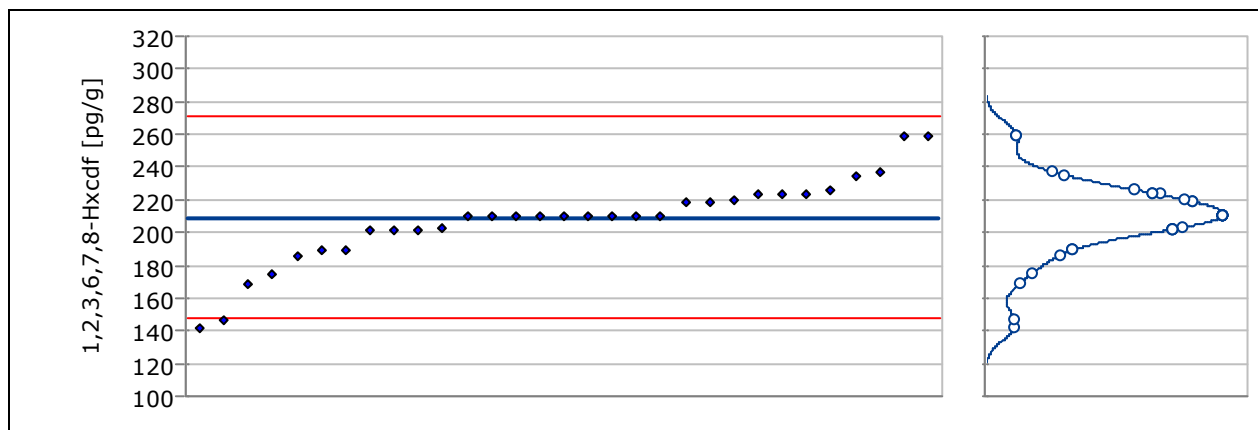
**4.2.8 1,2,3,6,7,8-Hxcdd**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	983 pg/g
Proficiency std. dev.	71.6 pg/g
Acceptance window	768 - 1200 pg/g

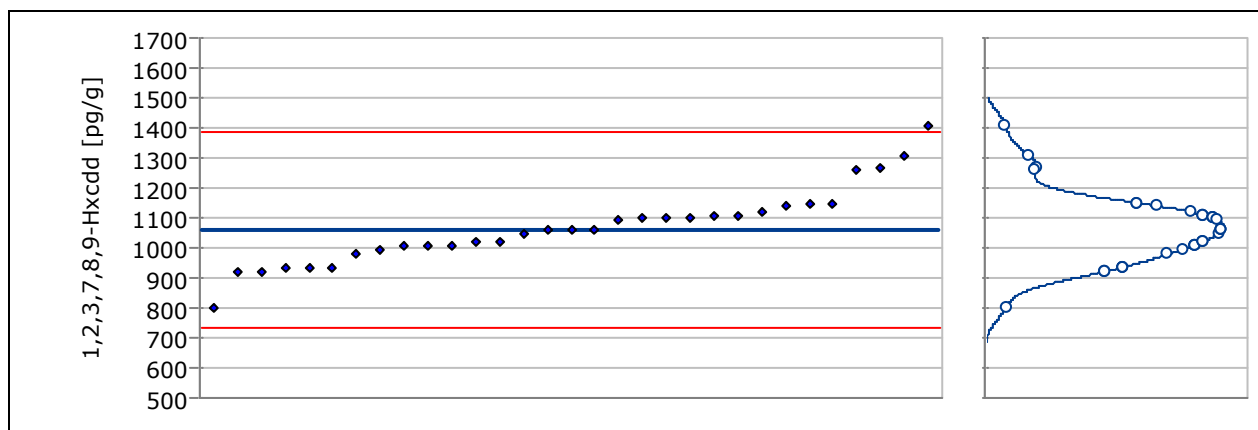


4.2.9 1,2,3,6,7,8-Hxcdf

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	209 pg/g
Proficiency std. dev.	20.7 pg/g
Acceptance window	147 - 271 pg/g

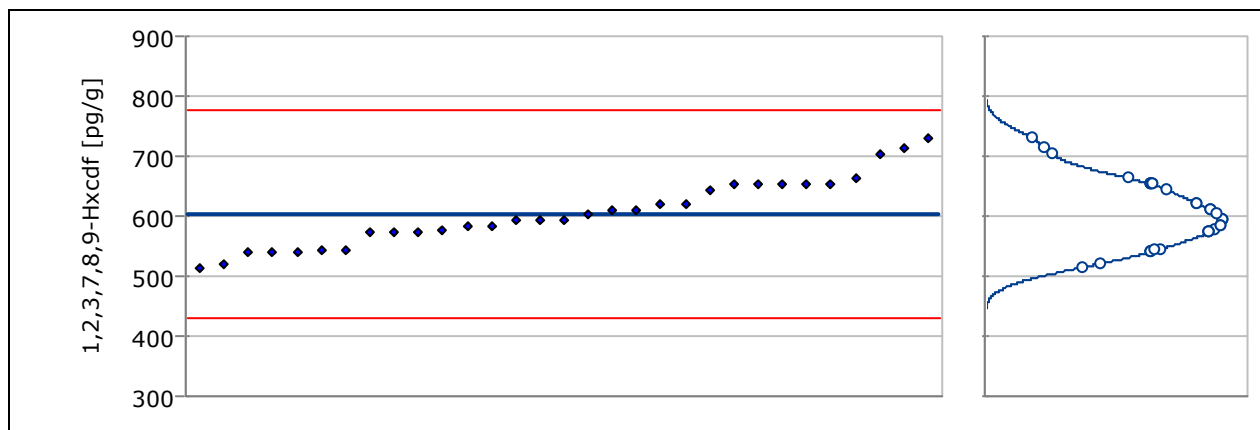
**4.2.10 1,2,3,7,8,9-Hxcdd**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	1060 pg/g
Proficiency std. dev.	109 pg/g
Acceptance window	734 - 1390 pg/g

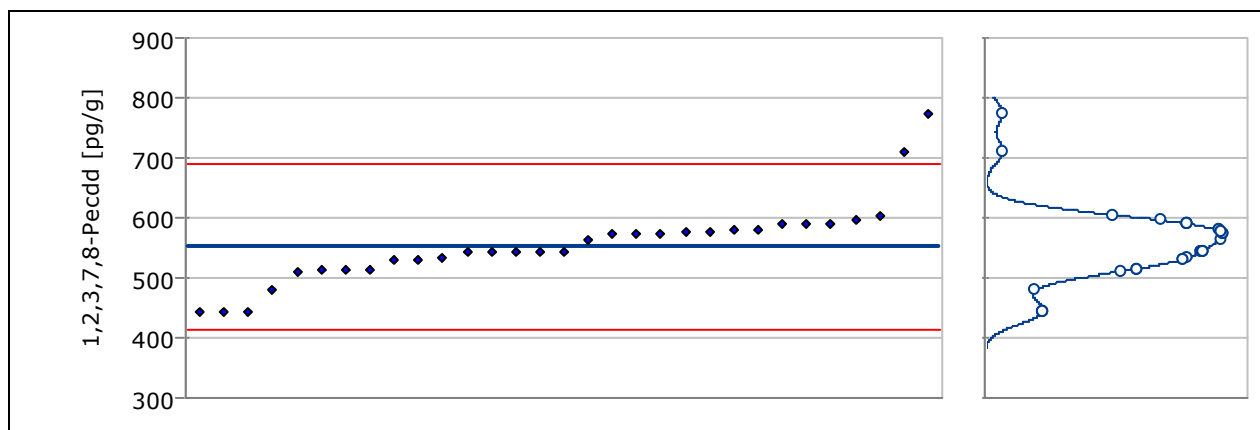


4.2.11 1,2,3,7,8,9-Hxcdf

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	603 pg/g
Proficiency std. dev.	58.0 pg/g
Acceptance window	429 - 777 pg/g

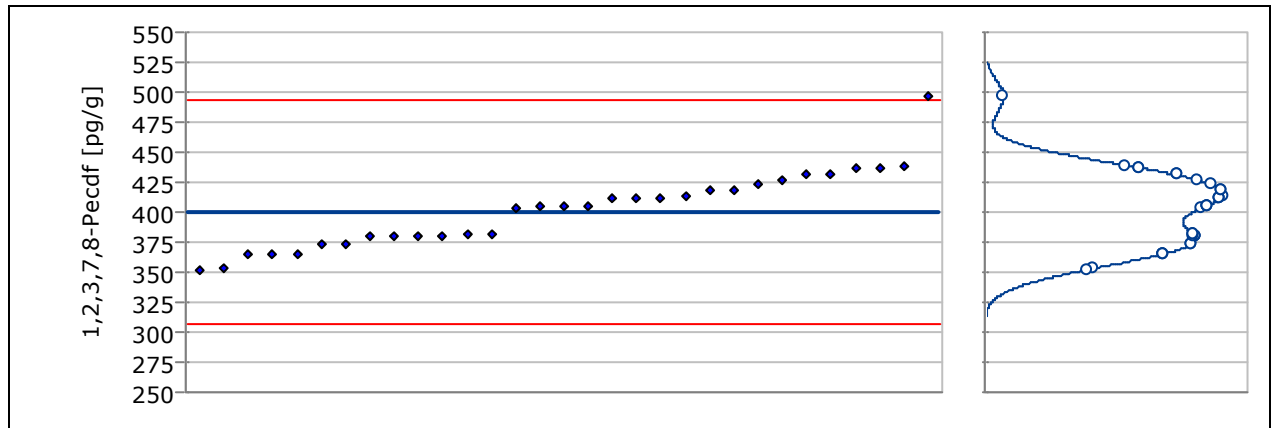
**4.2.12 1,2,3,7,8-Pecdd**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	552 pg/g
Proficiency std. dev.	45.9 pg/g
Acceptance window	415 - 690 pg/g

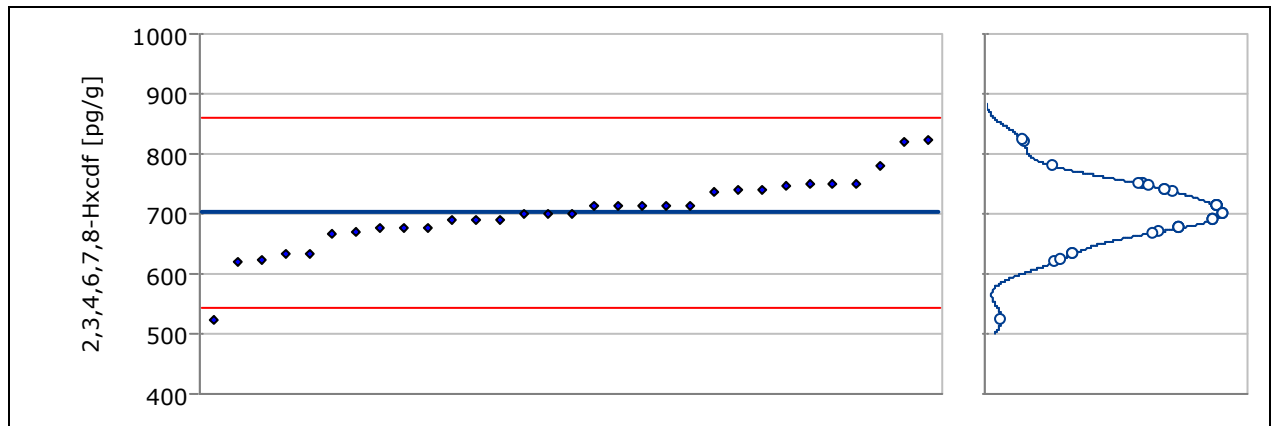


4.2.13 1,2,3,7,8-Pecdf

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	400 pg/g
Proficiency std. dev.	31.2 pg/g
Acceptance window	307 - 494 pg/g

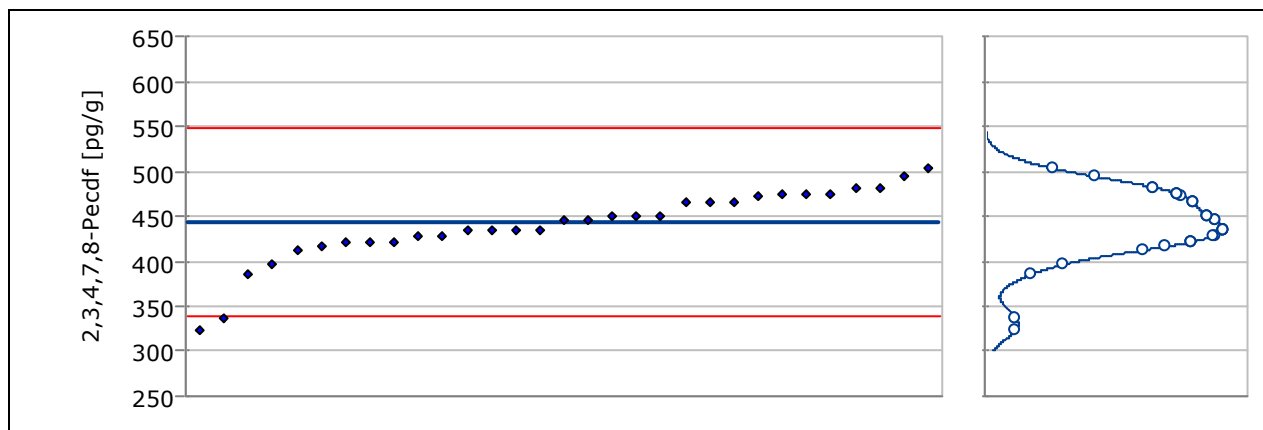
**4.2.14 2,3,4,6,7,8-Hxcdf**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	703 pg/g
Proficiency std. dev.	52.7 pg/g
Acceptance window	545 - 861 pg/g

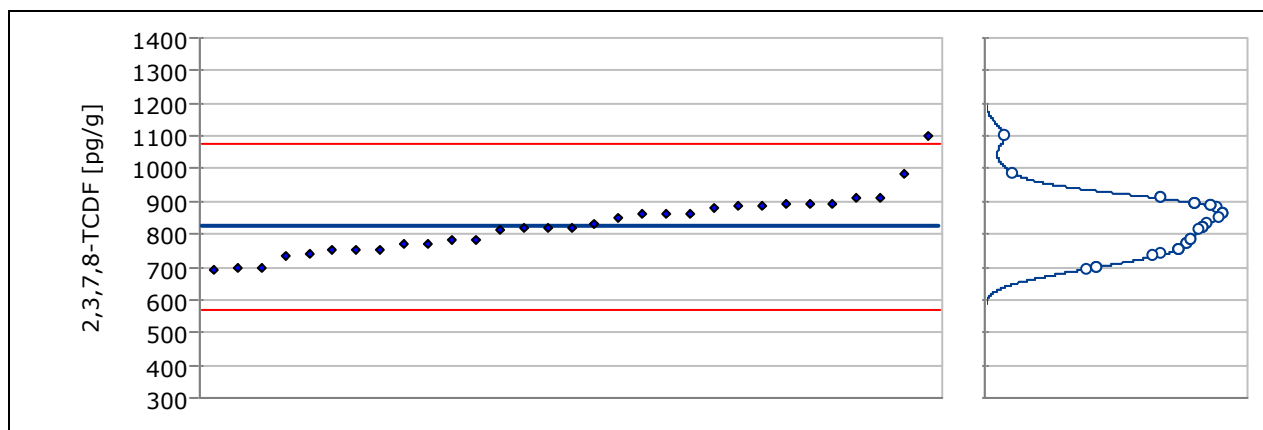


4.2.15 2,3,4,7,8-Pecdf

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	443 pg/g
Proficiency std. dev.	34.9 pg/g
Acceptance window	338 - 548 pg/g

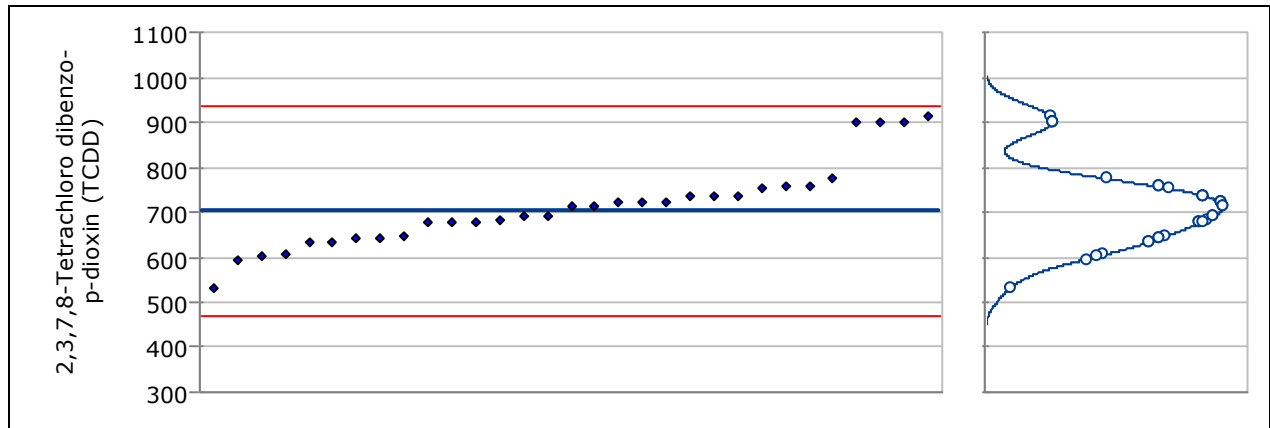
**4.2.16 2,3,7,8-TCDF**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	823 pg/g
Proficiency std. dev.	84.0 pg/g
Acceptance window	571 - 1080 pg/g

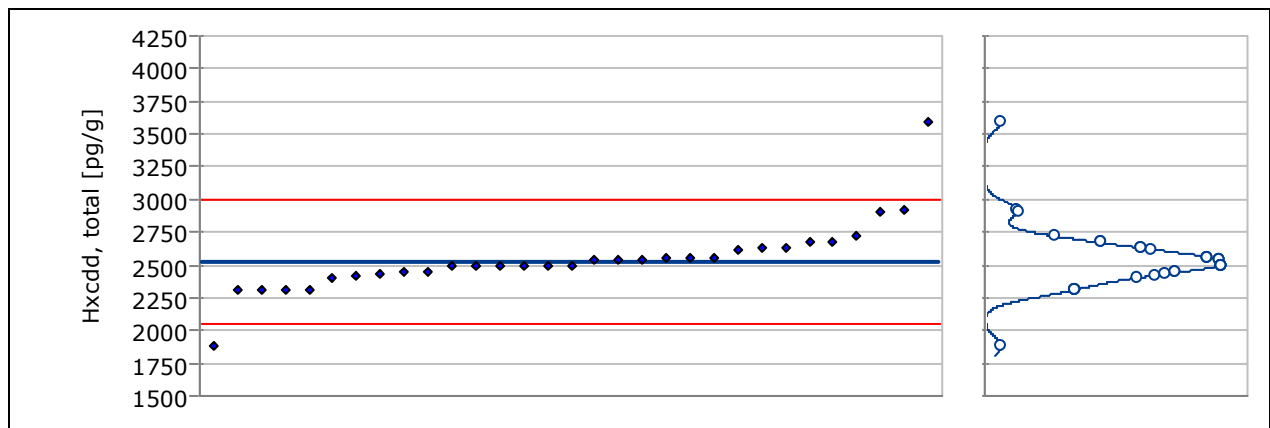


4.2.17 2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD)

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	703 pg/g
Proficiency std. dev.	77.7 pg/g
Acceptance window	470 - 936 pg/g

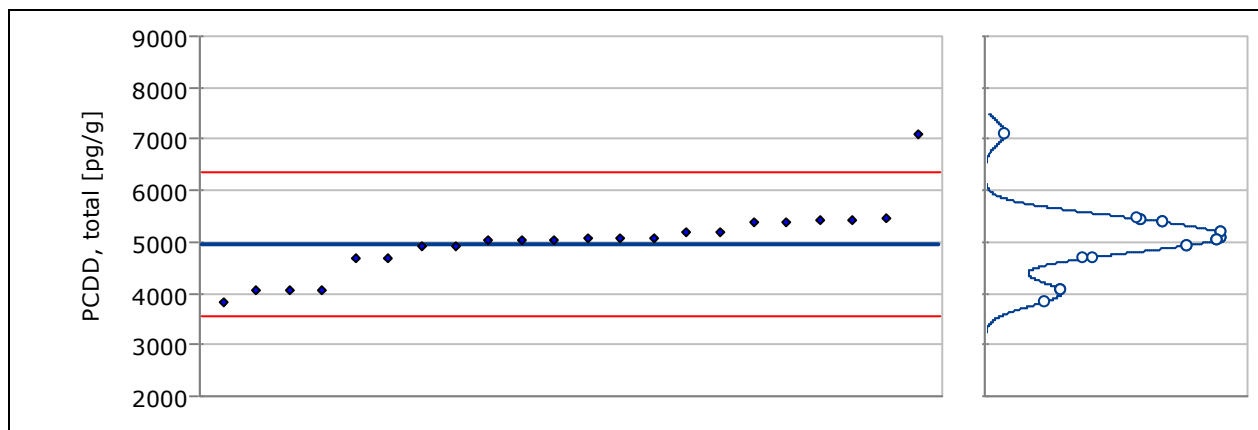
**4.2.18 Hxcdd, total**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	2520 pg/g
Proficiency std. dev.	156 pg/g
Acceptance window	2050 - 2990 pg/g

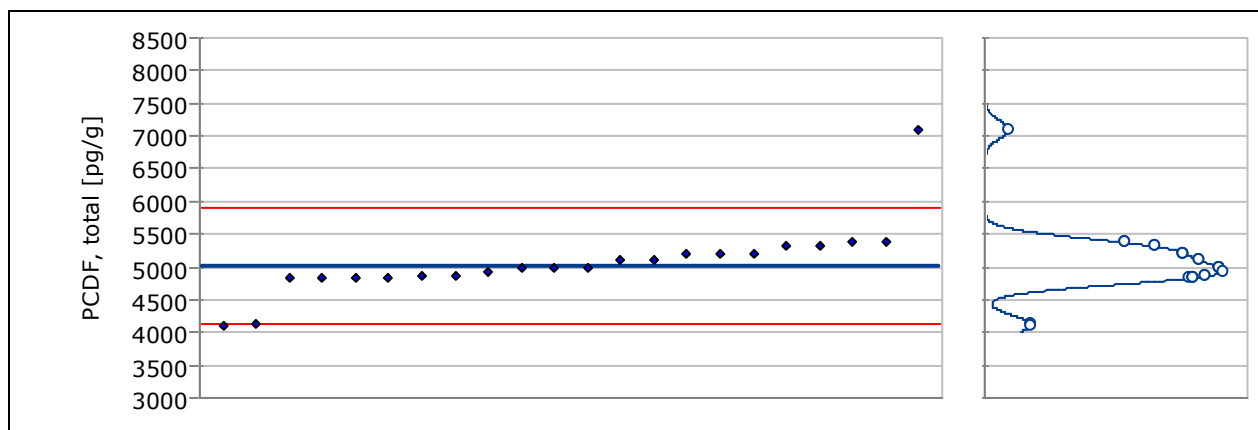


4.2.19 PCDD, total

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	22 / 22
Assigned value	4950 pg/g
Proficiency std. dev.	471 pg/g
Acceptance window	3540 - 6370 pg/g

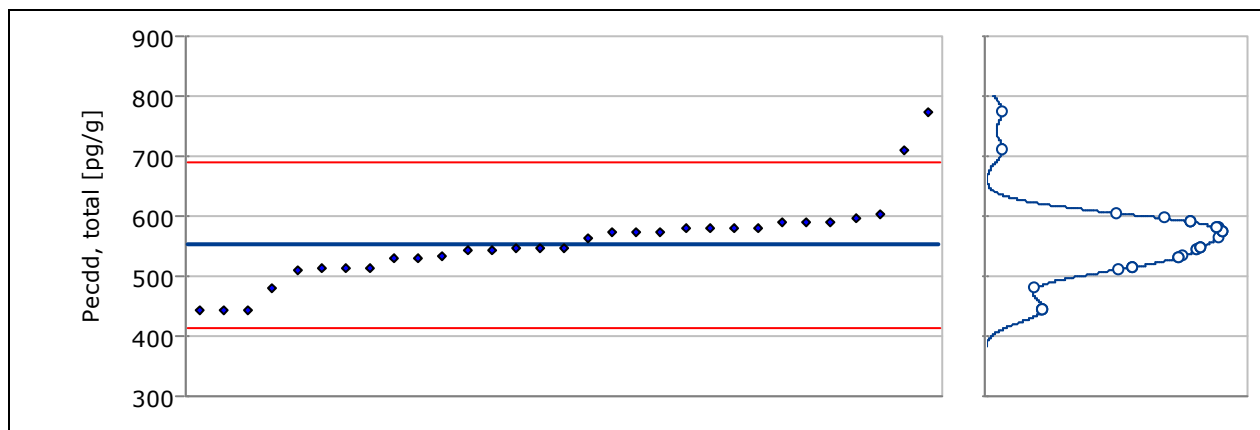
**4.2.20 PCDF, total**

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	22 / 22
Assigned value	5010 pg/g
Proficiency std. dev.	298 pg/g
Acceptance window	4120 - 5910 pg/g

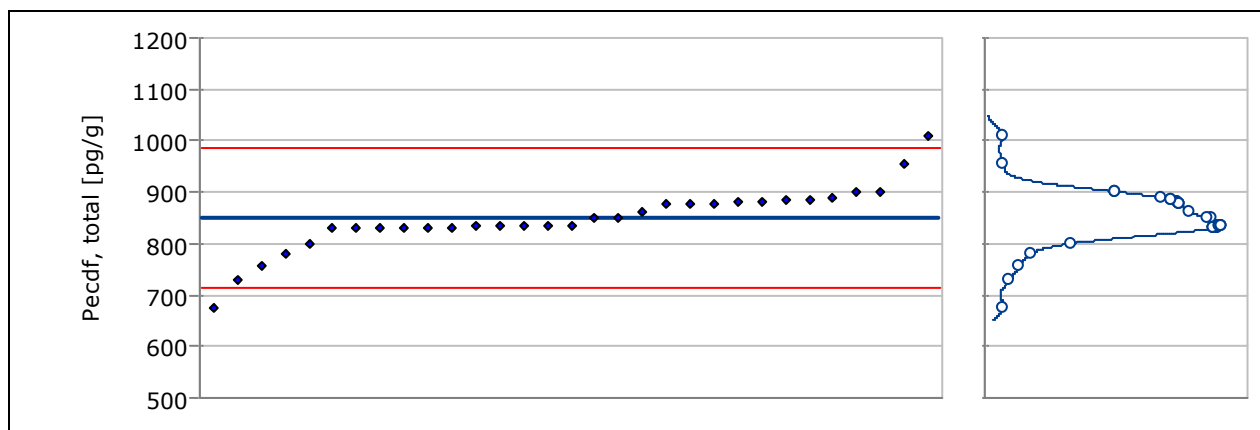


4.2.21 Pecdd, total

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	553 pg/g
Proficiency std. dev.	46.1 pg/g
Acceptance window	414 - 691 pg/g

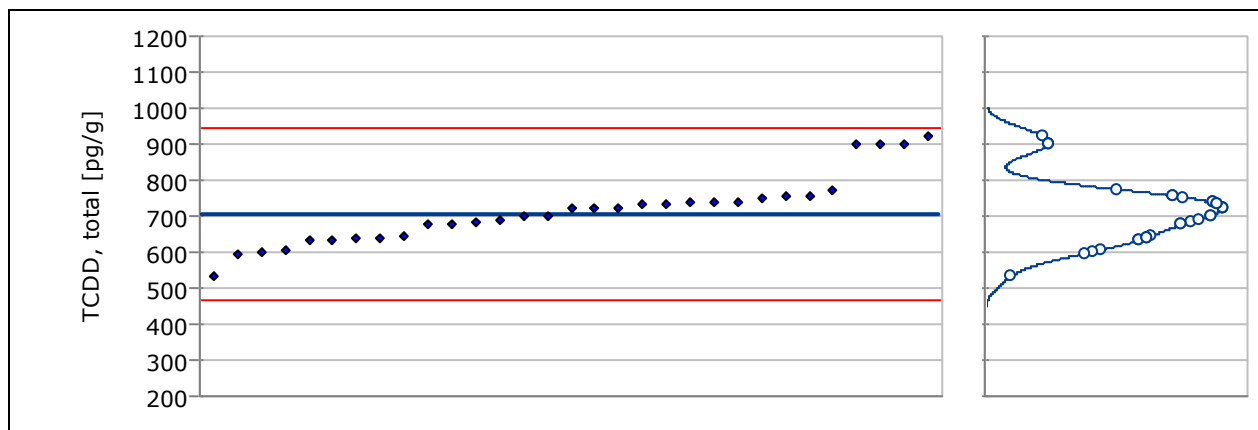
**4.2.22 Pecdf, total**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	850 pg/g
Proficiency std. dev.	44.9 pg/g
Acceptance window	715 - 984 pg/g

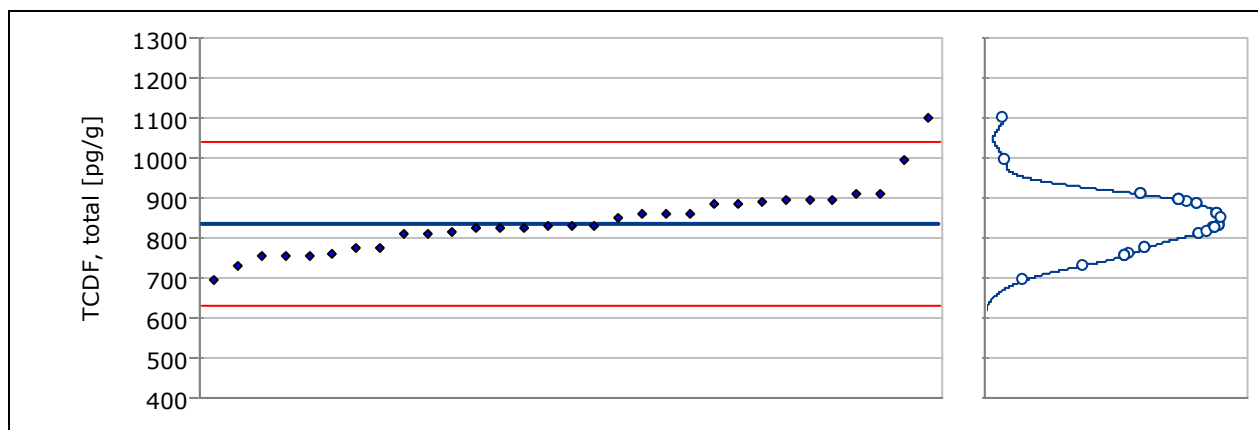


4.2.23 TCDD, total

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	706 pg/g
Proficiency std. dev.	79.2 pg/g
Acceptance window	468 - 944 pg/g

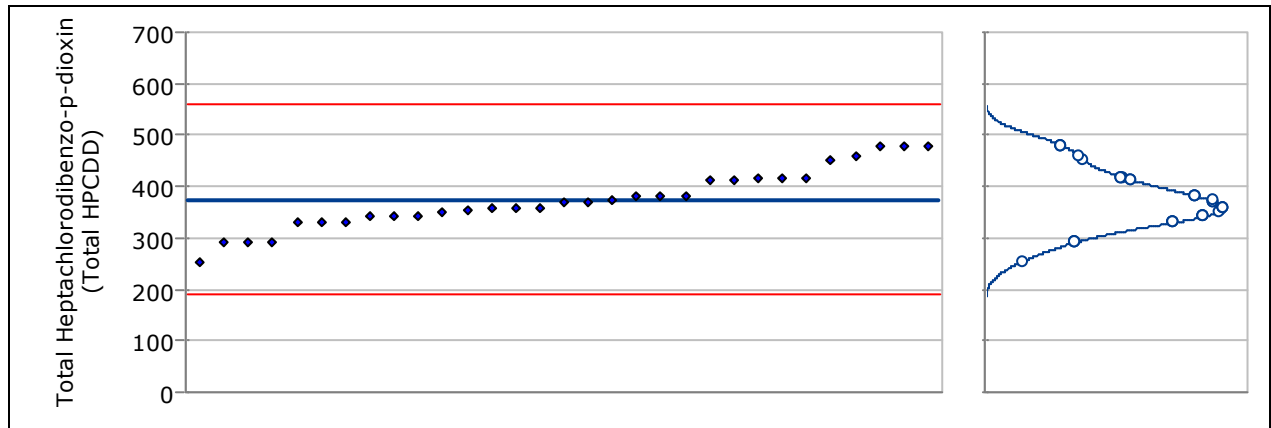
**4.2.24 TCDF, total**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	836 pg/g
Proficiency std. dev.	68.4 pg/g
Acceptance window	631 - 1040 pg/g

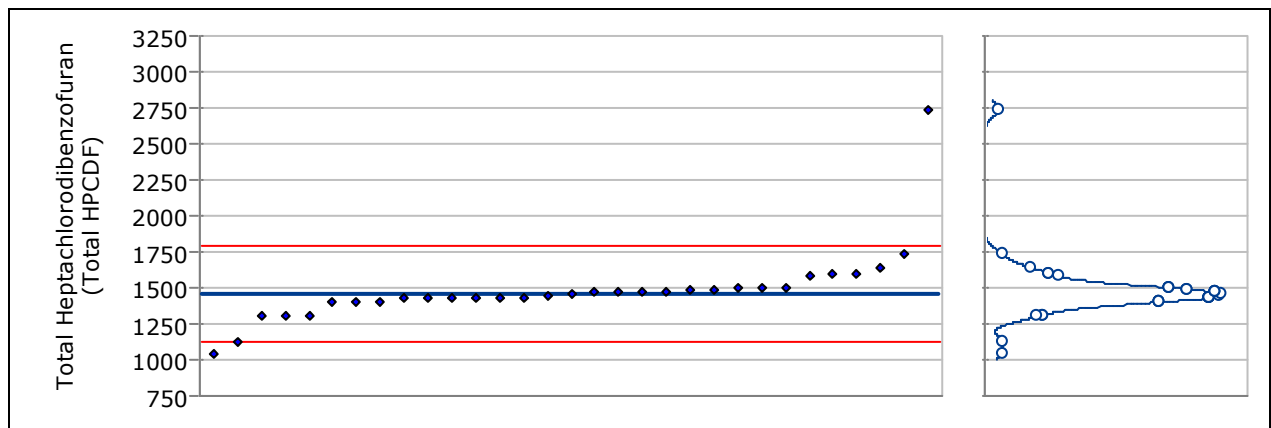


4.2.25 Total Heptachlorodibenzo-p-dioxin (Total HPCDD)

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	374 pg/g
Proficiency std. dev.	61.5 pg/g
Acceptance window	189 - 558 pg/g

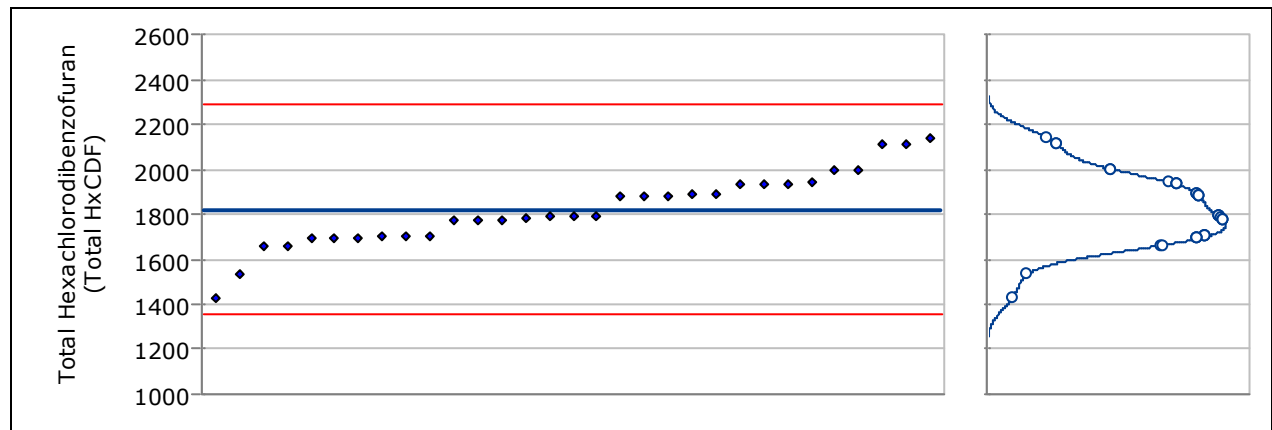
**4.2.26 Total Heptachlorodibenzofuran (Total HPCDF)**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	1460 pg/g
Proficiency std. dev.	110 pg/g
Acceptance window	1130 - 1790 pg/g



4.2.27 Total Hexachlorodibenzofuran (Total HxCDF)

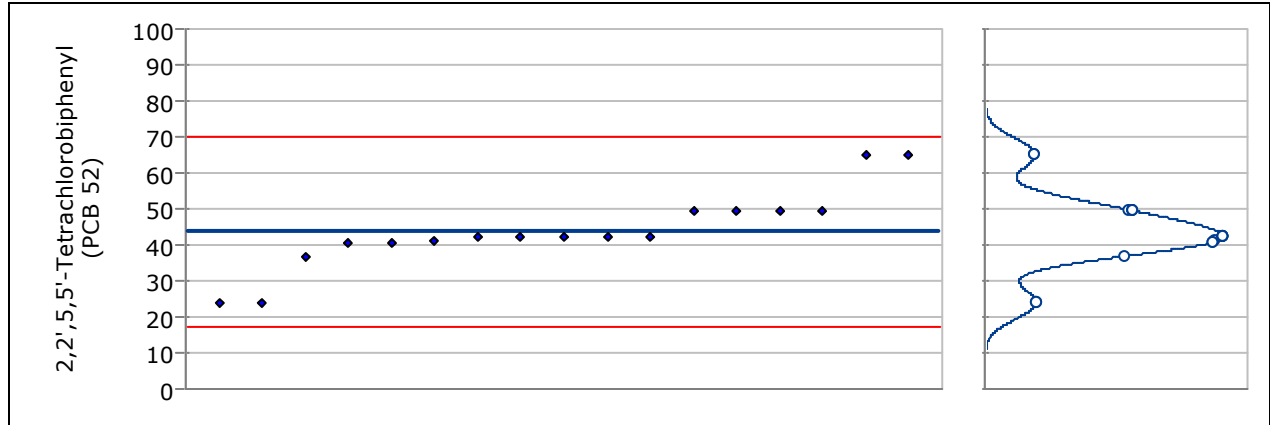
No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	31 / 31
Assigned value	1820 pg/g
Proficiency std. dev.	155 pg/g
Acceptance window	1350 - 2290 pg/g



4.3 SPE068-50G PCB Congeners in Soil - PT / LRAC1564

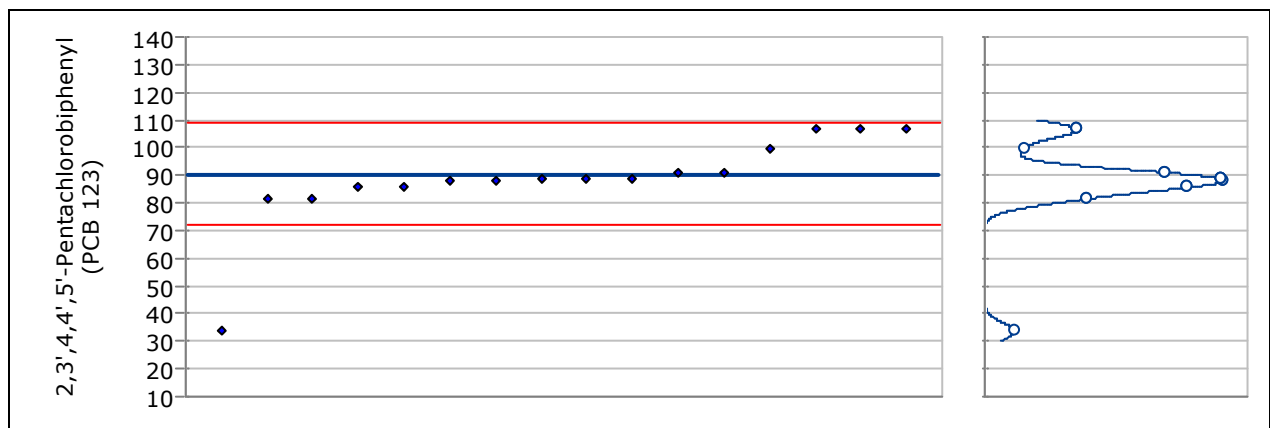
4.3.1 2,2',5,5'-Tetrachlorobiphenyl (PCB 52)

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	17 / 17
Assigned value	43.8 ug/Kg
Proficiency std. dev.	8.79 ug/Kg
Acceptance window	17.4 - 70.2 ug/Kg



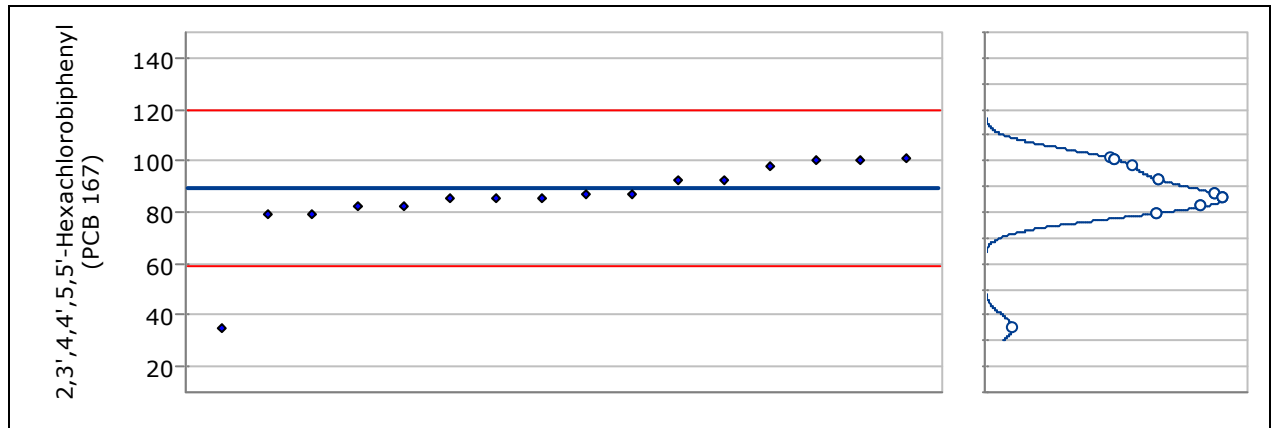
4.3.2 2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	16 / 16
Assigned value	90.4 ug/Kg
Proficiency std. dev.	6.13 ug/Kg
Acceptance window	72.0 - 109 ug/Kg

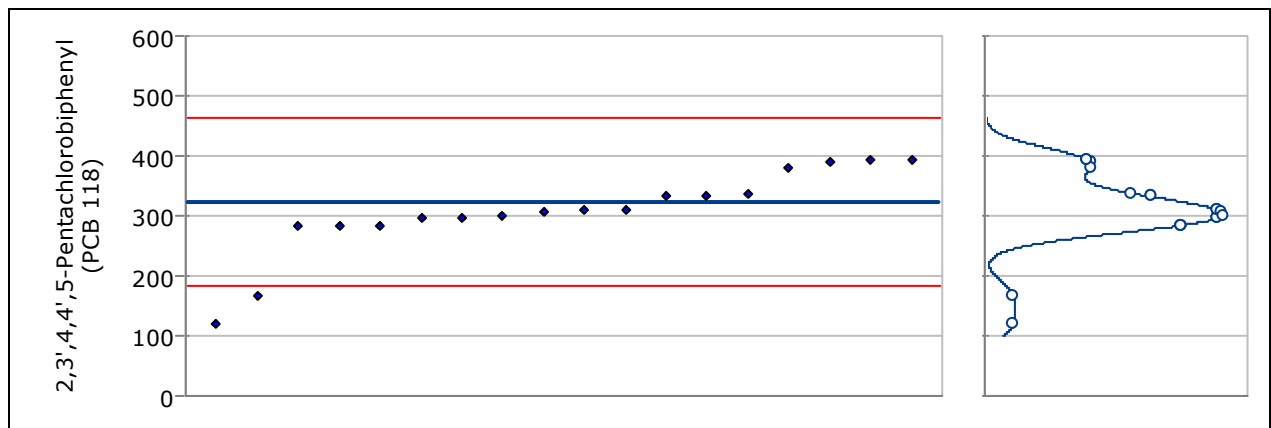


4.3.3 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	16 / 16
Assigned value	89.3 ug/Kg
Proficiency std. dev.	10.0 ug/Kg
Acceptance window	59.2 - 119 ug/Kg

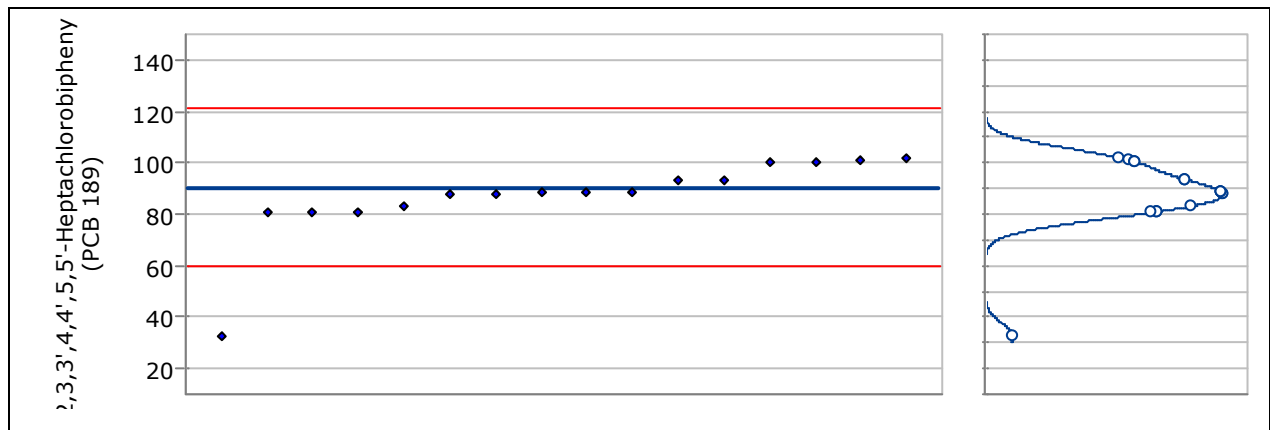
**4.3.4 2,3',4,4',5-Pentachlorobiphenyl (PCB 118)**

No. of participating laboratories (in total / with quant. data points only)	10 / 10
No. of data points (in total / quantitative)	18 / 18
Assigned value	323 ug/Kg
Proficiency std. dev.	46.9 ug/Kg
Acceptance window	182 - 463 ug/Kg

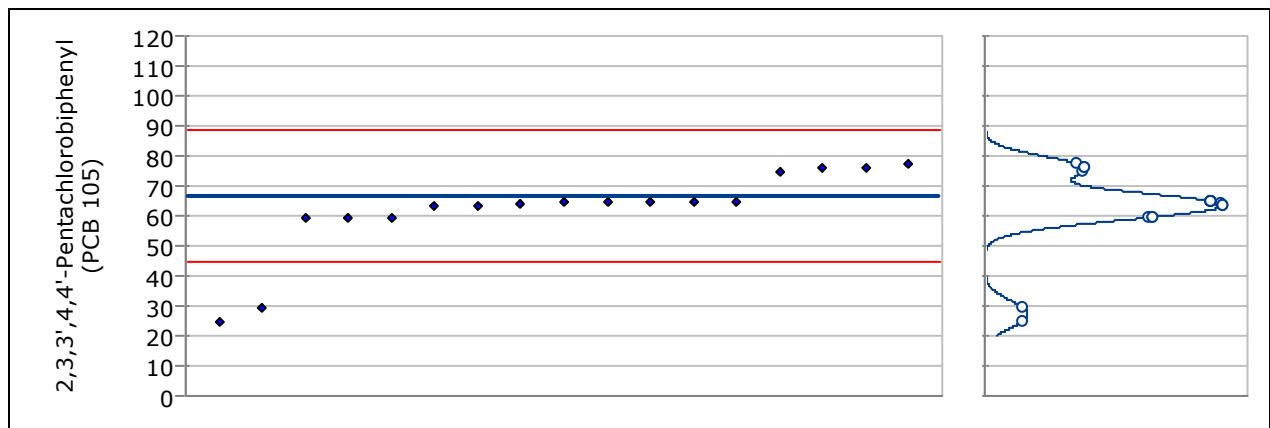


4.3.5 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	16 / 16
Assigned value	90.5 ug/Kg
Proficiency std. dev.	10.3 ug/Kg
Acceptance window	59.7 - 121 ug/Kg

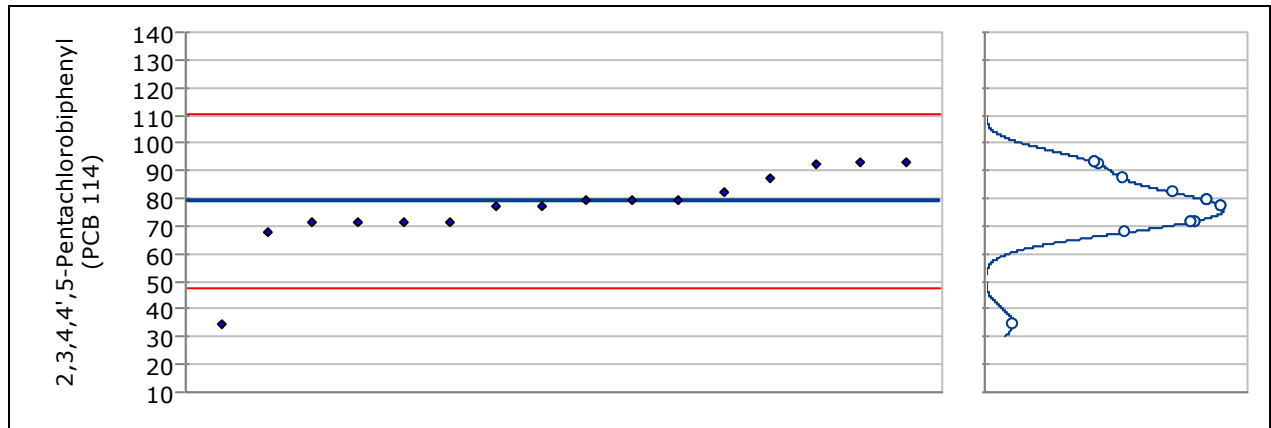
**4.3.6 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)**

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	17 / 17
Assigned value	66.5 ug/Kg
Proficiency std. dev.	7.33 ug/Kg
Acceptance window	44.5 - 88.5 ug/Kg

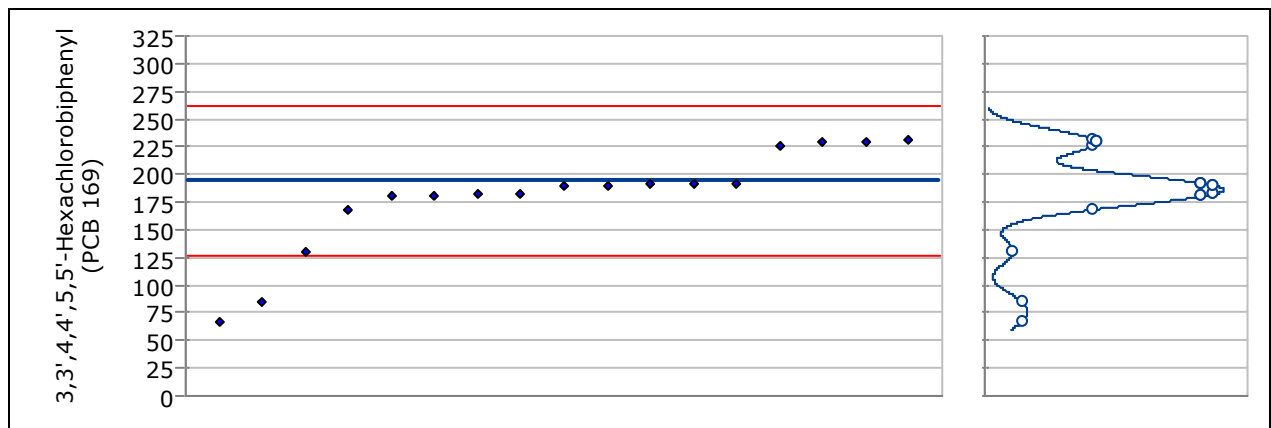


4.3.7 2,3,4,4',5-Pentachlorobiphenyl (PCB 114)

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	16 / 16
Assigned value	79.2 ug/Kg
Proficiency std. dev.	10.5 ug/Kg
Acceptance window	47.7 - 111 ug/Kg

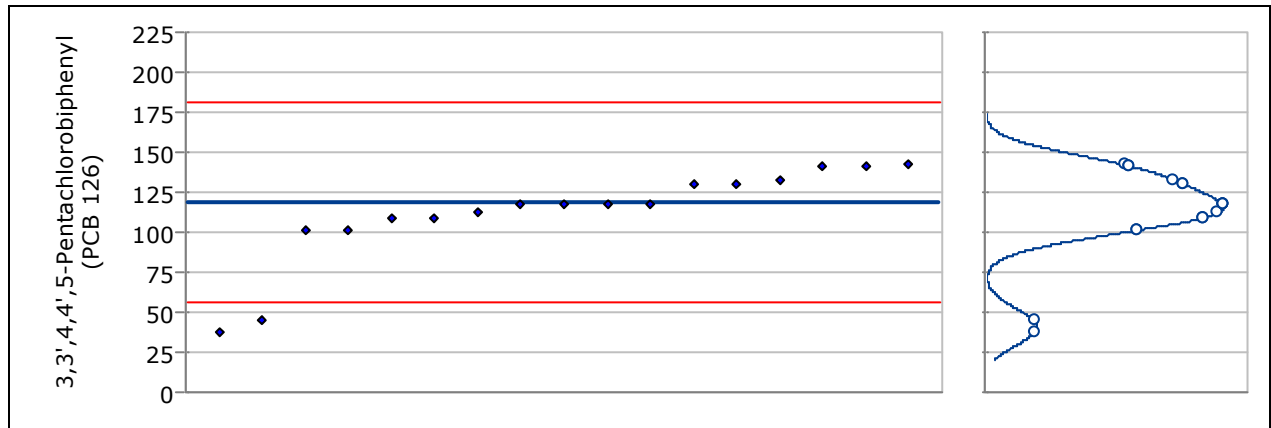
**4.3.8 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)**

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	17 / 17
Assigned value	195 ug/Kg
Proficiency std. dev.	22.6 ug/Kg
Acceptance window	127 - 262 ug/Kg

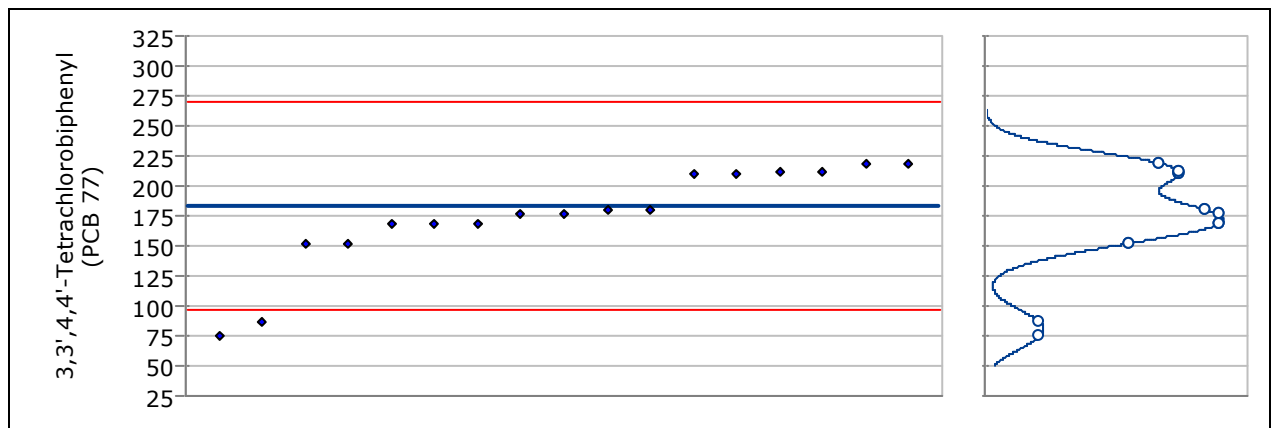


4.3.9 3,3',4,4',5-Pentachlorobiphenyl (PCB 126)

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	17 / 17
Assigned value	119 ug/Kg
Proficiency std. dev.	20.9 ug/Kg
Acceptance window	56.3 - 182 ug/Kg

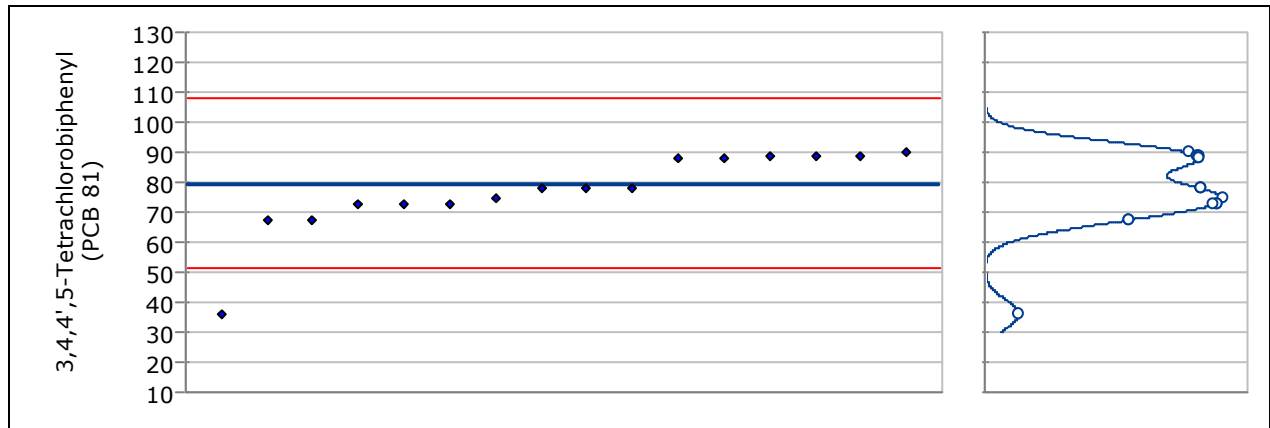
**4.3.10 3,3',4,4'-Tetrachlorobiphenyl (PCB 77)**

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	17 / 17
Assigned value	183 ug/Kg
Proficiency std. dev.	28.7 ug/Kg
Acceptance window	96.9 - 269 ug/Kg

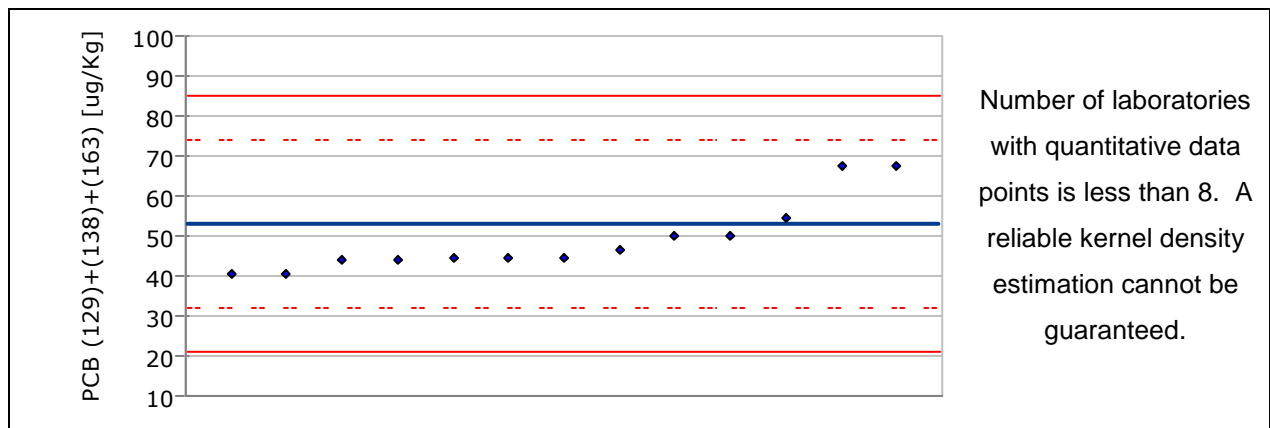


4.3.11 3,4,4',5-Tetrachlorobiphenyl (PCB 81)

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	16 / 16
Assigned value	79.6 ug/Kg
Proficiency std. dev.	9.46 ug/Kg
Acceptance window	51.2 - 108 ug/Kg

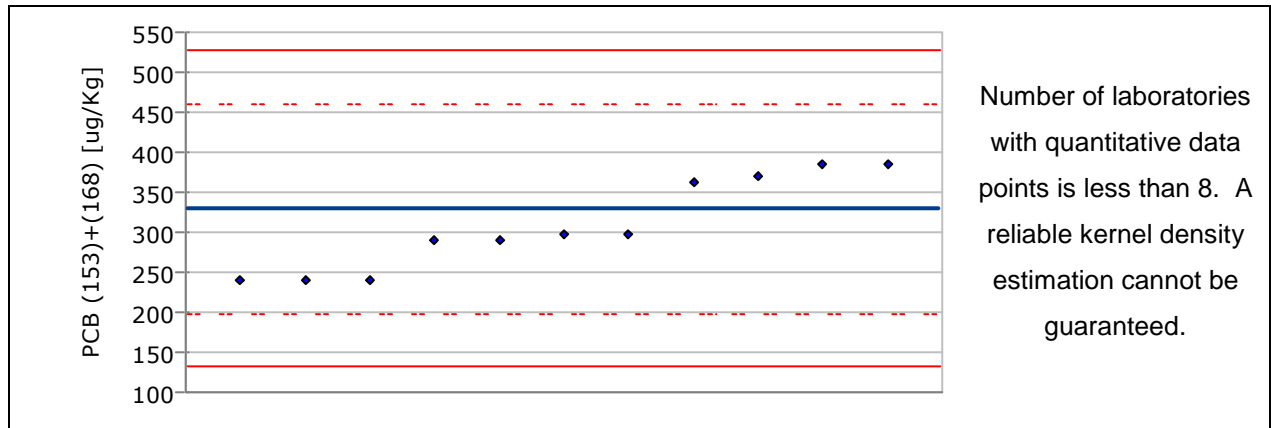
**4.3.12 PCB (129)+(138)+(163)**

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	13 / 13
Assigned value	53.0 ug/Kg
Proficiency std. dev.	10.6 ug/Kg
Acceptance window	21.2 - 84.8 ug/Kg

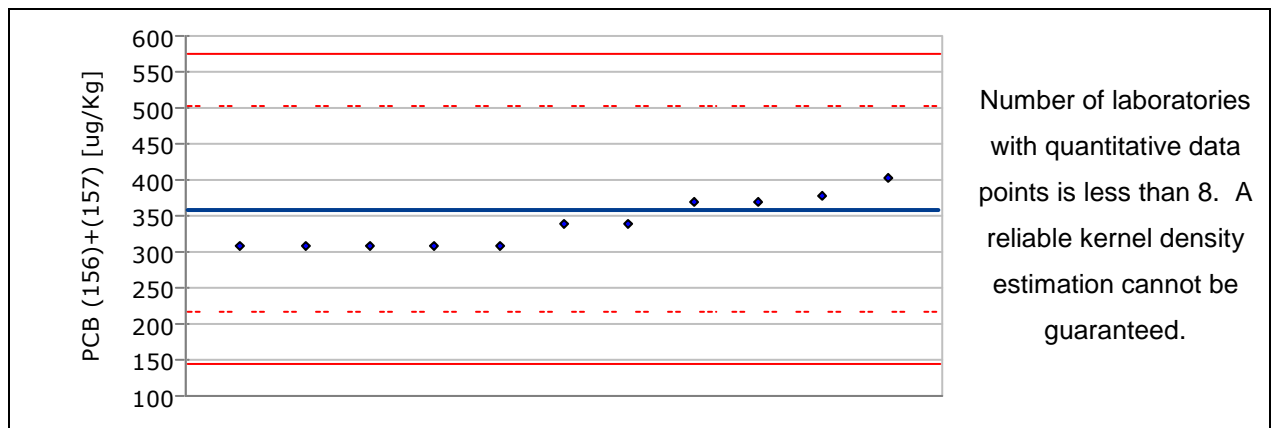


4.3.13 PCB (153)+(168)

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	11 / 11
Assigned value	329 ug/Kg
Proficiency std. dev.	65.8 ug/Kg
Acceptance window	132 - 527 ug/Kg

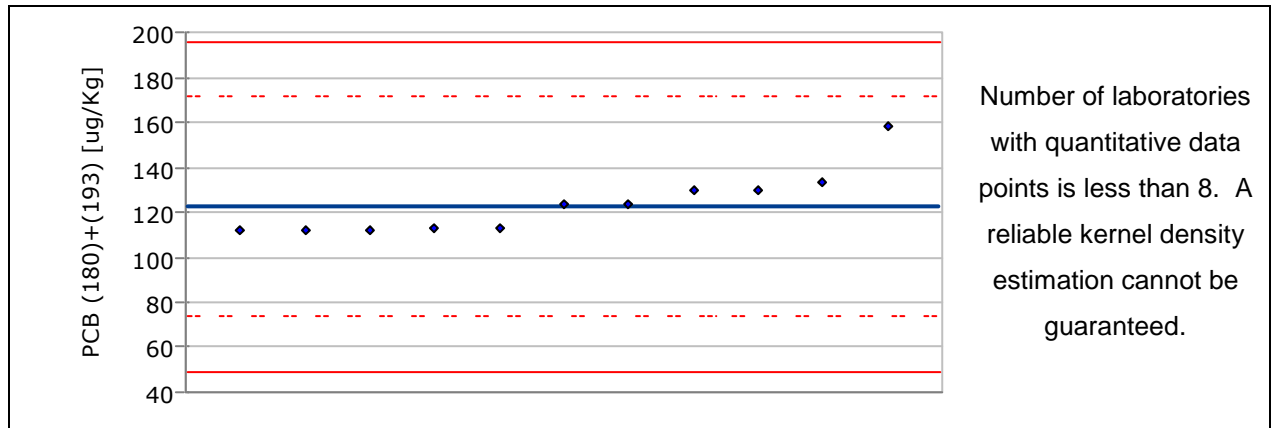
**4.3.14 PCB (156)+(157)**

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	11 / 11
Assigned value	360 ug/Kg
Proficiency std. dev.	71.9 ug/Kg
Acceptance window	144 - 575 ug/Kg

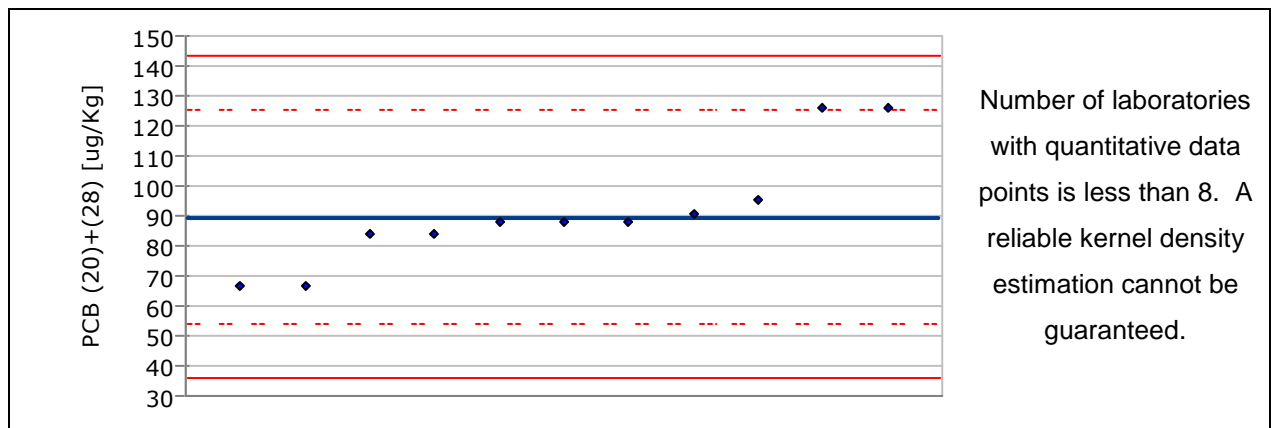


4.3.15 PCB (180)+(193)

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	11 / 11
Assigned value	122 ug/Kg
Proficiency std. dev.	24.5 ug/Kg
Acceptance window	49.0 - 196 ug/Kg

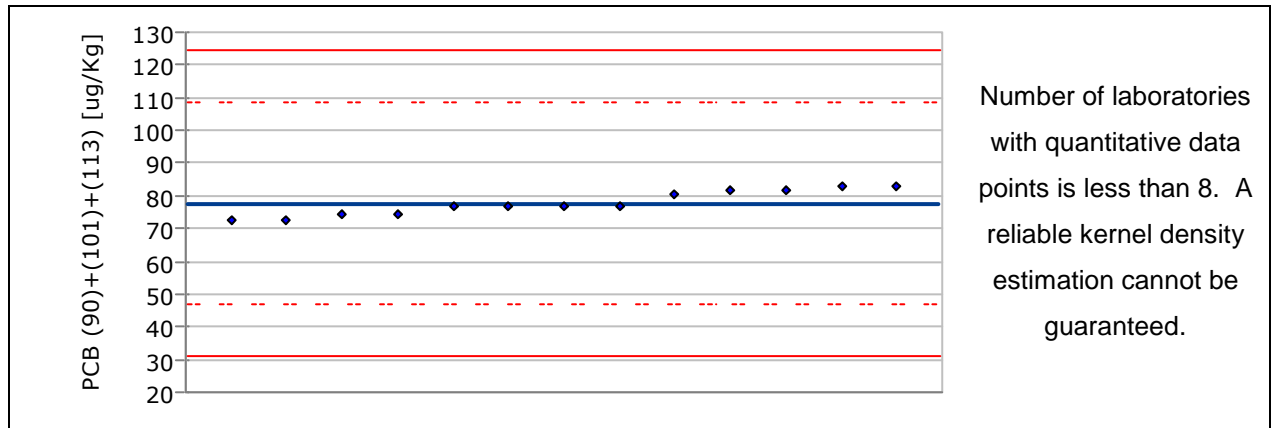
**4.3.16 PCB (20)+(28)**

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	11 / 11
Assigned value	89.6 ug/Kg
Proficiency std. dev.	17.9 ug/Kg
Acceptance window	35.8 - 143 ug/Kg

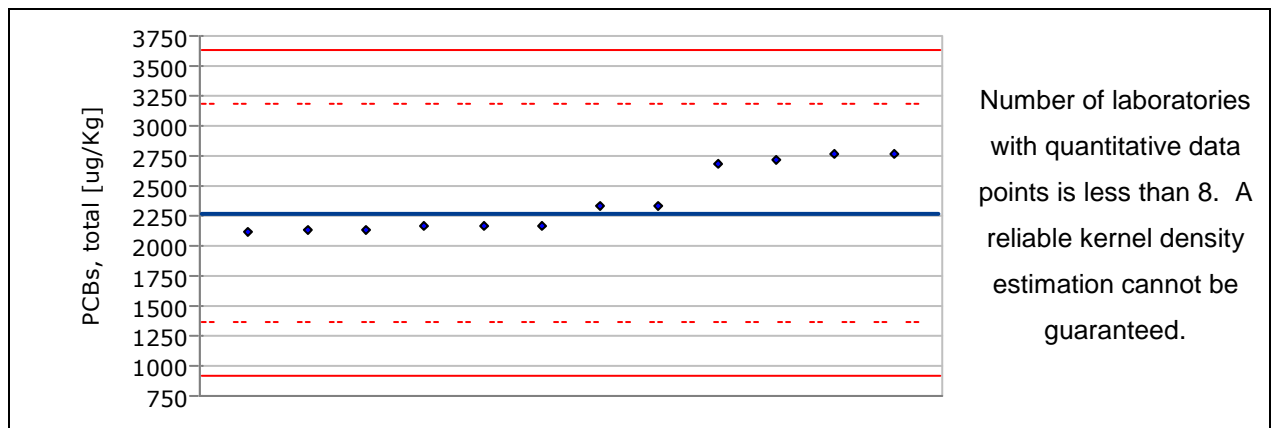


4.3.17 PCB (90)+(101)+(113)

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	13 / 13
Assigned value	77.7 ug/Kg
Proficiency std. dev.	15.5 ug/Kg
Acceptance window	31.1 - 124 ug/Kg

**4.3.18 PCBs, total**

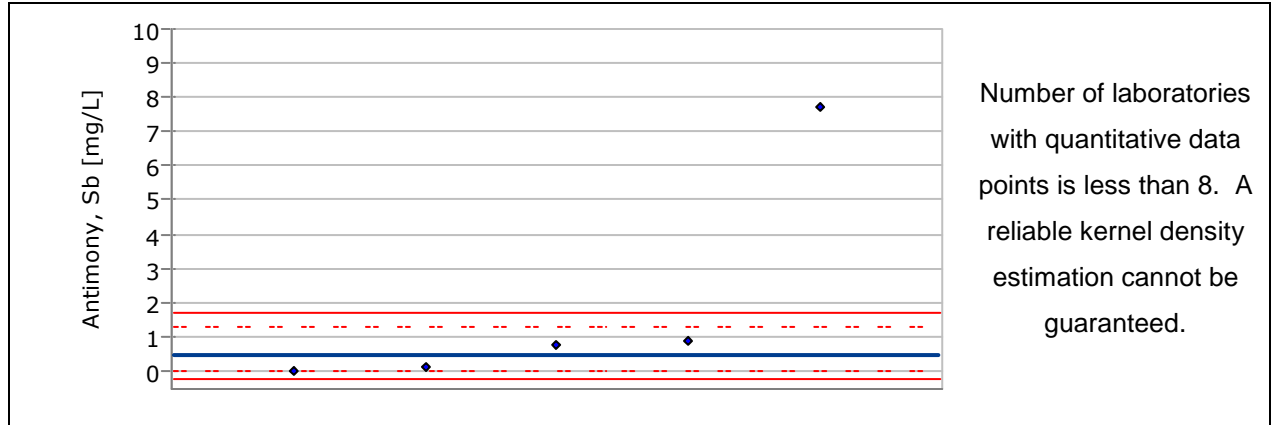
No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	2270 ug/Kg
Proficiency std. dev.	455 ug/Kg
Acceptance window	910 - 3640 ug/Kg



4.4 SPE006-225G TCLP Metals CA - WET in Soil - PT / LRAB5592

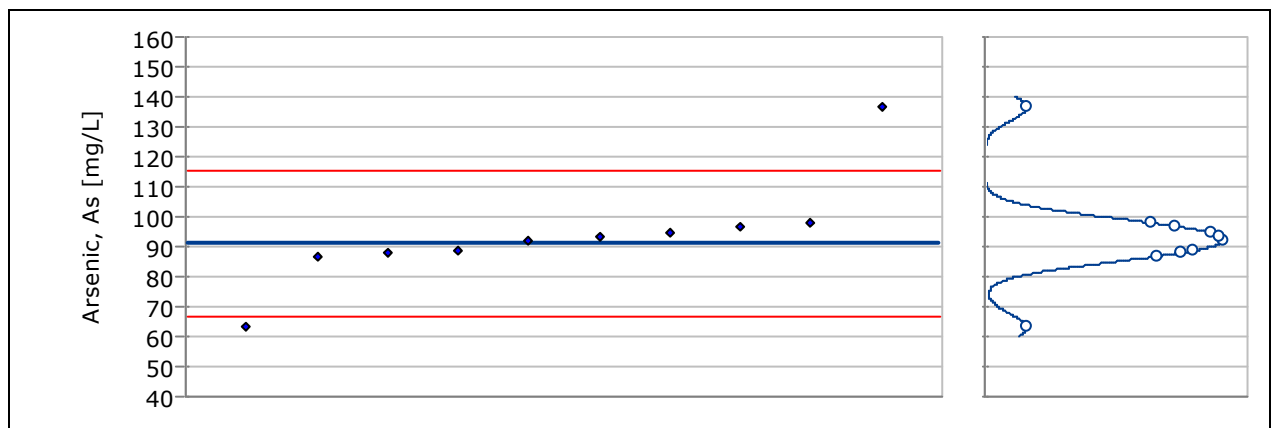
4.4.1 Antimony, Sb

No. of participating laboratories (in total / with quant. data points only)	9 / 5
No. of data points (in total / quantitative)	10 / 5
Assigned value	0.450 mg/L
Proficiency std. dev.	0.407 mg/L
Acceptance window	0 - 1.67 mg/L



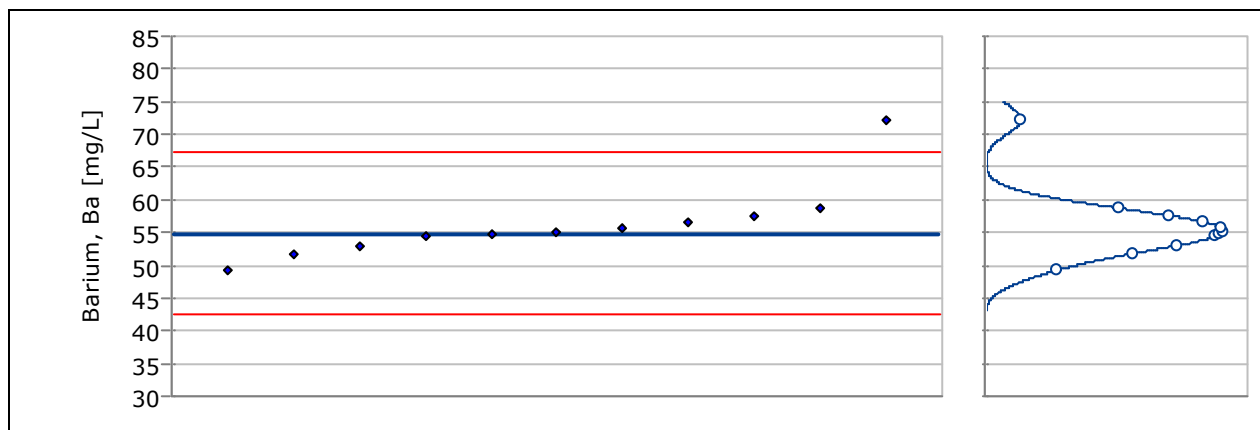
4.4.2 Arsenic, As

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	10 / 10
Assigned value	91.2 mg/L
Proficiency std. dev.	8.10 mg/L
Acceptance window	66.9 - 116 mg/L



4.4.3 Barium, Ba

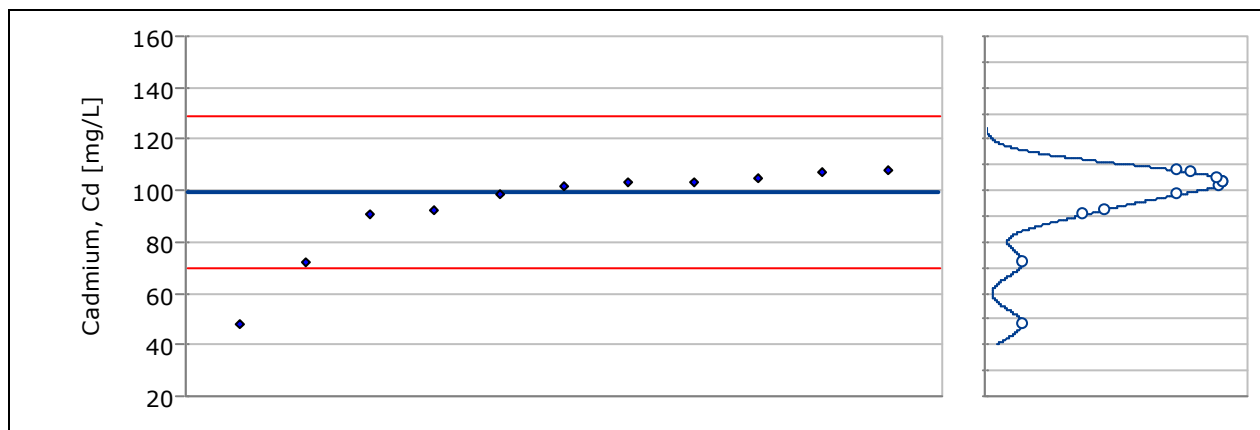
No. of participating laboratories (in total / with quant. data points only)	10 / 10
No. of data points (in total / quantitative)	11 / 11
Assigned value	54.8 mg/L
Proficiency std. dev.	4.14 mg/L
Acceptance window	42.4 - 67.2 mg/L

**4.4.4 Beryllium, Be**

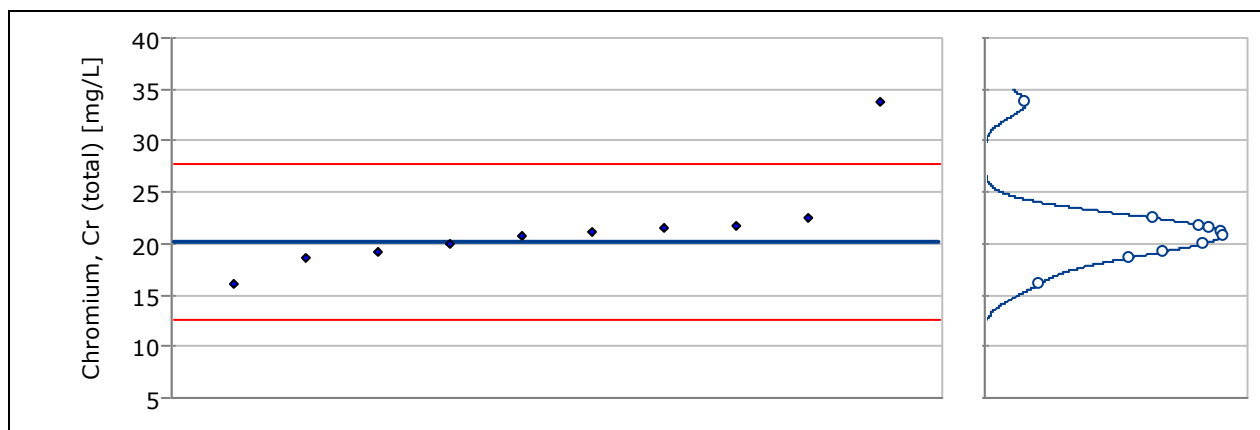
No. of participating laboratories (in total / with quant. data points only)	9 / 2
No. of data points (in total / quantitative)	10 / 2
Assigned value	0 mg/L
Proficiency std. dev.	0 mg/L
Acceptance window	--- mg/L

4.4.5 Cadmium, Cd

No. of participating laboratories (in total / with quant. data points only)	10 / 10
No. of data points (in total / quantitative)	11 / 11
Assigned value	99.3 mg/L
Proficiency std. dev.	9.92 mg/L
Acceptance window	69.6 - 129 mg/L

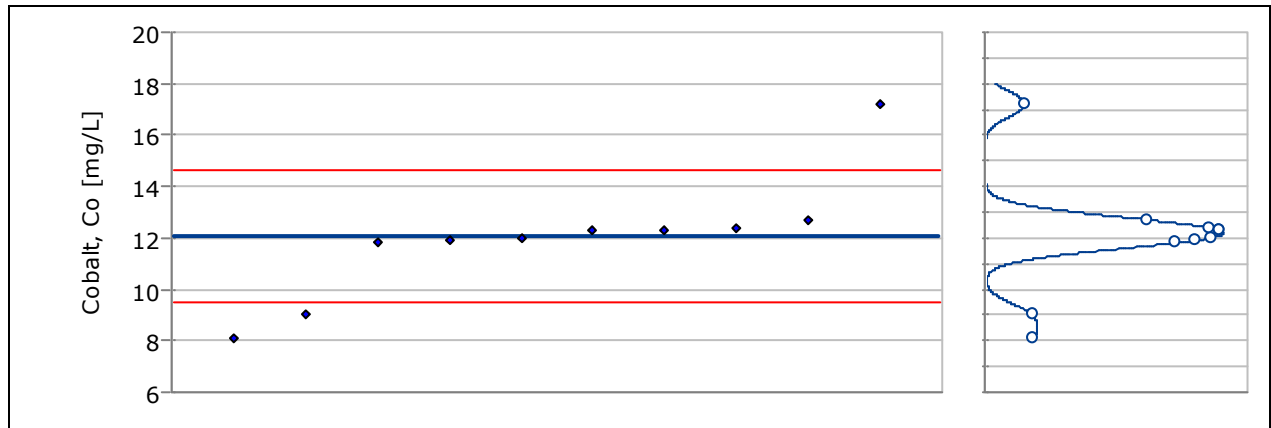
**4.4.6 Chromium, Cr (total)**

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	10 / 10
Assigned value	20.2 mg/L
Proficiency std. dev.	2.52 mg/L
Acceptance window	12.6 - 27.8 mg/L

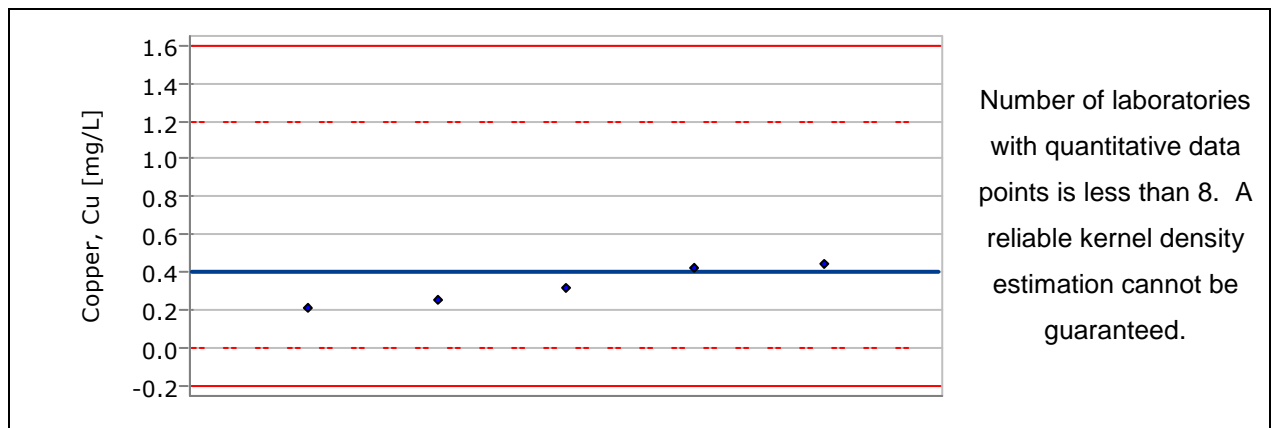


4.4.7 Cobalt, Co

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	10 / 10
Assigned value	12.1 mg/L
Proficiency std. dev.	0.856 mg/L
Acceptance window	9.52 - 14.7 mg/L

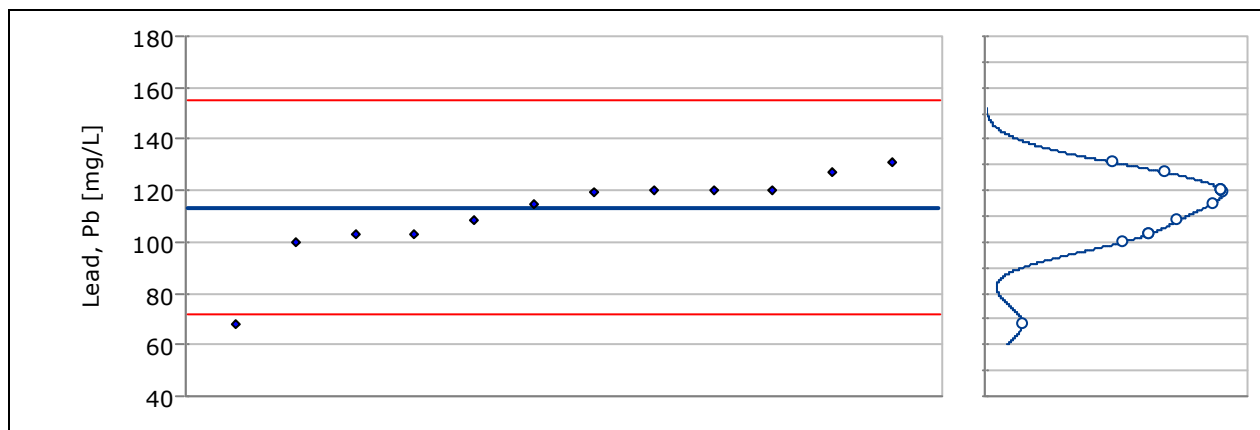
**4.4.8 Copper, Cu**

No. of participating laboratories (in total / with quant. data points only)	9 / 5
No. of data points (in total / quantitative)	10 / 5
Assigned value	0.400 mg/L
Proficiency std. dev.	0.400 mg/L
Acceptance window	0 - 1.60 mg/L

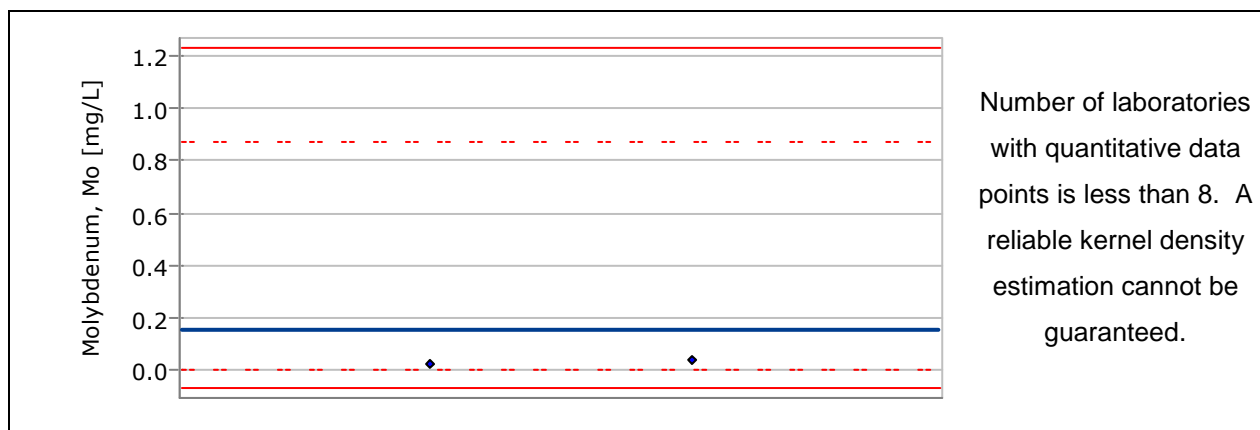


4.4.9 Lead, Pb

No. of participating laboratories (in total / with quant. data points only)	11 / 11
No. of data points (in total / quantitative)	12 / 12
Assigned value	113 mg/L
Proficiency std. dev.	14.0 mg/L
Acceptance window	71.5 - 155 mg/L

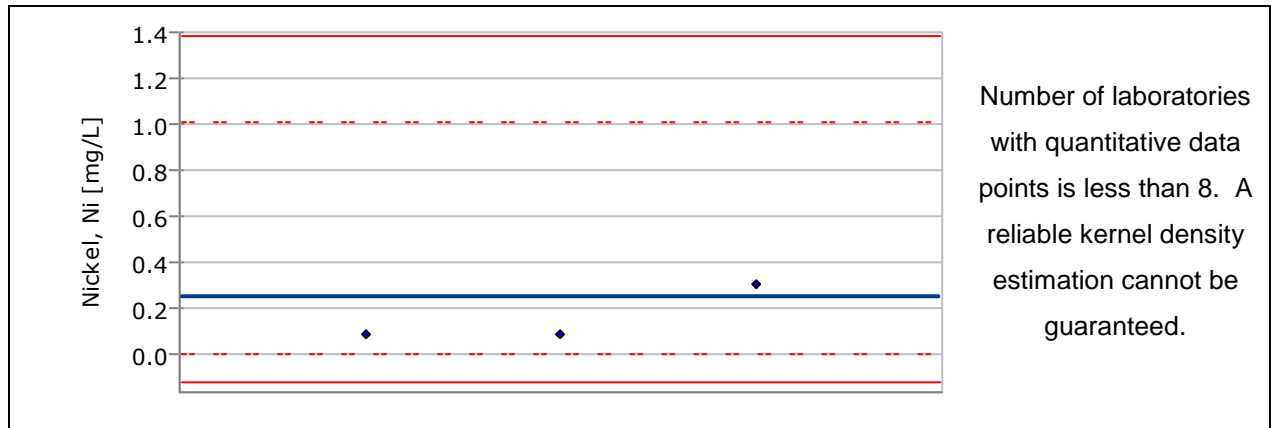
**4.4.10 Molybdenum, Mo**

No. of participating laboratories (in total / with quant. data points only)	10 / 2
No. of data points (in total / quantitative)	11 / 2
Assigned value	0.150 mg/L
Proficiency std. dev.	0.363 mg/L
Acceptance window	0 - 1.24 mg/L

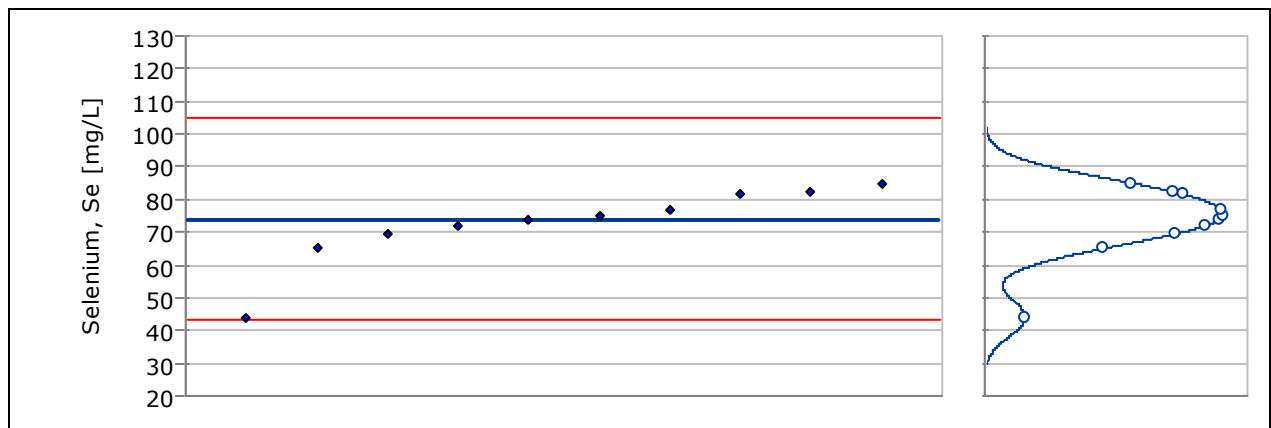


4.4.11 Nickel, Ni

No. of participating laboratories (in total / with quant. data points only)	9 / 3
No. of data points (in total / quantitative)	10 / 3
Assigned value	0.250 mg/L
Proficiency std. dev.	0.377 mg/L
Acceptance window	0 - 1.38 mg/L

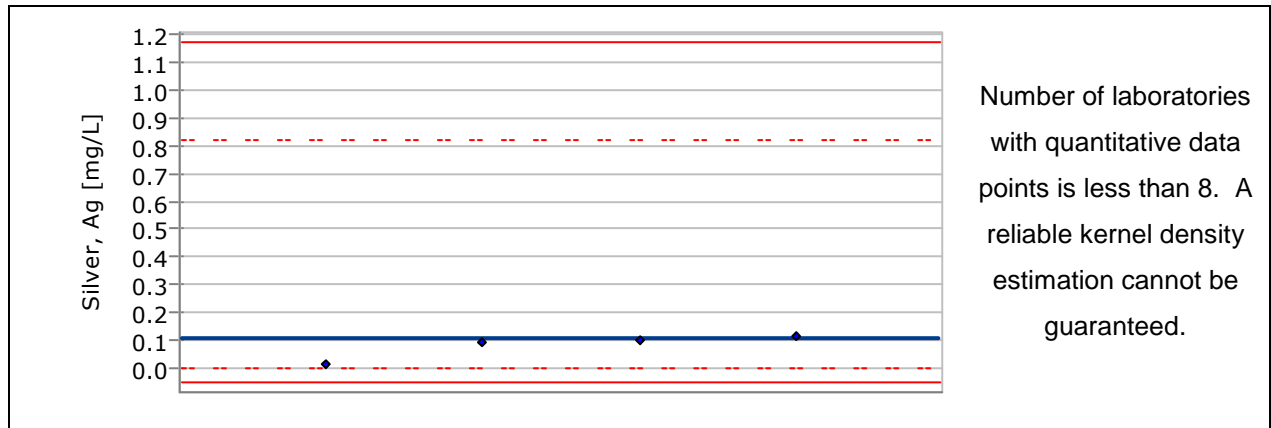
**4.4.12 Selenium, Se**

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	10 / 10
Assigned value	74.0 mg/L
Proficiency std. dev.	10.3 mg/L
Acceptance window	43.0 - 105 mg/L

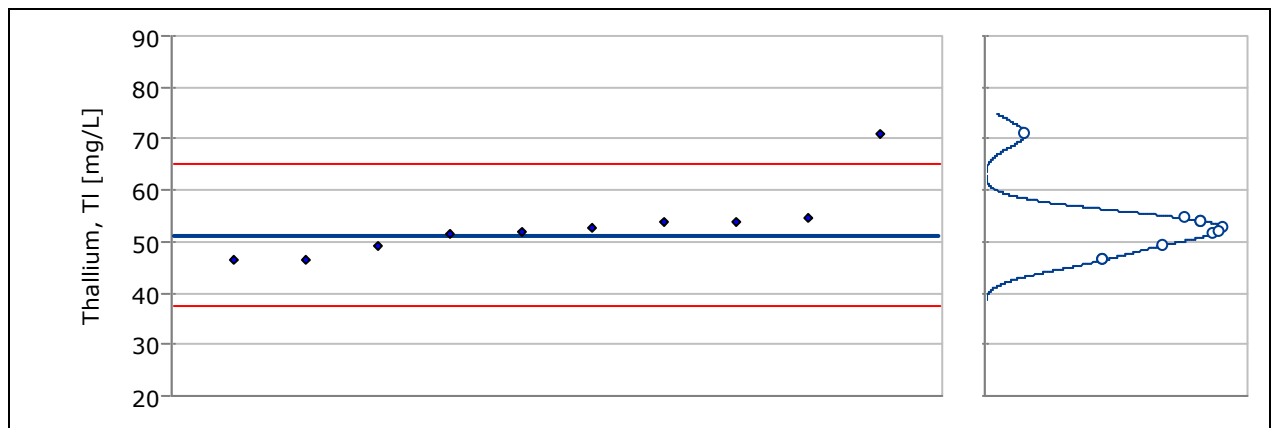


4.4.13 Silver, Ag

No. of participating laboratories (in total / with quant. data points only)	9 / 4
No. of data points (in total / quantitative)	10 / 4
Assigned value	0.108 mg/L
Proficiency std. dev.	0.356 mg/L
Acceptance window	0 - 1.18 mg/L

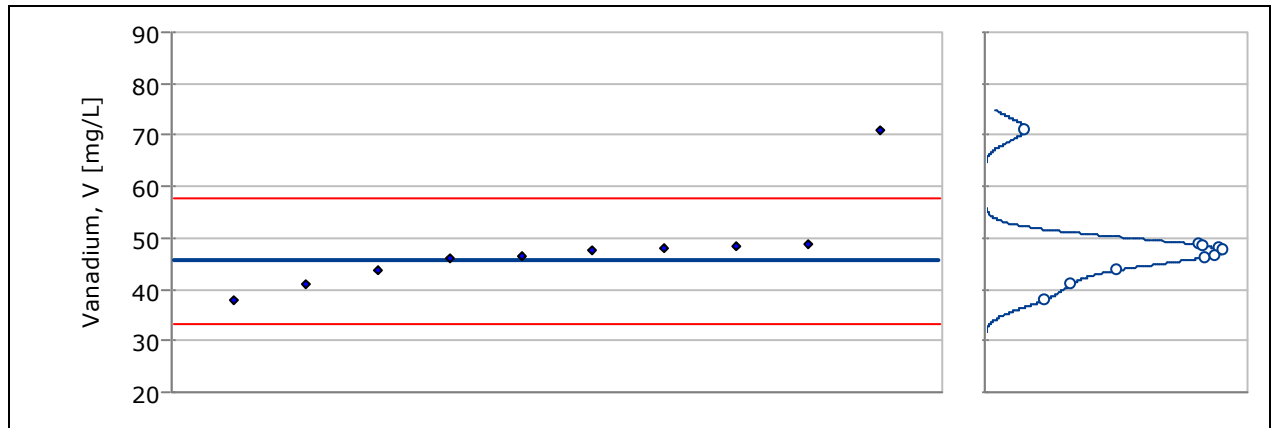
**4.4.14 Thallium, Tl**

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	10 / 10
Assigned value	51.3 mg/L
Proficiency std. dev.	4.61 mg/L
Acceptance window	37.4 - 65.1 mg/L

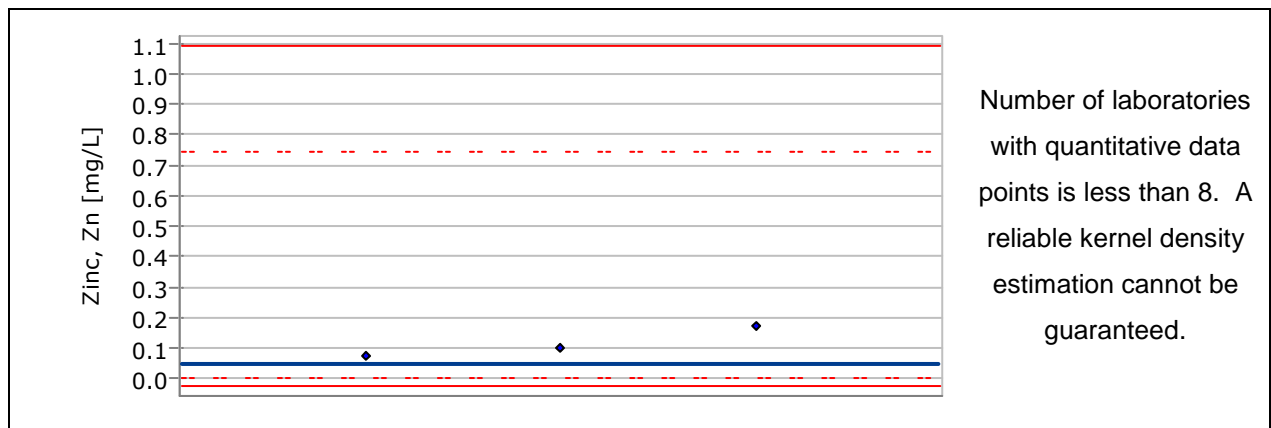


4.4.15 Vanadium, V

No. of participating laboratories (in total / with quant. data points only)	9 / 9
No. of data points (in total / quantitative)	10 / 10
Assigned value	45.5 mg/L
Proficiency std. dev.	4.11 mg/L
Acceptance window	33.2 - 57.8 mg/L

**4.4.16 Zinc, Zn**

No. of participating laboratories (in total / with quant. data points only)	9 / 3
No. of data points (in total / quantitative)	10 / 3
Assigned value	0.0500 mg/L
Proficiency std. dev.	0.347 mg/L
Acceptance window	0 - 1.09 mg/L



5 Statistical Analysis

5.1 Definitions and Interpretation

Reported Value

The participant's result.

Assigned Value

Value attributed to a particular quantity and accepted, sometimes by convention, as having an uncertainty appropriate for a given purpose. See ISO/IEC 17043 for additional information. In general, the assigned value is the value used to assess proficiency and may or may not be the made to value (gravimetric value).

Acceptance Window

The range of values that constitute acceptable performance for a laboratory participating in this PT study.

z-score

A z-score shows how a single data point compares to normal data. A z-score says not only whether a point was above or below average, but how unusual the measurement is. Generally, a method result with a z-score less than |2| is considered to be in control and 'Acceptable'; a z-score between |2| and |3| is considered 'Questionable', but still within control and 'Acceptable' and a z-score greater than |3| is considered 'Not Acceptable' and the method is out of control. For WS studies, a z-score greater than |2| is not acceptable.

Calculated as $z = (\text{Reported Value} - \text{Assigned Value}) / \text{Proficiency Std. Dev.}$

A z-score cannot be provided

- (1) for presence/absence data,
- (2) for identification data and other categorical data,
- (3) where the analyte is not present in the sample,
- (4) for "less than" and "greater than" values,
- (5) NOEC analytes (in the framework of WETT analysis).

In cases (1) to (3) the participant's result is only evaluated by "acceptable" if it matches with the assigned value. Otherwise the result is indicated as "not acceptable". In case the analyte is not present in the sample and a PTRL is available, the participant's result is indicated as "acceptable" as long the result is less than the PTRL.

In case (4) the following evaluation rules will be applied:

- “less than” values:
 - When the analyte is not present in the sample the result is always “acceptable”.
 - When the analyte is truly present in the sample, the result is only “acceptable” if the “less than” value is greater than the lower limit of the acceptance window.
- “greater than” values:
 - When the analyte is not present in the sample the result is always “not acceptable”.
 - When the analyte is truly present in the sample, the result is only “acceptable” if the “greater than” value is less than the upper limit of the acceptance window.

In case (5) the result is indicated as “acceptable” if it lies within the acceptance window, otherwise the result is indicated as “not acceptable”.

Proficiency Std. Dev.

Standard deviation calculated based on Evaluation Criteria.

PTRL

Proficiency Testing Reporting Limit

Study Mean

Statistical study mean calculated using a robust statistical model. Robust statistical techniques are used to minimize the influence extreme results can have on estimates of the mean and standard deviation. NOTE - These techniques assign less weight to extreme results, rather than eliminate them from a data set.

Choice of statistical technique: In case of quantitative data points from at least 8 laboratories, Algorithm A (ISO 13528, Section C.3.1), and in case of quantitative data points of 4 to 7 laboratories, the Hampel estimator (ISO 13528, Section C.5.3) is applied. A study mean cannot be calculated in case there are quantitative data points from less than 4 laboratories available.

Study Std. Dev.

Standard deviation calculated from study data using robust statistics.

In case of quantitative data points from at least 8 laboratories, Algorithm A (ISO 13528, Section C.3.1), and in case of quantitative data points of 4 to 7 laboratories, the Q method (ISO 13528, Section C.5.2) is applied. A study standard deviation cannot be calculated in case there are quantitative data points from less than 4 laboratories available.

Gravimetric Value

The 'prepared to' value, determined by gravimetric means. The uncertainty associated with this value is the standard uncertainty and based on Sigma-Aldrich RTC's gravimetric tolerances.

Analytical Value

The measured value, determined after preparation. The uncertainty associated to this value is the standard uncertainty and based on the measurement process.

5.2 Evaluation Criteria

1 - Regression Equation

Acceptance windows based on TNI adopted equation of proficiency value ± 3 proficiency standard deviations and check limits of proficiency value ± 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c & d as proficiency value = $a * \text{gravimetric} + b$ and proficiency standard deviation = $c * \text{gravimetric} + d$.

2 - Study Robust Mean and c, d regression

Acceptance windows based on TNI adopted equation of proficiency value ± 3 proficiency standard deviations and check limits of proficiency value ± 2 proficiency standard deviations. Proficiency value and proficiency standard deviation calculated from robust study mean and variables c & d as proficiency value = robust mean and proficiency standard deviation = $c * \text{proficiency value} + d$.

3 - Fixed Limits

Acceptance windows based on span of gravimetric percentage from gravimetric as $\text{gravimetric} \pm \text{gravimetric} * \text{percentage}$.

4 - Adjustable Fixed Limits

Acceptance windows based on a span of gravimetric percentage from gravimetric as $\text{gravimetric} \pm \text{gravimetric} * \text{lowPercentage}$ where $\text{gravimetric} < \text{break}$ and $\text{gravimetric} \pm \text{gravimetric} * \text{highPercentage}$ where $\text{gravimetric} \geq \text{break}$.

5 - Study Statistics

Acceptance windows based on a number of standard deviations span from the study mean as $\text{study mean} \pm (\text{deviations} * \text{standard deviation})$.

6 - Log Transform Statistics

Acceptance windows based on lognormal distributed data. Acceptance windows = $\text{mean}(\text{lognormal}) \pm \text{span} * \text{standard deviation}(\text{lognormal})$.

7 - Regression Equation 2SD

Acceptance windows based on EPA equation of proficiency value ± 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c & d as proficiency value = $a * \text{gravimetric} + b$ and proficiency standard deviation = $c * \text{gravimetric} + d$. Generally reserved for drinking water studies.

8 - Study Median and Dilution Levels

Acceptance windows based on study median ± 1 dilution. If the median falls between two test dilutions, then the assigned value is set at the higher value, and the lower acceptance limit is the second test dilution below the median, and the upper acceptance limit is the second test dilution above the median. Generally reserved for NOEC analytes (in the framework of WETT analysis).

9 - Fixed Limits based on Analytical Value

Acceptance windows based on span of analytical value from measurements.

6 Notes on the Interpretation of the Results

z score Overview

The z-scores are presented as colored triangles. For each item, the z-scores of all analytes of the current and the previous (up to three) scheduled studies of this study type. The z-scores depend on the lot, analytical method used, and analyst (if given). A red cross is shown if no z-score is available.

For the assessment of participants by means of z-scores according to ISO/IEC 17043:2010 [2], the triangles were colored as follows:

$ z \leq 2$	green
$2 < z < 3$	yellow (WS studies, WETT samples: red)
$ z \geq 3$	red.

For $|z| \geq 3$, the corresponding triangles are displayed as -3 or 3. For $|z| > 2$, the value of the z score is displayed next to the triangle (yellow or red). A z-score = 0 is shown as a light blue vertical bar.

Interpretation of the z-scores' overview:

A z-score < 0 , i.e. the triangle points to the left, means that the measurement result is lower than the assigned value.

A z-score > 0 , i.e. the triangle points to the right, means that the measurement result is higher than the assigned value.

A z-score = 0, i.e. a light blue vertical bar is shown, means that the measurement result coincides with the assigned value.

Figures per Combination of Item, Lot and Analyte

The *diagram on the left* shows the participant results by means of blue diamonds.

The horizontal blue line indicates the assigned value.

Both the acceptance and the check limits for the participant results are calculated based on z-scores.

The acceptance limits are displayed as solid lines and correspond to z-scores of ± 3 . For WS studies and non-NOEC analytes (in the framework of WETT analysis), the acceptance limits correspond to a z-score ± 2 . For NOEC analytes (in the framework of WETT analysis), the acceptance limits correspond to ± 1 dilution.

The check limits are displayed as dashed lines and correspond to z-scores of ± 2 . They are only calculated if a rule is given by the evaluation criterion.

In case there are at least 8 laboratories with quantitative data points are available: The *diagram on the right* is a kernel density estimation of the distribution of the participant results. The measurement values are indicated as small circles. The kernel width is determined by the ISO 13528 formula from section 10.3.2 i) a).

7 Proficiency Test Item Preparation, Homogeneity and Stability Assessment

Sigma-Aldrich RTC uses proprietary and published methods for the manufacture, homogeneity and stability testing of proficiency test items. Sigma-Aldrich RTC's proficiency test materials meet the requirements of ISO 17034. For more information contact Sigma-Aldrich RTC. Additionally, Sigma-Aldrich RTC complies with the TNI Volume 3 'General Requirements for Environmental Proficiency Test Providers', EL-V3-2009, 2009 for all TNI Fields of Proficiency Testing analytes.

8 Metrological Traceability

All preparations are made using balances calibrated annually traceable to NIST standards. Where appropriate analytical measurements are traceable through an unbroken chain to NIST standards, or a Certified Reference Material manufactured under ISO 17034 in conjunction with ISO/IEC 17025.

9 Additional Information

Go to merck-pt.com for additional information on summary statistics for specific methods, advice on the interpretation of the statistical analysis and additional comments/recommendations. Sigma-Aldrich RTC recommends that you contact your accreditation body for specific instruction.

10 References

- [1] ISO 13528: Statistical methods for use in proficiency testing by interlaboratory comparison, August 2015
- [2] ISO/IEC 17025:2017: General requirements for the competence of testing and calibration laboratories
- [3] ISO/IEC 17043:2010: Conformity assessment - General requirements for proficiency testing, May 2010
- [4] S. Uhlig und P. Henschel (1997): Limits of tolerance and z-scores in ring tests. Fresenius' J. Anal. Chem., Vol. 358, pp. 761-766.
- [5] ISO 17034:2016: General requirements for the competence of reference material producers.

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Lit. No. MS_BR1761EN
2018 - 10431
06/2018

PROFICIENCY TESTING

Evaluation Report

Scheduled Study

LPTP19-S3

Study Type

RCRA_UST

Open Date

2019-07-24

Close Date

2019-09-06

Report Generated

2019-09-24

Laboratory

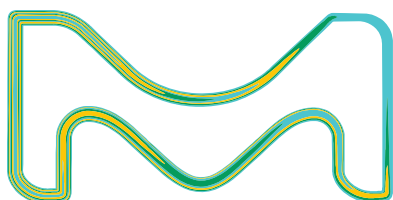
Pace Analytical Services, LLC. - Minneapolis MN
Jerry Thao
1700 Elm Street SE, Suite 200
Minneapolis MN 55414-2485 US

Account Number

49456465

US EPA Lab Code

MN00064



Provider of the proficiency test

Sigma-Aldrich RTC, Inc.
2931 Soldier Springs Road
Laramie, WY 82070 USA
ptservice@milliporesigma.com

Statistical analysis and reporting powered by

QuoData GmbH Quality & Statistics!



Authorized release of the report

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(PT coordinator)

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Accreditors

Evaluations of this study will be sent to the accreditor(s) listed below. If any of the information listed below is not correct, please contact Sigma-Aldrich RTC immediately.

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Accrediting Agency

Louisiana DEQ

Paul Bergeron /Jacqueline Prudente
Office of Environmental Services, Permit Support Services Division, Notifications
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West Virginia DEP

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Charleston WV 25304 US

Summary Results for LPTP19-S3
SPE016-10G Dioxin and Furans in Soil - PT
LRAC0626

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 1613B 10120602				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: JRH Analysis Date: 2019-08-02	958 pg/g	923 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	712 - 1130 pg/g	0.5 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: JRH Analysis Date: 2019-08-02	703 pg/g	696 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	558 - 833 pg/g	0.2 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: JRH Analysis Date: 2019-08-02	760 pg/g	757 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	595 - 918 pg/g	0.1 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: JRH Analysis Date: 2019-08-02	770 pg/g	772 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	561 - 984 pg/g	0.0 Acceptable
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: JRH Analysis Date: 2019-08-02	1660 pg/g	1640 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1270 - 2000 pg/g	0.2 Acceptable
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: JRH Analysis Date: 2019-08-02	260 pg/g	247 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	186 - 308 pg/g	0.6 Acceptable
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: JRH Analysis Date: 2019-08-02	960 pg/g	887 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	649 - 1130 pg/g	0.9 Acceptable
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: JRH Analysis Date: 2019-08-02	1950 pg/g	1790 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1100 - 2490 pg/g	0.7 Acceptable
Hxcdd, total ² 9468 Analyst: JRH Analysis Date: 2019-08-02	3170 pg/g	2920 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1980 - 3860 pg/g	0.8 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: JRH Analysis Date: 2019-08-02	177 pg/g	168 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	126 - 210 pg/g	0.7 Acceptable
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: JRH Analysis Date: 2019-08-02	274 pg/g	276 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	240 - 313 pg/g	-0.2 Acceptable
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: JRH Analysis Date: 2019-08-02	830 pg/g	819 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	632 - 1010 pg/g	0.2 Acceptable
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: JRH Analysis Date: 2019-08-02	249 pg/g	258 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	209 - 307 pg/g	-0.6 Acceptable
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: JRH Analysis Date: 2019-08-02	1530 pg/g	1520 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1230 - 1810 pg/g	0.1 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: JRH Analysis Date: 2019-08-02	870 pg/g	813 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	513 - 1110 pg/g	0.6 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: JRH Analysis Date: 2019-08-02	1320 pg/g	1190 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	769 - 1610 pg/g	0.9 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: JRH Analysis Date: 2019-08-02	984 pg/g	993 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	635 - 1350 pg/g	-0.1 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: JRH Analysis Date: 2019-08-02	279 pg/g	272 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	210 - 335 pg/g	0.3 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: JRH Analysis Date: 2019-08-02	510 pg/g	530 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	413 - 646 pg/g	-0.5 Acceptable
Pecdf, total ² 9552 Analyst: JRH Analysis Date: 2019-08-02	800 pg/g	809 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	672 - 946 pg/g	-0.2 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Pecdd, total ² 9555 Analyst: JRH Analysis Date: 2019-08-02	984 pg/g	994 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	640 - 1350 pg/g	-0.1 Acceptable
TCDD, total ² 9609 Analyst: JRH Analysis Date: 2019-08-02	315 pg/g	292 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	217 - 367 pg/g	0.9 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: JRH Analysis Date: 2019-08-02	267 pg/g	252 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	184 - 319 pg/g	0.7 Acceptable
TCDF, total ² 9615 Analyst: JRH Analysis Date: 2019-08-02	268 pg/g	253 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	182 - 324 pg/g	0.6 Acceptable
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: JRH Analysis Date: 2019-08-02	310 pg/g	289 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	213 - 366 pg/g	0.8 Acceptable
PCDF, total ² 9657 Analyst: JRH Analysis Date: 2019-08-02	5130 pg/g	4950 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	3670 - 6240 pg/g	0.4 Acceptable
PCDD, total ² 9660 Analyst: JRH Analysis Date: 2019-08-02	6560 pg/g	6060 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	3690 - 8430 pg/g	0.6 Acceptable
Group Analysis Summary		Acceptable: 27/27		
EPA 8280B (1998) 10187005				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: JRH Analysis Date: 2019-08-03	920 pg/g	923 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	712 - 1130 pg/g	0.0 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: JRH Analysis Date: 2019-08-03	669 pg/g	696 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	558 - 833 pg/g	-0.6 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: JRH Analysis Date: 2019-08-03	747 pg/g	757 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	595 - 918 pg/g	-0.2 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: JRH Analysis Date: 2019-08-03	747 pg/g	772 pg/g	561 - 984 pg/g	-0.4 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: JRH Analysis Date: 2019-08-03	1590 pg/g	1640 pg/g	1270 - 2000 pg/g	-0.4 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: JRH Analysis Date: 2019-08-03	261 pg/g	247 pg/g	186 - 308 pg/g	0.7 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: JRH Analysis Date: 2019-08-03	927 pg/g	887 pg/g	649 - 1130 pg/g	0.5 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: JRH Analysis Date: 2019-08-03	1860 pg/g	1790 pg/g	1100 - 2490 pg/g	0.3 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
Hxcdd, total ² 9468 Analyst: JRH Analysis Date: 2019-08-03	3050 pg/g	2920 pg/g	1980 - 3860 pg/g	0.4 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: JRH Analysis Date: 2019-08-03	171 pg/g	168 pg/g	126 - 210 pg/g	0.2 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: JRH Analysis Date: 2019-08-03	269 pg/g	276 pg/g	240 - 313 pg/g	-0.6 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: JRH Analysis Date: 2019-08-03	819 pg/g	819 pg/g	632 - 1010 pg/g	0.0 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: JRH Analysis Date: 2019-08-03	247 pg/g	258 pg/g	209 - 307 pg/g	-0.7 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: JRH Analysis Date: 2019-08-03	1510 pg/g	1520 pg/g	1230 - 1810 pg/g	-0.1 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: JRH Analysis Date: 2019-08-03	822 pg/g	813 pg/g	513 - 1110 pg/g	0.1 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: JRH Analysis Date: 2019-08-03	1280 pg/g	1190 pg/g	769 - 1610 pg/g	0.7 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: JRH Analysis Date: 2019-08-03	914 pg/g	993 pg/g	635 - 1350 pg/g	-0.7 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: JRH Analysis Date: 2019-08-03	273 pg/g	272 pg/g	210 - 335 pg/g	0.0 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: JRH Analysis Date: 2019-08-03	495 pg/g	530 pg/g	413 - 646 pg/g	-0.9 Acceptable
Pecdf, total ² 9552 Analyst: JRH Analysis Date: 2019-08-03	768 pg/g	809 pg/g	672 - 946 pg/g	-0.9 Acceptable
Pecdd, total ² 9555 Analyst: JRH Analysis Date: 2019-08-03	914 pg/g	994 pg/g	640 - 1350 pg/g	-0.7 Acceptable
TCDD, total ² 9609 Analyst: JRH Analysis Date: 2019-08-03	300 pg/g	292 pg/g	217 - 367 pg/g	0.3 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: JRH Analysis Date: 2019-08-03	252 pg/g	252 pg/g	184 - 319 pg/g	0.0 Acceptable
TCDF, total ² 9615 Analyst: JRH Analysis Date: 2019-08-03	252 pg/g	253 pg/g	182 - 324 pg/g	-0.1 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: JRH Analysis Date: 2019-08-03	300 pg/g	289 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	213 - 366 pg/g	0.4 Acceptable
PCDF, total ² 9657 Analyst: JRH Analysis Date: 2019-08-03	4940 pg/g	4950 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	3670 - 6240 pg/g	0.0 Acceptable
PCDD, total ² 9660 Analyst: JRH Analysis Date: 2019-08-03	6290 pg/g	6060 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	3690 - 8430 pg/g	0.3 Acceptable
Group Analysis Summary		Acceptable: 27/27	Score: 100% - Acceptable	
EPA 8290 (1994) 10187209				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: JRH Analysis Date: 2019-08-02	958 pg/g	923 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	712 - 1130 pg/g	0.5 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: JRH Analysis Date: 2019-08-02	703 pg/g	696 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	558 - 833 pg/g	0.2 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: JRH Analysis Date: 2019-08-02	760 pg/g	757 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	595 - 918 pg/g	0.1 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: JRH Analysis Date: 2019-08-02	770 pg/g	772 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	561 - 984 pg/g	0.0 Acceptable
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: JRH Analysis Date: 2019-08-02	1660 pg/g	1640 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1270 - 2000 pg/g	0.2 Acceptable
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: JRH Analysis Date: 2019-08-02	260 pg/g	247 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	186 - 308 pg/g	0.6 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: JRH Analysis Date: 2019-08-02	960 pg/g	887 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	649 - 1130 pg/g	0.9 Acceptable
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: JRH Analysis Date: 2019-08-02	1950 pg/g	1790 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1100 - 2490 pg/g	0.7 Acceptable
Hxcdd, total ² 9468 Analyst: JRH Analysis Date: 2019-08-02	3170 pg/g	2920 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1980 - 3860 pg/g	0.8 Acceptable
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: JRH Analysis Date: 2019-08-02	177 pg/g	168 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	126 - 210 pg/g	0.7 Acceptable
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: JRH Analysis Date: 2019-08-02	274 pg/g	276 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	240 - 313 pg/g	-0.2 Acceptable
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: JRH Analysis Date: 2019-08-02	830 pg/g	819 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	632 - 1010 pg/g	0.2 Acceptable
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: JRH Analysis Date: 2019-08-02	249 pg/g	258 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	209 - 307 pg/g	-0.6 Acceptable
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: JRH Analysis Date: 2019-08-02	1530 pg/g	1520 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1230 - 1810 pg/g	0.1 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: JRH Analysis Date: 2019-08-02	870 pg/g	813 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	513 - 1110 pg/g	0.6 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: JRH Analysis Date: 2019-08-02	1320 pg/g	1190 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	769 - 1610 pg/g	0.9 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: JRH Analysis Date: 2019-08-02	984 pg/g	993 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	635 - 1350 pg/g	-0.1 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,7,8-Pecdf ² 9543 Analyst: JRH Analysis Date: 2019-08-02	279 pg/g	272 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	210 - 335 pg/g	0.3 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: JRH Analysis Date: 2019-08-02	510 pg/g	530 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	413 - 646 pg/g	-0.5 Acceptable
Pecdf, total ² 9552 Analyst: JRH Analysis Date: 2019-08-02	800 pg/g	809 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	672 - 946 pg/g	-0.2 Acceptable
Pecdd, total ² 9555 Analyst: JRH Analysis Date: 2019-08-02	984 pg/g	994 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	640 - 1350 pg/g	-0.1 Acceptable
TCDD, total ² 9609 Analyst: JRH Analysis Date: 2019-08-02	315 pg/g	292 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	217 - 367 pg/g	0.9 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: JRH Analysis Date: 2019-08-02	267 pg/g	252 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	184 - 319 pg/g	0.7 Acceptable
TCDF, total ² 9615 Analyst: JRH Analysis Date: 2019-08-02	268 pg/g	253 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	182 - 324 pg/g	0.6 Acceptable
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: JRH Analysis Date: 2019-08-02	310 pg/g	289 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	213 - 366 pg/g	0.8 Acceptable
PCDF, total ² 9657 Analyst: JRH Analysis Date: 2019-08-02	5130 pg/g	4950 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	3670 - 6240 pg/g	0.4 Acceptable
PCDD, total ² 9660 Analyst: JRH Analysis Date: 2019-08-02	6560 pg/g	6060 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	3690 - 8430 pg/g	0.6 Acceptable
Group Analysis Summary	Acceptable: 27/27		Score: 100% - Acceptable	

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 8290A (2007) 10187403				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: JRH Analysis Date: 2019-08-02	958 pg/g	923 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	712 - 1130 pg/g	0.5 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: JRH Analysis Date: 2019-08-02	703 pg/g	696 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	558 - 833 pg/g	0.2 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: JRH Analysis Date: 2019-08-02	760 pg/g	757 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	595 - 918 pg/g	0.1 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: JRH Analysis Date: 2019-08-02	770 pg/g	772 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	561 - 984 pg/g	0.0 Acceptable
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: JRH Analysis Date: 2019-08-02	1660 pg/g	1640 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1270 - 2000 pg/g	0.2 Acceptable
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: JRH Analysis Date: 2019-08-02	260 pg/g	247 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	186 - 308 pg/g	0.6 Acceptable
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: JRH Analysis Date: 2019-08-02	960 pg/g	887 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	649 - 1130 pg/g	0.9 Acceptable
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: JRH Analysis Date: 2019-08-02	1950 pg/g	1790 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1100 - 2490 pg/g	0.7 Acceptable
Hxcdd, total ² 9468 Analyst: JRH Analysis Date: 2019-08-02	3170 pg/g	2920 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1980 - 3860 pg/g	0.8 Acceptable
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: JRH Analysis Date: 2019-08-02	177 pg/g	168 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	126 - 210 pg/g	0.7 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: JRH Analysis Date: 2019-08-02	274 pg/g	276 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	240 - 313 pg/g	-0.2 Acceptable
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: JRH Analysis Date: 2019-08-02	830 pg/g	819 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	632 - 1010 pg/g	0.2 Acceptable
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: JRH Analysis Date: 2019-08-02	249 pg/g	258 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	209 - 307 pg/g	-0.6 Acceptable
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: JRH Analysis Date: 2019-08-02	1530 pg/g	1520 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1230 - 1810 pg/g	0.1 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: JRH Analysis Date: 2019-08-02	870 pg/g	813 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	513 - 1110 pg/g	0.6 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: JRH Analysis Date: 2019-08-02	1320 pg/g	1190 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	769 - 1610 pg/g	0.9 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: JRH Analysis Date: 2019-08-02	984 pg/g	993 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	635 - 1350 pg/g	-0.1 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: JRH Analysis Date: 2019-08-02	279 pg/g	272 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	210 - 335 pg/g	0.3 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: JRH Analysis Date: 2019-08-02	510 pg/g	530 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	413 - 646 pg/g	-0.5 Acceptable
Pecdf, total ² 9552 Analyst: JRH Analysis Date: 2019-08-02	800 pg/g	809 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	672 - 946 pg/g	-0.2 Acceptable
Pecdd, total ² 9555 Analyst: JRH Analysis Date: 2019-08-02	984 pg/g	994 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	640 - 1350 pg/g	-0.1 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
TCDD, total ² 9609 Analyst: JRH Analysis Date: 2019-08-02	315 pg/g	292 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	217 - 367 pg/g	0.9 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: JRH Analysis Date: 2019-08-02	267 pg/g	252 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	184 - 319 pg/g	0.7 Acceptable
TCDF, total ² 9615 Analyst: JRH Analysis Date: 2019-08-02	268 pg/g	253 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	182 - 324 pg/g	0.6 Acceptable
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: JRH Analysis Date: 2019-08-02	310 pg/g	289 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	213 - 366 pg/g	0.8 Acceptable
PCDF, total ² 9657 Analyst: JRH Analysis Date: 2019-08-02	5130 pg/g	4950 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	3670 - 6240 pg/g	0.4 Acceptable
PCDD, total ² 9660 Analyst: JRH Analysis Date: 2019-08-02	6560 pg/g	6060 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	3690 - 8430 pg/g	0.6 Acceptable
Group Analysis Summary	Acceptable: 27/27		Score: 100% - Acceptable	

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**Summary Results for LPTP19-S3
SPE068-50G PCB Congeners in Soil - PT
LRAC1566**

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 1668A 10129405				
PCBs in Soil				
PCBs, total ² 8870 Analyst: BAL Analysis Date: 2019-08-11	3080 ug/Kg	3370 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	1350 - 5400 ug/Kg	-0.4 Acceptable
PCB (20)+(28) ² 8936 Analyst: BAL Analysis Date: 2019-08-11	119 ug/Kg	128 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	51.2 - 205 ug/Kg	-0.4 Acceptable
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) ² 8955 Analyst: BAL Analysis Date: 2019-08-11	289 ug/Kg	298 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	182 - 414 ug/Kg	-0.2 Acceptable
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) ² 8965 Analyst: BAL Analysis Date: 2019-08-11	271 ug/Kg	275 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	188 - 362 ug/Kg	-0.2 Acceptable
3,4,4',5-Tetrachlorobiphenyl (PCB 81) ² 8970 Analyst: BAL Analysis Date: 2019-08-11	116 ug/Kg	117 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	87.1 - 148 ug/Kg	-0.1 Acceptable
PCB (90)+(101)+(113) ² 8982 Analyst: BAL Analysis Date: 2019-08-11	80.3 ug/Kg	84.6 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	49.4 - 120 ug/Kg	-0.4 Acceptable
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) ² 8985 Analyst: BAL Analysis Date: 2019-08-11	41.7 ug/Kg	40.2 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	30.2 - 50.2 ug/Kg	0.5 Acceptable
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) ² 8995 Analyst: BAL Analysis Date: 2019-08-11	94.3 ug/Kg	88.3 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	67.0 - 110 ug/Kg	0.8 Acceptable

* Evaluation parameters used for the statistical analysis: explanation at the end of report; A yellow highlighted results is acceptable but to be checked.

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) ² 9000 Analyst: BAL Analysis Date: 2019-08-11	111 ug/Kg	112 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	65.4 - 159 ug/Kg	-0.1 Acceptable
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) ² 9005 Analyst: BAL Analysis Date: 2019-08-11	128 ug/Kg	123 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	88.0 - 158 ug/Kg	0.4 Acceptable
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) ² 9015 Analyst: BAL Analysis Date: 2019-08-11	209 ug/Kg	192 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	132 - 251 ug/Kg	0.9 Acceptable
PCB (129)+(138)+(163) ² 9026 Analyst: BAL Analysis Date: 2019-08-11	63.4 ug/Kg	64.3 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	49.6 - 79.0 ug/Kg	-0.2 Acceptable
PCB (153)+(168) ² 9041 Analyst: BAL Analysis Date: 2019-08-11	198 ug/Kg	204 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	81.7 - 327 ug/Kg	-0.2 Acceptable
PCB (156)+(157) ² 9046 Analyst: BAL Analysis Date: 2019-08-11	511 ug/Kg	519 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	208 - 830 ug/Kg	-0.1 Acceptable
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) ² 9055 Analyst: BAL Analysis Date: 2019-08-11	395 ug/Kg	386 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	281 - 492 ug/Kg	0.2 Acceptable
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) ² 9060 Analyst: BAL Analysis Date: 2019-08-11	223 ug/Kg	221 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	191 - 251 ug/Kg	0.2 Acceptable
PCB (180)+(193) ² 9070 Analyst: BAL Analysis Date: 2019-08-11	53.8 ug/Kg	73.0 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	29.2 - 117 ug/Kg	-1.3 Acceptable
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) ² 9085 Analyst: BAL Analysis Date: 2019-08-11	175 ug/Kg	173 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	145 - 202 ug/Kg	0.2 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Group Analysis Summary	Acceptable: 18/18		Score: 100% - Acceptable	
EPA 1668A (1999) 10262007				
PCBs in Soil				
PCBs, total ² 8870 Analyst: BAL Analysis Date: 2019-08-11	3080 ug/Kg	3370 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	1350 - 5400 ug/Kg	-0.4 Acceptable
PCB (20)+(28) ² 8936 Analyst: BAL Analysis Date: 2019-08-11	119 ug/Kg	128 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	51.2 - 205 ug/Kg	-0.4 Acceptable
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) ² 8955 Analyst: BAL Analysis Date: 2019-08-11	289 ug/Kg	298 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	182 - 414 ug/Kg	-0.2 Acceptable
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) ² 8965 Analyst: BAL Analysis Date: 2019-08-11	271 ug/Kg	275 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	188 - 362 ug/Kg	-0.2 Acceptable
3,4,4',5-Tetrachlorobiphenyl (PCB 81) ² 8970 Analyst: BAL Analysis Date: 2019-08-11	116 ug/Kg	117 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	87.1 - 148 ug/Kg	-0.1 Acceptable
PCB (90)+(101)+(113) ² 8982 Analyst: BAL Analysis Date: 2019-08-11	80.3 ug/Kg	84.6 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	49.4 - 120 ug/Kg	-0.4 Acceptable
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) ² 8985 Analyst: BAL Analysis Date: 2019-08-11	41.7 ug/Kg	40.2 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	30.2 - 50.2 ug/Kg	0.5 Acceptable
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) ² 8995 Analyst: BAL Analysis Date: 2019-08-11	94.3 ug/Kg	88.3 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	67.0 - 110 ug/Kg	0.8 Acceptable
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) ² 9000 Analyst: BAL Analysis Date: 2019-08-11	111 ug/Kg	112 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	65.4 - 159 ug/Kg	-0.1 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) ² 9005 Analyst: BAL Analysis Date: 2019-08-11	128 ug/Kg	123 ug/Kg	88.0 - 158 ug/Kg	0.4 Acceptable
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) ² 9015 Analyst: BAL Analysis Date: 2019-08-11	209 ug/Kg	192 ug/Kg	132 - 251 ug/Kg	0.9 Acceptable
PCB (129)+(138)+(163) ² 9026 Analyst: BAL Analysis Date: 2019-08-11	63.4 ug/Kg	64.3 ug/Kg	49.6 - 79.0 ug/Kg	-0.2 Acceptable
PCB (153)+(168) ² 9041 Analyst: BAL Analysis Date: 2019-08-11	198 ug/Kg	204 ug/Kg	81.7 - 327 ug/Kg	-0.2 Acceptable
PCB (156)+(157) ² 9046 Analyst: BAL Analysis Date: 2019-08-11	511 ug/Kg	519 ug/Kg	208 - 830 ug/Kg	-0.1 Acceptable
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) ² 9055 Analyst: BAL Analysis Date: 2019-08-11	395 ug/Kg	386 ug/Kg	281 - 492 ug/Kg	0.2 Acceptable
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) ² 9060 Analyst: BAL Analysis Date: 2019-08-11	223 ug/Kg	221 ug/Kg	191 - 251 ug/Kg	0.2 Acceptable
PCB (180)+(193) ² 9070 Analyst: BAL Analysis Date: 2019-08-11	53.8 ug/Kg	73.0 ug/Kg	29.2 - 117 ug/Kg	-1.3 Acceptable
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) ² 9085 Analyst: BAL Analysis Date: 2019-08-11	175 ug/Kg	173 ug/Kg	145 - 202 ug/Kg	0.2 Acceptable
Group Analysis Summary		Acceptable: 18/18	Score: 100% - Acceptable	

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 1668C (2010) 10262109				
PCBs in Soil				
PCBs, total ² 8870 Analyst: BAL Analysis Date: 2019-08-11	3080 ug/Kg	3370 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	1350 - 5400 ug/Kg	-0.4 Acceptable
PCB (20)+(28) ² 8936 Analyst: BAL Analysis Date: 2019-08-11	119 ug/Kg	128 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	51.2 - 205 ug/Kg	-0.4 Acceptable
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) ² 8955 Analyst: BAL Analysis Date: 2019-08-11	289 ug/Kg	298 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	182 - 414 ug/Kg	-0.2 Acceptable
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) ² 8965 Analyst: BAL Analysis Date: 2019-08-11	271 ug/Kg	275 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	188 - 362 ug/Kg	-0.2 Acceptable
3,4,4',5-Tetrachlorobiphenyl (PCB 81) ² 8970 Analyst: BAL Analysis Date: 2019-08-11	116 ug/Kg	117 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	87.1 - 148 ug/Kg	-0.1 Acceptable
PCB (90)+(101)+(113) ² 8982 Analyst: BAL Analysis Date: 2019-08-11	80.3 ug/Kg	84.6 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	49.4 - 120 ug/Kg	-0.4 Acceptable
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) ² 8985 Analyst: BAL Analysis Date: 2019-08-11	41.7 ug/Kg	40.2 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	30.2 - 50.2 ug/Kg	0.5 Acceptable
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) ² 8995 Analyst: BAL Analysis Date: 2019-08-11	94.3 ug/Kg	88.3 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	67.0 - 110 ug/Kg	0.8 Acceptable
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) ² 9000 Analyst: BAL Analysis Date: 2019-08-11	111 ug/Kg	112 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	65.4 - 159 ug/Kg	-0.1 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) ² 9005 Analyst: BAL Analysis Date: 2019-08-11	128 ug/Kg	123 ug/Kg	88.0 - 158 ug/Kg	0.4 Acceptable
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) ² 9015 Analyst: BAL Analysis Date: 2019-08-11	209 ug/Kg	192 ug/Kg	132 - 251 ug/Kg	0.9 Acceptable
PCB (129)+(138)+(163) ² 9026 Analyst: BAL Analysis Date: 2019-08-11	63.4 ug/Kg	64.3 ug/Kg	49.6 - 79.0 ug/Kg	-0.2 Acceptable
PCB (153)+(168) ² 9041 Analyst: BAL Analysis Date: 2019-08-11	198 ug/Kg	204 ug/Kg	81.7 - 327 ug/Kg	-0.2 Acceptable
PCB (156)+(157) ² 9046 Analyst: BAL Analysis Date: 2019-08-11	511 ug/Kg	519 ug/Kg	208 - 830 ug/Kg	-0.1 Acceptable
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) ² 9055 Analyst: BAL Analysis Date: 2019-08-11	395 ug/Kg	386 ug/Kg	281 - 492 ug/Kg	0.2 Acceptable
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) ² 9060 Analyst: BAL Analysis Date: 2019-08-11	223 ug/Kg	221 ug/Kg	191 - 251 ug/Kg	0.2 Acceptable
PCB (180)+(193) ² 9070 Analyst: BAL Analysis Date: 2019-08-11	53.8 ug/Kg	73.0 ug/Kg	29.2 - 117 ug/Kg	-1.3 Acceptable
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) ² 9085 Analyst: BAL Analysis Date: 2019-08-11	175 ug/Kg	173 ug/Kg	145 - 202 ug/Kg	0.2 Acceptable
Group Analysis Summary		Acceptable: 18/18	Score: 100% - Acceptable	

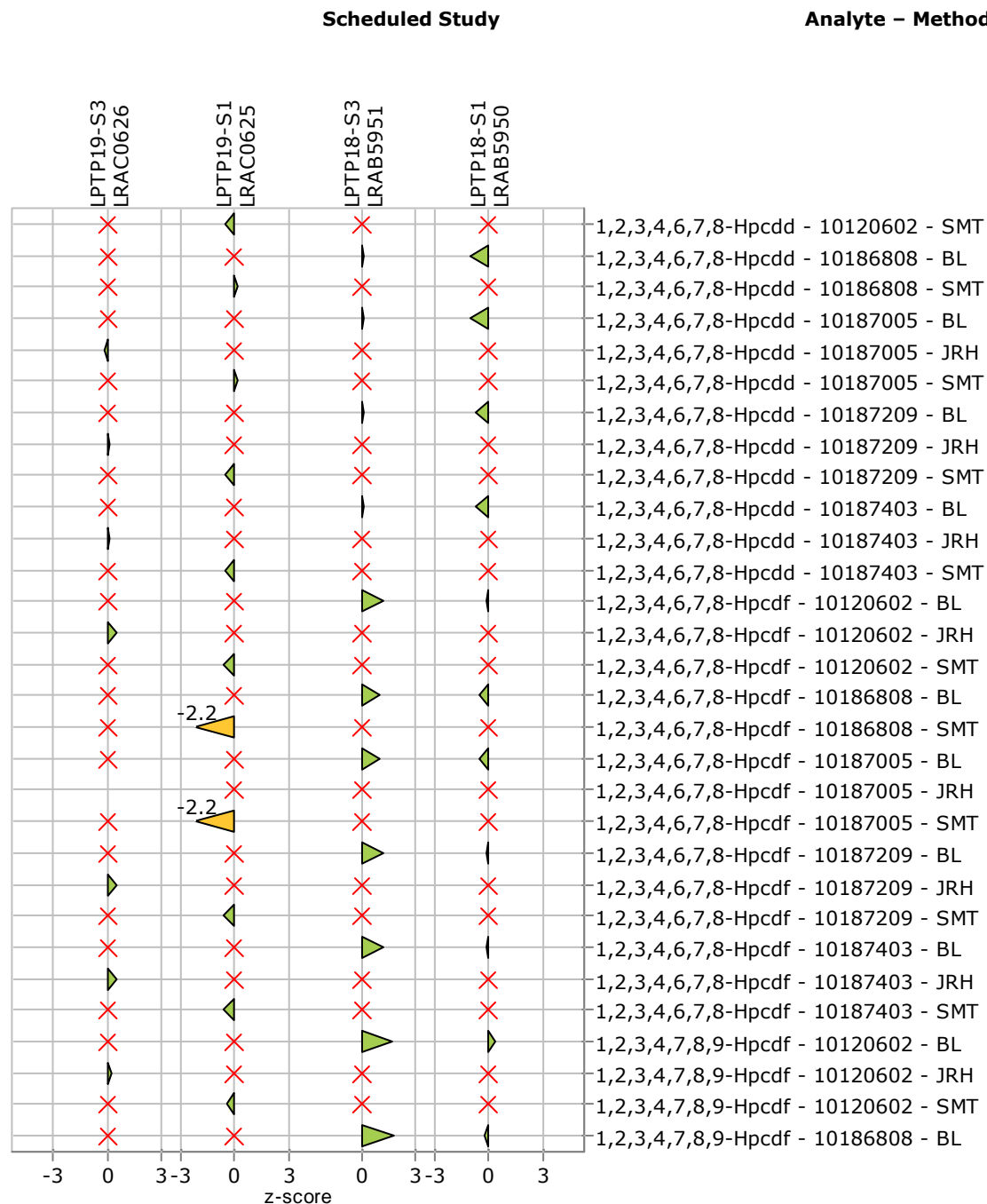
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Graphical z-score Overview for LPTP19-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

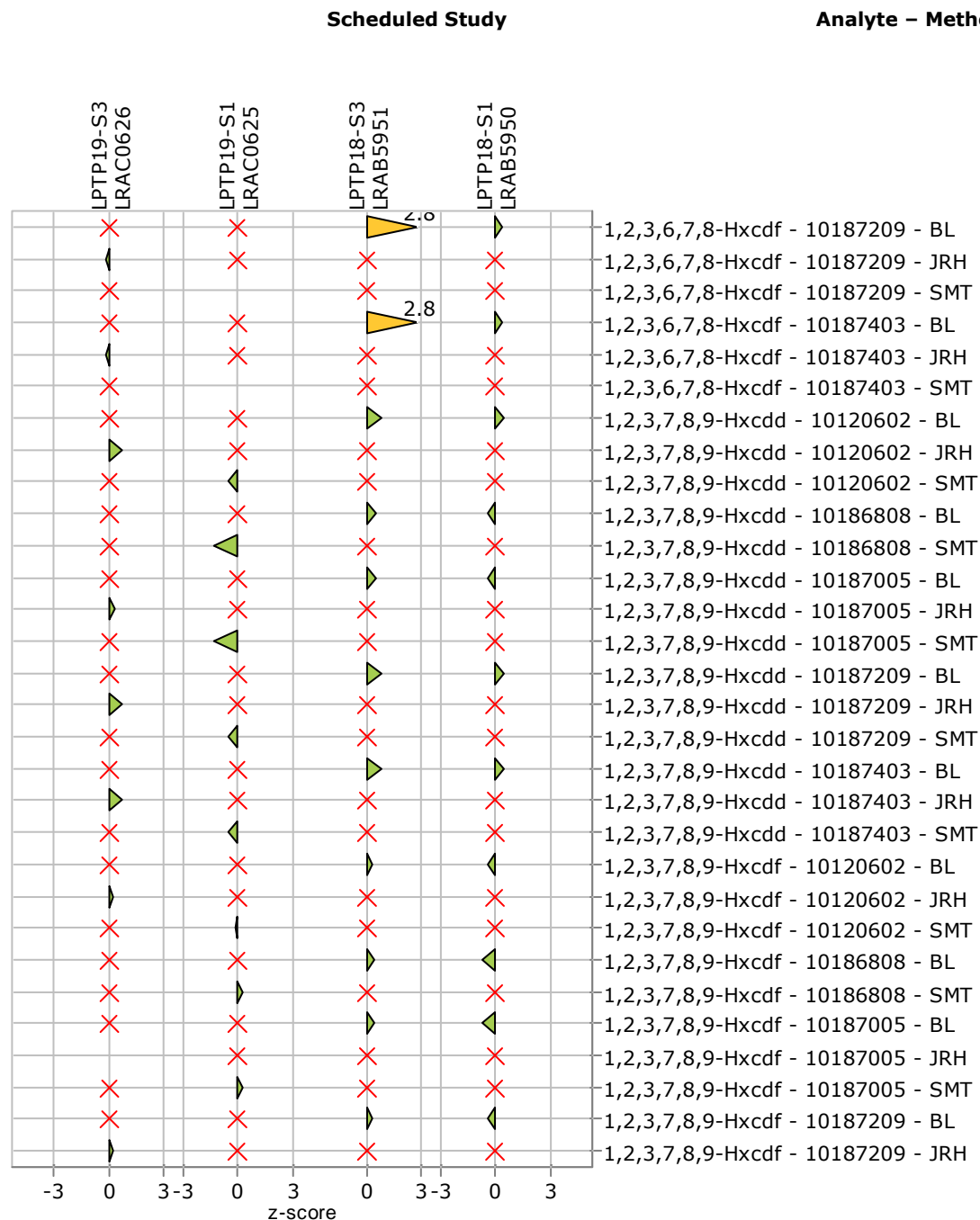
z-score Overview* for LPTP19-S3 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

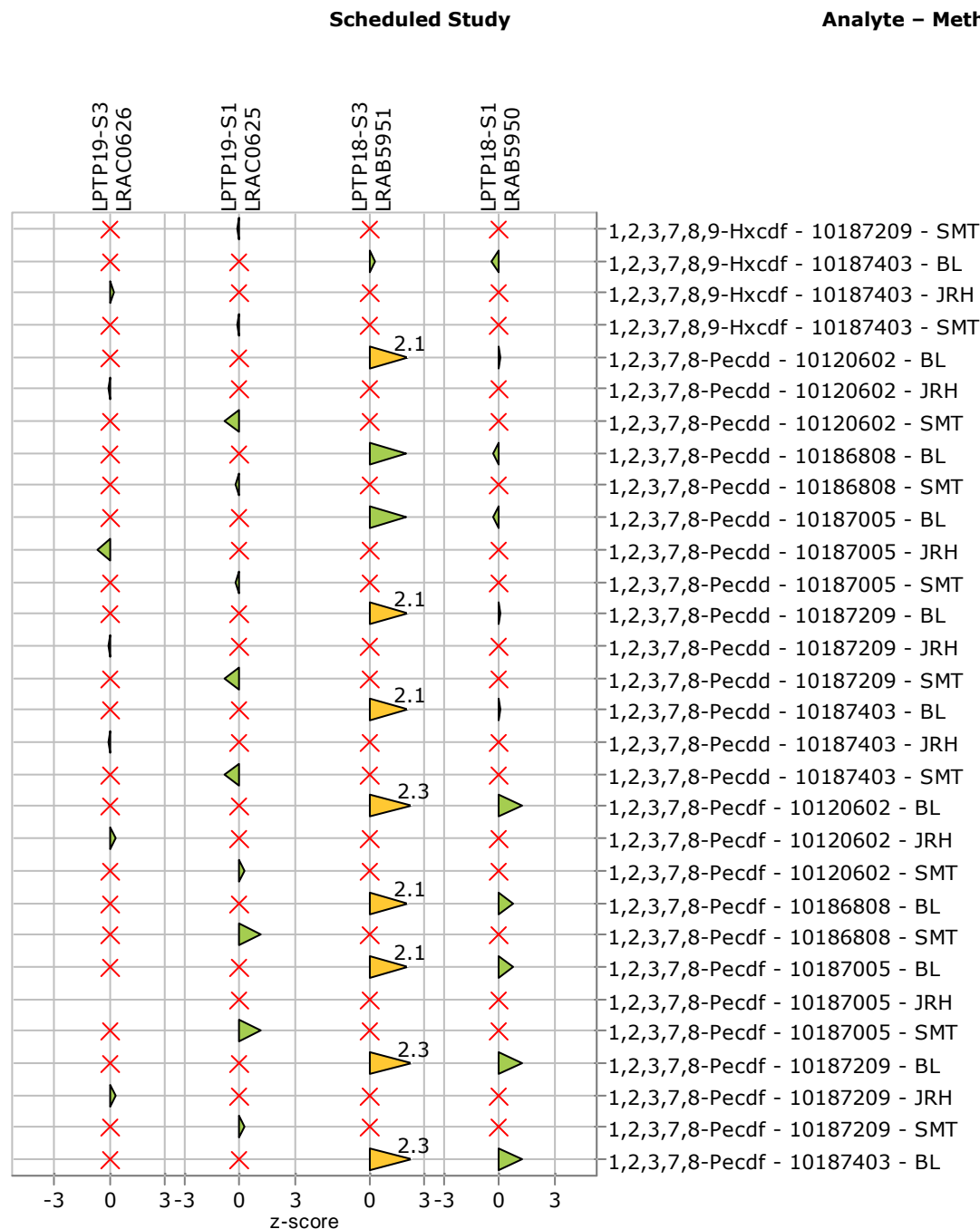
z-score Overview* for LPTP19-S3 and the Previous three Scheduled Studies of this Study Type



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Graphical z-score Overview for LPTP19-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

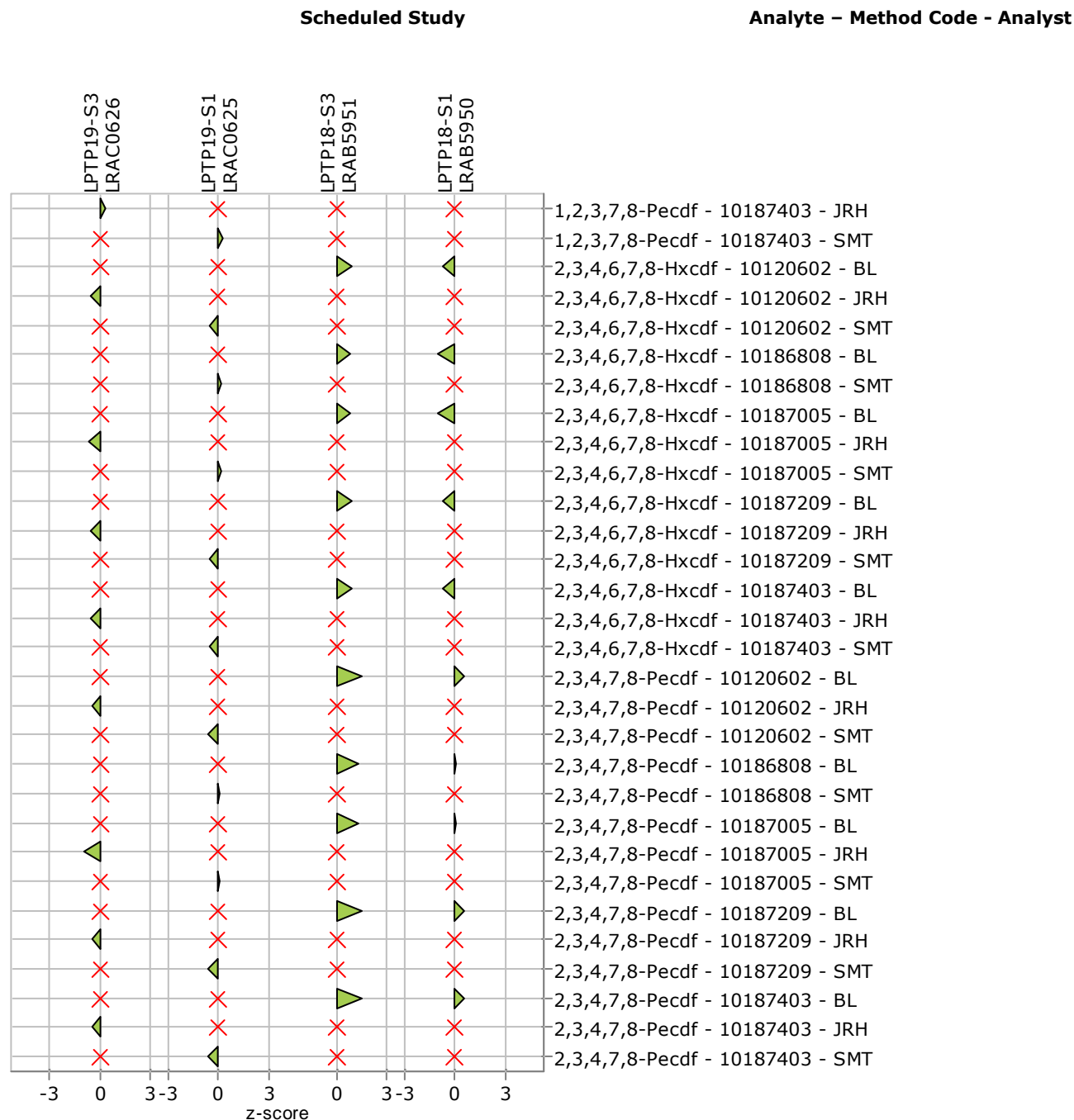
z-score Overview* for LPTP19-S3 and the Previous three Scheduled Studies of this Study Type



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Graphical z-score Overview for LPTP19-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

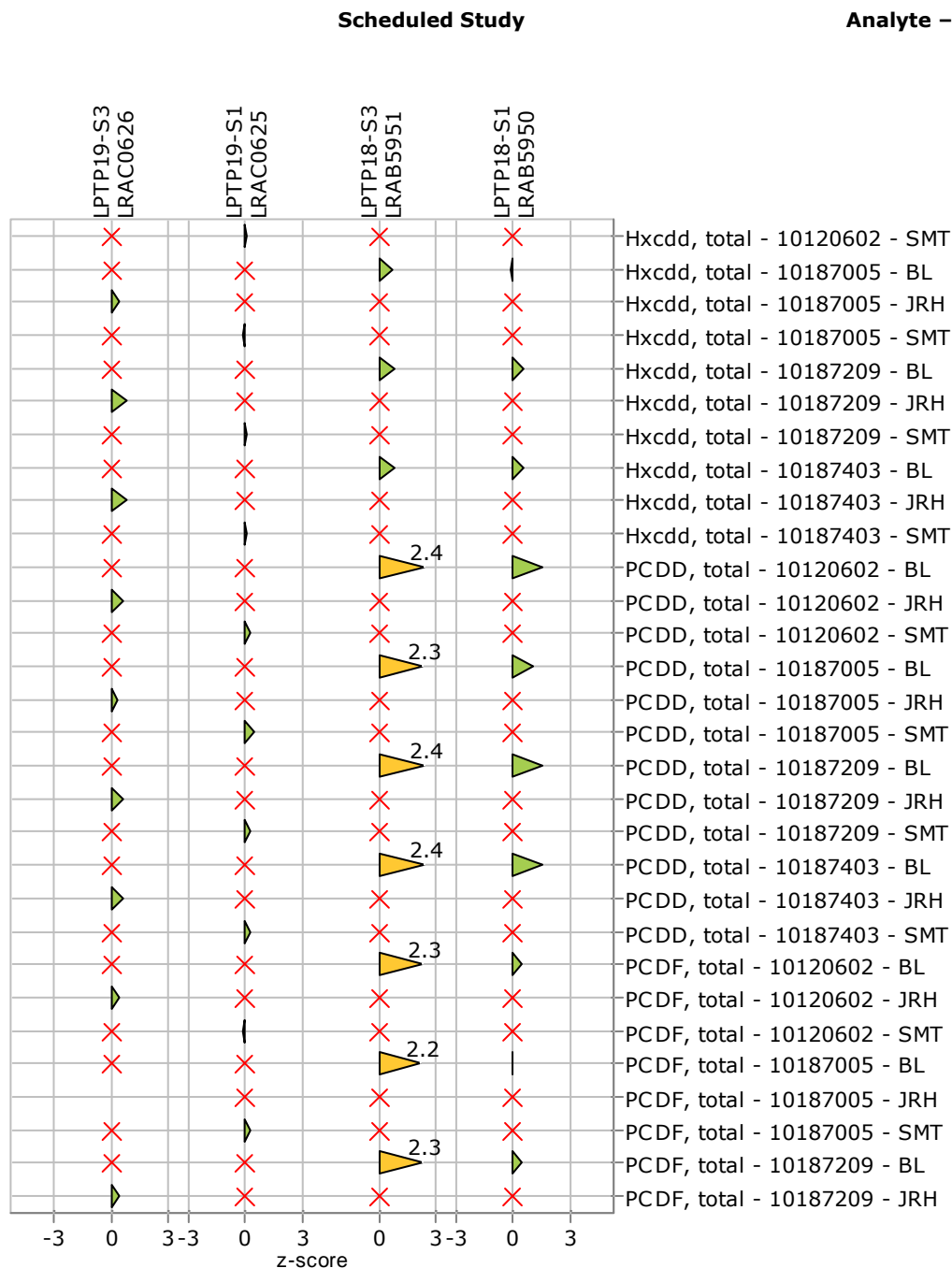
z-score Overview* for LPTP19-S3 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

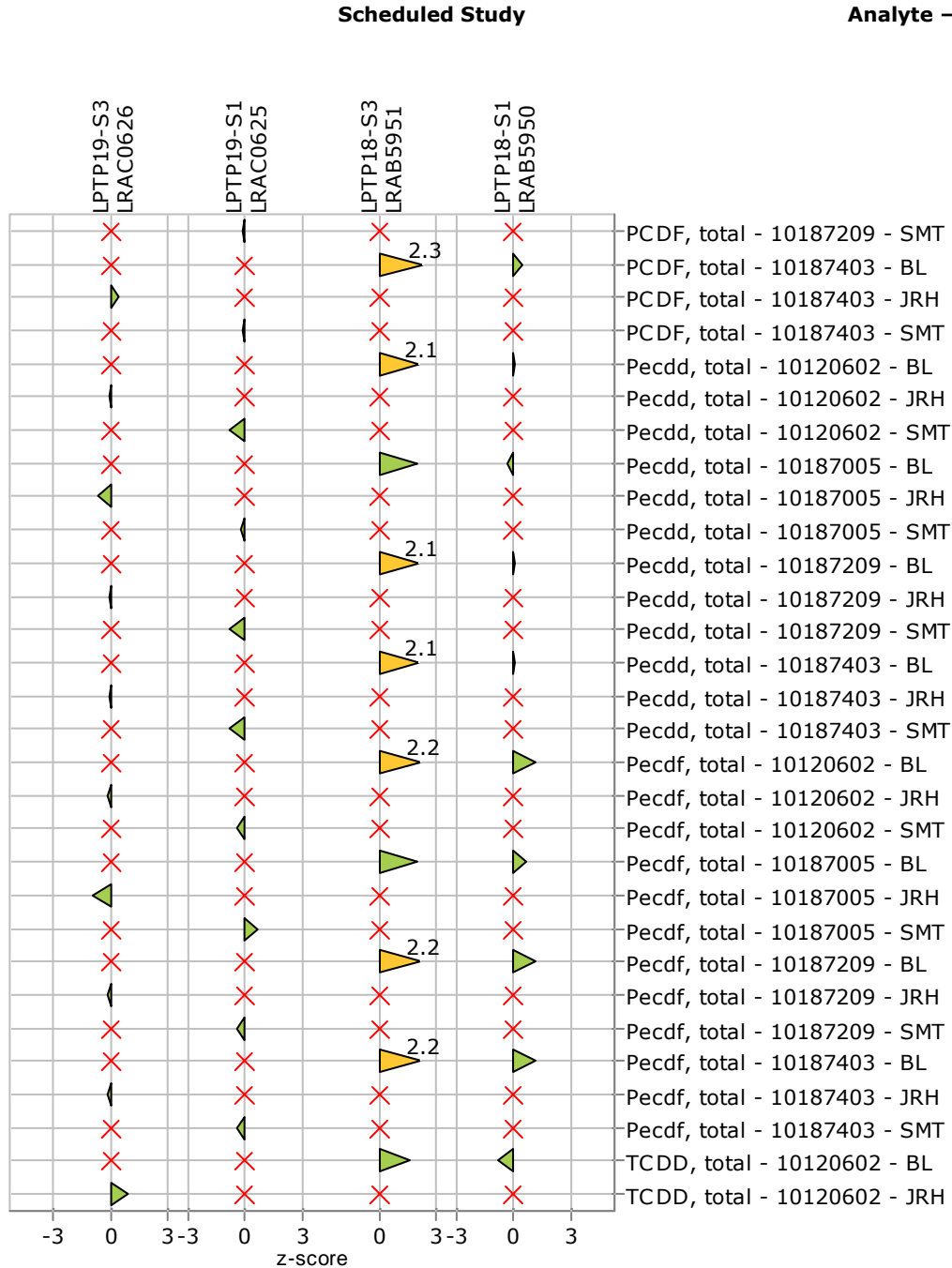
z-score Overview* for LPTP19-S3 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

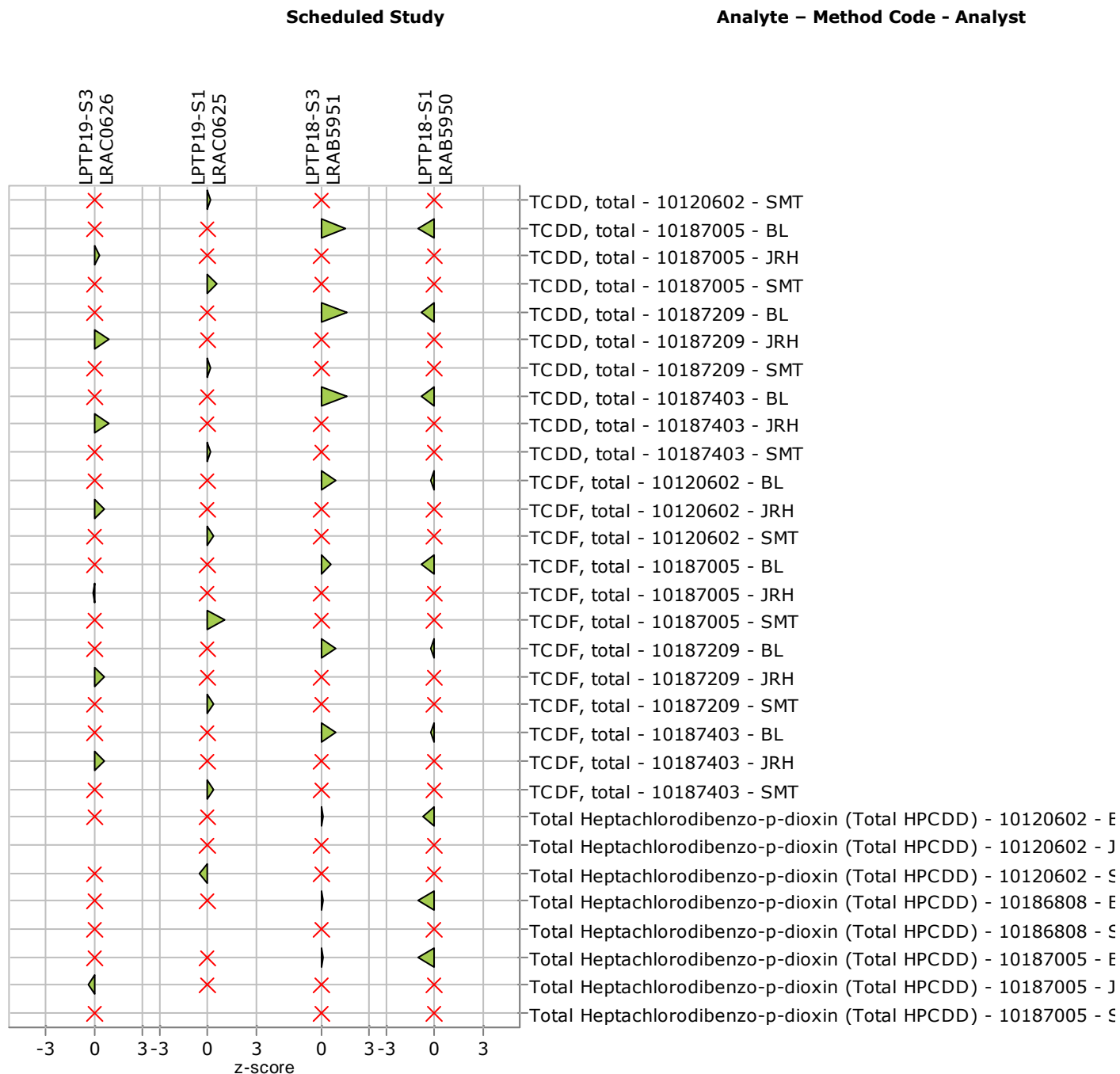
z-score Overview* for LPTP19-S3 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP19-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

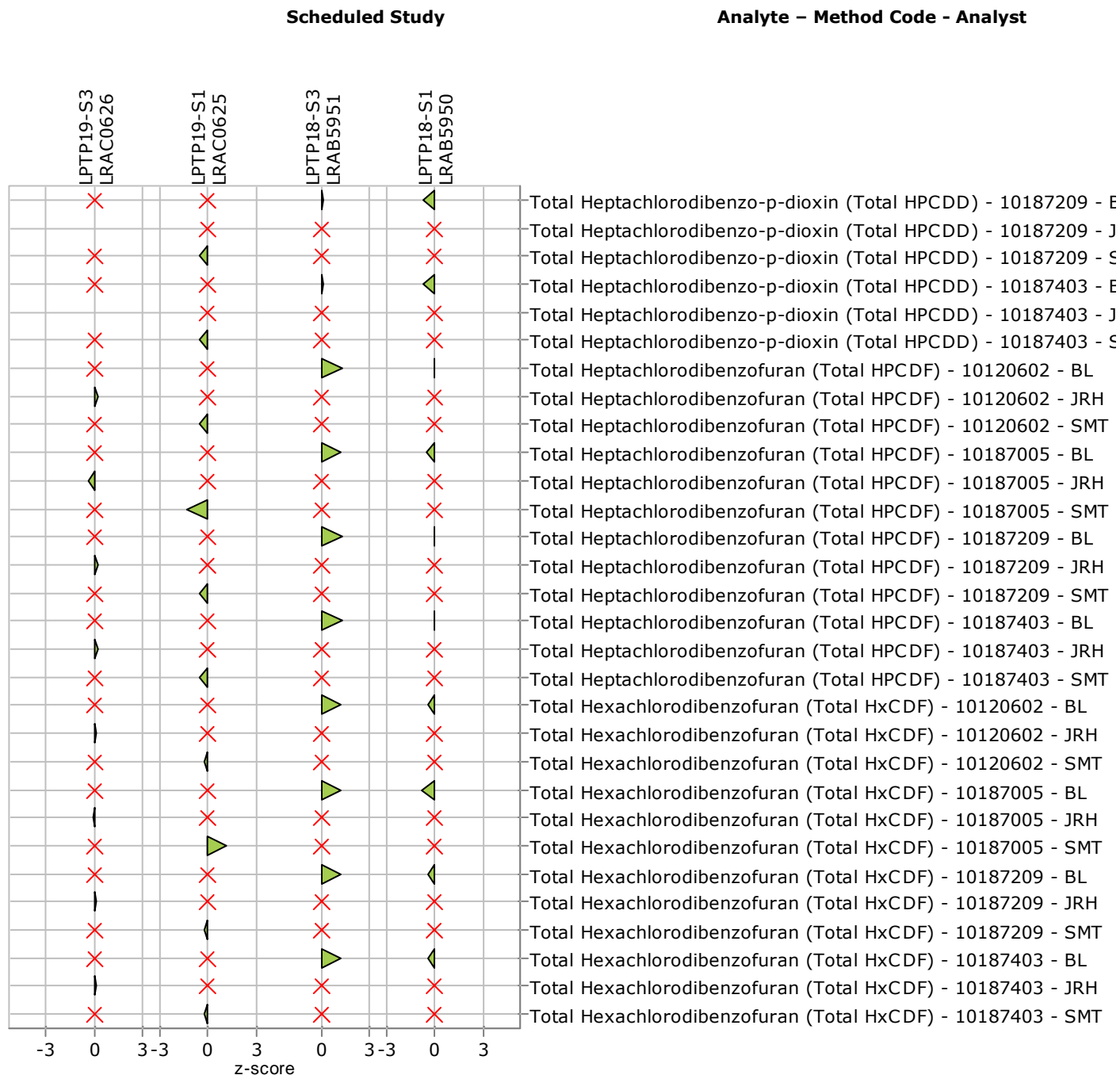
z-score Overview* for LPTP19-S3 and the Previous three Scheduled Studies of this Study Type



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Graphical z-score Overview for LPTP19-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

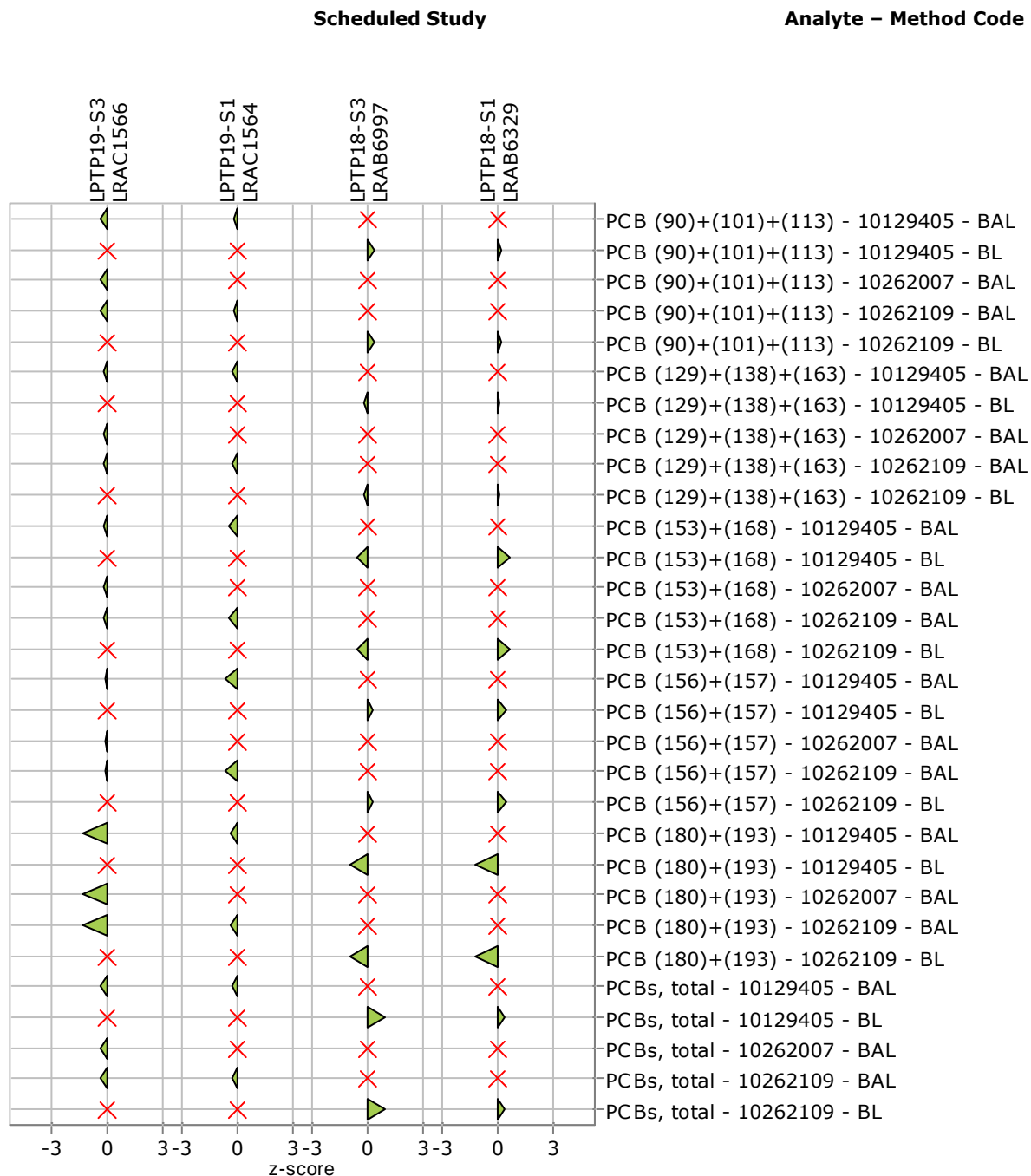
z-score Overview* for LPTP19-S3 and the Previous three Scheduled Studies of this Study Type



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Graphical z-score Overview for LPTP19-S3 SPE068-50G PCB Congeners in Soil - PT [Continuation]

z-score Overview* for LPTP19-S3 and the Previous three Scheduled Studies of this Study Type



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1 Aim of the Proficiency Test

This interlaboratory study is a proficiency test for the assessment of laboratory performance. It was conducted in the framework of external quality assurance and the report provides an external appraisal of the participant laboratories' competence in the particular testing field.

2 Sample Information

SPE016-10G Dioxin and Furans in Soil - PT LRAC0626

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
1,2,3,4,6,7,8-Hpcdf 9420	pg/g	830 ± 24.9	---	923	70.5
1,2,3,4,7,8,9-Hpcdf 9423	pg/g	606 ± 18.2	---	696	45.7
1,2,3,4,6,7,8-Hpcdd 9426	pg/g	766 ± 23.0	---	757	53.8
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) 9438	pg/g	766 ± 23.0	---	772	70.4
Total Heptachlorodibenzofuran (Total HPCDF) 9444	pg/g	1440 ± 43.1	---	1640	122
1,2,3,4,7,8-Hxcdd 9453	pg/g	255 ± 7.70	---	247	20.4
1,2,3,6,7,8-Hxcdd 9456	pg/g	798 ± 23.9	---	887	79.5
1,2,3,7,8,9-Hxcdd 9459	pg/g	670 ± 20.1	---	1790	232
Hxcdd, total 9468	pg/g	1720 ± 51.7	---	2920	314
1,2,3,4,7,8-Hxcdf 9471	pg/g	172 ± 5.20	---	168	14.0
1,2,3,6,7,8-Hxcdf 9474	pg/g	300 ± 9.00	---	276	12.0
1,2,3,7,8,9-Hxcdf 9477	pg/g	862 ± 25.8	---	819	62.4
2,3,4,6,7,8-Hxcdf 9480	pg/g	281 ± 8.40	---	258	16.2
Total Hexachlorodibenzofuran (Total HxCDF) 9483	pg/g	1610 ± 48.4	---	1520	97.0
1,2,3,4,6,7,8,9-OCDF 9516	pg/g	542 ± 16.3	---	813	100
1,2,3,4,6,7,8,9-OCDD 9519	pg/g	734 ± 22.0	---	1190	140
1,2,3,7,8-Pecdd 9540	pg/g	830 ± 24.9	---	993	119
1,2,3,7,8-Pecdf 9543	pg/g	230 ± 6.90	---	272	20.9
2,3,4,7,8-Pecdf 9549	pg/g	447 ± 13.4	---	530	38.9

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
Pecdf, total 9552	pg/g	676 ± 20.3	---	809	45.7
Pecdd, total 9555	pg/g	830 ± 24.9	---	994	118
TCDD, total 9609	pg/g	340 ± 4.50	---	292	25.0
2,3,7,8-TCDF 9612	pg/g	281 ± 8.40	---	252	22.5
TCDF, total 9615	pg/g	281 ± 8.40	---	253	23.6
2,3,7,8-Tetrachloro dibenzo- p- dioxin (TCDD) 9618	pg/g	313 ± 9.40	---	289	25.5
PCDF, total 9657	pg/g	4010 ± 120	---	4950	428
PCDD, total 9660	pg/g	4370 ± 131	---	6060	791

SPE068-50G PCB Congeners in Soil - PT LRAC1566

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
PCBs, total 8870	ug/Kg	3370 ± 60.2	---	3240	209
PCB (20)+(28) 8936	ug/Kg	139 ± 4.16	---	128	9.28
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) 8955	ug/Kg	356 ± 10.7	---	298	38.7
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) 8965	ug/Kg	304 ± 9.11	---	275	29.0
3,4,4',5-Tetrachlorobiphenyl (PCB 81) 8970	ug/Kg	133 ± 4.00	---	117	10.1
PCB (90)+(101)+(113) 8982	ug/Kg	95.6 ± 2.87	---	84.6	11.7
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) 8985	ug/Kg	41.4 ± 1.24	---	40.2	3.33
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) 8995	ug/Kg	93.0 ± 2.79	---	88.3	7.13
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) 9000	ug/Kg	152 ± 4.57	---	112	15.6

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) 9005	ug/Kg	121 ± 3.63	---	123	11.7
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) 9015	ug/Kg	196 ± 5.87	---	192	19.9
PCB (129)+(138)+(163) 9026	ug/Kg	82.3 ± 2.47	---	64.3	4.91
PCB (153)+(168) 9041	ug/Kg	251 ± 7.53	---	204	26.8
PCB (156)+(157) 9046	ug/Kg	208 ± 6.24	---	519	27.6
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) 9055	ug/Kg	339 ± 10.2	---	386	35.2
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) 9060	ug/Kg	259 ± 7.76	---	221	9.96
PCB (180)+(193) 9070	ug/Kg	73.0	---	63.4	9.88
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) 9085	ug/Kg	174 ± 5.21	---	173	9.54

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

3 Data Availability

SPE016-10G Dioxin and Furans in Soil - PT LRAC0626

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
1,2,3,4,6,7,8-Hpcdf 9420	20	20	50	50
1,2,3,4,7,8,9-Hpcdf 9423	20	20	50	50
1,2,3,4,6,7,8-Hpcdd 9426	20	20	50	50
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) 9438	20	20	50	50
Total Heptachlorodibenzofuran (Total HPCDF) 9444	20	20	50	50
1,2,3,4,7,8-Hxcdd 9453	20	20	50	50
1,2,3,6,7,8-Hxcdd 9456	20	20	50	50
1,2,3,7,8,9-Hxcdd 9459	20	20	50	50
Hxcdd, total 9468	20	20	50	50
1,2,3,4,7,8-Hxcdf 9471	20	20	50	50
1,2,3,6,7,8-Hxcdf 9474	20	20	50	50
1,2,3,7,8,9-Hxcdf 9477	20	20	50	50
2,3,4,6,7,8-Hxcdf 9480	20	20	50	50
Total Hexachlorodibenzofuran (Total HxCDF) 9483	20	20	50	50
1,2,3,4,6,7,8,9-OCDF 9516	20	20	50	50
1,2,3,4,6,7,8,9-OCDD 9519	20	20	50	50
1,2,3,7,8-Pecdd 9540	20	20	50	50
1,2,3,7,8-Pecdf 9543	20	20	50	50

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
2,3,4,7,8-Pecdf 9549	20	20	50	50
Pecdf, total 9552	20	20	50	50
Pecdd, total 9555	20	20	50	50
TCDD, total 9609	20	20	50	50
2,3,7,8-TCDF 9612	20	20	50	50
TCDF, total 9615	20	20	50	50
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) 9618	20	20	50	50
PCDF, total 9657	15	15	37	37
PCDD, total 9660	15	15	37	37

SPE068-50G PCB Congeners in Soil - PT LRAC1566

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
PCBs, total 8870	6	6	13	13
PCB (20)+(28) 8936	7	7	16	16
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) 8955	11	11	22	22
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) 8965	11	11	22	22
3,4,4',5-Tetrachlorobiphenyl (PCB 81) 8970	11	11	21	21
PCB (90)+(101)+(113) 8982	8	8	18	18
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) 8985	11	11	22	22
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) 8995	11	11	22	22

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) 9000	11	11	21	21
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) 9005	11	11	21	21
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) 9015	11	11	22	22
PCB (129)+(138)+(163) 9026	8	8	18	18
PCB (153)+(168) 9041	7	7	16	16
PCB (156)+(157) 9046	7	7	16	16
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) 9055	11	11	21	21
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) 9060	11	11	22	22
PCB (180)+(193) 9070	7	7	16	16
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) 9085	11	11	21	21

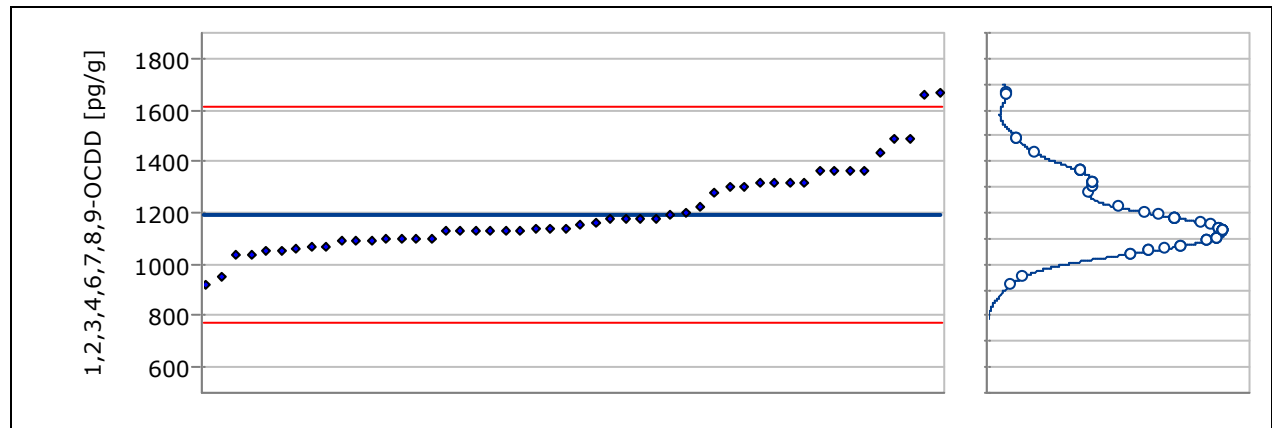
* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

4 Results

4.1 SPE016-10G Dioxin and Furans in Soil - PT / LRAC0626

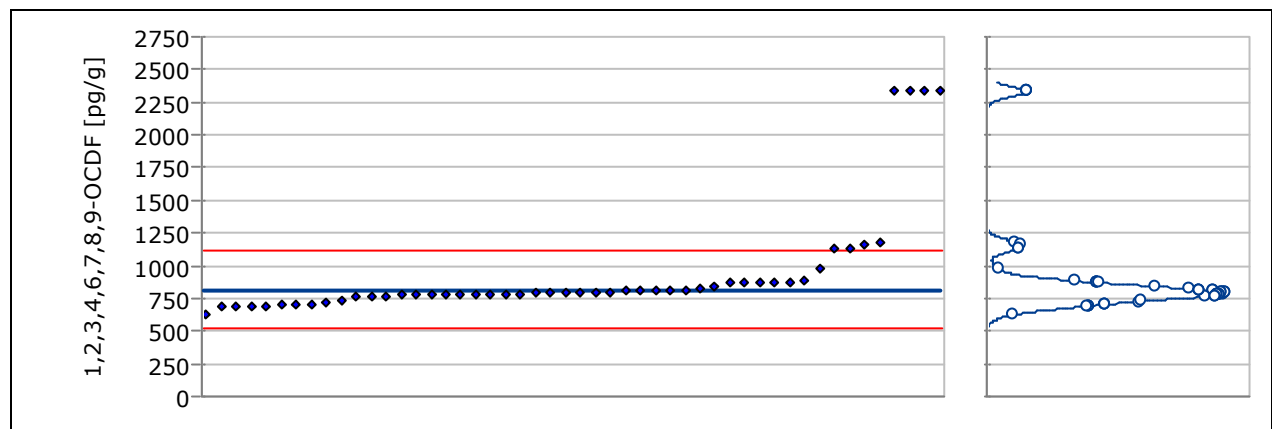
4.1.1 1,2,3,4,6,7,8,9-OCDD

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	1190 pg/g
Proficiency std. dev.	140 pg/g
Acceptance window	769 - 1610 pg/g



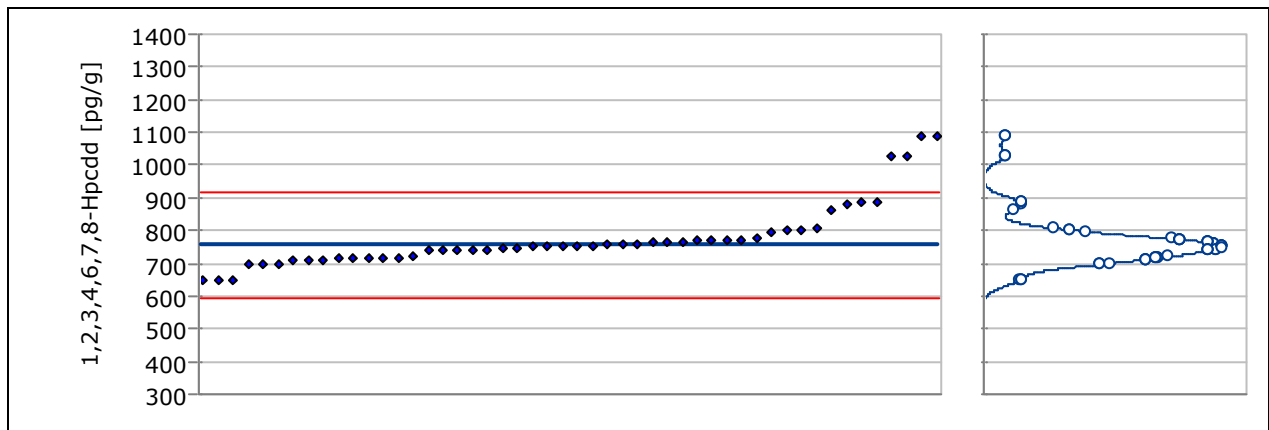
4.1.2 1,2,3,4,6,7,8,9-OCDF

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	813 pg/g
Proficiency std. dev.	100 pg/g
Acceptance window	513 - 1110 pg/g

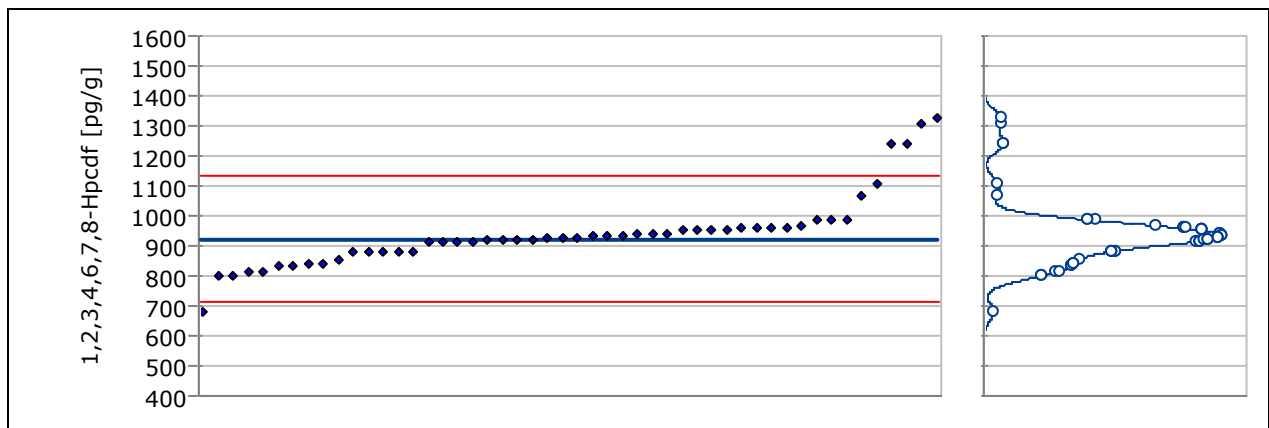


4.1.3 1,2,3,4,6,7,8-Hpcdd

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	757 pg/g
Proficiency std. dev.	53.8 pg/g
Acceptance window	595 - 918 pg/g

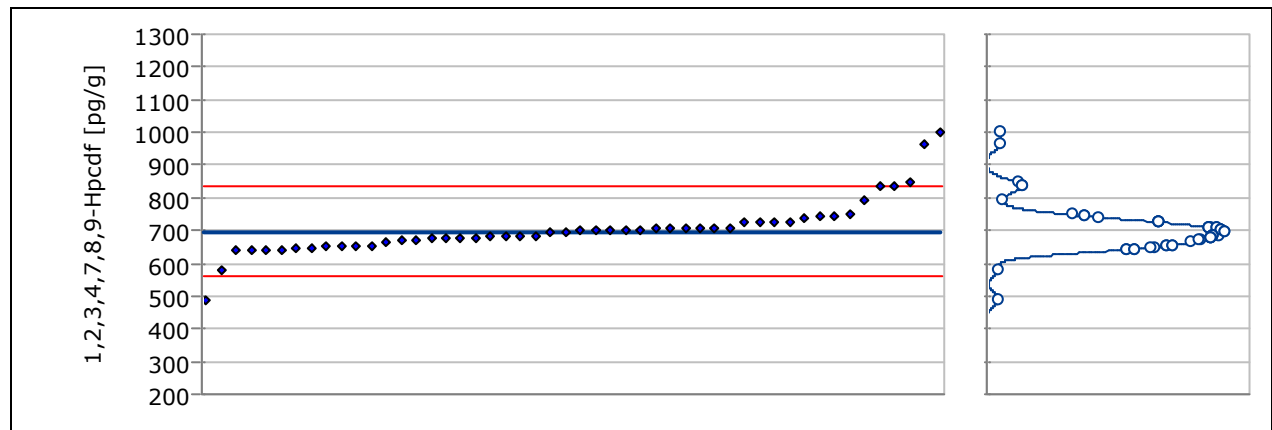
**4.1.4 1,2,3,4,6,7,8-Hpcdf**

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	923 pg/g
Proficiency std. dev.	70.5 pg/g
Acceptance window	712 - 1130 pg/g

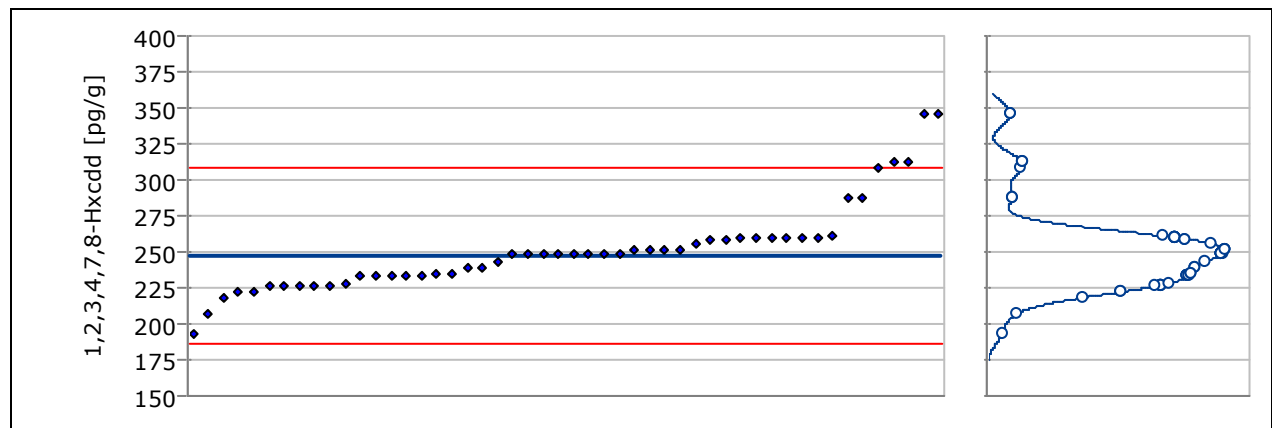


4.1.5 1,2,3,4,7,8,9-Hpcdf

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	696 pg/g
Proficiency std. dev.	45.7 pg/g
Acceptance window	558 - 833 pg/g

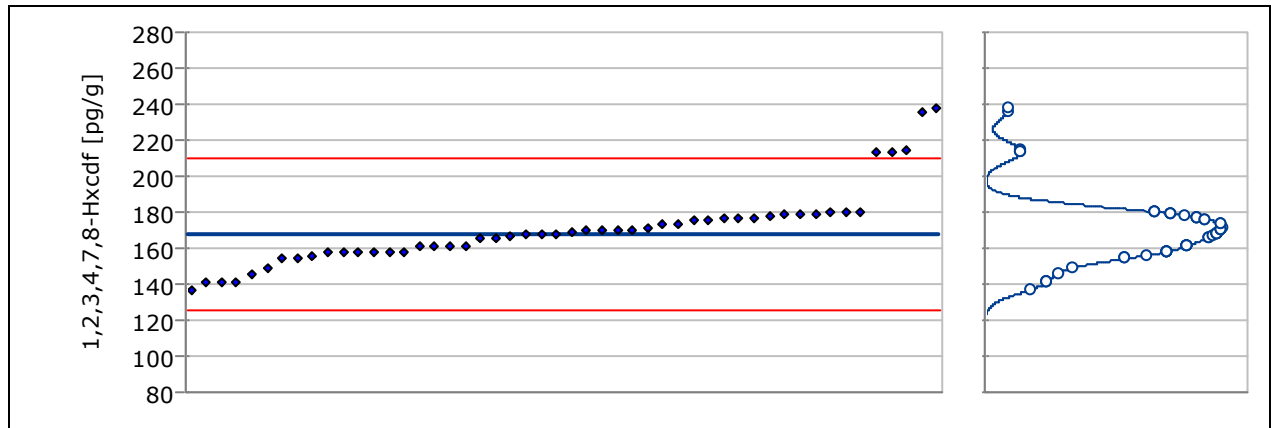
**4.1.6 1,2,3,4,7,8-Hxcdd**

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	247 pg/g
Proficiency std. dev.	20.4 pg/g
Acceptance window	186 - 308 pg/g

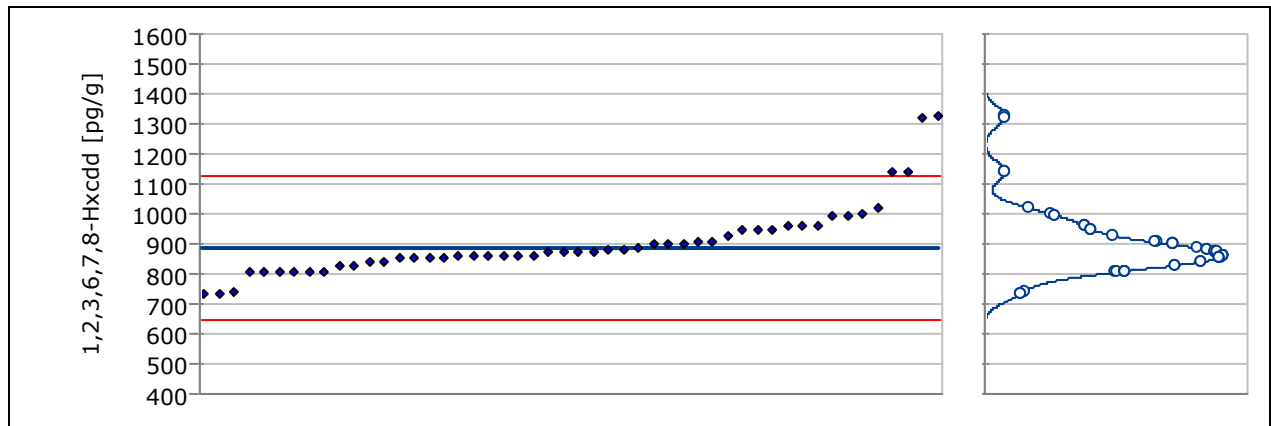


4.1.7 1,2,3,4,7,8-Hxcdf

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	168 pg/g
Proficiency std. dev.	14.0 pg/g
Acceptance window	126 - 210 pg/g

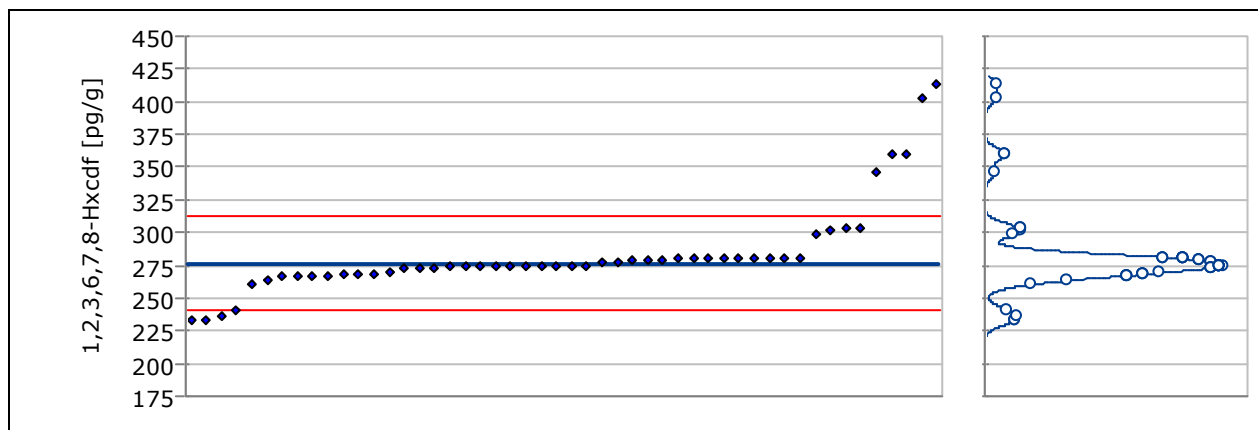
**4.1.8 1,2,3,6,7,8-Hxcdd**

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	887 pg/g
Proficiency std. dev.	79.5 pg/g
Acceptance window	649 - 1130 pg/g

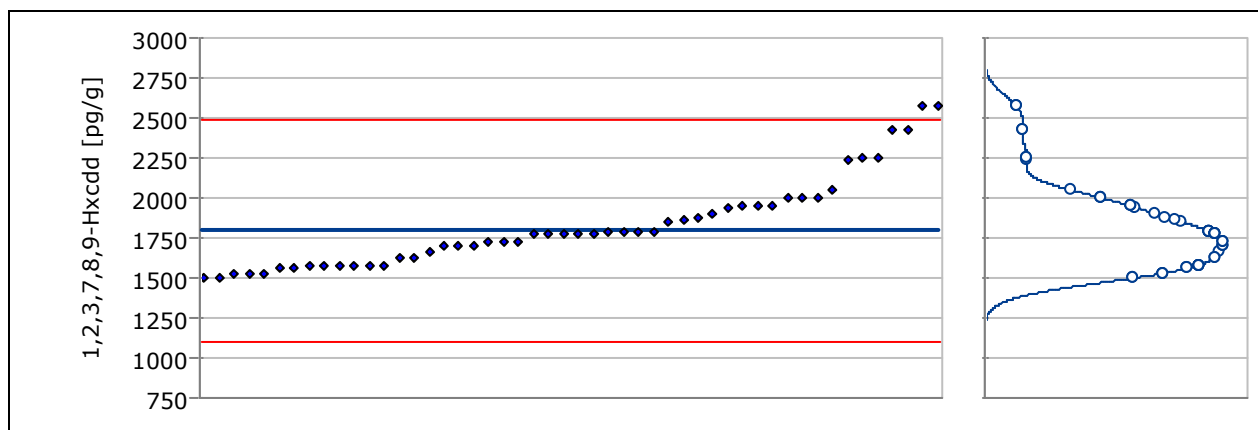


4.1.9 1,2,3,6,7,8-Hxcdf

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	276 pg/g
Proficiency std. dev.	12.0 pg/g
Acceptance window	240 - 313 pg/g

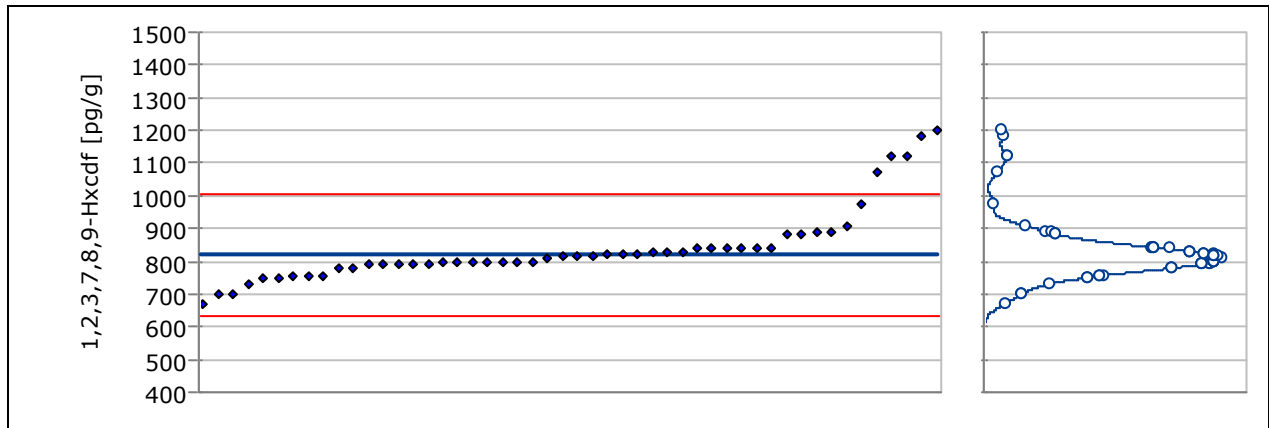
**4.1.10 1,2,3,7,8,9-Hxcdd**

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	1790 pg/g
Proficiency std. dev.	232 pg/g
Acceptance window	1100 - 2490 pg/g

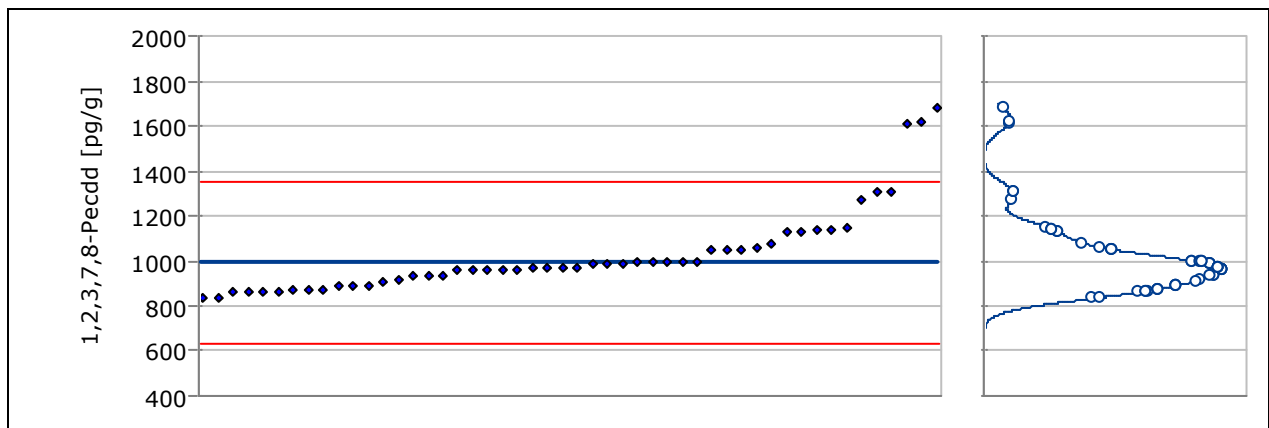


4.1.11 1,2,3,7,8,9-Hxcdf

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	819 pg/g
Proficiency std. dev.	62.4 pg/g
Acceptance window	632 - 1010 pg/g

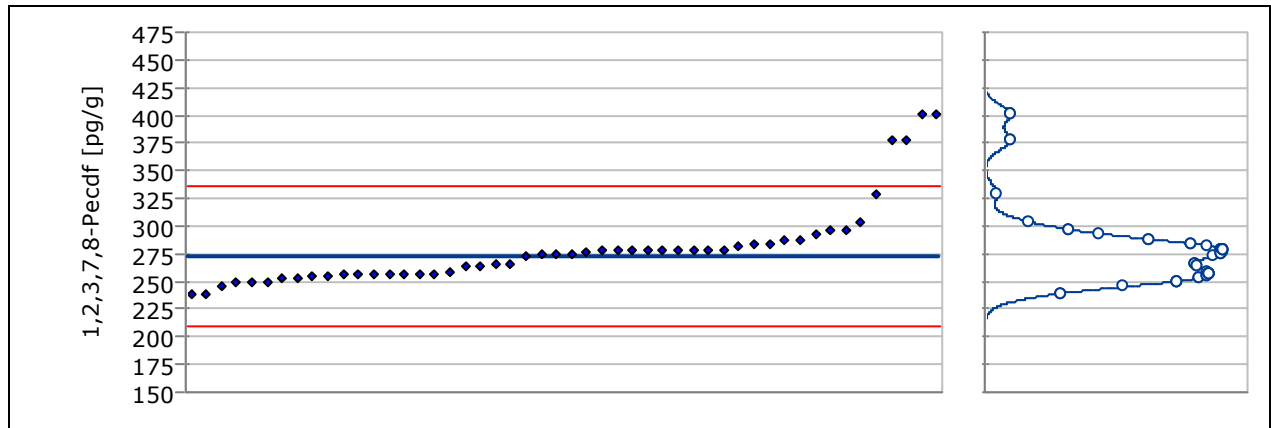
**4.1.12 1,2,3,7,8-Pecdd**

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	993 pg/g
Proficiency std. dev.	119 pg/g
Acceptance window	635 - 1350 pg/g

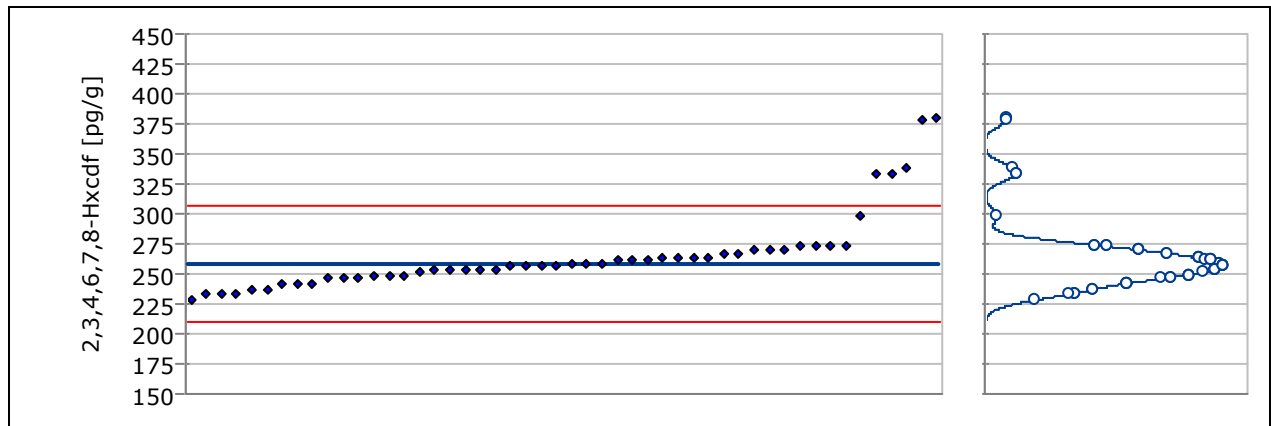


4.1.13 1,2,3,7,8-Pecdf

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	272 pg/g
Proficiency std. dev.	20.9 pg/g
Acceptance window	210 - 335 pg/g

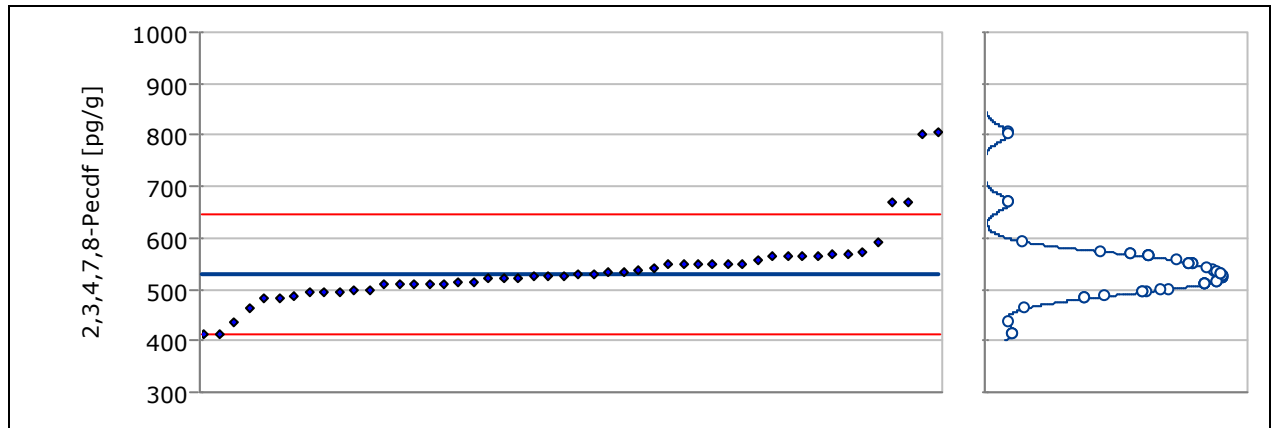
**4.1.14 2,3,4,6,7,8-Hxcdf**

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	258 pg/g
Proficiency std. dev.	16.2 pg/g
Acceptance window	209 - 307 pg/g

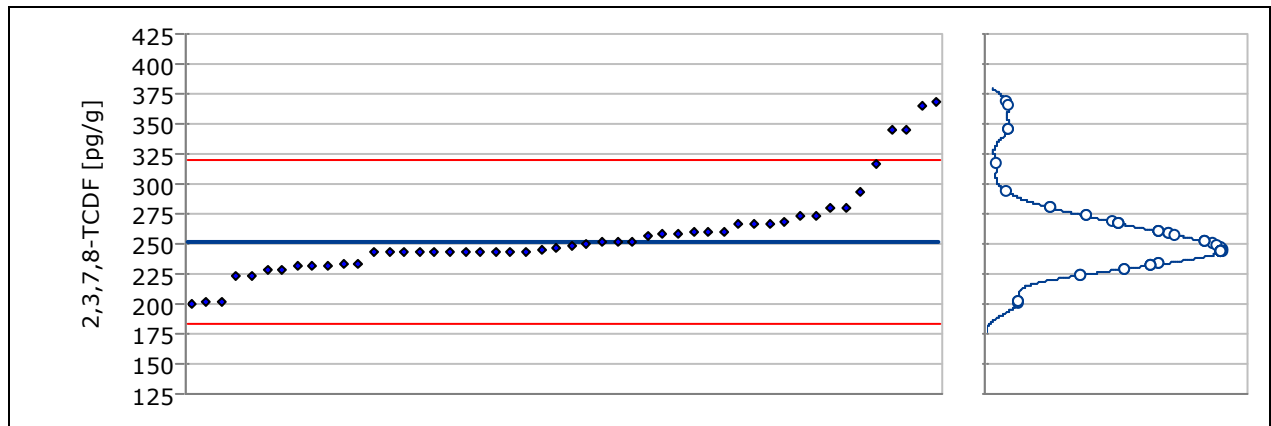


4.1.15 2,3,4,7,8-Pecdf

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	530 pg/g
Proficiency std. dev.	38.9 pg/g
Acceptance window	413 - 646 pg/g

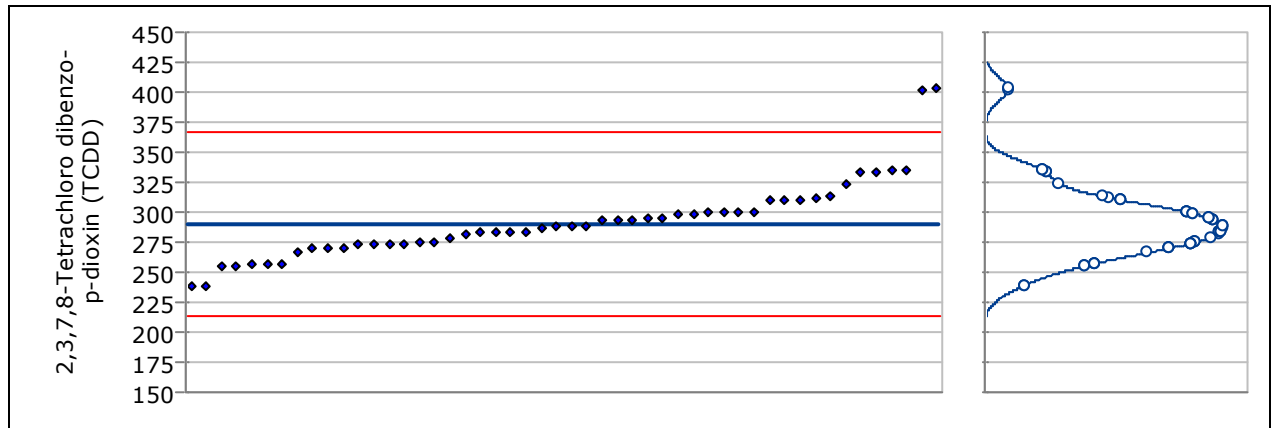
**4.1.16 2,3,7,8-TCDF**

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	252 pg/g
Proficiency std. dev.	22.5 pg/g
Acceptance window	184 - 319 pg/g

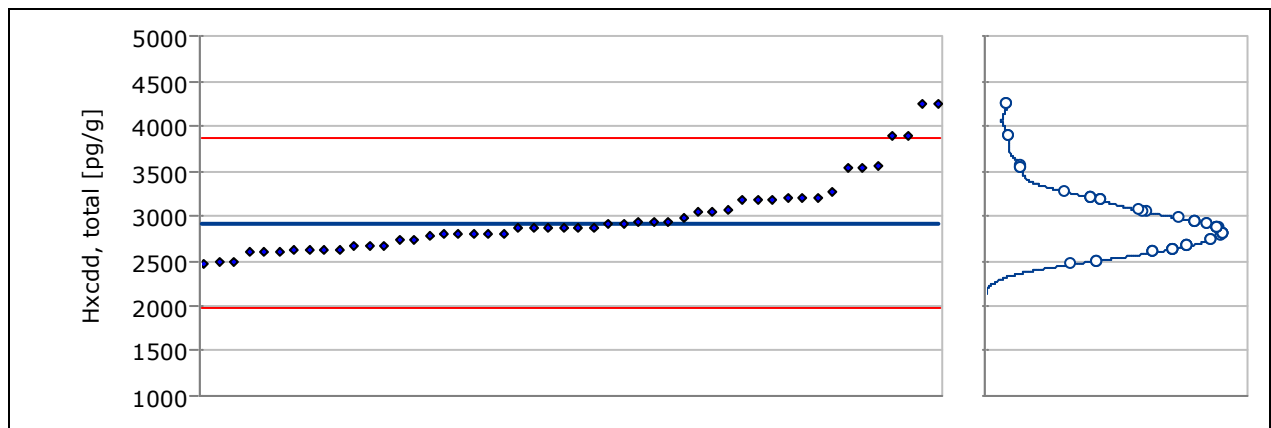


4.1.17 2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD)

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	289 pg/g
Proficiency std. dev.	25.5 pg/g
Acceptance window	213 - 366 pg/g

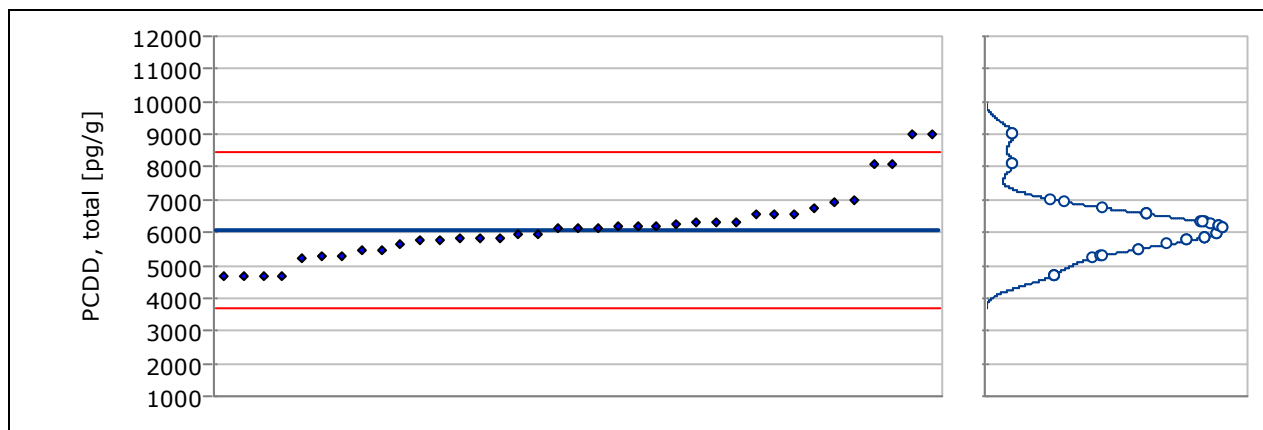
**4.1.18 Hxcccdd, total**

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	2920 pg/g
Proficiency std. dev.	314 pg/g
Acceptance window	1980 - 3860 pg/g

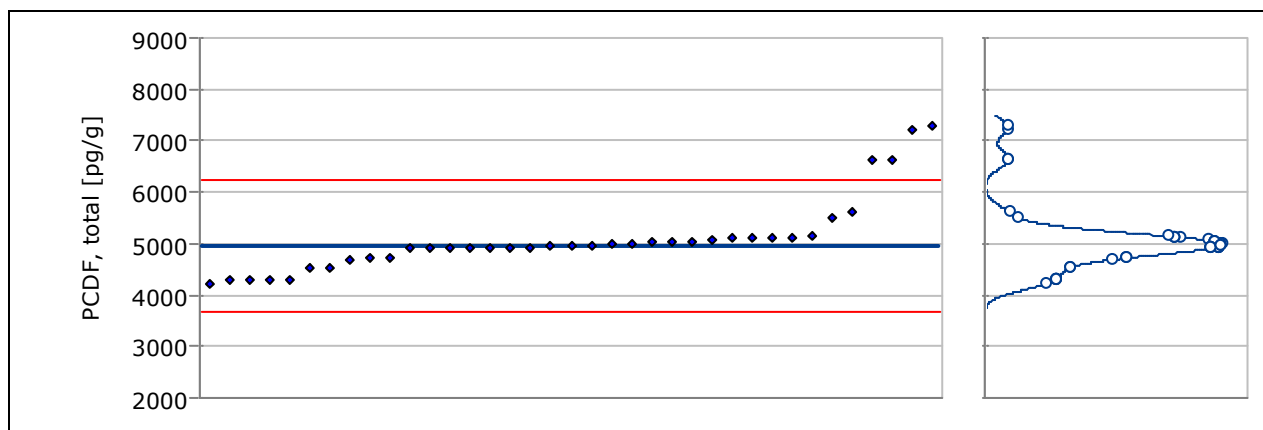


4.1.19 PCDD, total

No. of participating laboratories (in total / with quant. data points only)	15 / 15
No. of data points (in total / quantitative)	37 / 37
Assigned value	6060 pg/g
Proficiency std. dev.	791 pg/g
Acceptance window	3690 - 8430 pg/g

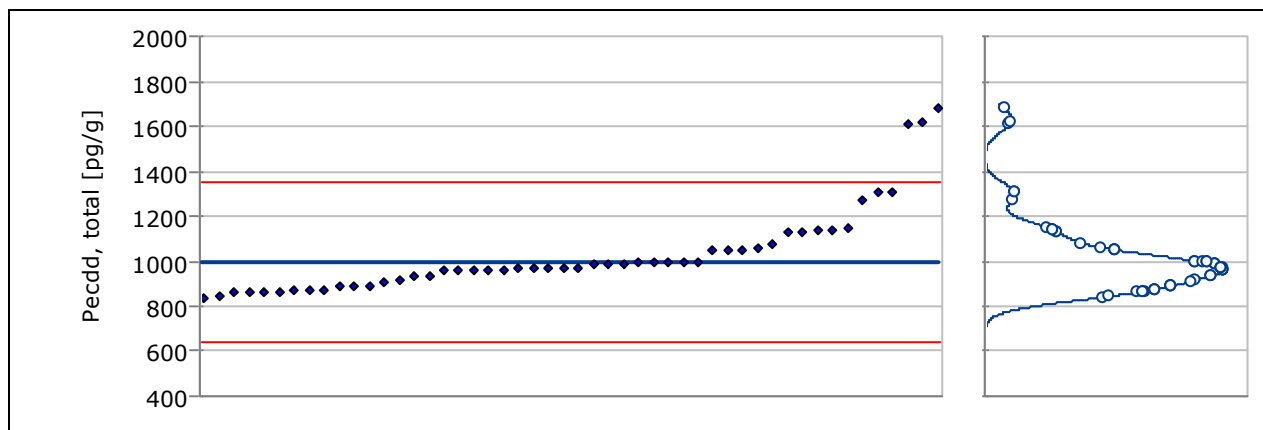
**4.1.20 PCDF, total**

No. of participating laboratories (in total / with quant. data points only)	15 / 15
No. of data points (in total / quantitative)	37 / 37
Assigned value	4950 pg/g
Proficiency std. dev.	428 pg/g
Acceptance window	3670 - 6240 pg/g

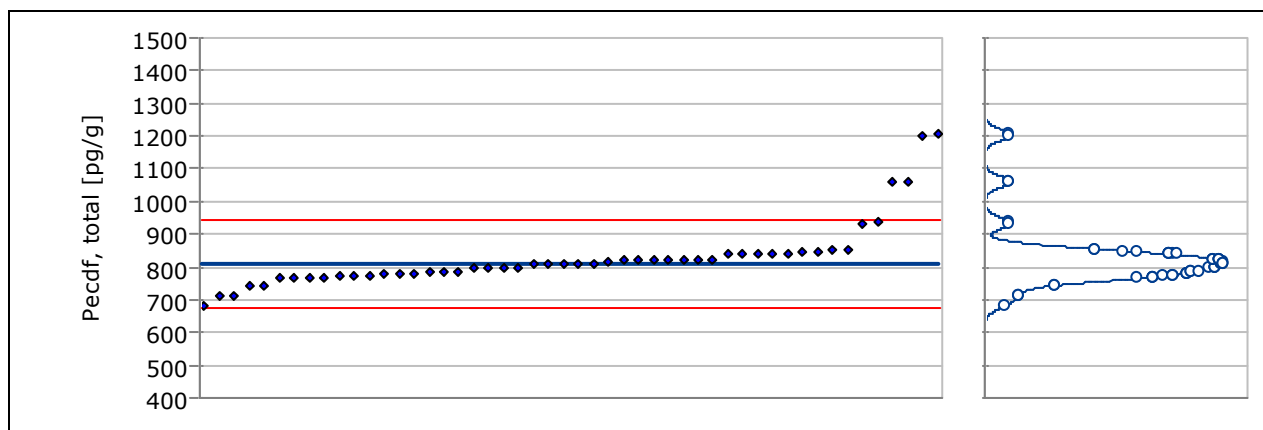


4.1.21 Pecdd, total

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	994 pg/g
Proficiency std. dev.	118 pg/g
Acceptance window	640 - 1350 pg/g

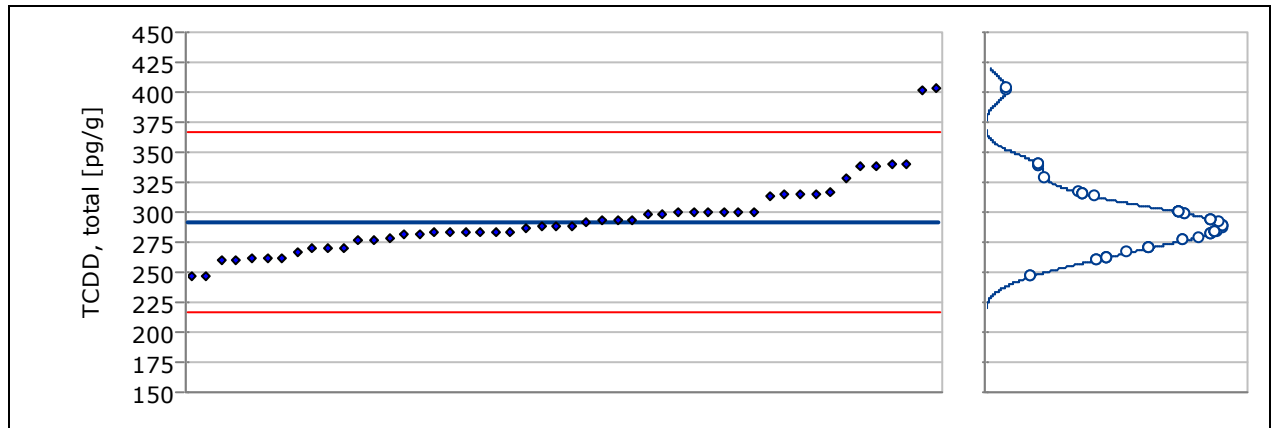
**4.1.22 Pecdf, total**

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	809 pg/g
Proficiency std. dev.	45.7 pg/g
Acceptance window	672 - 946 pg/g

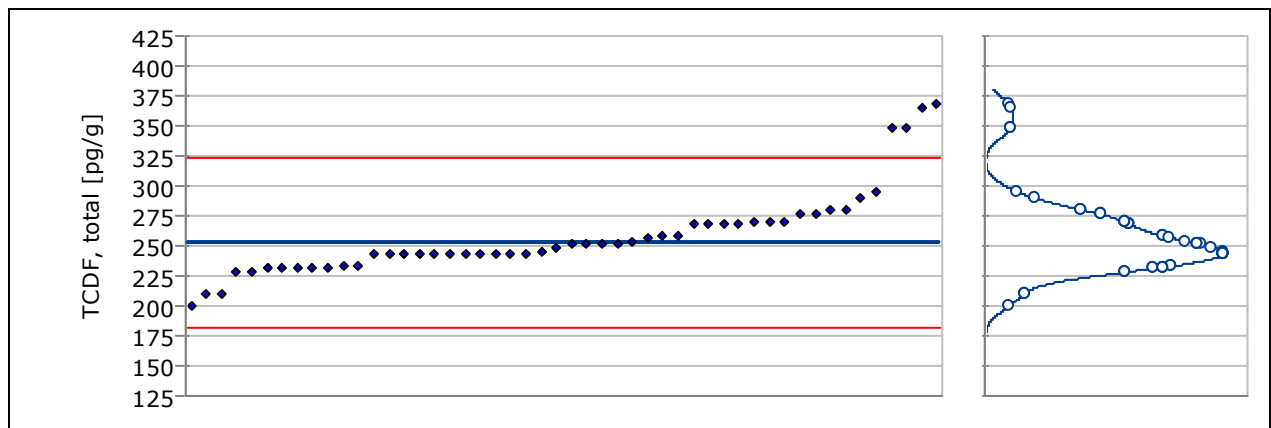


4.1.23 TCDD, total

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	292 pg/g
Proficiency std. dev.	25.0 pg/g
Acceptance window	217 - 367 pg/g

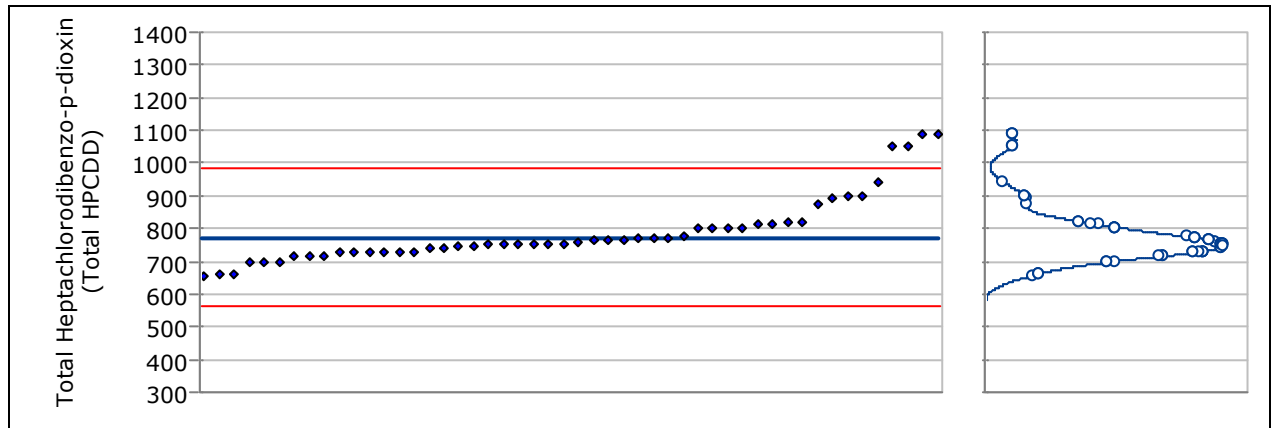
**4.1.24 TCDF, total**

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	253 pg/g
Proficiency std. dev.	23.6 pg/g
Acceptance window	182 - 324 pg/g

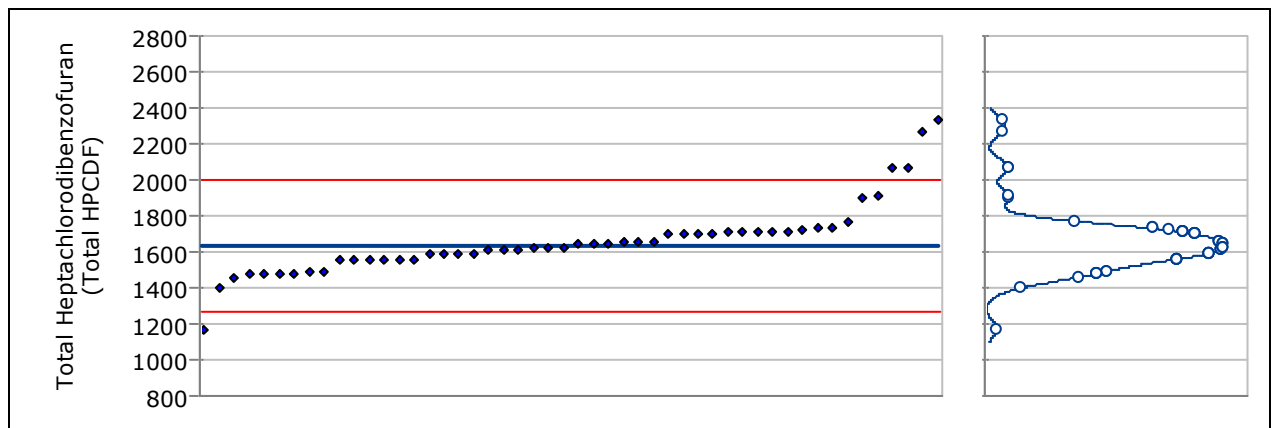


4.1.25 Total Heptachlorodibenzo-p-dioxin (Total HPCDD)

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	772 pg/g
Proficiency std. dev.	70.4 pg/g
Acceptance window	561 - 984 pg/g

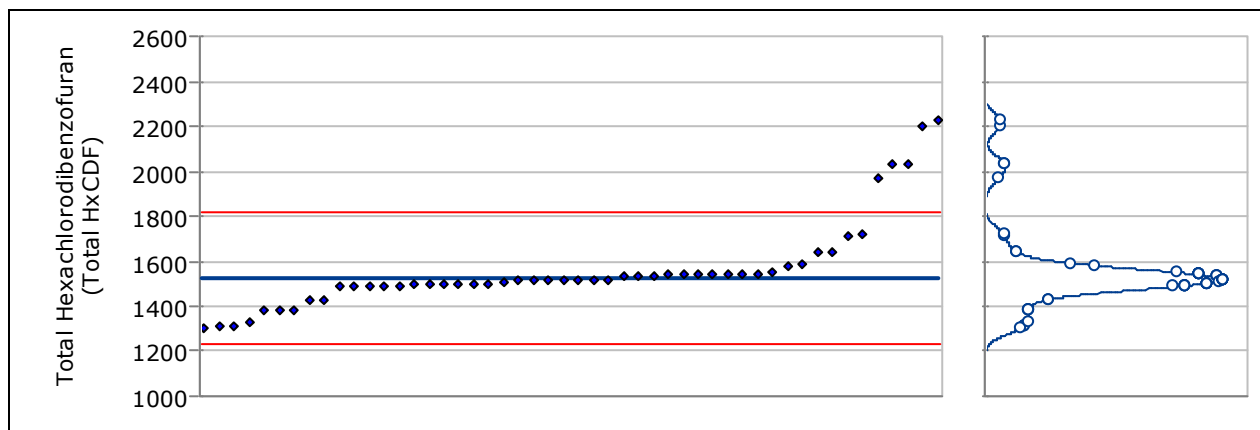
**4.1.26 Total Heptachlorodibenzofuran (Total HPCDF)**

No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	1640 pg/g
Proficiency std. dev.	122 pg/g
Acceptance window	1270 - 2000 pg/g



4.1.27 Total Hexachlorodibenzofuran (Total HxCDF)

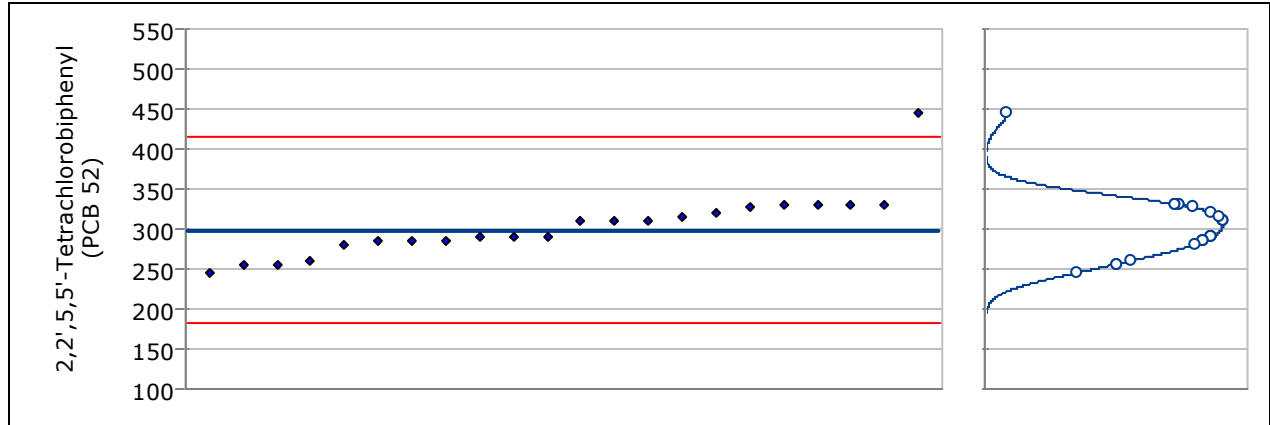
No. of participating laboratories (in total / with quant. data points only)	20 / 20
No. of data points (in total / quantitative)	50 / 50
Assigned value	1520 pg/g
Proficiency std. dev.	97.0 pg/g
Acceptance window	1230 - 1810 pg/g



4.2 SPE068-50G PCB Congeners in Soil - PT / LRAC1566

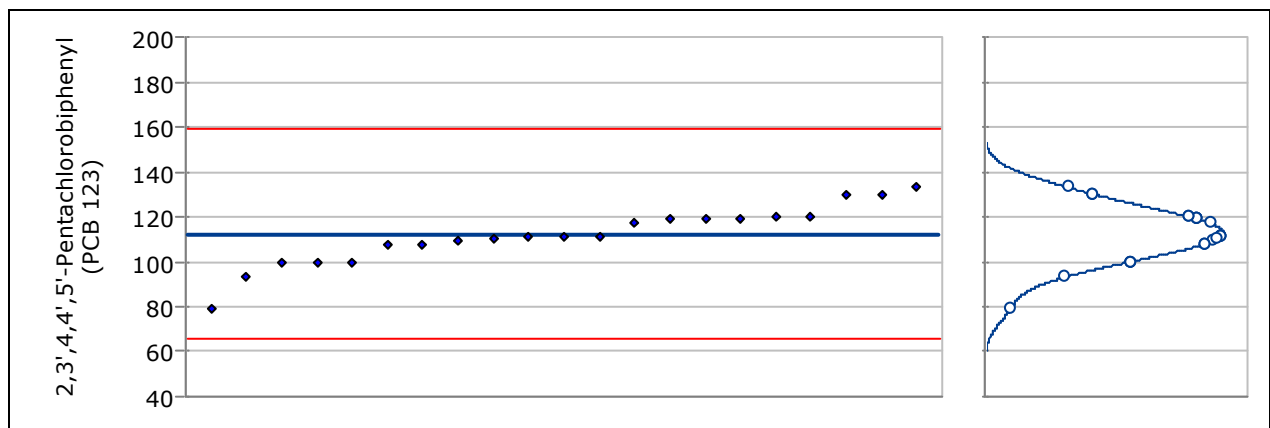
4.2.1 2,2',5,5'-Tetrachlorobiphenyl (PCB 52)

No. of participating laboratories (in total / with quant. data points only)	11 / 11
No. of data points (in total / quantitative)	22 / 22
Assigned value	298 ug/Kg
Proficiency std. dev.	38.7 ug/Kg
Acceptance window	182 - 414 ug/Kg



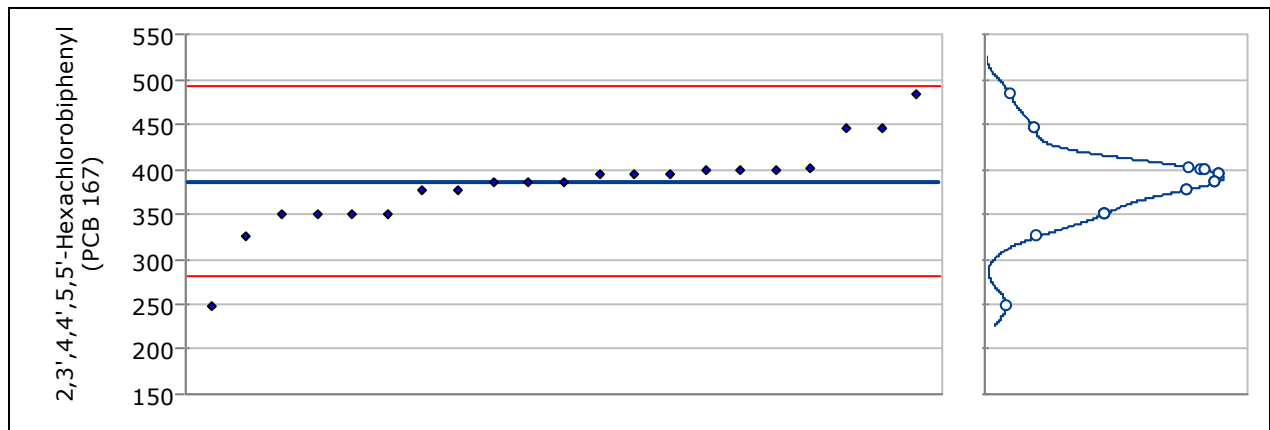
4.2.2 2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)

No. of participating laboratories (in total / with quant. data points only)	11 / 11
No. of data points (in total / quantitative)	21 / 21
Assigned value	112 ug/Kg
Proficiency std. dev.	15.6 ug/Kg
Acceptance window	65.4 - 159 ug/Kg

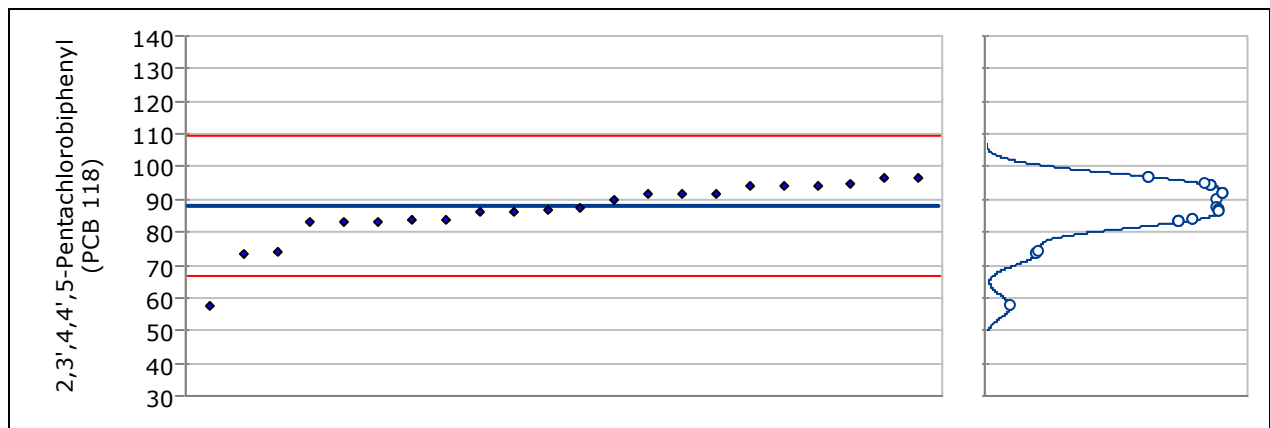


4.2.3 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)

No. of participating laboratories (in total / with quant. data points only)	11 / 11
No. of data points (in total / quantitative)	21 / 21
Assigned value	386 ug/Kg
Proficiency std. dev.	35.2 ug/Kg
Acceptance window	281 - 492 ug/Kg

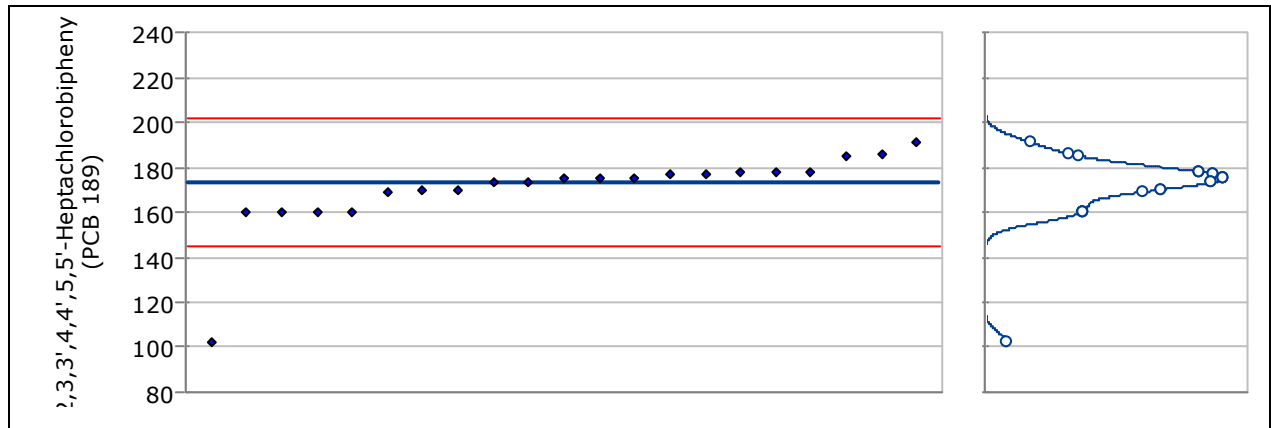
**4.2.4 2,3',4,4',5-Pentachlorobiphenyl (PCB 118)**

No. of participating laboratories (in total / with quant. data points only)	11 / 11
No. of data points (in total / quantitative)	22 / 22
Assigned value	88.3 ug/Kg
Proficiency std. dev.	7.13 ug/Kg
Acceptance window	67.0 - 110 ug/Kg

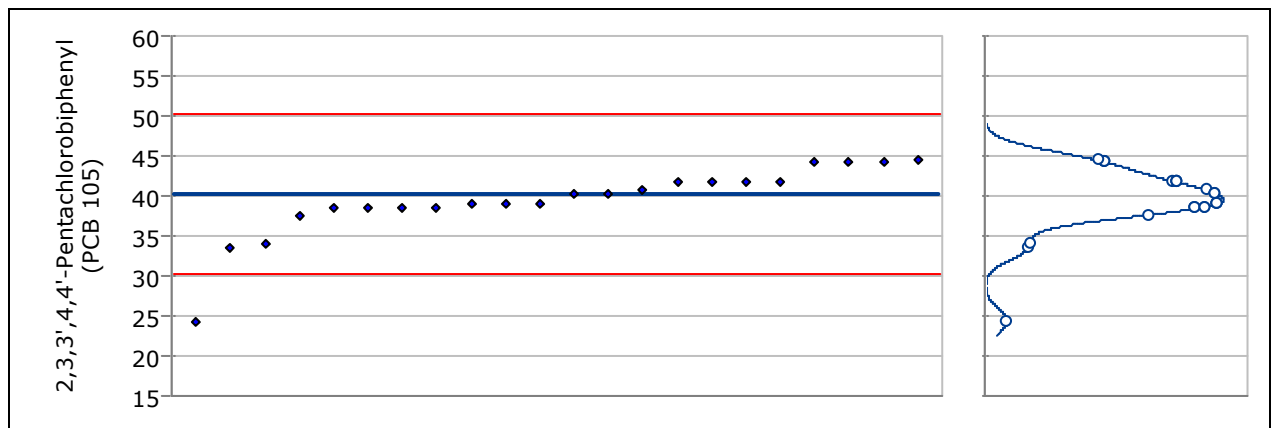


4.2.5 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)

No. of participating laboratories (in total / with quant. data points only)	11 / 11
No. of data points (in total / quantitative)	21 / 21
Assigned value	173 ug/Kg
Proficiency std. dev.	9.54 ug/Kg
Acceptance window	145 - 202 ug/Kg

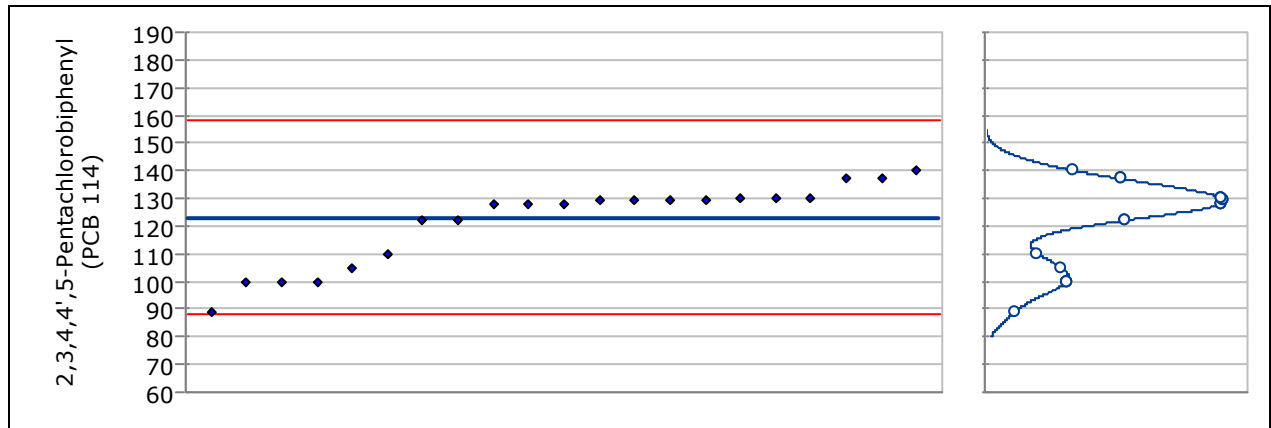
**4.2.6 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)**

No. of participating laboratories (in total / with quant. data points only)	11 / 11
No. of data points (in total / quantitative)	22 / 22
Assigned value	40.2 ug/Kg
Proficiency std. dev.	3.33 ug/Kg
Acceptance window	30.2 - 50.2 ug/Kg

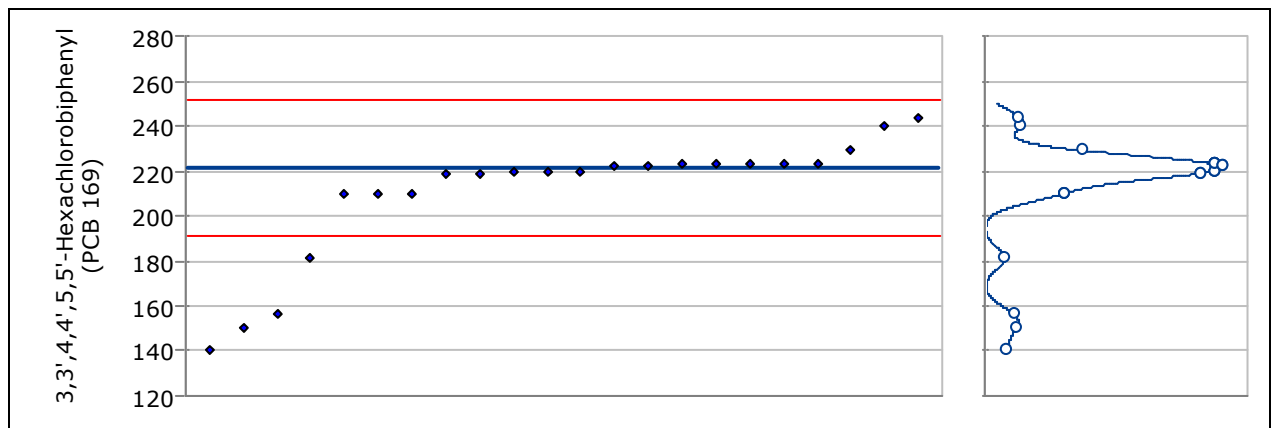


4.2.7 2,3,4,4',5-Pentachlorobiphenyl (PCB 114)

No. of participating laboratories (in total / with quant. data points only)	11 / 11
No. of data points (in total / quantitative)	21 / 21
Assigned value	123 ug/Kg
Proficiency std. dev.	11.7 ug/Kg
Acceptance window	88.0 - 158 ug/Kg

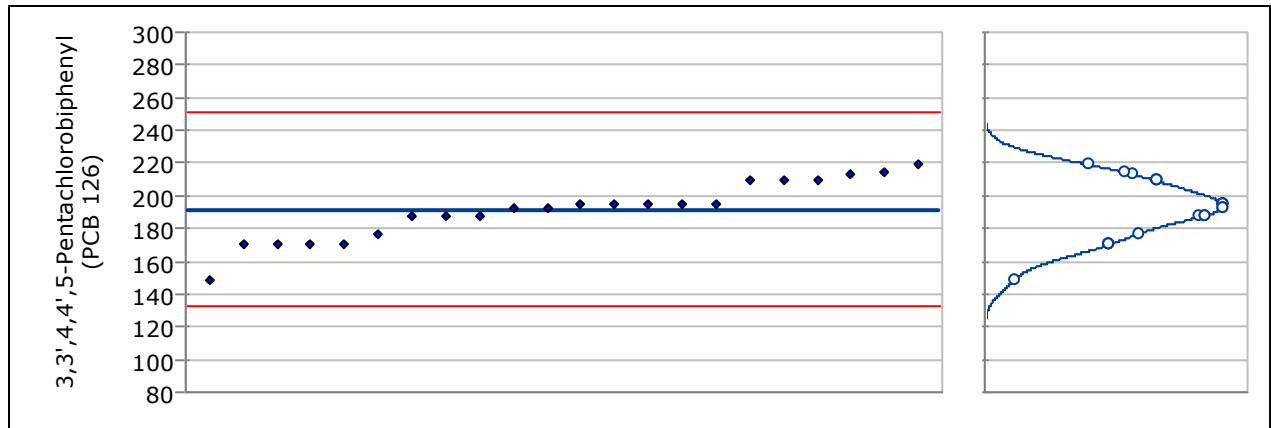
**4.2.8 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)**

No. of participating laboratories (in total / with quant. data points only)	11 / 11
No. of data points (in total / quantitative)	22 / 22
Assigned value	221 ug/Kg
Proficiency std. dev.	9.96 ug/Kg
Acceptance window	191 - 251 ug/Kg

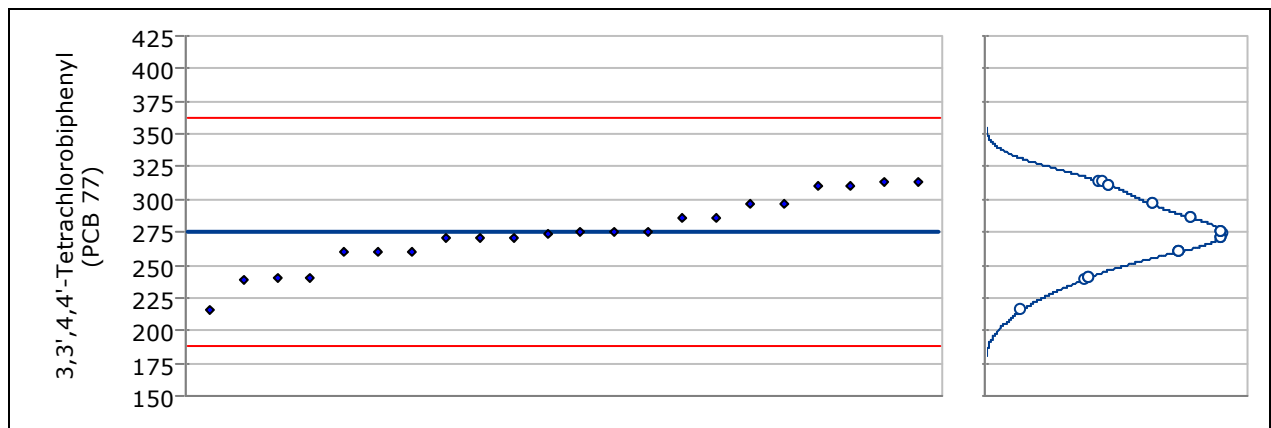


4.2.9 3,3',4,4',5-Pentachlorobiphenyl (PCB 126)

No. of participating laboratories (in total / with quant. data points only)	11 / 11
No. of data points (in total / quantitative)	22 / 22
Assigned value	192 ug/Kg
Proficiency std. dev.	19.9 ug/Kg
Acceptance window	132 - 251 ug/Kg

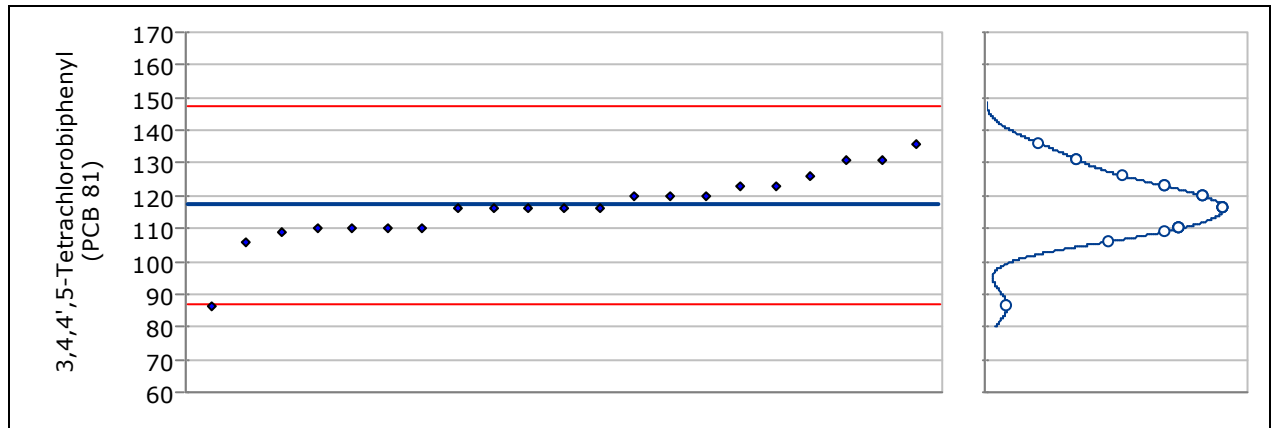
**4.2.10 3,3',4,4'-Tetrachlorobiphenyl (PCB 77)**

No. of participating laboratories (in total / with quant. data points only)	11 / 11
No. of data points (in total / quantitative)	22 / 22
Assigned value	275 ug/Kg
Proficiency std. dev.	29.0 ug/Kg
Acceptance window	188 - 362 ug/Kg

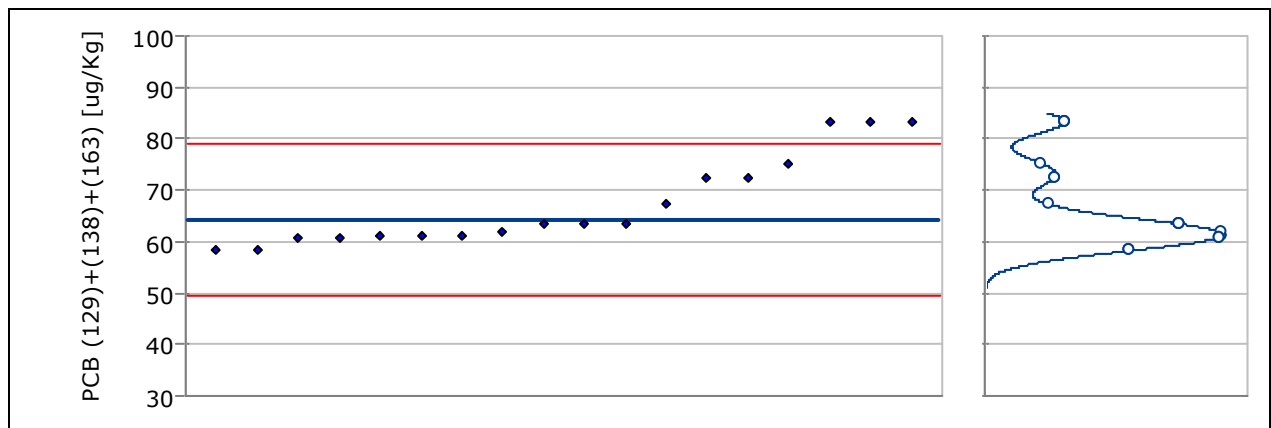


4.2.11 3,4,4',5-Tetrachlorobiphenyl (PCB 81)

No. of participating laboratories (in total / with quant. data points only)	11 / 11
No. of data points (in total / quantitative)	21 / 21
Assigned value	117 ug/Kg
Proficiency std. dev.	10.1 ug/Kg
Acceptance window	87.1 - 148 ug/Kg

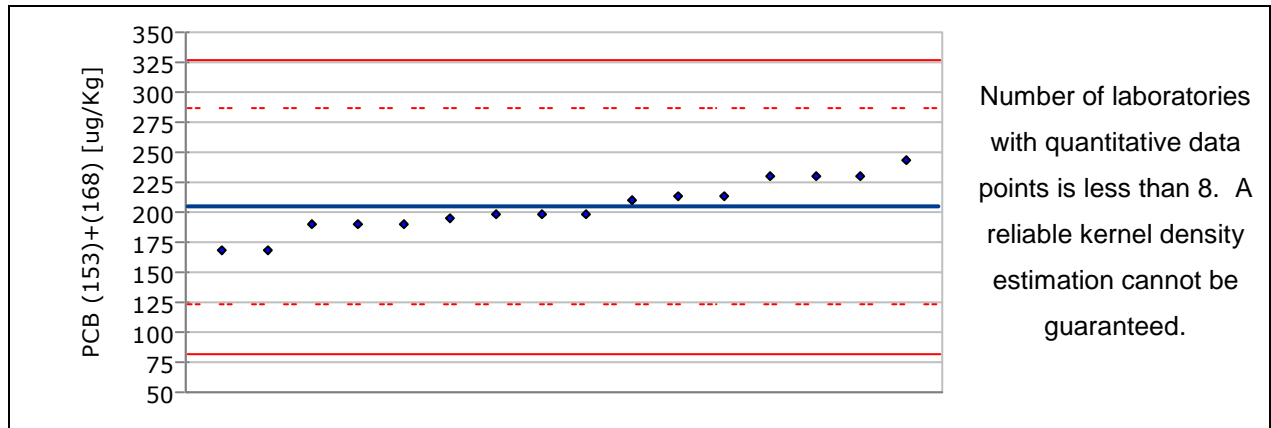
**4.2.12 PCB (129)+(138)+(163)**

No. of participating laboratories (in total / with quant. data points only)	8 / 8
No. of data points (in total / quantitative)	18 / 18
Assigned value	64.3 ug/Kg
Proficiency std. dev.	4.91 ug/Kg
Acceptance window	49.6 - 79.0 ug/Kg

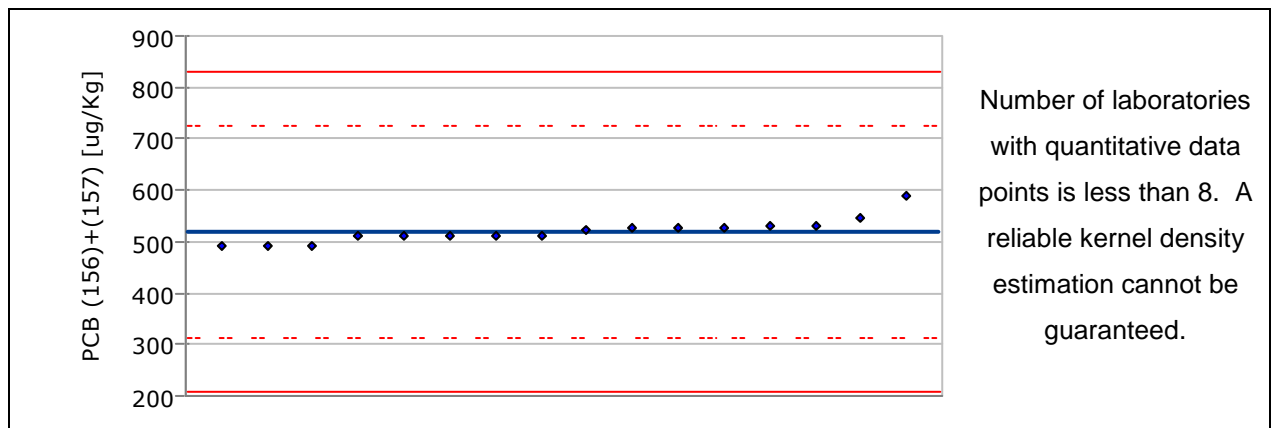


4.2.13 PCB (153)+(168)

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	16 / 16
Assigned value	204 ug/Kg
Proficiency std. dev.	40.8 ug/Kg
Acceptance window	81.7 - 327 ug/Kg

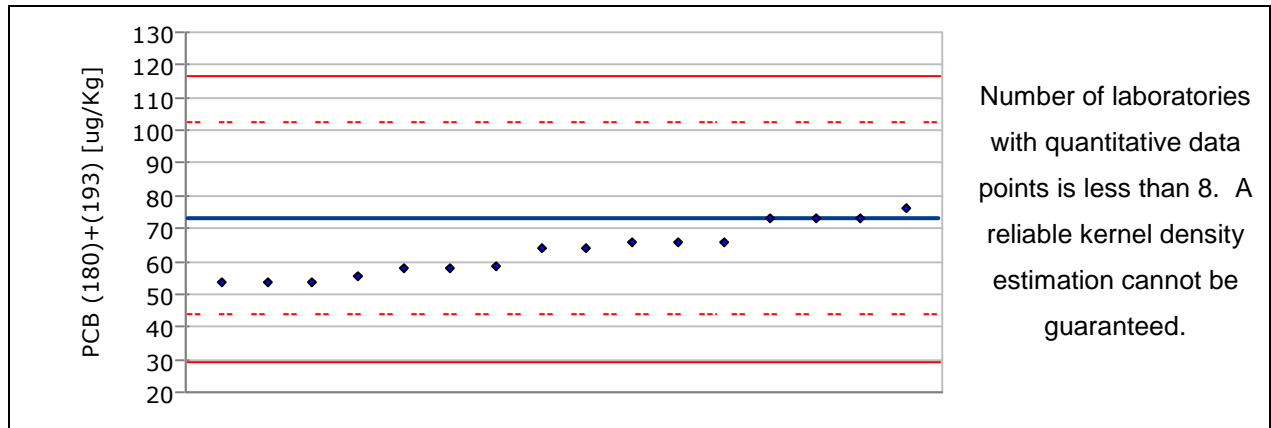
**4.2.14 PCB (156)+(157)**

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	16 / 16
Assigned value	519 ug/Kg
Proficiency std. dev.	104 ug/Kg
Acceptance window	208 - 830 ug/Kg

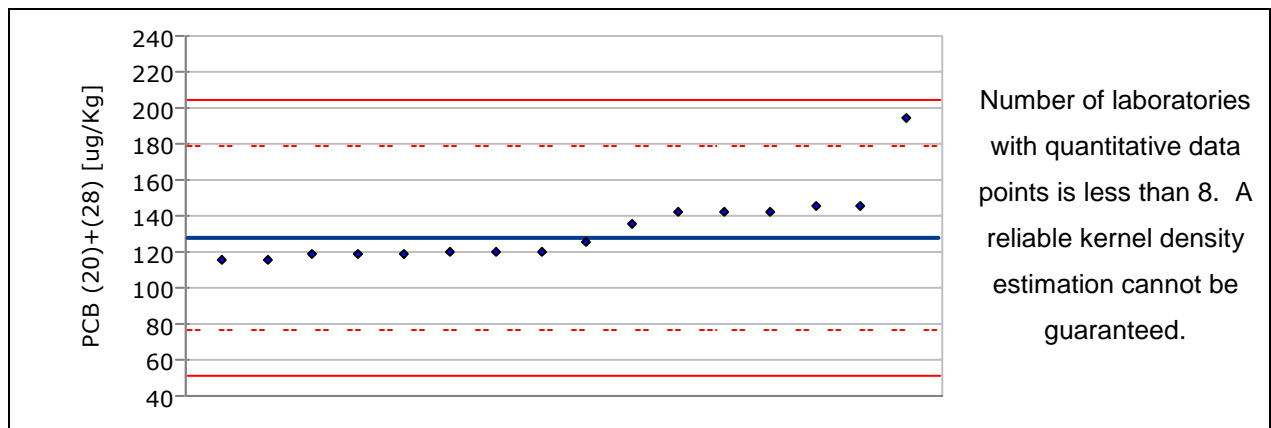


4.2.15 PCB (180)+(193)

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	16 / 16
Assigned value	73.0 ug/Kg
Proficiency std. dev.	14.6 ug/Kg
Acceptance window	29.2 - 117 ug/Kg

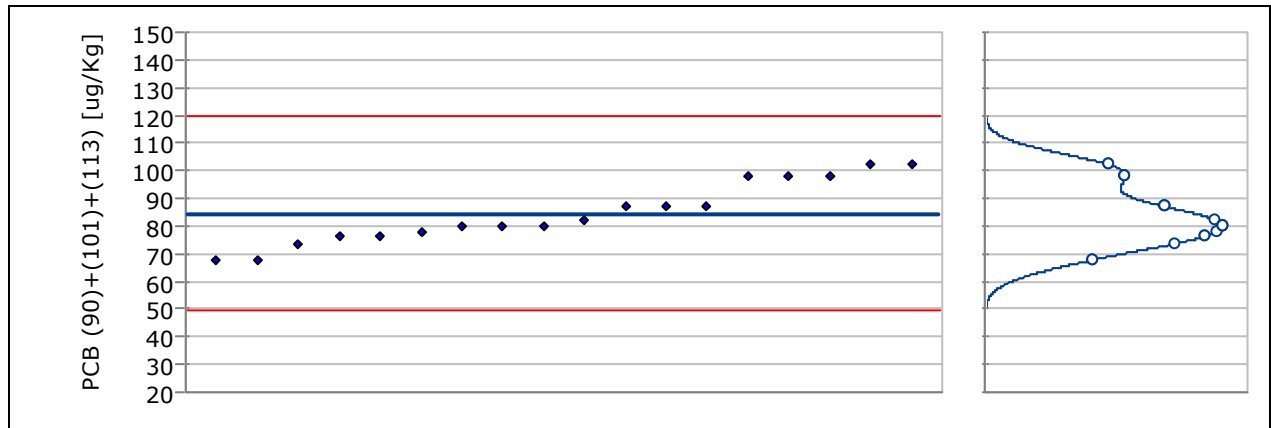
**4.2.16 PCB (20)+(28)**

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	16 / 16
Assigned value	128 ug/Kg
Proficiency std. dev.	25.6 ug/Kg
Acceptance window	51.2 - 205 ug/Kg

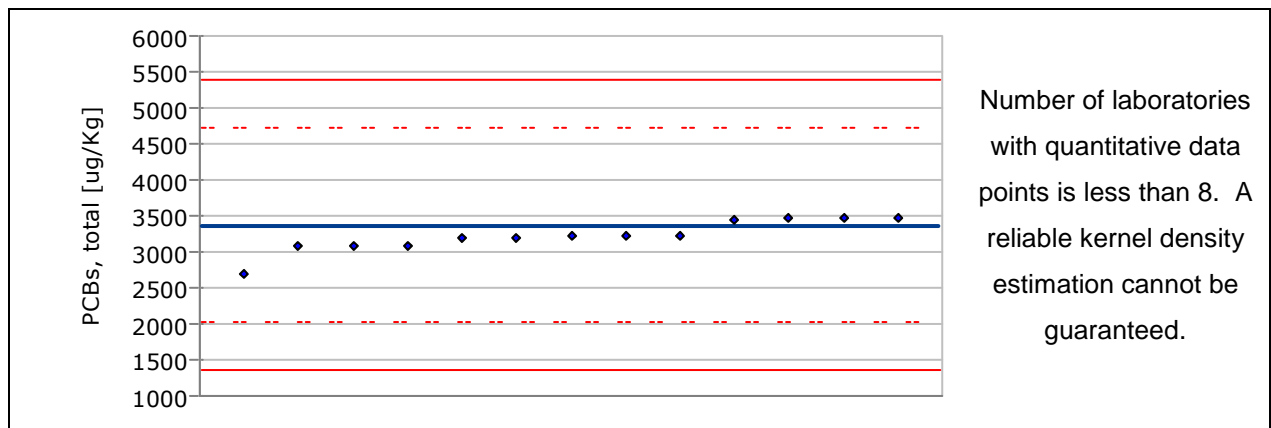


4.2.17 PCB (90)+(101)+(113)

No. of participating laboratories (in total / with quant. data points only)	8 / 8
No. of data points (in total / quantitative)	18 / 18
Assigned value	84.6 ug/Kg
Proficiency std. dev.	11.7 ug/Kg
Acceptance window	49.4 - 120 ug/Kg

**4.2.18 PCBs, total**

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	13 / 13
Assigned value	3370 ug/Kg
Proficiency std. dev.	675 ug/Kg
Acceptance window	1350 - 5400 ug/Kg



5 Statistical Analysis

5.1 Definitions and Interpretation

Reported Value

The participant's result.

Assigned Value

Value attributed to a particular quantity and accepted, sometimes by convention, as having an uncertainty appropriate for a given purpose. See ISO/IEC 17043 for additional information. In general, the assigned value is the value used to assess proficiency and may or may not be the made to value (gravimetric value).

Acceptance Window

The range of values that constitute acceptable performance for a laboratory participating in this PT study.

z-score

A z-score shows how a single data point compares to normal data. A z-score says not only whether a point was above or below average, but how unusual the measurement is. Generally, a method result with a z-score less than |2| is considered to be in control and 'Acceptable'; a z-score between |2| and |3| is considered 'Questionable', but still within control and 'Acceptable' and a z-score greater than |3| is considered 'Not Acceptable' and the method is out of control. For WS studies, a z-score greater than |2| is not acceptable.

Calculated as $z = (\text{Reported Value} - \text{Assigned Value}) / \text{Proficiency Std. Dev.}$

A z-score cannot be provided

- (1) for presence/absence data,
- (2) for identification data and other categorical data,
- (3) where the analyte is not present in the sample,
- (4) for "less than" and "greater than" values,
- (5) NOEC analytes (in the framework of WETT analysis).

In cases (1) to (3) the participant's result is only evaluated by "acceptable" if it matches with the assigned value. Otherwise the result is indicated as "not acceptable". In case the analyte is not present in the sample and a PTRL is available, the participant's result is indicated as "acceptable" as long the result is less than the PTRL.

In case (4) the following evaluation rules will be applied:

- “less than” values:
 - When the analyte is not present in the sample the result is always “acceptable”.
 - When the analyte is truly present in the sample, the result is only “acceptable” if the “less than” value is greater than the lower limit of the acceptance window.
- “greater than” values:
 - When the analyte is not present in the sample the result is always “not acceptable”.
 - When the analyte is truly present in the sample, the result is only “acceptable” if the “greater than” value is less than the upper limit of the acceptance window.

In case (5) the result is indicated as “acceptable” if it lies within the acceptance window, otherwise the result is indicated as “not acceptable”.

Proficiency Std. Dev.

Standard deviation calculated based on Evaluation Criteria.

PTRL

Proficiency Testing Reporting Limit

Study Mean

Statistical study mean calculated using a robust statistical model. Robust statistical techniques are used to minimize the influence extreme results can have on estimates of the mean and standard deviation. NOTE - These techniques assign less weight to extreme results, rather than eliminate them from a data set.

Choice of statistical technique: In case of quantitative data points from at least 8 laboratories, Algorithm A (ISO 13528, Section C.3.1), and in case of quantitative data points of 4 to 7 laboratories, the Hampel estimator (ISO 13528, Section C.5.3) is applied. A study mean cannot be calculated in case there are quantitative data points from less than 4 laboratories available.

Study Std. Dev.

Standard deviation calculated from study data using robust statistics.

In case of quantitative data points from at least 8 laboratories, Algorithm A (ISO 13528, Section C.3.1), and in case of quantitative data points of 4 to 7 laboratories, the Q method (ISO 13528, Section C.5.2) is applied. A study standard deviation cannot be calculated in case there are quantitative data points from less than 4 laboratories available.

Gravimetric Value

The 'prepared to' value, determined by gravimetric means. The uncertainty associated with this value is the standard uncertainty and based on Sigma-Aldrich RTC's gravimetric tolerances.

Analytical Value

The measured value, determined after preparation. The uncertainty associated to this value is the standard uncertainty and based on the measurement process.

5.2 Evaluation Criteria

1 - Regression Equation

Acceptance windows based on TNI adopted equation of proficiency value ± 3 proficiency standard deviations and check limits of proficiency value ± 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c & d as proficiency value = $a * \text{gravimetric} + b$ and proficiency standard deviation = $c * \text{gravimetric} + d$.

2 - Study Robust Mean and c, d regression

Acceptance windows based on TNI adopted equation of proficiency value ± 3 proficiency standard deviations and check limits of proficiency value ± 2 proficiency standard deviations. Proficiency value and proficiency standard deviation calculated from robust study mean and variables c & d as proficiency value = robust mean and proficiency standard deviation = $c * \text{proficiency value} + d$.

3 - Fixed Limits

Acceptance windows based on span of gravimetric percentage from gravimetric as $\text{gravimetric} \pm \text{gravimetric} * \text{percentage}$.

4 - Adjustable Fixed Limits

Acceptance windows based on a span of gravimetric percentage from gravimetric as $\text{gravimetric} \pm \text{gravimetric} * \text{lowPercentage}$ where $\text{gravimetric} < \text{break}$ and $\text{gravimetric} \pm \text{gravimetric} * \text{highPercentage}$ where $\text{gravimetric} \geq \text{break}$.

5 - Study Statistics

Acceptance windows based on a number of standard deviations span from the study mean as $\text{study mean} \pm (\text{deviations} * \text{standard deviation})$.

6 - Log Transform Statistics

Acceptance windows based on lognormal distributed data. Acceptance windows = $\text{mean}(\text{lognormal}) \pm \text{span} * \text{standard deviation}(\text{lognormal})$.

7 - Regression Equation 2SD

Acceptance windows based on EPA equation of proficiency value ± 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c & d as proficiency value = $a * \text{gravimetric} + b$ and proficiency standard deviation = $c * \text{gravimetric} + d$. Generally reserved for drinking water studies.

8 - Study Median and Dilution Levels

Acceptance windows based on study median ± 1 dilution. If the median falls between two test dilutions, then the assigned value is set at the higher value, and the lower acceptance limit is the second test dilution below the median, and the upper acceptance limit is the second test dilution above the median. Generally reserved for NOEC analytes (in the framework of WETT analysis).

9 - Fixed Limits based on Analytical Value

Acceptance windows based on span of analytical value from measurements.

6 Notes on the Interpretation of the Results

z score Overview

The z-scores are presented as colored triangles. For each item, the z-scores of all analytes of the current and the previous (up to three) scheduled studies of this study type. The z-scores depend on the lot, analytical method used, and analyst (if given). A red cross is shown if no z-score is available.

For the assessment of participants by means of z-scores according to ISO/IEC 17043:2010 [2], the triangles were colored as follows:

$ z \leq 2$	green
$2 < z < 3$	yellow (WS studies, WETT samples: red)
$ z \geq 3$	red.

For $|z| \geq 3$, the corresponding triangles are displayed as -3 or 3. For $|z| > 2$, the value of the z score is displayed next to the triangle (yellow or red). A z-score = 0 is shown as a light blue vertical bar.

Interpretation of the z-scores' overview:

A z-score < 0 , i.e. the triangle points to the left, means that the measurement result is lower than the assigned value.

A z-score > 0 , i.e. the triangle points to the right, means that the measurement result is higher than the assigned value.

A z-score = 0, i.e. a light blue vertical bar is shown, means that the measurement result coincides with the assigned value.

Figures per Combination of Item, Lot and Analyte

The *diagram on the left* shows the participant results by means of blue diamonds.

The horizontal blue line indicates the assigned value.

Both the acceptance and the check limits for the participant results are calculated based on z-scores.

The acceptance limits are displayed as solid lines and correspond to z-scores of ± 3 . For WS studies and non-NOEC analytes (in the framework of WETT analysis), the acceptance limits correspond to a z-score ± 2 . For NOEC analytes (in the framework of WETT analysis), the acceptance limits correspond to ± 1 dilution.

The check limits are displayed as dashed lines and correspond to z-scores of ± 2 . They are only calculated if a rule is given by the evaluation criterion.

In case there are at least 8 laboratories with quantitative data points are available: The *diagram on the right* is a kernel density estimation of the distribution of the participant results. The measurement values are indicated as small circles. The kernel width is determined by the ISO 13528 formula from section 10.3.2 i) a).

7 Proficiency Test Item Preparation, Homogeneity and Stability Assessment

Sigma-Aldrich RTC uses proprietary and published methods for the manufacture, homogeneity and stability testing of proficiency test items. Sigma-Aldrich RTC's proficiency test materials meet the requirements of ISO 17034. For more information contact Sigma-Aldrich RTC. Additionally, Sigma-Aldrich RTC complies with the TNI Volume 3 'General Requirements for Environmental Proficiency Test Providers', EL-V3-2009, 2009 for all TNI Fields of Proficiency Testing analytes.

8 Metrological Traceability

All preparations are made using balances calibrated annually traceable to NIST standards. Where appropriate analytical measurements are traceable through an unbroken chain to NIST standards, or a Certified Reference Material manufactured under ISO 17034 in conjunction with ISO/IEC 17025.

9 Additional Information

Go to merck-pt.com for additional information on summary statistics for specific methods, advice on the interpretation of the statistical analysis and additional comments/recommendations. Sigma-Aldrich RTC recommends that you contact your accreditation body for specific instruction.

10 References

- [1] ISO 13528: Statistical methods for use in proficiency testing by interlaboratory comparison, August 2015
- [2] ISO/IEC 17025:2017: General requirements for the competence of testing and calibration laboratories
- [3] ISO/IEC 17043:2010: Conformity assessment - General requirements for proficiency testing, May 2010
- [4] S. Uhlig und P. Henschel (1997): Limits of tolerance and z-scores in ring tests. Fresenius' J. Anal. Chem., Vol. 358, pp. 761-766.
- [5] ISO 17034:2016: General requirements for the competence of reference material producers.

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Lit. No. MS_BR1761EN
2018 - 10431
06/2018

PROFICIENCY TESTING

Evaluation Report

Scheduled Study

LPTP20-S1

Study Type

RCRA_UST

Open Date

2020-01-29

Close Date

2020-03-13

Report Generated

2020-04-01

Laboratory

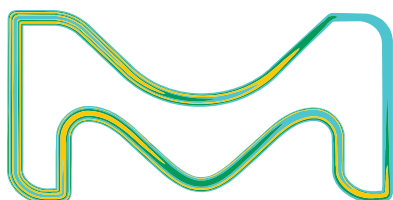
Pace Analytical Services, LLC. - Minneapolis MN
Jerry Thao
1700 Elm Street SE
Minneapolis MN 55414-2485 US

Account Number

49456465

US EPA Lab Code

MN00064



Provider of the proficiency test

Sigma-Aldrich RTC, Inc.
2931 Soldier Springs Road
Laramie, WY 82070 USA
ptservice@milliporesigma.com

Statistical analysis and reporting powered by

QuoData GmbH Quality & Statistics!



Authorized release of the report

Jennifer Duhon
(PT coordinator)

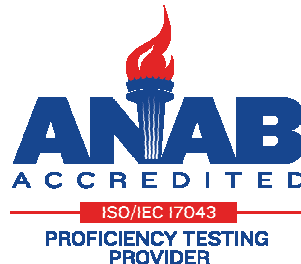
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Sigma-Aldrich RTC, Inc. is accredited by ANAB to provide PT programs for the scope of accreditation under ANAB Certificate # AP-1469.

All batch numbers of proficiency testing samples, including microbiological materials, are manufactured and tested in accordance with ISO/IEC 17043 requirements. For further information on proficiency testing samples, please check the PT product code information on each product detail page located on our website.

This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.



Accreditors

Evaluations of this study will be sent to the accreditor(s) listed below. If any of the information listed below is not correct, please contact Sigma-Aldrich RTC immediately.

Accrediting Agency

A2LA

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Frederick MD 21703 US

Accrediting Agency

Arizona DHS

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Lab Certification
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Phoenix AZ 85007 US

Accrediting Agency

California State Water Resources Control Board

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PO Box 100
Sacramento CA 94244-0100 US

Accrediting Agency

Louisiana DEQ

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Paul Bergeron /Jacqueline Prudente
Office of Environmental Services, Permit Support Services Division, Notifications
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PO Box 4313
Baton Rouge LA 70821-4313 US

Accrediting Agency

Maine Department of Health & Human Services

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286 WATER STREET 3RD FLOOR
Augusta ME 04333-0011 US

Accrediting Agency

Minnesota DOH

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Accrediting Agency

Washington State Dept. of Ecology

Agency lab code: C486

Rebecca Wood

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Manchester WA 98353 US

Accrediting Agency

West Virginia DEP

Agency lab code: 382

Lab Certification

601 57th St SE

Charleston WV 25304 US

Summary Results for LPTP20-S1
SPE016-10G Dioxin and Furans in Soil - PT
LRAC1605

This proficiency testing sample was produced in accordance with ISO/IEC 17043:2010.

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 1613B 10120602				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: JRH Analysis Date: 2020-02-08	189 pg/g	188 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	116 - 259 pg/g	0.1 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: JRH Analysis Date: 2020-02-08	589 pg/g	577 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	382 - 771 pg/g	0.2 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: JRH Analysis Date: 2020-02-08	289 pg/g	325 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	210 - 441 pg/g	-0.9 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: JRH Analysis Date: 2020-02-08	289 pg/g	332 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	200 - 464 pg/g	-1.0 Acceptable
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: JRH Analysis Date: 2020-02-08	779 pg/g	765 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	538 - 991 pg/g	0.2 Acceptable
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: JRH Analysis Date: 2020-02-08	831 pg/g	847 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	503 - 1190 pg/g	-0.1 Acceptable
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: JRH Analysis Date: 2020-02-08	1160 pg/g	1060 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	679 - 1440 pg/g	0.8 Acceptable
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: JRH Analysis Date: 2020-02-08	1880 pg/g	1860 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1080 - 2640 pg/g	0.1 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Hxcdd, total ² 9468 Analyst: JRH Analysis Date: 2020-02-08	3870 pg/g	3770 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	2260 - 5280 pg/g	0.2 Acceptable
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: JRH Analysis Date: 2020-02-08	699 pg/g	672 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	473 - 871 pg/g	0.4 Acceptable
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: JRH Analysis Date: 2020-02-08	492 pg/g	493 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	342 - 644 pg/g	0.0 Acceptable
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: JRH Analysis Date: 2020-02-08	433 pg/g	419 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	304 - 535 pg/g	0.4 Acceptable
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: JRH Analysis Date: 2020-02-08	787 pg/g	831 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	545 - 1120 pg/g	-0.5 Acceptable
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: JRH Analysis Date: 2020-02-08	2410 pg/g	2410 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1680 - 3150 pg/g	0.0 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: JRH Analysis Date: 2020-02-08	565 pg/g	544 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	292 - 796 pg/g	0.2 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: JRH Analysis Date: 2020-02-08	1150 pg/g	1150 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	757 - 1540 pg/g	0.0 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: JRH Analysis Date: 2020-02-08	688 pg/g	770 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	555 - 986 pg/g	-1.1 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: JRH Analysis Date: 2020-02-08	974 pg/g	948 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	588 - 1310 pg/g	0.2 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,4,7,8-Pecdf ² 9549 Analyst: JRH Analysis Date: 2020-02-08	998 pg/g	1010 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	691 - 1320 pg/g	-0.1 Acceptable
Pecdf, total ² 9552 Analyst: JRH Analysis Date: 2020-02-08	1970 pg/g	1980 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1320 - 2630 pg/g	0.0 Acceptable
Pecdd, total ² 9555 Analyst: JRH Analysis Date: 2020-02-08	688 pg/g	774 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	542 - 1010 pg/g	-1.1 Acceptable
TCDD, total ² 9609 Analyst: JRH Analysis Date: 2020-02-08	637 pg/g	695 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	502 - 887 pg/g	-0.9 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: JRH Analysis Date: 2020-02-08	789 pg/g	737 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	549 - 925 pg/g	0.8 Acceptable
TCDF, total ² 9615 Analyst: JRH Analysis Date: 2020-02-08	789 pg/g	757 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	511 - 1000 pg/g	0.4 Acceptable
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: JRH Analysis Date: 2020-02-08	637 pg/g	694 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	509 - 878 pg/g	-0.9 Acceptable
PCDF, total ² 9657 Analyst: JRH Analysis Date: 2020-02-08	6510 pg/g	6310 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	4350 - 8280 pg/g	0.3 Acceptable
PCDD, total ² 9660 Analyst: JRH Analysis Date: 2020-02-08	6630 pg/g	6540 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	4230 - 8850 pg/g	0.1 Acceptable
Group Analysis Summary	Acceptable: 27/27		Score: 100% - Acceptable	

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 8280B (1998) 10187005				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: JRH Analysis Date: 2020-02-07	210 pg/g	188 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	116 - 259 pg/g	0.9 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: JRH Analysis Date: 2020-02-07	592 pg/g	577 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	382 - 771 pg/g	0.2 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: JRH Analysis Date: 2020-02-07	320 pg/g	325 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	210 - 441 pg/g	-0.1 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: JRH Analysis Date: 2020-02-07	320 pg/g	332 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	200 - 464 pg/g	-0.3 Acceptable
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: JRH Analysis Date: 2020-02-07	802 pg/g	765 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	538 - 991 pg/g	0.5 Acceptable
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: JRH Analysis Date: 2020-02-07	992 pg/g	847 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	503 - 1190 pg/g	1.3 Acceptable
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: JRH Analysis Date: 2020-02-07	1200 pg/g	1060 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	679 - 1440 pg/g	1.1 Acceptable
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: JRH Analysis Date: 2020-02-07	2120 pg/g	1860 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1080 - 2640 pg/g	1.0 Acceptable
Hxcdd, total ² 9468 Analyst: JRH Analysis Date: 2020-02-07	4310 pg/g	3770 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	2260 - 5280 pg/g	1.1 Acceptable
1,2,3,4,7,8-Hxcd ² 9471 Analyst: JRH Analysis Date: 2020-02-07	780 pg/g	672 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	473 - 871 pg/g	1.6 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: JRH Analysis Date: 2020-02-07	550 pg/g	493 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	342 - 644 pg/g	1.1 Acceptable
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: JRH Analysis Date: 2020-02-07	501 pg/g	419 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	304 - 535 pg/g	2.1 Acceptable
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: JRH Analysis Date: 2020-02-07	908 pg/g	831 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	545 - 1120 pg/g	0.8 Acceptable
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: JRH Analysis Date: 2020-02-07	2740 pg/g	2410 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1680 - 3150 pg/g	1.3 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: JRH Analysis Date: 2020-02-07	656 pg/g	544 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	292 - 796 pg/g	1.3 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: JRH Analysis Date: 2020-02-07	1230 pg/g	1150 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	757 - 1540 pg/g	0.6 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: JRH Analysis Date: 2020-02-07	726 pg/g	770 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	555 - 986 pg/g	-0.6 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: JRH Analysis Date: 2020-02-07	1070 pg/g	948 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	588 - 1310 pg/g	1.0 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: JRH Analysis Date: 2020-02-07	1130 pg/g	1010 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	691 - 1320 pg/g	1.2 Acceptable
Pecdf, total ² 9552 Analyst: JRH Analysis Date: 2020-02-07	2200 pg/g	1980 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1320 - 2630 pg/g	1.0 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Pecdd, total ² 9555 Analyst: JRH Analysis Date: 2020-02-07	726 pg/g	774 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	542 - 1010 pg/g	-0.6 Acceptable
TCDD, total ² 9609 Analyst: JRH Analysis Date: 2020-02-07	712 pg/g	695 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	502 - 887 pg/g	0.3 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: JRH Analysis Date: 2020-02-07	879 pg/g	737 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	549 - 925 pg/g	2.3 Acceptable
TCDF, total ² 9615 Analyst: JRH Analysis Date: 2020-02-07	879 pg/g	757 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	511 - 1000 pg/g	1.5 Acceptable
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PCDD, total ² 9660 Analyst: JRH Analysis Date: 2020-02-07	7300 pg/g	6540 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	4230 - 8850 pg/g	1.0 Acceptable
Group Analysis Summary		Acceptable: 27/27		
Score: 100% - Acceptable				
EPA 8290 (1994) 10187209				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: JRH Analysis Date: 2020-02-08	189 pg/g	188 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	116 - 259 pg/g	0.1 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: JRH Analysis Date: 2020-02-08	589 pg/g	577 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	382 - 771 pg/g	0.2 Acceptable

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Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: JRH Analysis Date: 2020-02-08	779 pg/g	765 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	538 - 991 pg/g	0.2 Acceptable
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: JRH Analysis Date: 2020-02-08	831 pg/g	847 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	503 - 1190 pg/g	-0.1 Acceptable
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: JRH Analysis Date: 2020-02-08	1160 pg/g	1060 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	679 - 1440 pg/g	0.8 Acceptable
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: JRH Analysis Date: 2020-02-08	1880 pg/g	1860 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1080 - 2640 pg/g	0.1 Acceptable
Hxcdd, total ² 9468 Analyst: JRH Analysis Date: 2020-02-08	3870 pg/g	3770 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	2260 - 5280 pg/g	0.2 Acceptable
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: JRH Analysis Date: 2020-02-08	699 pg/g	672 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	473 - 871 pg/g	0.4 Acceptable
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: JRH Analysis Date: 2020-02-08	492 pg/g	493 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	342 - 644 pg/g	0.0 Acceptable
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: JRH Analysis Date: 2020-02-08	433 pg/g	419 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	304 - 535 pg/g	0.4 Acceptable

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Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: JRH Analysis Date: 2020-02-08	2410 pg/g	2410 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1680 - 3150 pg/g	0.0 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: JRH Analysis Date: 2020-02-08	565 pg/g	544 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	292 - 796 pg/g	0.2 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: JRH Analysis Date: 2020-02-08	1150 pg/g	1150 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	757 - 1540 pg/g	0.0 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: JRH Analysis Date: 2020-02-08	688 pg/g	770 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	555 - 986 pg/g	-1.1 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: JRH Analysis Date: 2020-02-08	974 pg/g	948 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	588 - 1310 pg/g	0.2 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: JRH Analysis Date: 2020-02-08	998 pg/g	1010 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	691 - 1320 pg/g	-0.1 Acceptable
Pecdf, total ² 9552 Analyst: JRH Analysis Date: 2020-02-08	1970 pg/g	1980 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1320 - 2630 pg/g	0.0 Acceptable
Pecdd, total ² 9555 Analyst: JRH Analysis Date: 2020-02-08	688 pg/g	774 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	542 - 1010 pg/g	-1.1 Acceptable
TCDD, total ² 9609 Analyst: JRH Analysis Date: 2020-02-08	637 pg/g	695 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	502 - 887 pg/g	-0.9 Acceptable

* Evaluation parameters used for the statistical analysis: explanation at the end of report; a yellow highlighted results is acceptable but to be checked.

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,7,8-TCDF ² 9612 Analyst: JRH Analysis Date: 2020-02-08	789 pg/g	737 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	549 - 925 pg/g	0.8 Acceptable
TCDF, total ² 9615 Analyst: JRH Analysis Date: 2020-02-08	789 pg/g	757 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	511 - 1000 pg/g	0.4 Acceptable
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: JRH Analysis Date: 2020-02-08	637 pg/g	694 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	509 - 878 pg/g	-0.9 Acceptable
PCDF, total ² 9657 Analyst: JRH Analysis Date: 2020-02-08	6510 pg/g	6310 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	4350 - 8280 pg/g	0.3 Acceptable
PCDD, total ² 9660 Analyst: JRH Analysis Date: 2020-02-08	6630 pg/g	6540 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	4230 - 8850 pg/g	0.1 Acceptable
Group Analysis Summary		Acceptable: 27/27		
Score: 100% - Acceptable				
EPA 8290A (2007) 10187403				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: JRH Analysis Date: 2020-02-08	189 pg/g	188 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	116 - 259 pg/g	0.1 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: JRH Analysis Date: 2020-02-08	589 pg/g	577 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	382 - 771 pg/g	0.2 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: JRH Analysis Date: 2020-02-08	289 pg/g	325 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	210 - 441 pg/g	-0.9 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: JRH Analysis Date: 2020-02-08	289 pg/g	332 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	200 - 464 pg/g	-1.0 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: JRH Analysis Date: 2020-02-08	779 pg/g	765 pg/g	538 - 991 pg/g	0.2 Acceptable
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: JRH Analysis Date: 2020-02-08	831 pg/g	847 pg/g	503 - 1190 pg/g	-0.1 Acceptable
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: JRH Analysis Date: 2020-02-08	1160 pg/g	1060 pg/g	679 - 1440 pg/g	0.8 Acceptable
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: JRH Analysis Date: 2020-02-08	1880 pg/g	1860 pg/g	1080 - 2640 pg/g	0.1 Acceptable
Hxcdd, total ² 9468 Analyst: JRH Analysis Date: 2020-02-08	3870 pg/g	3770 pg/g	2260 - 5280 pg/g	0.2 Acceptable
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: JRH Analysis Date: 2020-02-08	699 pg/g	672 pg/g	473 - 871 pg/g	0.4 Acceptable
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: JRH Analysis Date: 2020-02-08	492 pg/g	493 pg/g	342 - 644 pg/g	0.0 Acceptable
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: JRH Analysis Date: 2020-02-08	433 pg/g	419 pg/g	304 - 535 pg/g	0.4 Acceptable
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: JRH Analysis Date: 2020-02-08	787 pg/g	831 pg/g	545 - 1120 pg/g	-0.5 Acceptable
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: JRH Analysis Date: 2020-02-08	2410 pg/g	2410 pg/g	1680 - 3150 pg/g	0.0 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: JRH Analysis Date: 2020-02-08	565 pg/g	544 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	292 - 796 pg/g	0.2 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: JRH Analysis Date: 2020-02-08	1150 pg/g	1150 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	757 - 1540 pg/g	0.0 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: JRH Analysis Date: 2020-02-08	688 pg/g	770 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	555 - 986 pg/g	-1.1 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: JRH Analysis Date: 2020-02-08	974 pg/g	948 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	588 - 1310 pg/g	0.2 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: JRH Analysis Date: 2020-02-08	998 pg/g	1010 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	691 - 1320 pg/g	-0.1 Acceptable
Pecdf, total ² 9552 Analyst: JRH Analysis Date: 2020-02-08	1970 pg/g	1980 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	1320 - 2630 pg/g	0.0 Acceptable
Pecdd, total ² 9555 Analyst: JRH Analysis Date: 2020-02-08	688 pg/g	774 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	542 - 1010 pg/g	-1.1 Acceptable
TCDD, total ² 9609 Analyst: JRH Analysis Date: 2020-02-08	637 pg/g	695 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	502 - 887 pg/g	-0.9 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: JRH Analysis Date: 2020-02-08	789 pg/g	737 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	549 - 925 pg/g	0.8 Acceptable
TCDF, total ² 9615 Analyst: JRH Analysis Date: 2020-02-08	789 pg/g	757 pg/g <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	511 - 1000 pg/g	0.4 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: JRH Analysis Date: 2020-02-08	637 pg/g	694 pg/g	509 - 878 pg/g	-0.9 Acceptable
<i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>				
PCDF, total ² 9657 Analyst: JRH Analysis Date: 2020-02-08	6510 pg/g	6310 pg/g	4350 - 8280 pg/g	0.3 Acceptable
<i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>				
PCDD, total ² 9660 Analyst: JRH Analysis Date: 2020-02-08	6630 pg/g	6540 pg/g	4230 - 8850 pg/g	0.1 Acceptable
<i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>				
Group Analysis Summary	Acceptable: 27/27		Score: 100% - Acceptable	

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**Summary Results for LPTP20-S1
SPE068-50G PCB Congeners in Soil - PT
LRAC1565**

This proficiency testing sample was produced in accordance with ISO/IEC 17043:2010.

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 1668A 10129405				
PCBs in Soil				
PCBs, total ² 8870 Analyst: CVS Analysis Date: 2020-02-12	3110 ug/Kg	3130 ug/Kg <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	2040 - 4220 ug/Kg	-0.1 Acceptable
PCB (20)+(28) ² 8936 Analyst: CVS Analysis Date: 2020-02-12	49.6 ug/Kg	47.3 ug/Kg <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	22.7 - 71.9 ug/Kg	0.3 Acceptable
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) ² 8955 Analyst: CVS Analysis Date: 2020-02-12	53.1 ug/Kg	47.5 ug/Kg <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	20.2 - 74.8 ug/Kg	0.6 Acceptable
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) ² 8965 Analyst: CVS Analysis Date: 2020-02-12	122 ug/Kg	125 ug/Kg <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	57.8 - 191 ug/Kg	-0.1 Acceptable
3,4,4',5-Tetrachlorobiphenyl (PCB 81) ² 8970 Analyst: CVS Analysis Date: 2020-02-12	351 ug/Kg	333 ug/Kg <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	111 - 555 ug/Kg	0.2 Acceptable
PCB (90)+(101)+(113) ² 8982 Analyst: CVS Analysis Date: 2020-02-12	128 ug/Kg	123 ug/Kg <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	56.5 - 190 ug/Kg	0.2 Acceptable
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) ² 8985 Analyst: CVS Analysis Date: 2020-02-12	282 ug/Kg	265 ug/Kg <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	81.6 - 448 ug/Kg	0.3 Acceptable
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) ² 8995 Analyst: CVS Analysis Date: 2020-02-12	350 ug/Kg	325 ug/Kg <i>Evaluation Criteria – 5* Parameters*: deviations:3</i>	153 - 497 ug/Kg	0.4 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) ² 9000 Analyst: CVS Analysis Date: 2020-02-12	61.2 ug/Kg	57.7 ug/Kg	19.0 - 96.3 ug/Kg	0.3 Acceptable
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) ² 9005 Analyst: CVS Analysis Date: 2020-02-12	40.5 ug/Kg	38.1 ug/Kg	14.7 - 61.4 ug/Kg	0.3 Acceptable
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) ² 9015 Analyst: CVS Analysis Date: 2020-02-12	119 ug/Kg	111 ug/Kg	36.4 - 186 ug/Kg	0.3 Acceptable
PCB (129)+(138)+(163) ² 9026 Analyst: CVS Analysis Date: 2020-02-12	178 ug/Kg	165 ug/Kg	64.3 - 265 ug/Kg	0.4 Acceptable
PCB (153)+(168) ² 9041 Analyst: CVS Analysis Date: 2020-02-12	158 ug/Kg	143 ug/Kg	77.9 - 209 ug/Kg	0.7 Acceptable
PCB (156)+(157) ² 9046 Analyst: CVS Analysis Date: 2020-02-12	572 ug/Kg	529 ug/Kg	165 - 893 ug/Kg	0.4 Acceptable
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) ² 9055 Analyst: CVS Analysis Date: 2020-02-12	181 ug/Kg	170 ug/Kg	37.6 - 302 ug/Kg	0.3 Acceptable
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) ² 9060 Analyst: CVS Analysis Date: 2020-02-12	248 ug/Kg	232 ug/Kg	68.9 - 394 ug/Kg	0.3 Acceptable
PCB (180)+(193) ² 9070 Analyst: CVS Analysis Date: 2020-02-12	147 ug/Kg	151 ug/Kg	84.0 - 217 ug/Kg	-0.2 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) ² 9085 Analyst: CVS Analysis Date: 2020-02-12	45.4 ug/Kg	42.6 ug/Kg	16.6 - 68.7 ug/Kg	0.3 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
Group Analysis Summary	Acceptable: 18/18		Score: 100% - Acceptable	
EPA 1668C (2010) 10262109				
PCBs in Soil				
PCBs, total ² 8870 Analyst: CVS Analysis Date: 2020-02-12	3110 ug/Kg	3130 ug/Kg	2040 - 4220 ug/Kg	-0.1 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
PCB (20)+(28) ² 8936 Analyst: CVS Analysis Date: 2020-02-12	49.6 ug/Kg	47.3 ug/Kg	22.7 - 71.9 ug/Kg	0.3 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) ² 8955 Analyst: CVS Analysis Date: 2020-02-12	53.1 ug/Kg	47.5 ug/Kg	20.2 - 74.8 ug/Kg	0.6 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) ² 8965 Analyst: CVS Analysis Date: 2020-02-12	122 ug/Kg	125 ug/Kg	57.8 - 191 ug/Kg	-0.1 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
3,4,4',5-Tetrachlorobiphenyl (PCB 81) ² 8970 Analyst: CVS Analysis Date: 2020-02-12	351 ug/Kg	333 ug/Kg	111 - 555 ug/Kg	0.2 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
PCB (90)+(101)+(113) ² 8982 Analyst: CVS Analysis Date: 2020-02-12	128 ug/Kg	123 ug/Kg	56.5 - 190 ug/Kg	0.2 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) ² 8985 Analyst: CVS Analysis Date: 2020-02-12	282 ug/Kg	265 ug/Kg	81.6 - 448 ug/Kg	0.3 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) ² 8995 Analyst: CVS Analysis Date: 2020-02-12	350 ug/Kg	325 ug/Kg	153 - 497 ug/Kg	0.4 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) ² 9000 Analyst: CVS Analysis Date: 2020-02-12	61.2 ug/Kg	57.7 ug/Kg	19.0 - 96.3 ug/Kg	0.3 Acceptable
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) ² 9005 Analyst: CVS Analysis Date: 2020-02-12	40.5 ug/Kg	38.1 ug/Kg	14.7 - 61.4 ug/Kg	0.3 Acceptable
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) ² 9015 Analyst: CVS Analysis Date: 2020-02-12	119 ug/Kg	111 ug/Kg	36.4 - 186 ug/Kg	0.3 Acceptable
PCB (129)+(138)+(163) ² 9026 Analyst: CVS Analysis Date: 2020-02-12	178 ug/Kg	165 ug/Kg	64.3 - 265 ug/Kg	0.4 Acceptable
PCB (153)+(168) ² 9041 Analyst: CVS Analysis Date: 2020-02-12	158 ug/Kg	143 ug/Kg	77.9 - 209 ug/Kg	0.7 Acceptable
PCB (156)+(157) ² 9046 Analyst: CVS Analysis Date: 2020-02-12	572 ug/Kg	529 ug/Kg	165 - 893 ug/Kg	0.4 Acceptable
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) ² 9055 Analyst: CVS Analysis Date: 2020-02-12	181 ug/Kg	170 ug/Kg	37.6 - 302 ug/Kg	0.3 Acceptable
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) ² 9060 Analyst: CVS Analysis Date: 2020-02-12	248 ug/Kg	232 ug/Kg	68.9 - 394 ug/Kg	0.3 Acceptable
PCB (180)+(193) ² 9070 Analyst: CVS Analysis Date: 2020-02-12	147 ug/Kg	151 ug/Kg	84.0 - 217 ug/Kg	-0.2 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) ² 9085 Analyst: CVS Analysis Date: 2020-02-12	45.4 ug/Kg	42.6 ug/Kg	16.6 - 68.7 ug/Kg	0.3 Acceptable
Group Analysis Summary		Acceptable: 18/18		Score: 100% - Acceptable

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Summary Results for LPTP20-S1
SPE006-225G STLC Metals CA - WET in Soil - PT
LRAC5370

This proficiency testing sample was produced in accordance with ISO/IEC 17043:2010.

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
CA Title 22 WET 90017235				
TCLP - CA WET				
Antimony, Sb ² 1005 Analyst: DM Analysis Date: 2020-02-14	0.540 mg/L	---	---	No evaluation**
Arsenic, As ² 1010 Analyst: DM Analysis Date: 2020-02-14	81.3 mg/L	62.6 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	30.8 - 94.3 mg/L	1.8 Acceptable
Barium, Ba ² 1015 Analyst: DM Analysis Date: 2020-02-14	54.4 mg/L	55.6 mg/L <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1, d:0</i>	38.9 - 72.2 mg/L	-0.2 Acceptable
Beryllium, Be ² 1020 Analyst: DM Analysis Date: 2020-02-14	<0.050 mg/L	0 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>	0 - 5.00 mg/L	Acceptable
Cadmium, Cd ² 1030 Analyst: DM Analysis Date: 2020-02-14	31.0 mg/L	30.3 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	20.2 - 40.4 mg/L	0.2 Acceptable
Chromium, Cr (total) ² 1040 Analyst: DM Analysis Date: 2020-02-14	34.3 mg/L	37.3 mg/L <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1, d:0</i>	26.1 - 48.4 mg/L	-0.8 Acceptable
Cobalt, Co ² 1050 Analyst: DM Analysis Date: 2020-02-14	26.2 mg/L	26.1 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	20.1 - 32.2 mg/L	0.0 Acceptable
Copper, Cu ² 1055 Analyst: DM Analysis Date: 2020-02-14	13.7 mg/L	13.4 mg/L <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.1, d:0</i>	9.40 - 17.5 mg/L	0.2 Acceptable
Lead, Pb ² 1075 Analyst: DM Analysis Date: 2020-02-14	123 mg/L	120 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	38.1 - 201 mg/L	0.1 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Molybdenum, Mo ² 1100 Analyst: DM Analysis Date: 2020-02-14	<0.15 mg/L	0 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>	0 - 5.00 mg/L	Acceptable
Nickel, Ni ² 1105 Analyst: DM Analysis Date: 2020-02-14	23.6 mg/L	23.1 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	15.3 - 30.8 mg/L	0.2 Acceptable
Selenium, Se ² 1140 Analyst: DM Analysis Date: 2020-02-14	137 mg/L	123 mg/L <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	95.0 - 152 mg/L	1.5 Acceptable
Silver, Ag ² 1150 Analyst: DM Analysis Date: 2020-02-14	<0.10 mg/L	0 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>	0 - 5.00 mg/L	Acceptable
Thallium, Tl ² 1165 Analyst: DM Analysis Date: 2020-02-14	<0.20 mg/L	0 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>	0 - 5.00 mg/L	Acceptable
Vanadium, V ² 1185 Analyst: DM Analysis Date: 2020-02-14	0.167 mg/L	0 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0, d:0</i>	0 - 5.00 mg/L	Acceptable
Zinc, Zn ² 1190 Analyst: DM Analysis Date: 2020-02-14	0.259 mg/L	0.437 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.1, d:0</i>	0.306 - 0.568 mg/L	-4.1 Not Acceptable
Group Analysis Summary	Acceptable: 14/15		Score: 93% - Acceptable	

* Evaluation parameters used for the statistical analysis: explanation at the end of report; a yellow highlighted results is acceptable but to be checked.

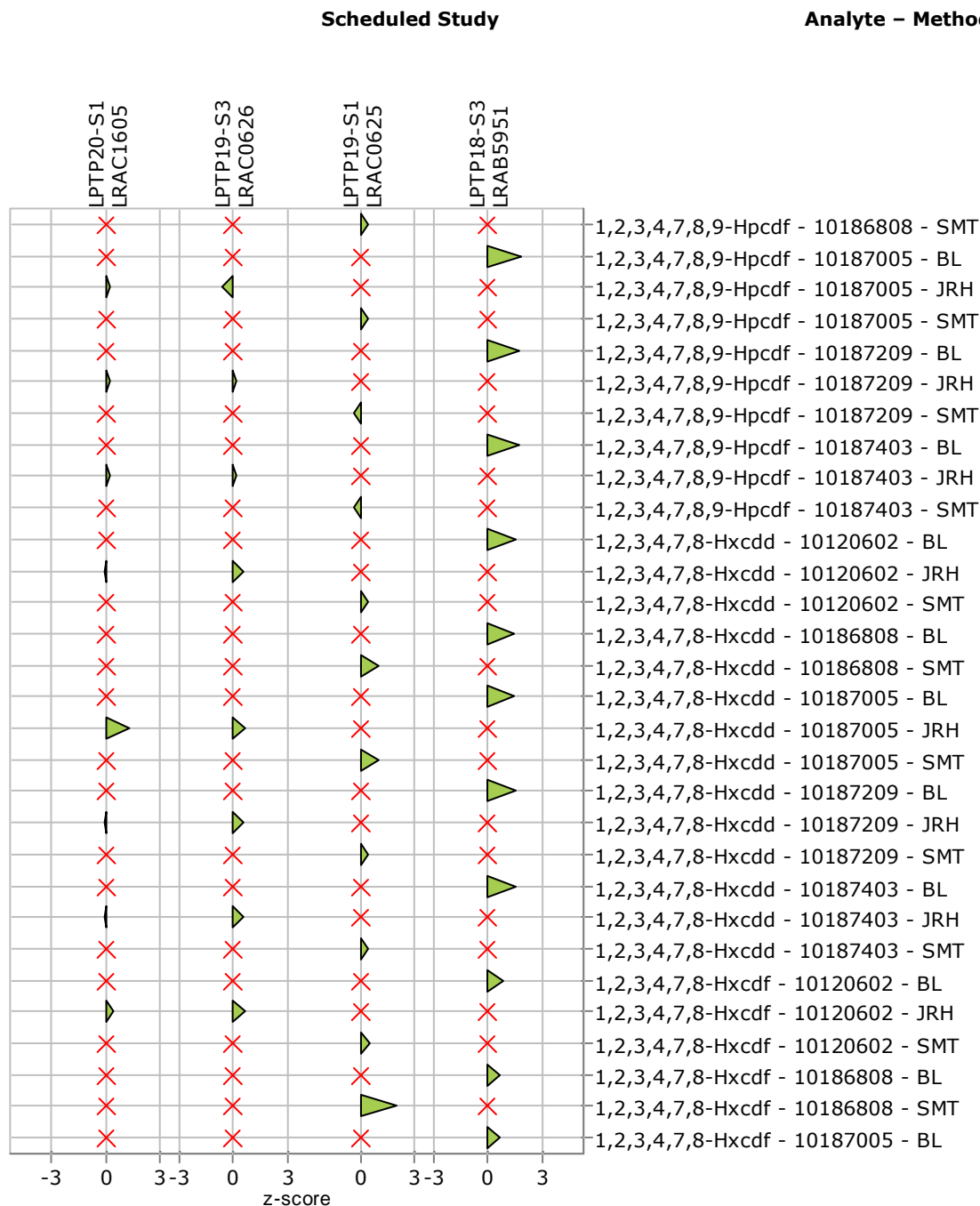
** Unable to calculate a study mean due to <4 data points being received, therefore an effective evaluation could not be performed.

¹ TNI Compliant, covered by Sigma-Aldrich RTC's ANAB Proficiency Testing Provider accreditation, Cert. AP-1469

² ISO/IEC 17043 Accredited, covered by Sigma-Aldrich RTC's ANAB Proficiency Testing Provider accreditation, Cert AP-1469

Graphical z-score Overview for LPTP20-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

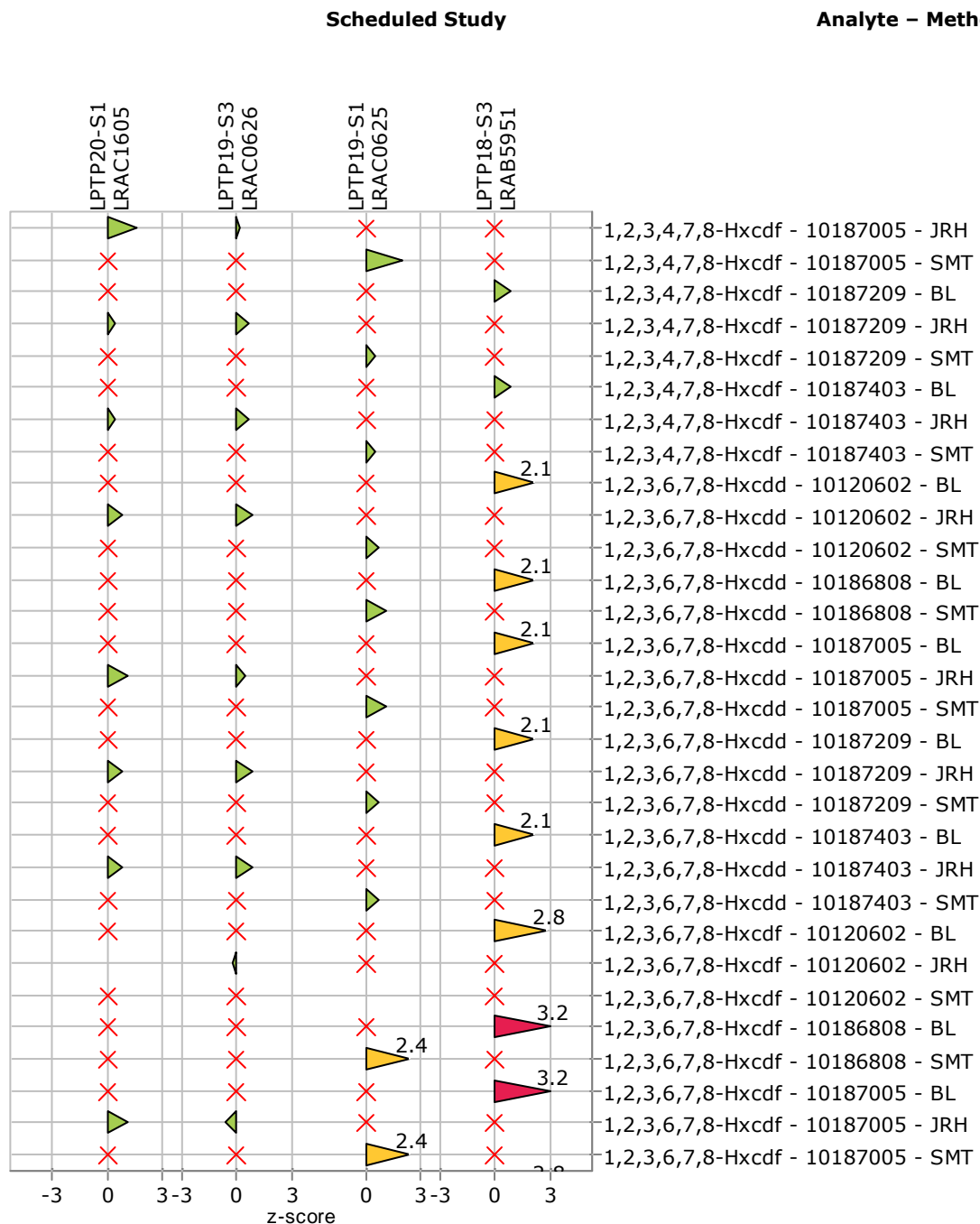
z-score Overview* for LPTP20-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

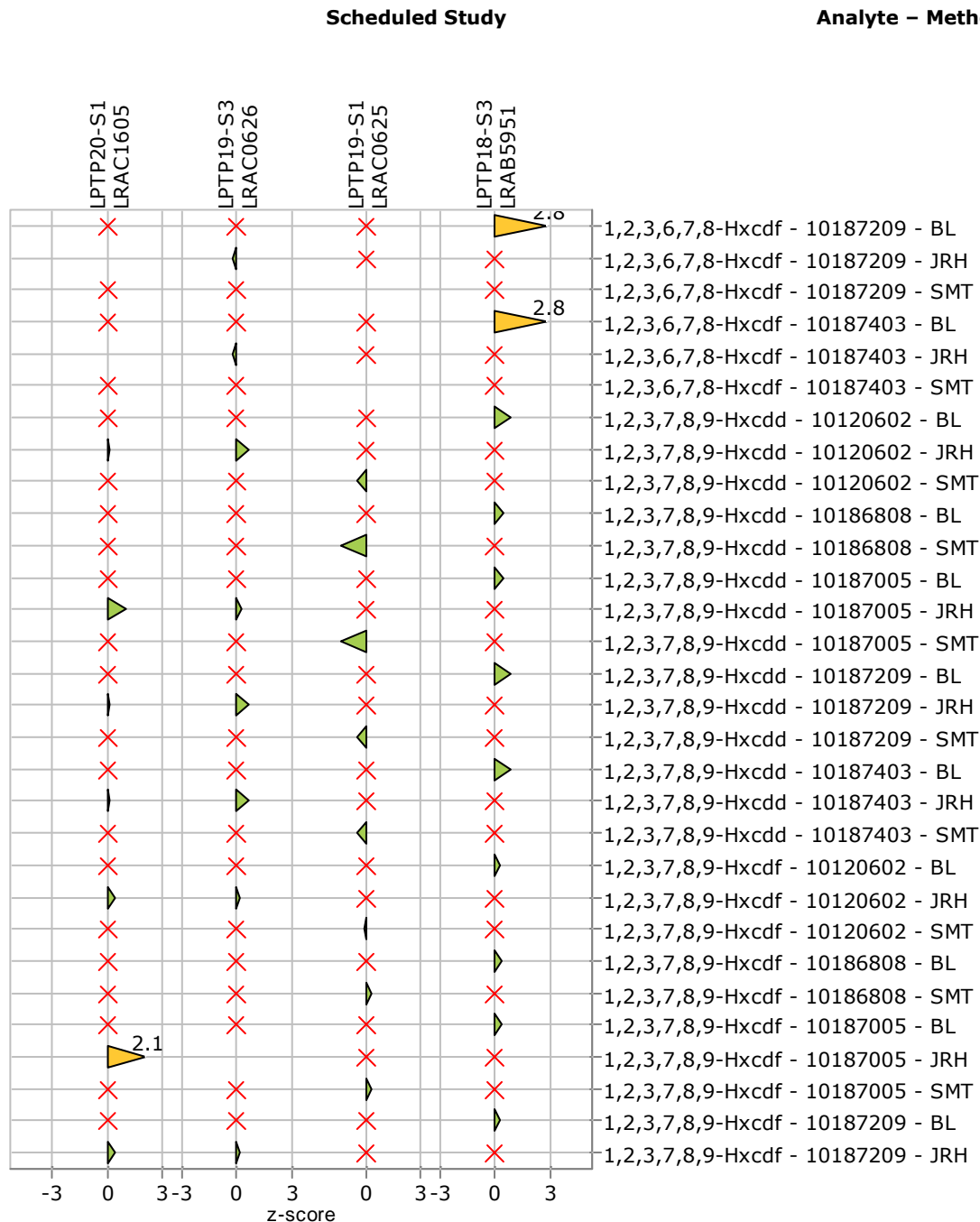
z-score Overview* for LPTP20-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

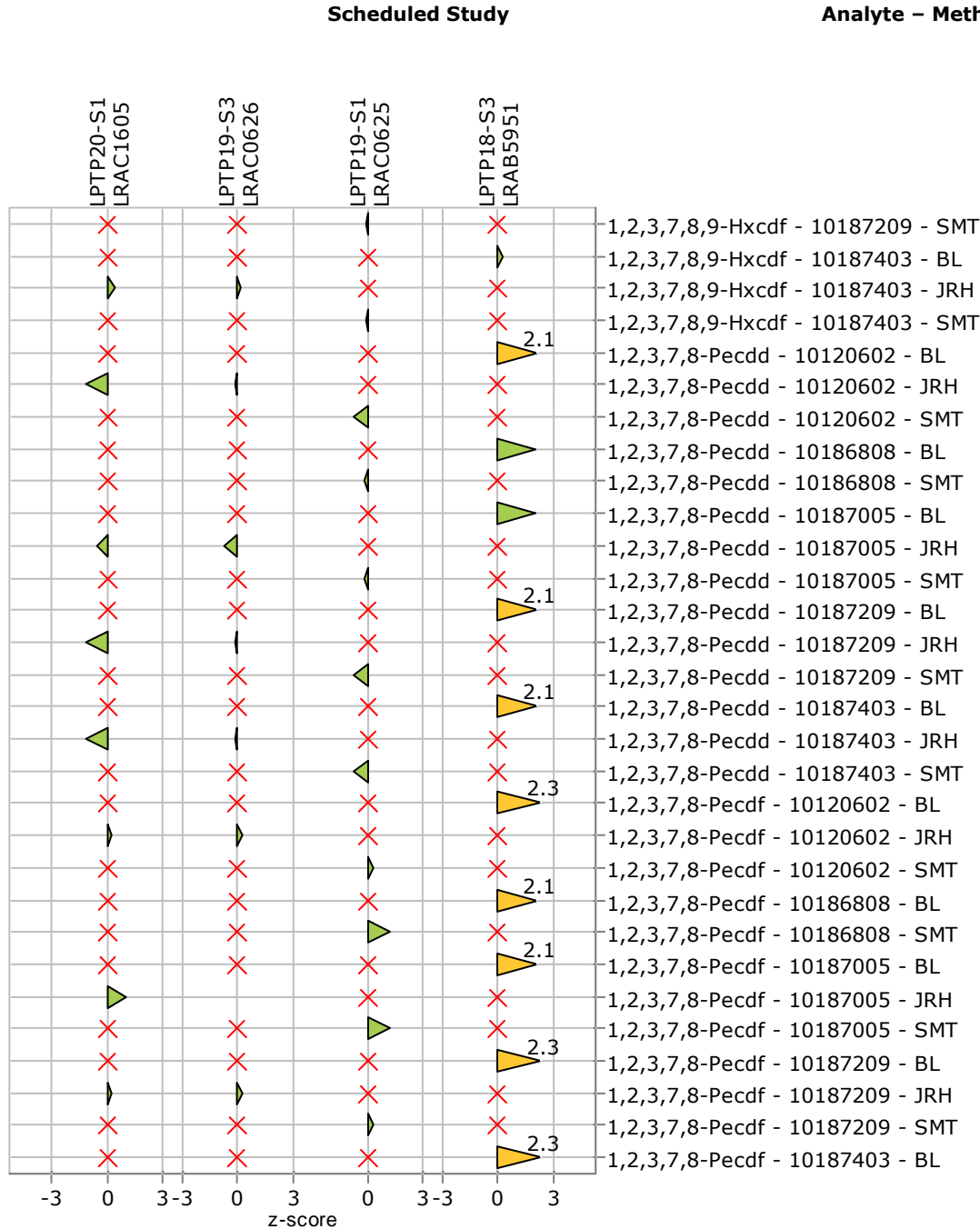
z-score Overview* for LPTP20-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

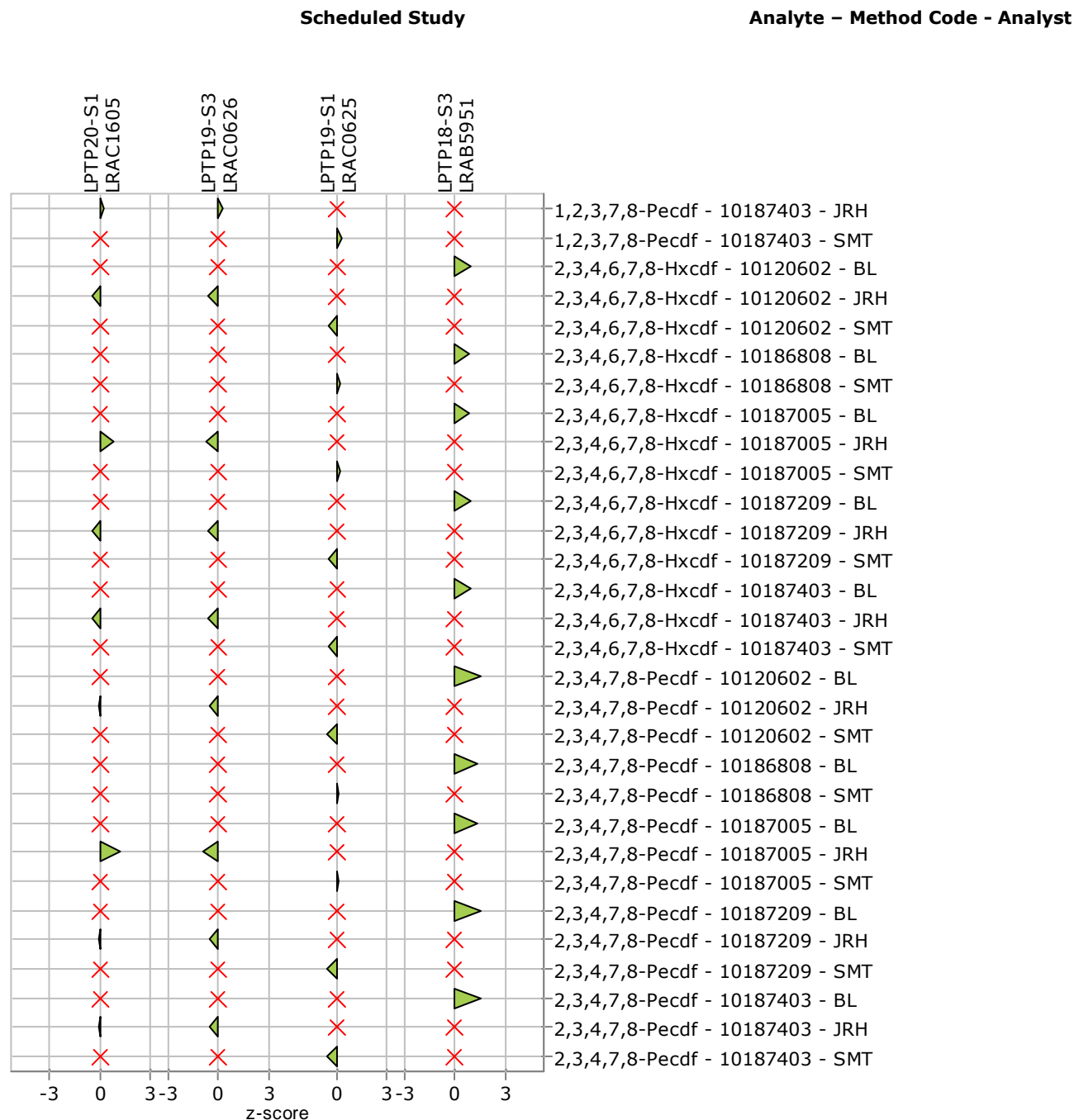
z-score Overview* for LPTP20-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

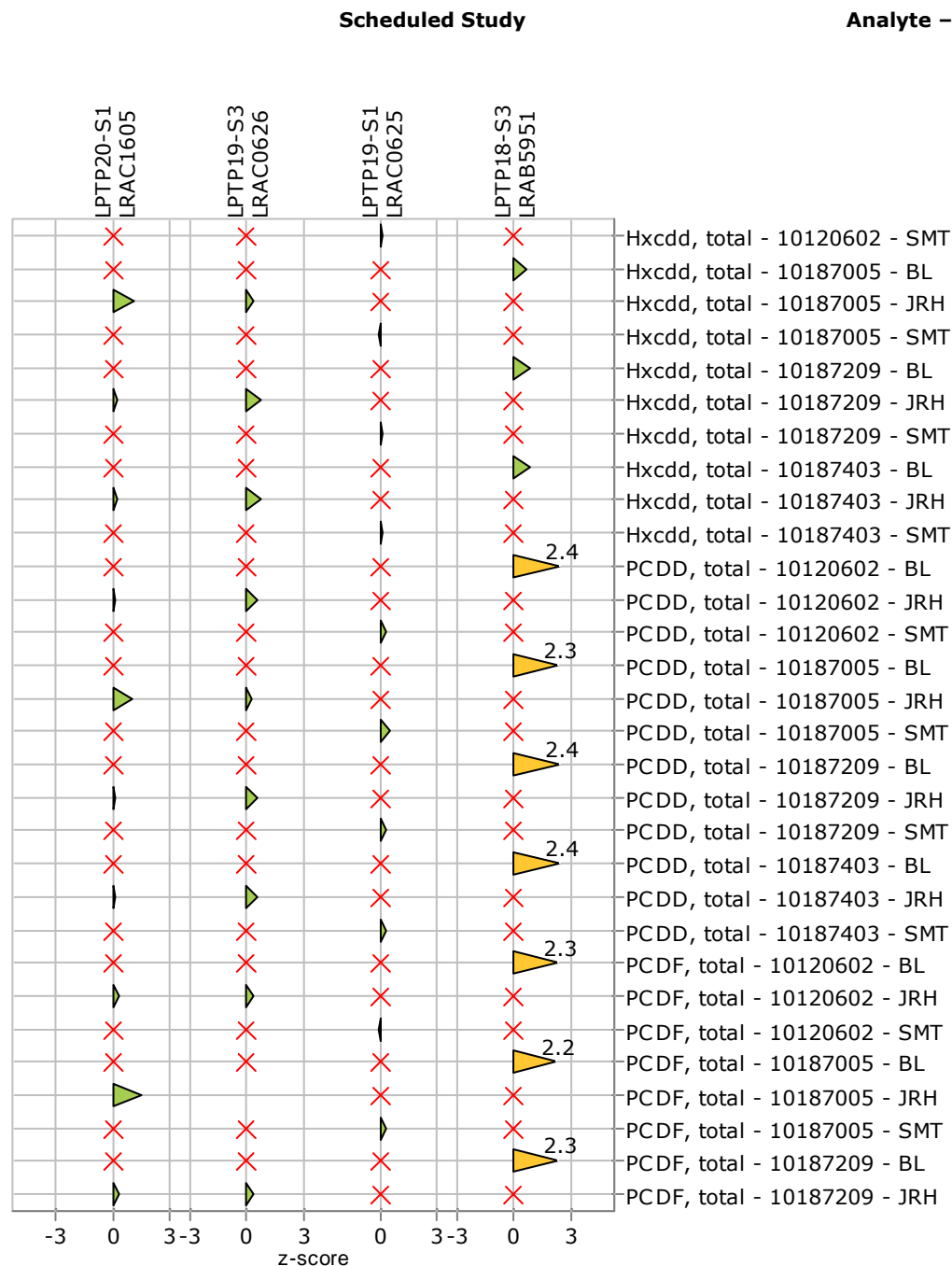
z-score Overview* for LPTP20-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

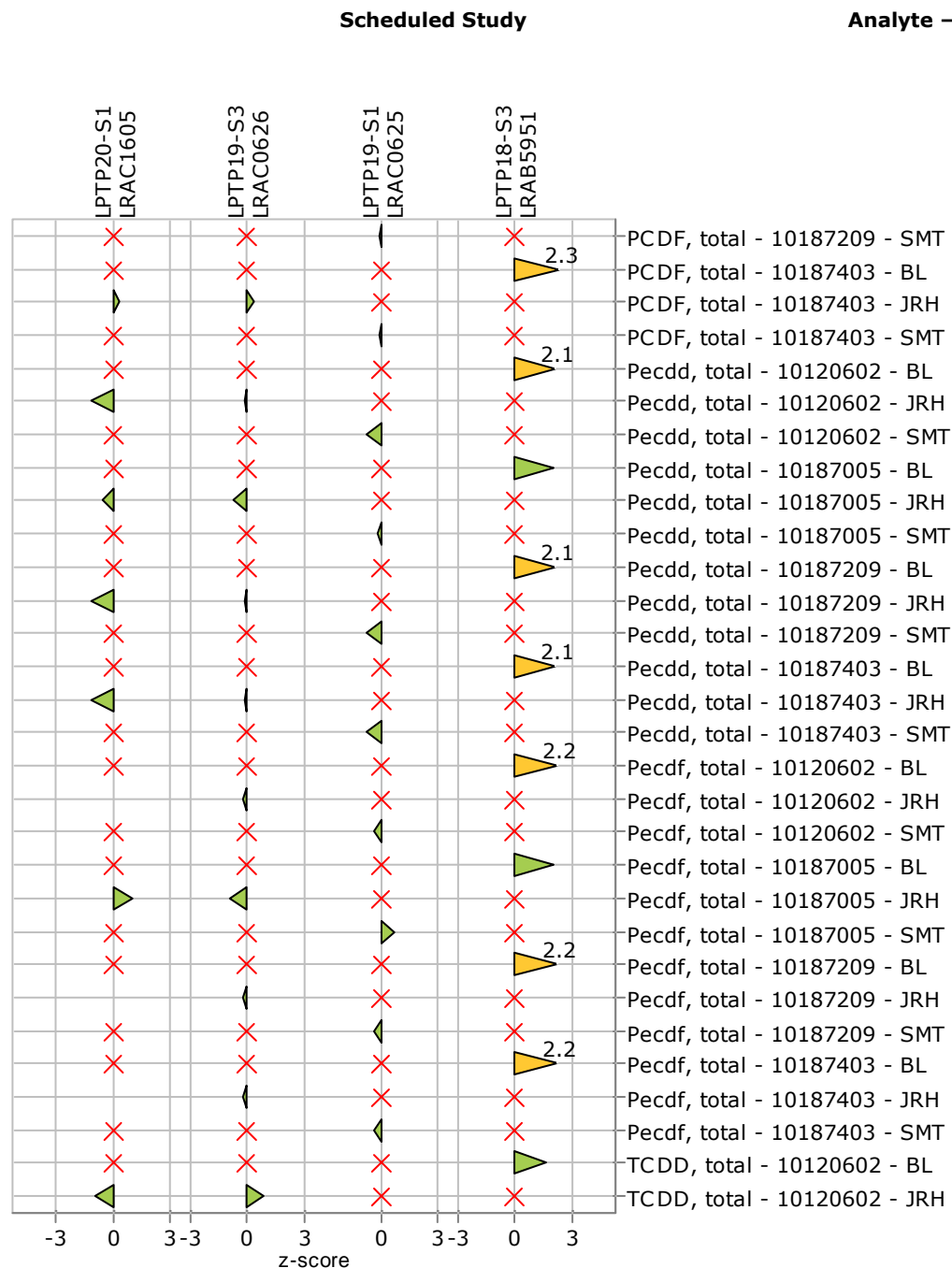
z-score Overview* for LPTP20-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

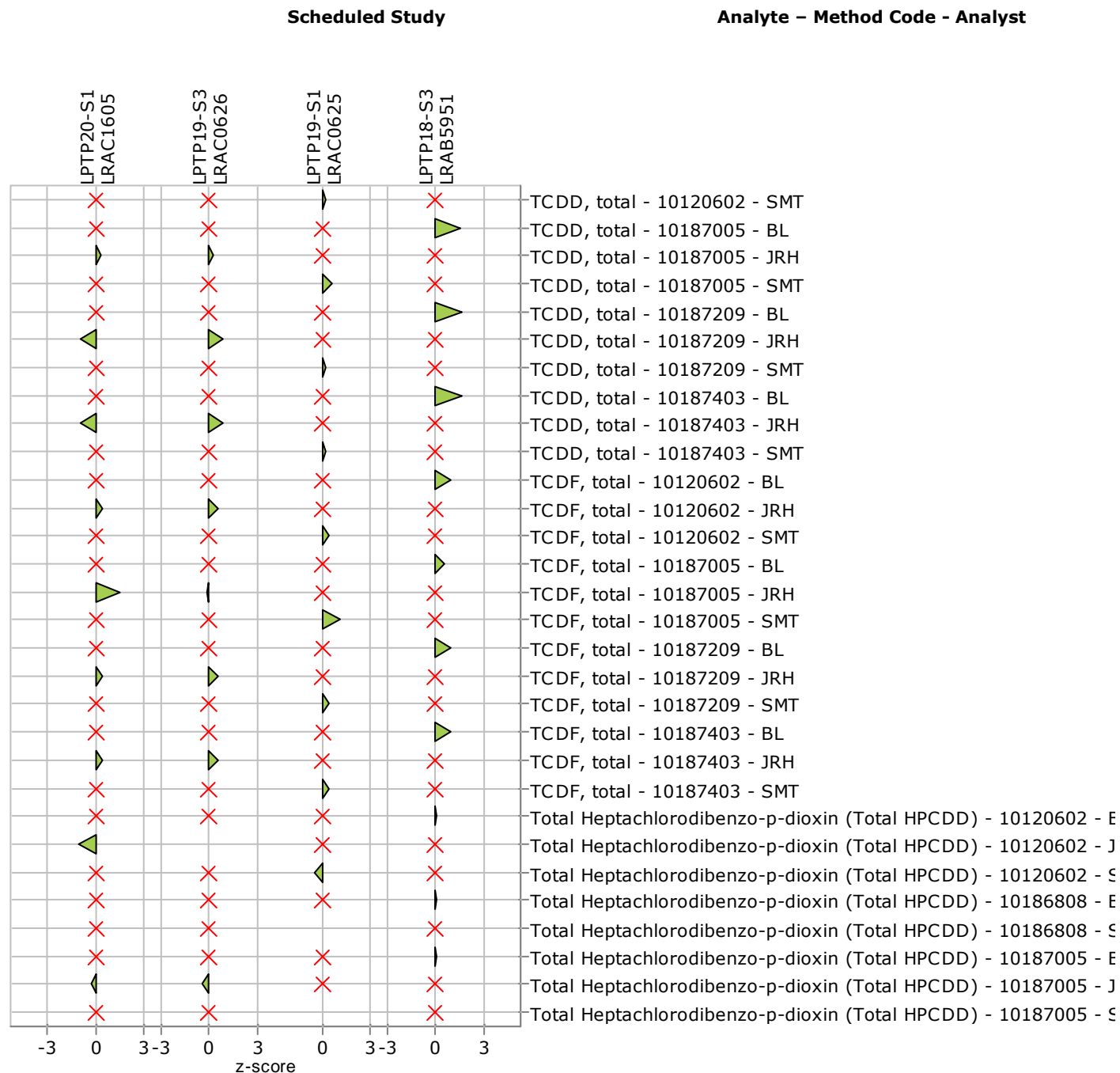
z-score Overview* for LPTP20-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S1 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

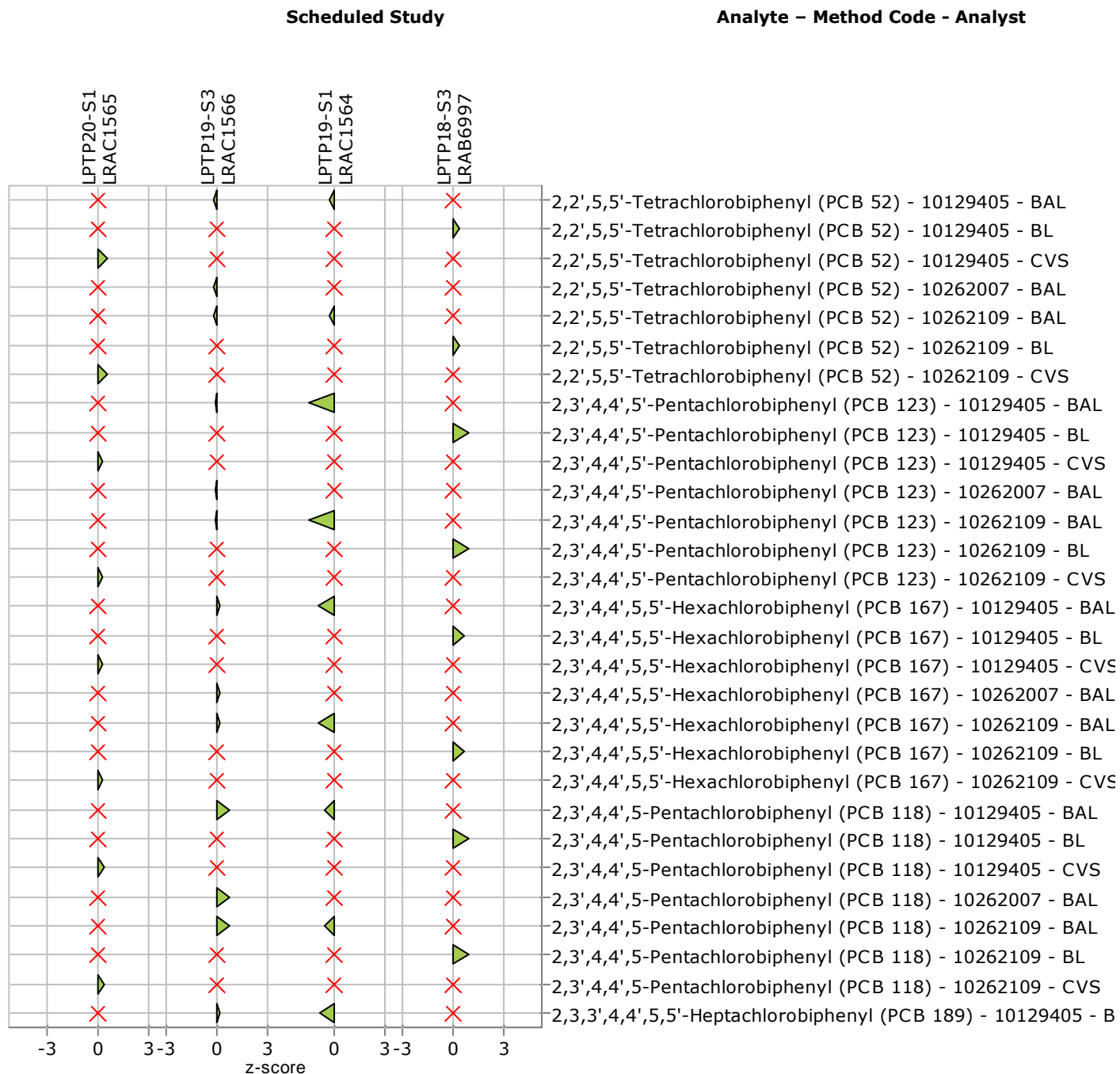
z-score Overview* for LPTP20-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S1 SPE068-50G PCB Congeners in Soil - PT

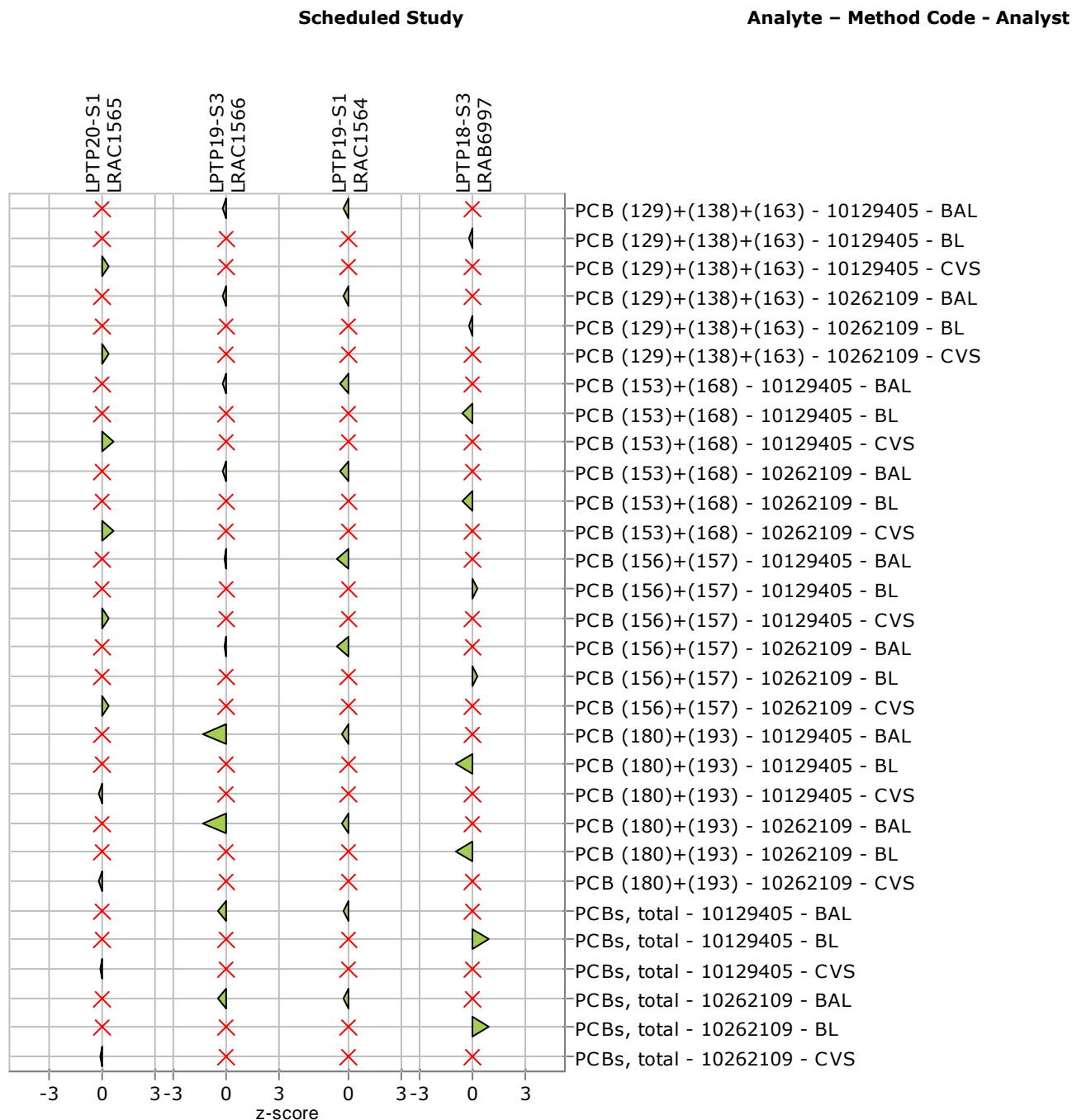
z-score Overview* for LPTP20-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S1 SPE068-50G PCB Congeners in Soil - PT [Continuation]

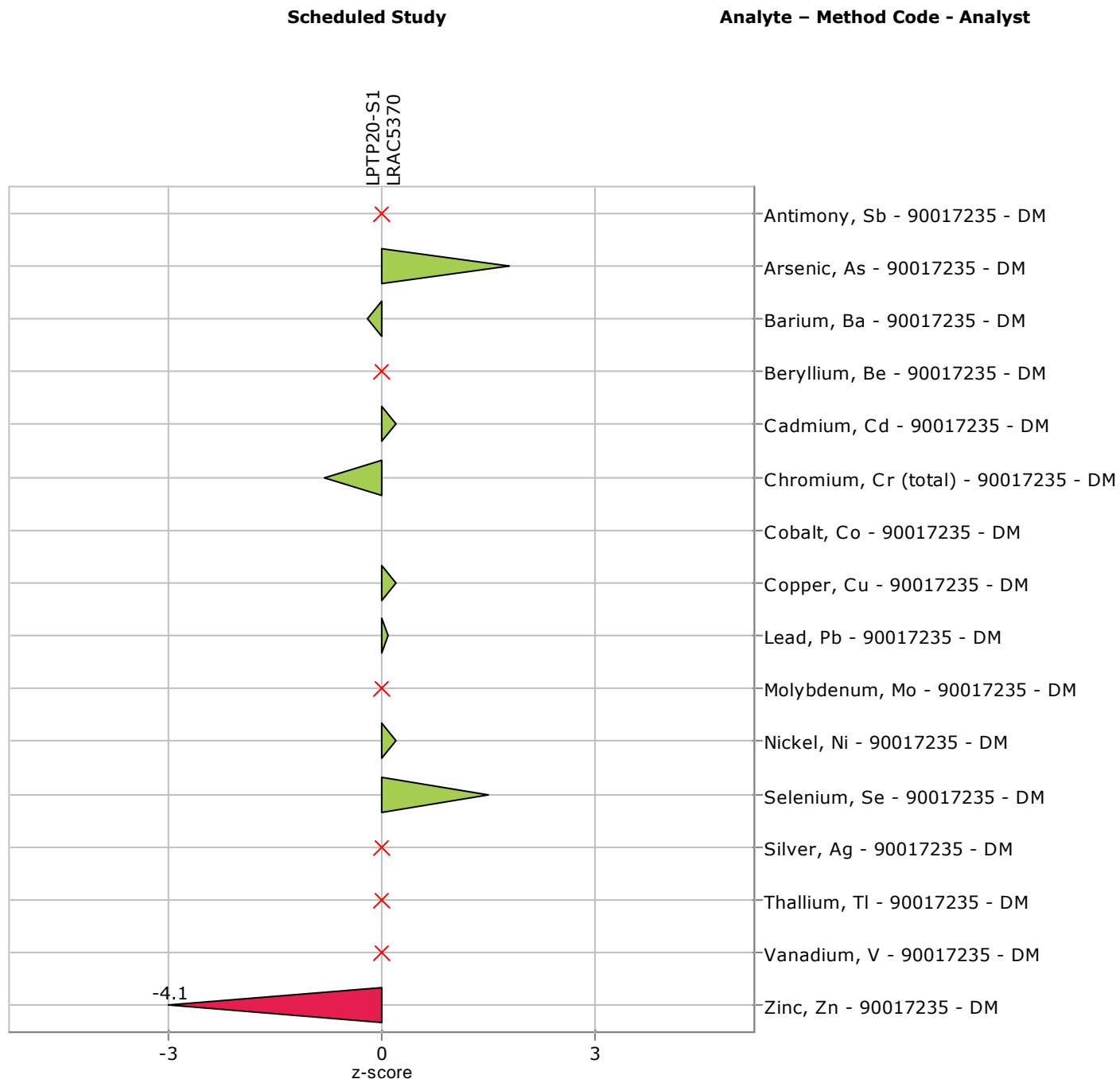
z-score Overview* for LPTP20-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S1 SPE006-225G STLC Metals CA - WET in Soil - PT

z-score Overview* for LPTP20-S1 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

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1 Aim of the Proficiency Test

This interlaboratory study is a proficiency test for the assessment of laboratory performance. It was conducted in the framework of external quality assurance and the report provides an external appraisal of the participant laboratories' competence in the particular testing field.

2 Sample Information

SPE016-10G Dioxin and Furans in Soil - PT LRAC1605

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
1,2,3,4,6,7,8-Hpcdf 9420	pg/g	547 ± 16.0	---	188	23.8
1,2,3,4,7,8,9-Hpcdf 9423	pg/g	198 ± 6.00	---	577	64.8
1,2,3,4,6,7,8-Hpcdd 9426	pg/g	749 ± 23.0	---	325	38.6
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) 9438	pg/g	749 ± 23.0	---	332	44.0
Total Heptachlorodibenzofuran (Total HPCDF) 9444	pg/g	745 ± 22.0	---	765	75.5
1,2,3,4,7,8-Hxcdd 9453	pg/g	674 ± 20.0	---	847	115
1,2,3,6,7,8-Hxcdd 9456	pg/g	220 ± 7.00	---	1060	127
1,2,3,7,8,9-Hxcdd 9459	pg/g	588 ± 18.0	---	1860	261
Hxcdd, total 9468	pg/g	1480 ± 44.0	---	3770	503
1,2,3,4,7,8-Hxcdf 9471	pg/g	178 ± 5.00	---	672	66.3
1,2,3,6,7,8-Hxcdf 9474	pg/g	855 ± 26.0	---	493	50.3
1,2,3,7,8,9-Hxcdf 9477	pg/g	889 ± 27.0	---	419	38.4
2,3,4,6,7,8-Hxcdf 9480	pg/g	765 ± 23.0	---	831	95.4
Total Hexachlorodibenzofuran (Total HxCDF) 9483	pg/g	2690 ± 81.0	---	2410	244
1,2,3,4,6,7,8,9-OCDF 9516	pg/g	459 ± 14.0	---	544	84.0
1,2,3,4,6,7,8,9-OCDD 9519	pg/g	817 ± 25.0	---	1150	130
1,2,3,7,8-Pecdd 9540	pg/g	389 ± 12.0	---	770	71.8
1,2,3,7,8-Pecdf 9543	pg/g	353 ± 11.0	---	948	120
2,3,4,7,8-Pecdf 9549	pg/g	772 ± 23.0	---	1010	105

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
Pecdf, total 9552	pg/g	1120 ± 34.0	---	1980	219
Pecdd, total 9555	pg/g	389 ± 12.0	---	774	77.2
TCDD, total 9609	pg/g	494 ± 15.0	---	695	64.1
2,3,7,8-TCDF 9612	pg/g	103 ± 3.00	---	737	62.5
TCDF, total 9615	pg/g	103 ± 3.00	---	757	82.0
2,3,7,8-Tetrachloro dibenzo- p- dioxin (TCDD) 9618	pg/g	494 ± 15.0	---	694	61.5
PCDF, total 9657	pg/g	4660 ± 140	---	6310	655
PCDD, total 9660	pg/g	3930 ± 118	---	6540	770

SPE068-50G PCB Congeners in Soil - PT LRAC1565

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
PCBs, total 8870	ug/Kg	3160	---	3130	362
PCB (20)+(28) 8936	ug/Kg	53.7 ± 1.61	---	47.3	8.19
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) 8955	ug/Kg	56.9 ± 1.71	---	47.5	9.10
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) 8965	ug/Kg	130 ± 3.90	---	125	22.3
3,4,4',5-Tetrachlorobiphenyl (PCB 81) 8970	ug/Kg	392 ± 11.8	---	333	74.0
PCB (90)+(101)+(113) 8982	ug/Kg	141 ± 4.24	---	123	22.2
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) 8985	ug/Kg	287 ± 8.60	---	265	61.1
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) 8995	ug/Kg	354 ± 10.6	---	325	57.3
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) 9000	ug/Kg	78.0 ± 2.34	---	57.7	12.9

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) 9005	ug/Kg	37.9 ± 1.14	---	38.1	7.79
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) 9015	ug/Kg	110 ± 3.30	---	111	24.9
PCB (129)+(138)+(163) 9026	ug/Kg	198 ± 5.94	---	165	33.4
PCB (153)+(168) 9041	ug/Kg	170 ± 5.10	---	143	21.8
PCB (156)+(157) 9046	ug/Kg	574 ± 17.2	---	529	121
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) 9055	ug/Kg	142 ± 4.26	---	170	44.1
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) 9060	ug/Kg	264 ± 7.93	---	232	54.2
PCB (180)+(193) 9070	ug/Kg	181 ± 5.42	---	151	22.2
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) 9085	ug/Kg	40.9 ± 1.23	---	42.6	8.68

SPE006-225G STLC Metals CA - WET in Soil - PT LRAC5370

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
Antimony, Sb 1005	mg/L	1.35	5.00	---	---
Arsenic, As 1010	mg/L	57.2 ± 0.553	5.00	62.6	10.6
Barium, Ba 1015	mg/L	70.5 ± 0.683	5.00	55.6	6.23
Beryllium, Be 1020	mg/L	0	5.00	---	---
Cadmium, Cd 1030	mg/L	28.7	1.00	30.3	3.37
Chromium, Cr (total) 1040	mg/L	43.5	5.00	37.3	4.79
Cobalt, Co 1050	mg/L	25.5	5.00	26.1	2.01
Copper, Cu 1055	mg/L	15.1	5.00	13.4	1.85
Lead, Pb 1075	mg/L	136	5.00	120	27.1

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
Molybdenum, Mo 1100	mg/L	0	5.00	---	---
Nickel, Ni 1105	mg/L	22.9	5.00	23.1	2.59
Selenium, Se 1140	mg/L	119	5.00	123	9.44
Silver, Ag 1150	mg/L	0	5.00	---	---
Thallium, Tl 1165	mg/L	0	5.00	---	---
Vanadium, V 1185	mg/L	0	5.00	---	---
Zinc, Zn 1190	mg/L	0.437	5.00	---	---

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

3 Data Availability

SPE016-10G Dioxin and Furans in Soil - PT LRAC1605

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
1,2,3,4,6,7,8-Hpcdf 9420	19	19	48	48
1,2,3,4,7,8,9-Hpcdf 9423	19	19	48	48
1,2,3,4,6,7,8-Hpcdd 9426	19	19	48	48
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) 9438	18	18	47	47
Total Heptachlorodibenzofuran (Total HPCDF) 9444	18	18	47	47
1,2,3,4,7,8-Hxcdd 9453	19	19	48	48
1,2,3,6,7,8-Hxcdd 9456	19	19	48	48
1,2,3,7,8,9-Hxcdd 9459	19	19	48	48
Hxcdd, total 9468	18	18	47	47
1,2,3,4,7,8-Hxcdf 9471	19	19	48	48
1,2,3,6,7,8-Hxcdf 9474	19	19	48	48
1,2,3,7,8,9-Hxcdf 9477	19	19	48	48
2,3,4,6,7,8-Hxcdf 9480	19	19	48	48
Total Hexachlorodibenzofuran (Total HxCDF) 9483	18	18	47	47
1,2,3,4,6,7,8,9-OCDF 9516	19	19	48	48
1,2,3,4,6,7,8,9-OCDD 9519	19	19	48	48
1,2,3,7,8-Pecdd 9540	19	19	48	48
1,2,3,7,8-Pecdf 9543	19	19	48	48

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
2,3,4,7,8-Pecdf 9549	19	19	48	48
Pecdf, total 9552	18	18	47	47
Pecdd, total 9555	18	18	47	47
TCDD, total 9609	18	18	47	47
2,3,7,8-TCDF 9612	19	19	48	48
TCDF, total 9615	18	18	47	47
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) 9618	19	19	48	48
PCDF, total 9657	14	14	37	37
PCDD, total 9660	14	14	37	37

SPE068-50G PCB Congeners in Soil - PT LRAC1565

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
PCBs, total 8870	11	11	16	16
PCB (20)+(28) 8936	13	13	20	20
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) 8955	24	24	31	31
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) 8965	19	19	27	27
3,4,4',5-Tetrachlorobiphenyl (PCB 81) 8970	17	17	25	25
PCB (90)+(101)+(113) 8982	15	15	23	23
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) 8985	20	19	28	27
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) 8995	25	25	33	33

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) 9000	16	16	24	24
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) 9005	16	16	24	24
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) 9015	19	19	27	27
PCB (129)+(138)+(163) 9026	14	14	22	22
PCB (153)+(168) 9041	13	13	20	20
PCB (156)+(157) 9046	12	12	19	19
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) 9055	16	16	24	24
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) 9060	18	18	26	26
PCB (180)+(193) 9070	13	13	20	20
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) 9085	16	16	24	24

SPE006-225G STLC Metals CA - WET in Soil - PT LRAC5370

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
Arsenic, As 1010	6	6	13	13
Barium, Ba 1015	6	6	13	13
Beryllium, Be 1020	5	2	11	4
Cadmium, Cd 1030	6	6	13	13
Chromium, Cr (total) 1040	6	6	13	13

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
Cobalt, Co 1050	6	6	13	13
Copper, Cu 1055	6	6	13	13
Lead, Pb 1075	6	6	13	13
Molybdenum, Mo 1100	5	2	11	4
Nickel, Ni 1105	6	6	13	13
Selenium, Se 1140	6	6	13	13
Silver, Ag 1150	5	3	11	5
Thallium, Tl 1165	5	2	11	2
Vanadium, V 1185	6	4	12	8
Zinc, Zn 1190	6	5	12	7

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

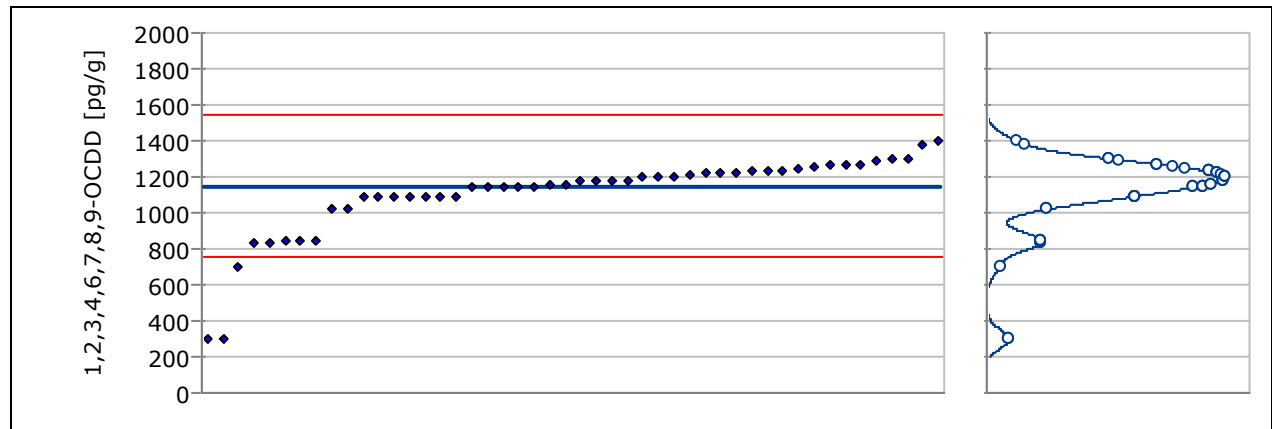
4 Results

4.1 SPE016-10G Dioxin and Furans in Soil - PT / LRAC1605

This proficiency testing sample was produced in accordance with ISO/IEC 17043:2010.

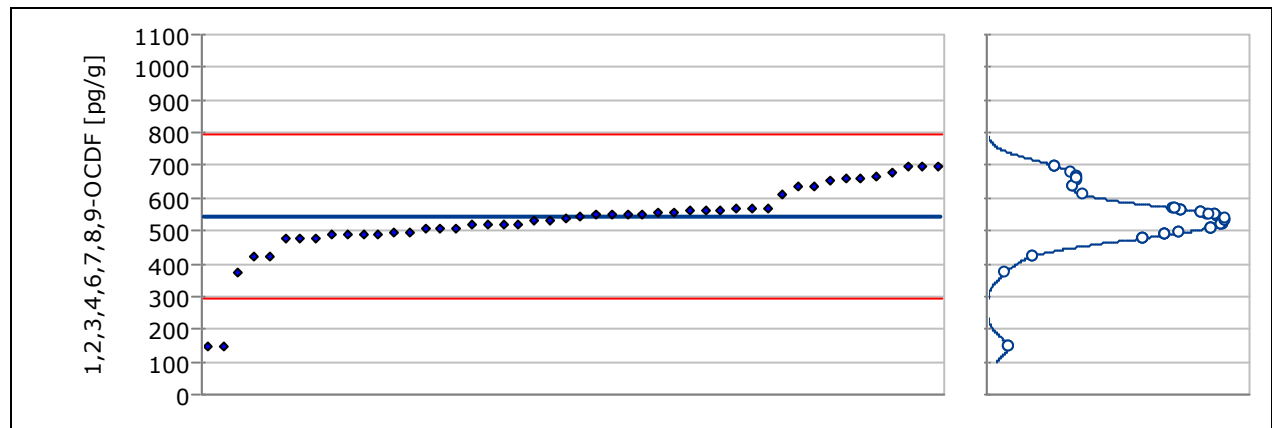
4.1.1 1,2,3,4,6,7,8,9-OCDD

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	1150 pg/g
Proficiency std. dev.	130 pg/g
Acceptance window	757 - 1540 pg/g



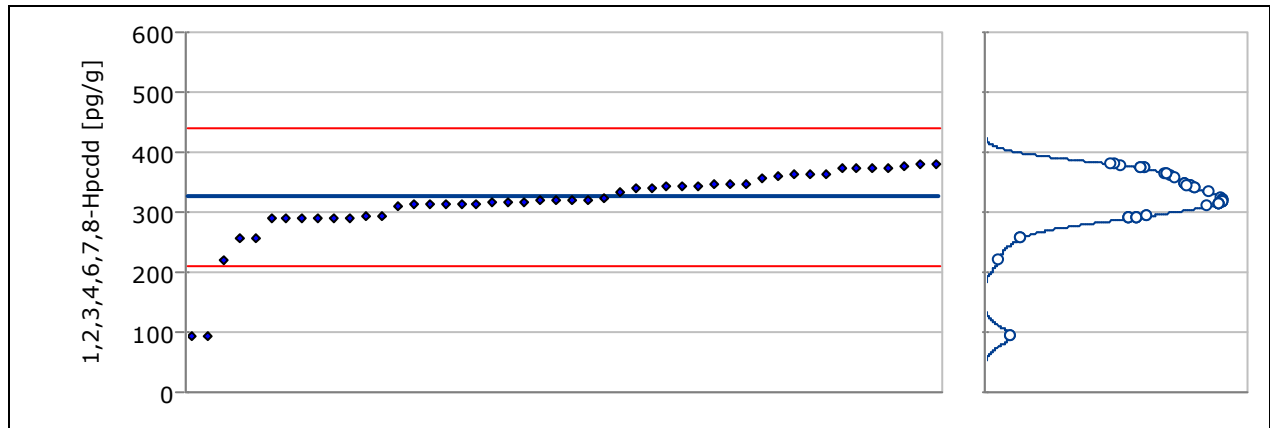
4.1.2 1,2,3,4,6,7,8,9-OCDF

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	544 pg/g
Proficiency std. dev.	84.0 pg/g
Acceptance window	292 - 796 pg/g

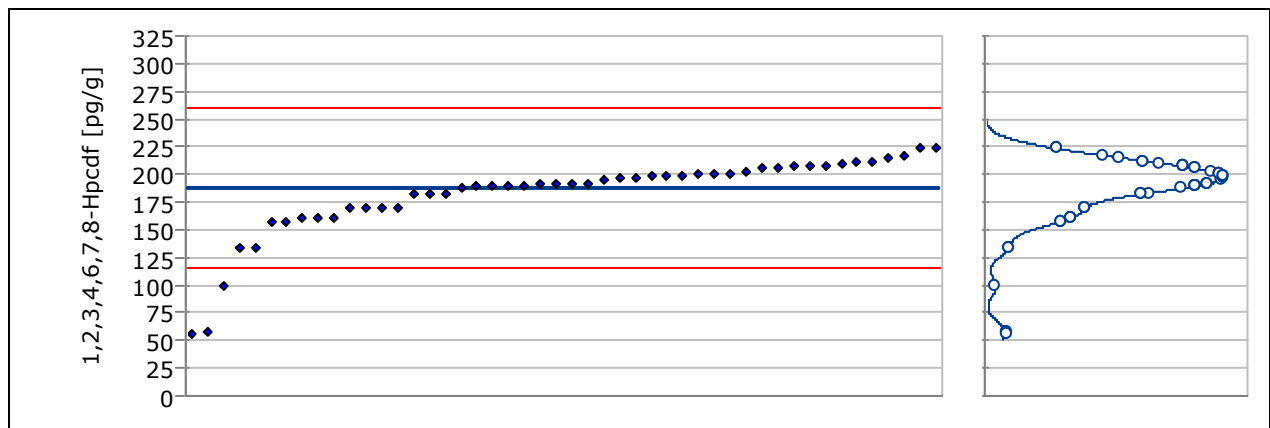


4.1.3 1,2,3,4,6,7,8-Hpcdd

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	325 pg/g
Proficiency std. dev.	38.6 pg/g
Acceptance window	210 - 441 pg/g

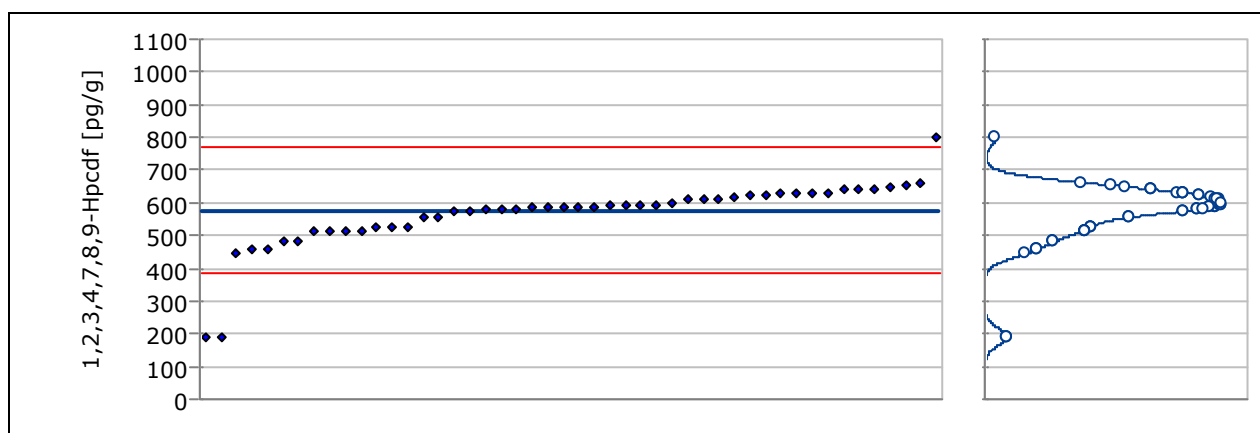
**4.1.4 1,2,3,4,6,7,8-Hpcdf**

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	188 pg/g
Proficiency std. dev.	23.8 pg/g
Acceptance window	116 - 259 pg/g

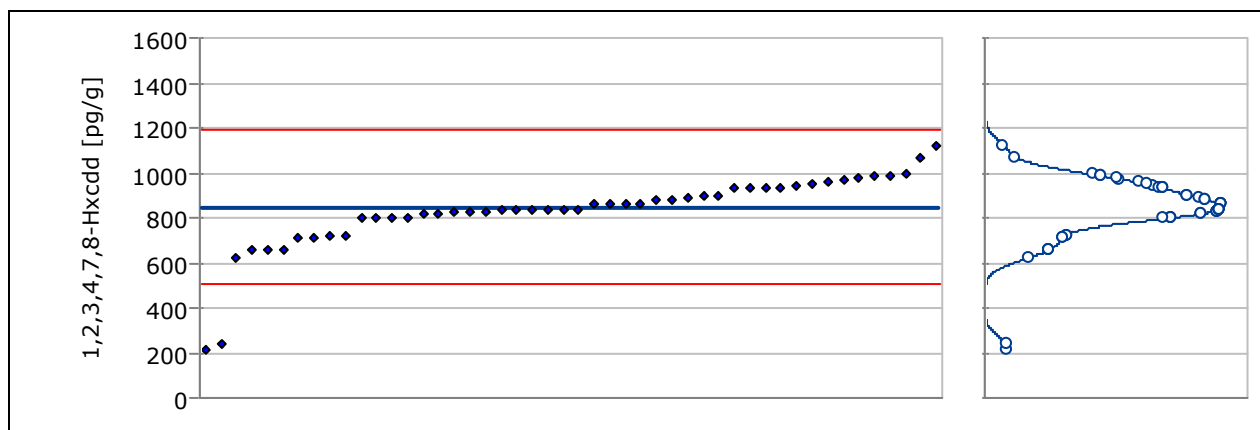


4.1.5 1,2,3,4,7,8,9-Hpcdf

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	577 pg/g
Proficiency std. dev.	64.8 pg/g
Acceptance window	382 - 771 pg/g

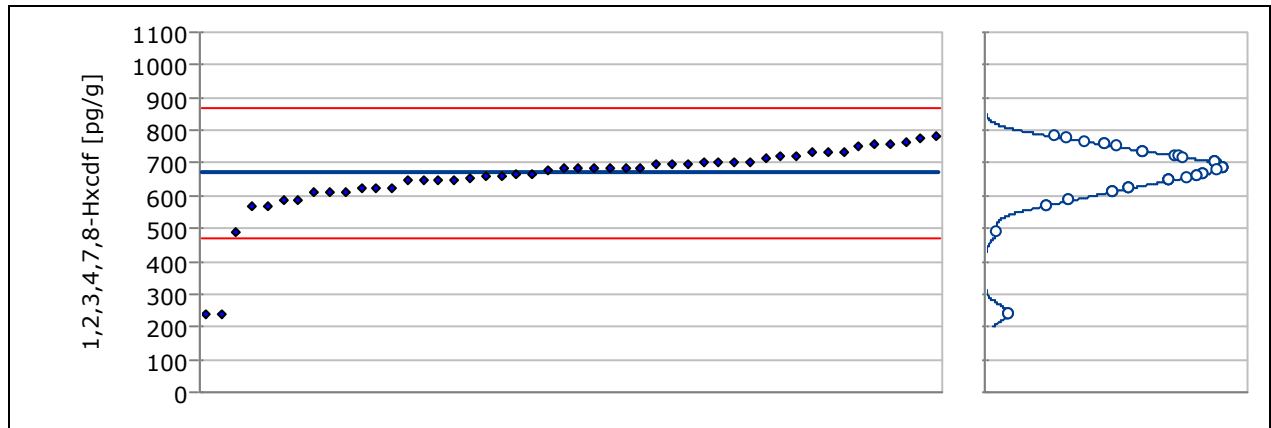
**4.1.6 1,2,3,4,7,8-Hxcdd**

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	847 pg/g
Proficiency std. dev.	115 pg/g
Acceptance window	503 - 1190 pg/g

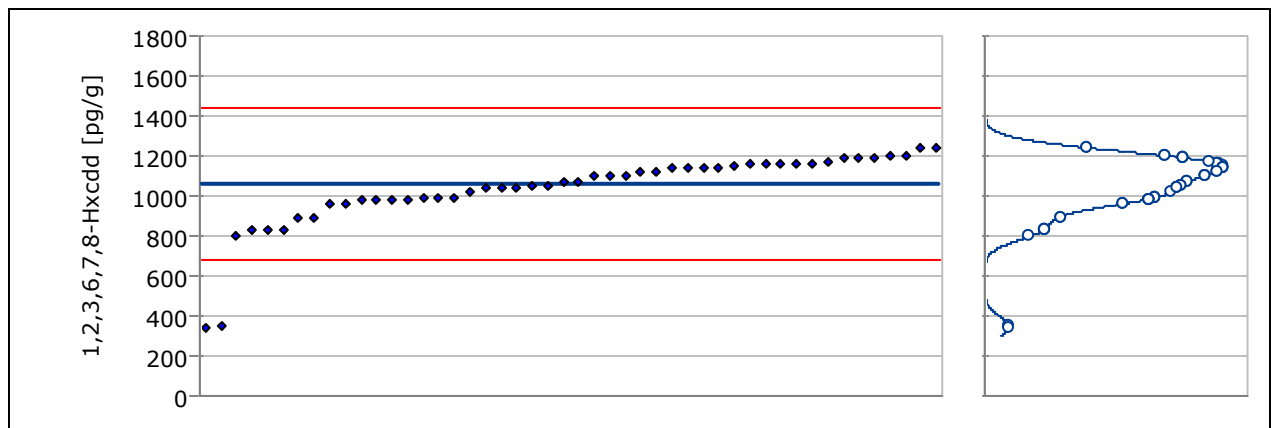


4.1.7 1,2,3,4,7,8-Hxcdf

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	672 pg/g
Proficiency std. dev.	66.3 pg/g
Acceptance window	473 - 871 pg/g

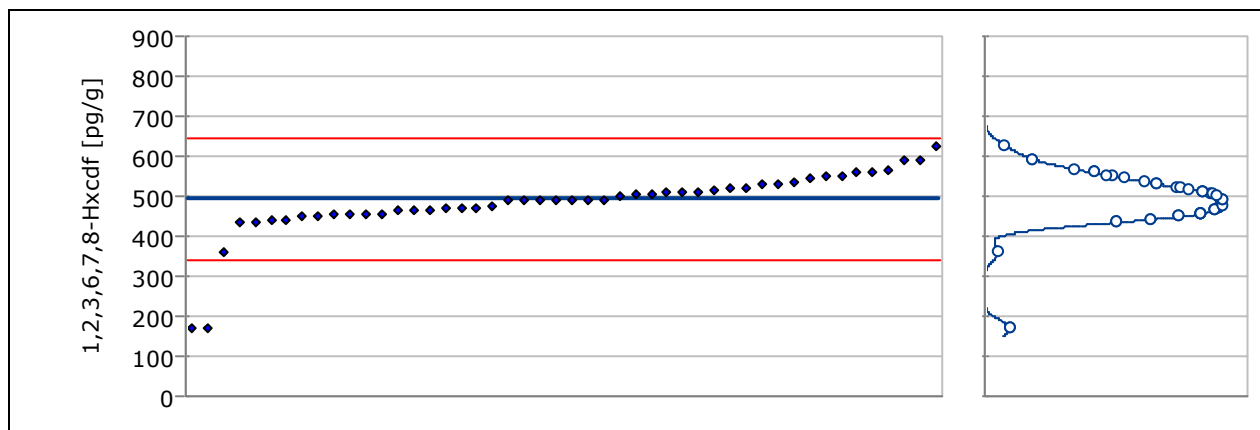
**4.1.8 1,2,3,6,7,8-Hxcdd**

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	1060 pg/g
Proficiency std. dev.	127 pg/g
Acceptance window	679 - 1440 pg/g

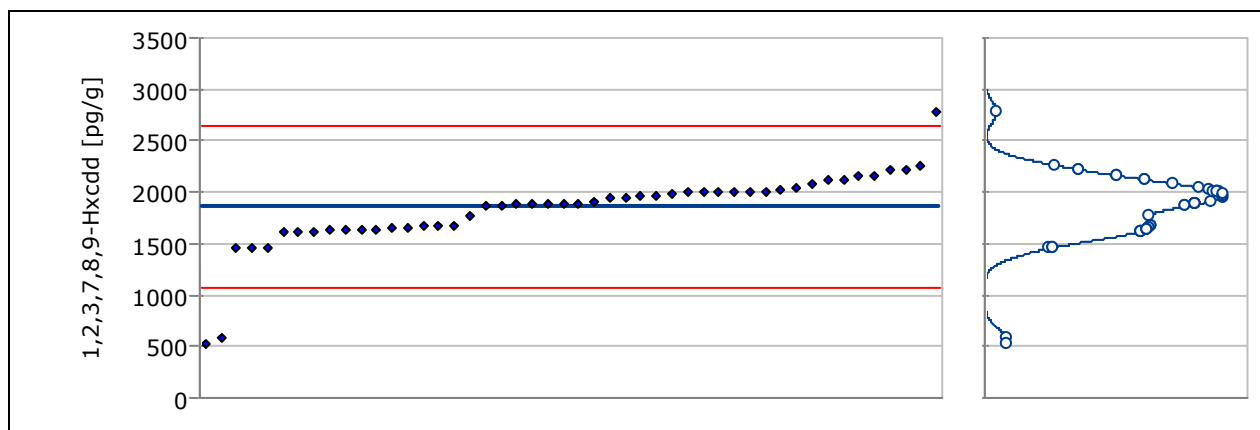


4.1.9 1,2,3,6,7,8-Hxcdf

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	493 pg/g
Proficiency std. dev.	50.3 pg/g
Acceptance window	342 - 644 pg/g

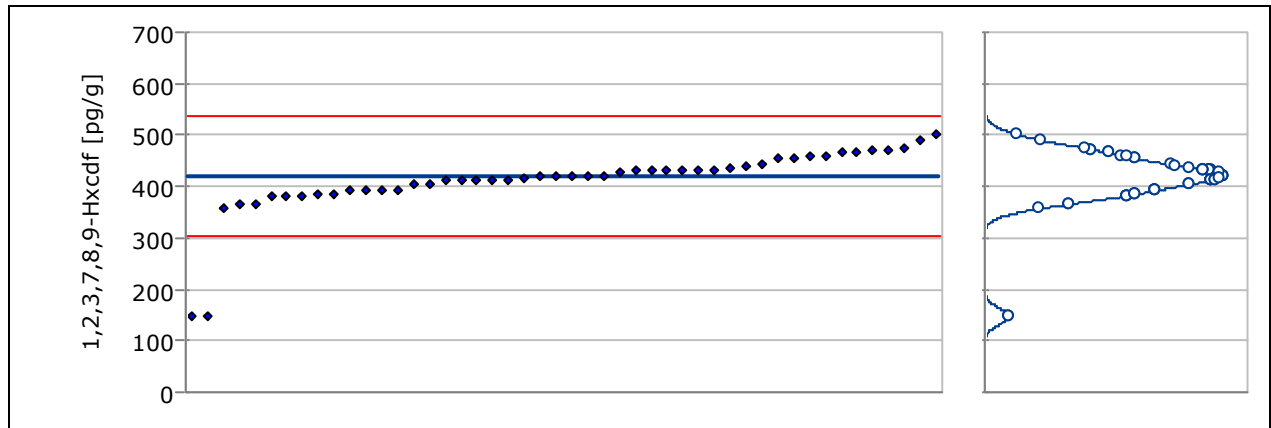
**4.1.10 1,2,3,7,8,9-Hxcdd**

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	1860 pg/g
Proficiency std. dev.	261 pg/g
Acceptance window	1080 - 2640 pg/g

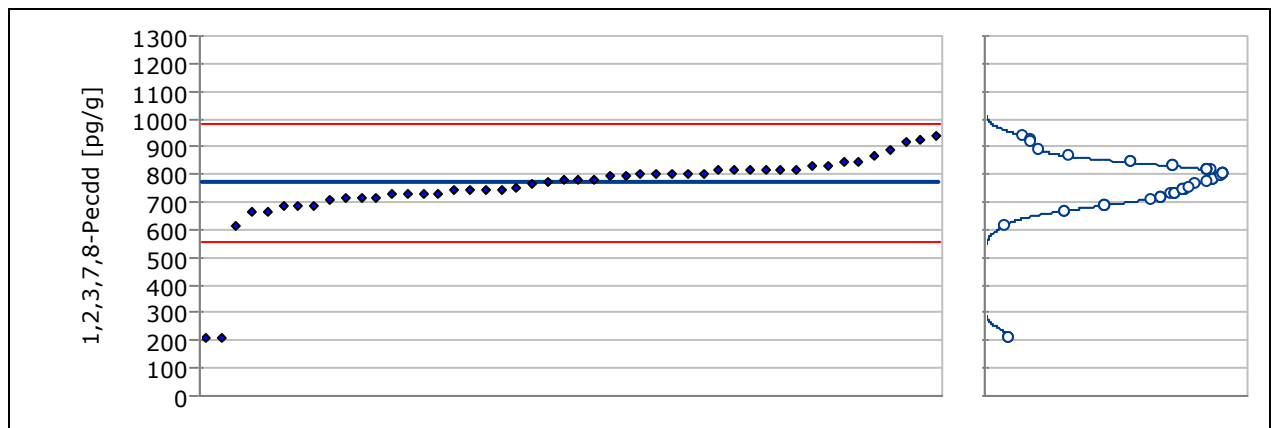


4.1.11 1,2,3,7,8,9-Hxcdf

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	419 pg/g
Proficiency std. dev.	38.4 pg/g
Acceptance window	304 - 535 pg/g

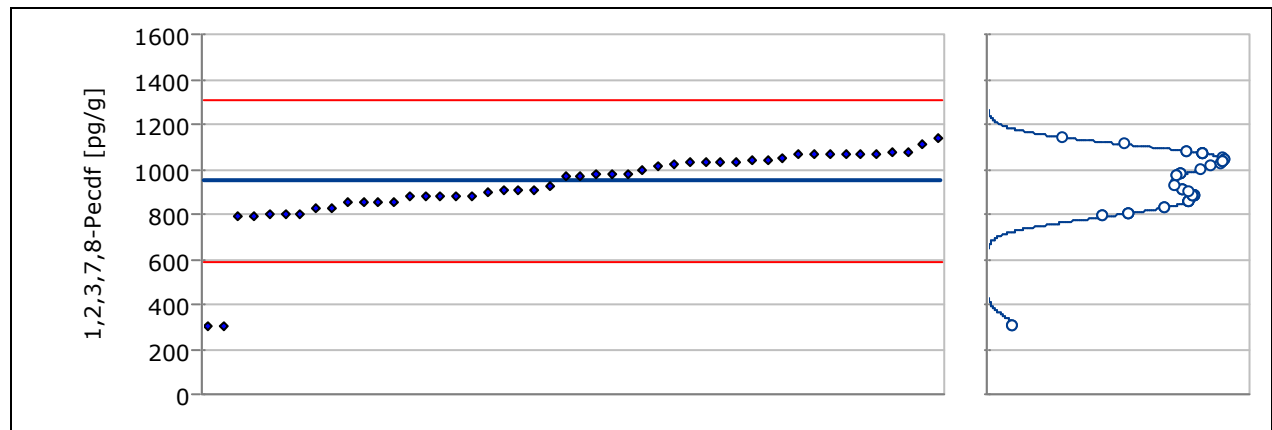
**4.1.12 1,2,3,7,8-Pecdd**

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	770 pg/g
Proficiency std. dev.	71.8 pg/g
Acceptance window	555 - 986 pg/g

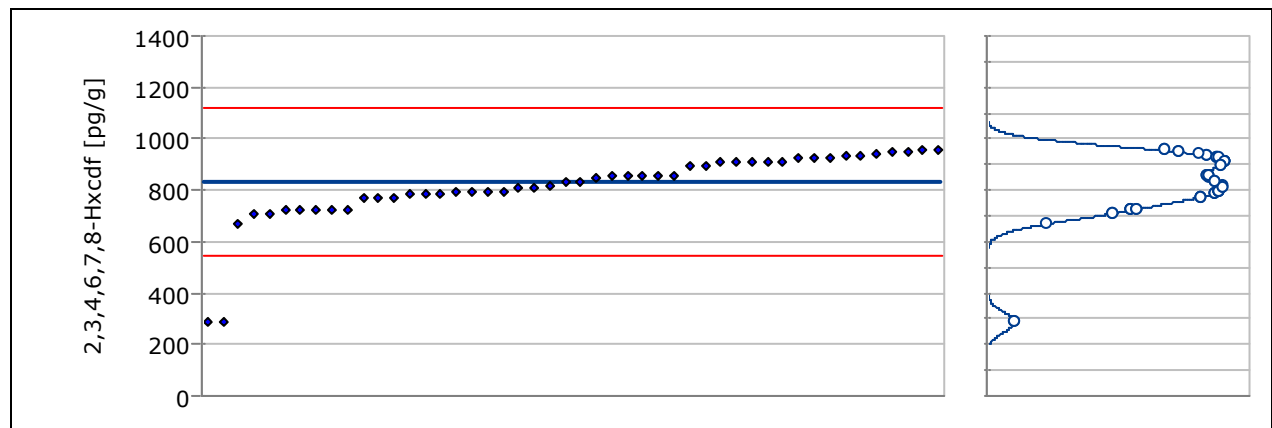


4.1.13 1,2,3,7,8-Pecdf

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	948 pg/g
Proficiency std. dev.	120 pg/g
Acceptance window	588 - 1310 pg/g

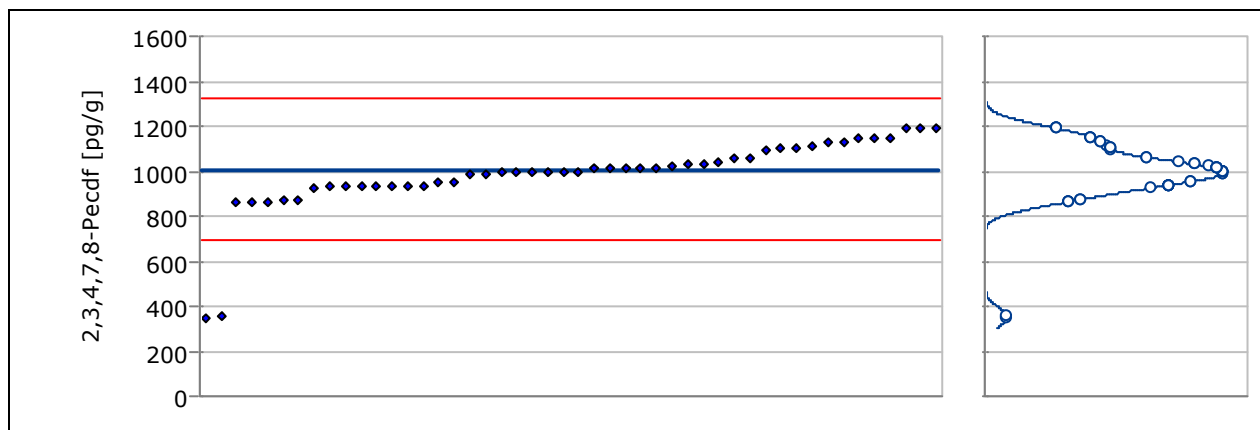
**4.1.14 2,3,4,6,7,8-Hxcdf**

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	831 pg/g
Proficiency std. dev.	95.4 pg/g
Acceptance window	545 - 1120 pg/g

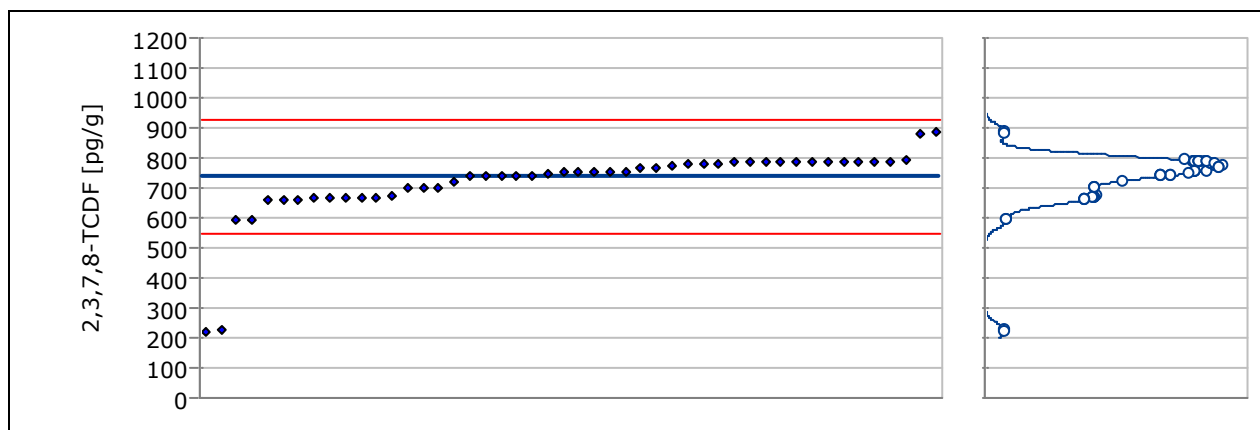


4.1.15 2,3,4,7,8-Pecdf

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	1010 pg/g
Proficiency std. dev.	105 pg/g
Acceptance window	691 - 1320 pg/g

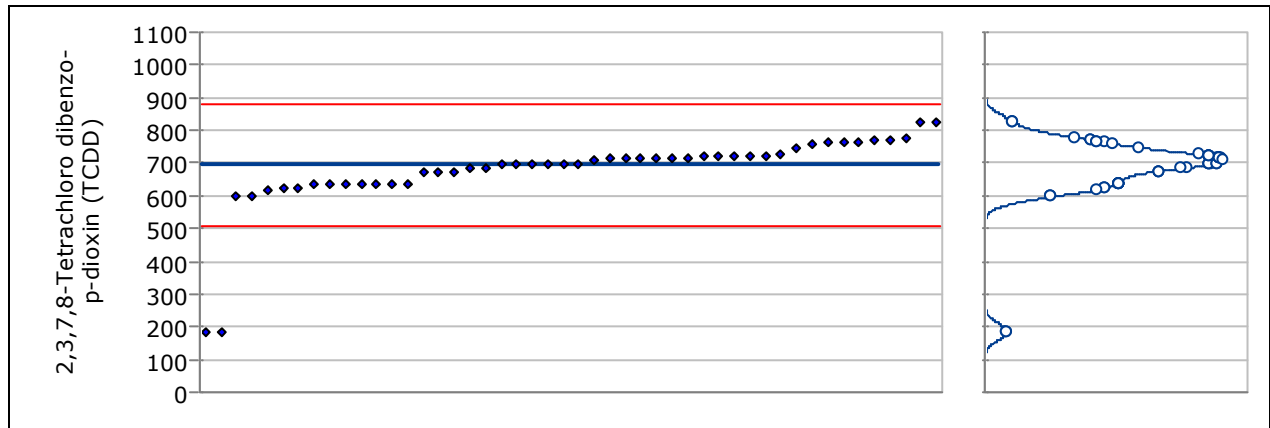
**4.1.16 2,3,7,8-TCDF**

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	737 pg/g
Proficiency std. dev.	62.5 pg/g
Acceptance window	549 - 925 pg/g

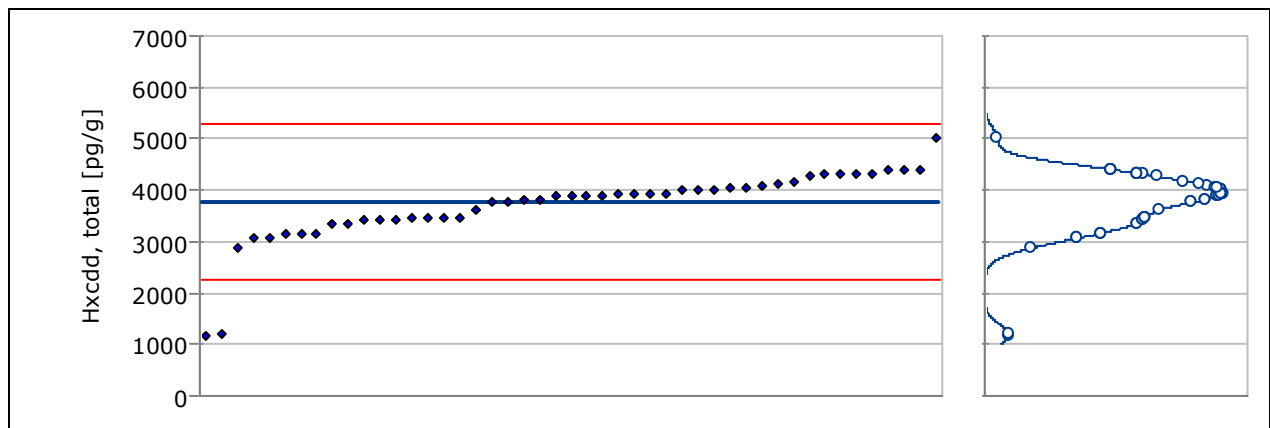


4.1.17 2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD)

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	48 / 48
Assigned value	694 pg/g
Proficiency std. dev.	61.5 pg/g
Acceptance window	509 - 878 pg/g

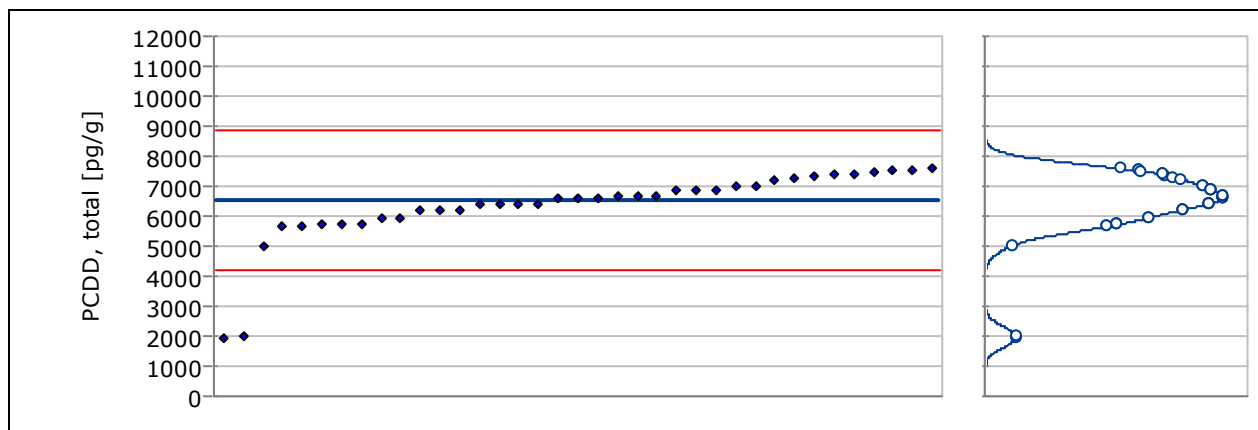
**4.1.18 Hxcdd, total**

No. of participating laboratories (in total / with quant. data points only)	18 / 18
No. of data points (in total / quantitative)	47 / 47
Assigned value	3770 pg/g
Proficiency std. dev.	503 pg/g
Acceptance window	2260 - 5280 pg/g

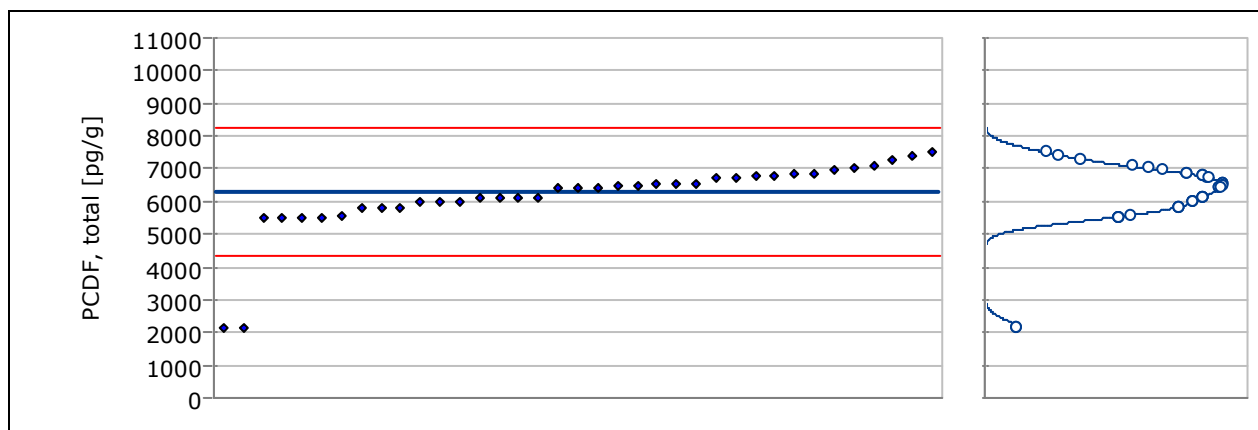


4.1.19 PCDD, total

No. of participating laboratories (in total / with quant. data points only)	14 / 14
No. of data points (in total / quantitative)	37 / 37
Assigned value	6540 pg/g
Proficiency std. dev.	770 pg/g
Acceptance window	4230 - 8850 pg/g

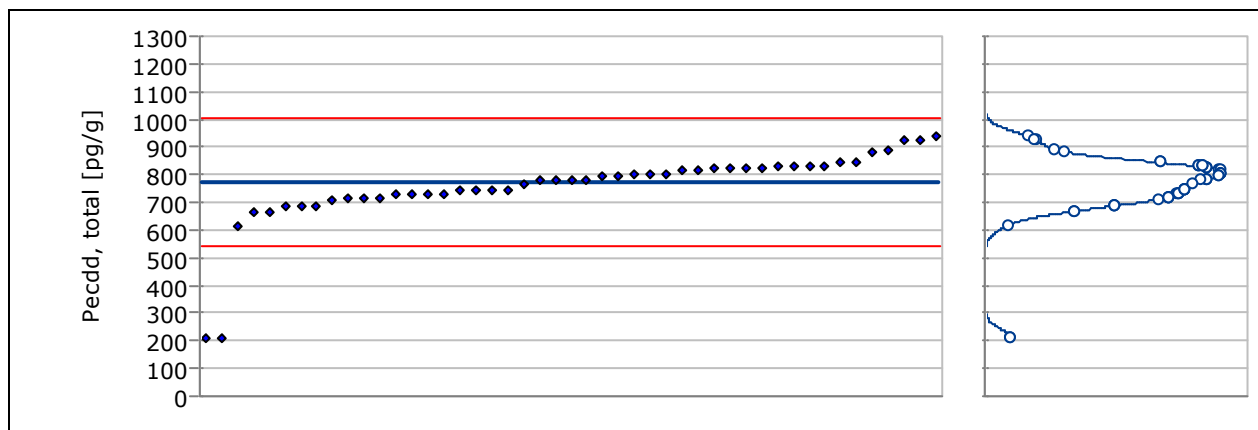
**4.1.20 PCDF, total**

No. of participating laboratories (in total / with quant. data points only)	14 / 14
No. of data points (in total / quantitative)	37 / 37
Assigned value	6310 pg/g
Proficiency std. dev.	655 pg/g
Acceptance window	4350 - 8280 pg/g

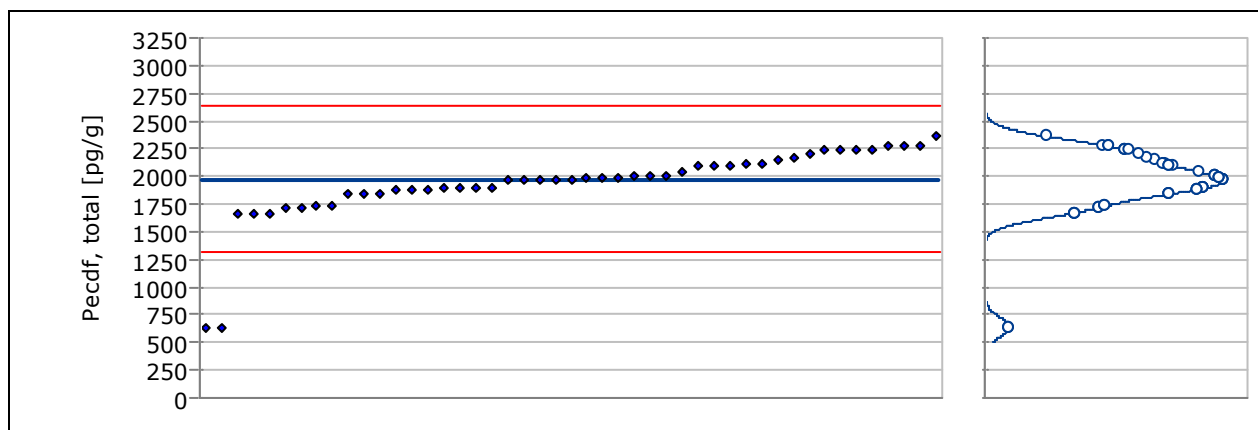


4.1.21 Pecdd, total

No. of participating laboratories (in total / with quant. data points only)	18 / 18
No. of data points (in total / quantitative)	47 / 47
Assigned value	774 pg/g
Proficiency std. dev.	77.2 pg/g
Acceptance window	542 - 1010 pg/g

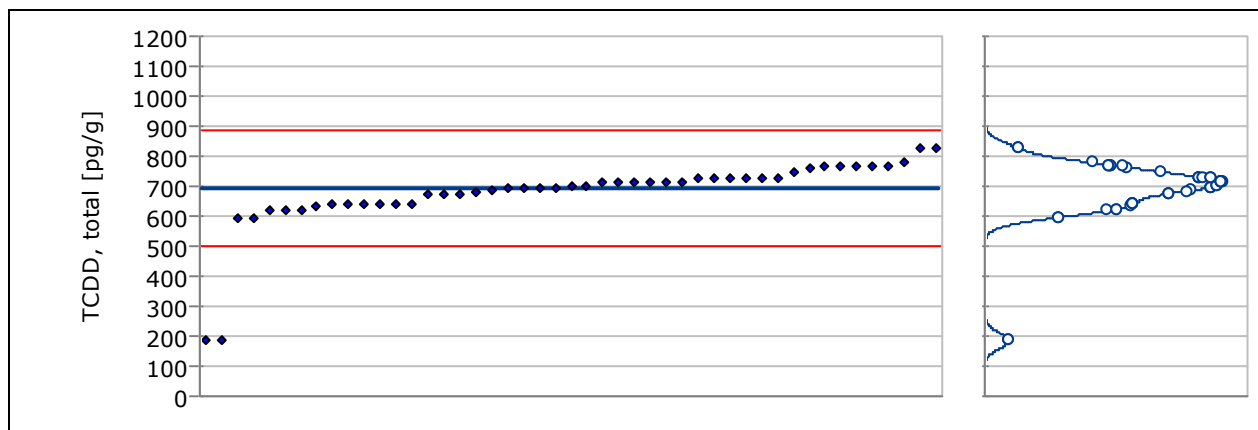
**4.1.22 Pecdf, total**

No. of participating laboratories (in total / with quant. data points only)	18 / 18
No. of data points (in total / quantitative)	47 / 47
Assigned value	1980 pg/g
Proficiency std. dev.	219 pg/g
Acceptance window	1320 - 2630 pg/g

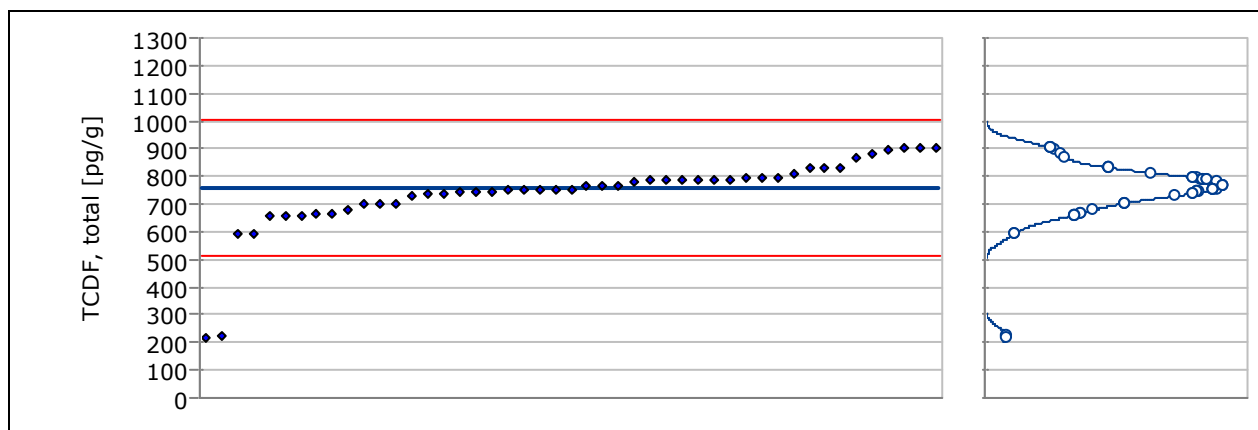


4.1.23 TCDD, total

No. of participating laboratories (in total / with quant. data points only)	18 / 18
No. of data points (in total / quantitative)	47 / 47
Assigned value	695 pg/g
Proficiency std. dev.	64.1 pg/g
Acceptance window	502 - 887 pg/g

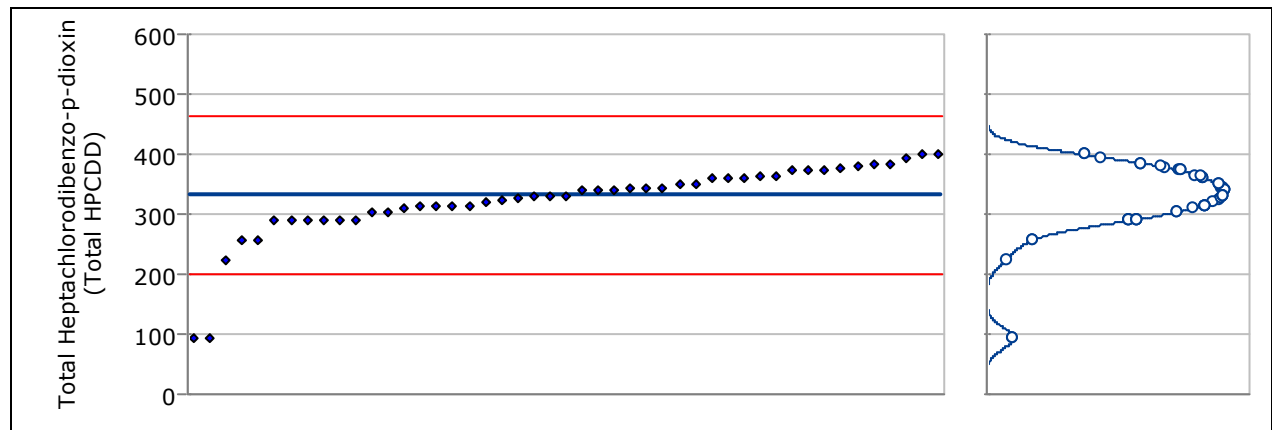
**4.1.24 TCDF, total**

No. of participating laboratories (in total / with quant. data points only)	18 / 18
No. of data points (in total / quantitative)	47 / 47
Assigned value	757 pg/g
Proficiency std. dev.	82.0 pg/g
Acceptance window	511 - 1000 pg/g

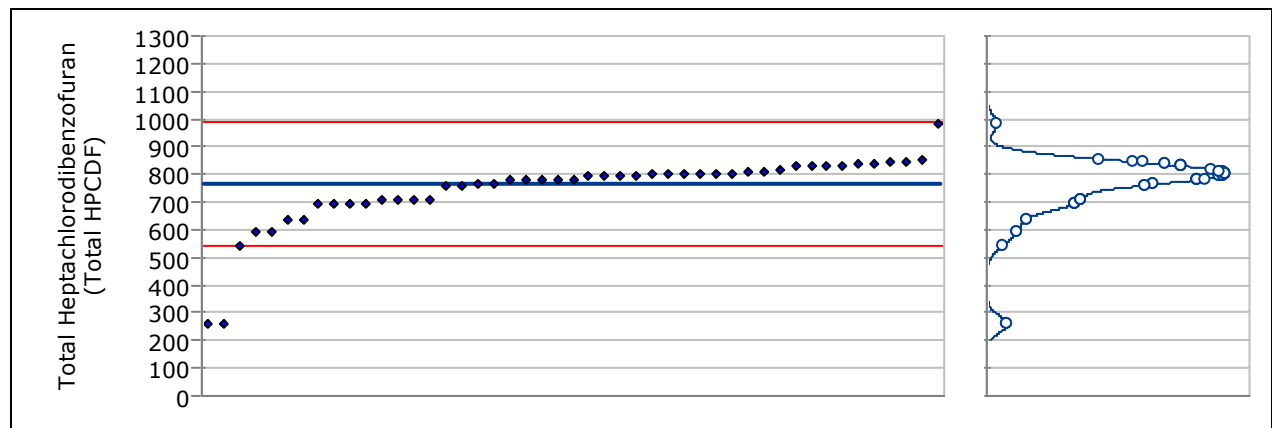


4.1.25 Total Heptachlorodibenzo-p-dioxin (Total HPCDD)

No. of participating laboratories (in total / with quant. data points only)	18 / 18
No. of data points (in total / quantitative)	47 / 47
Assigned value	332 pg/g
Proficiency std. dev.	44.0 pg/g
Acceptance window	200 - 464 pg/g

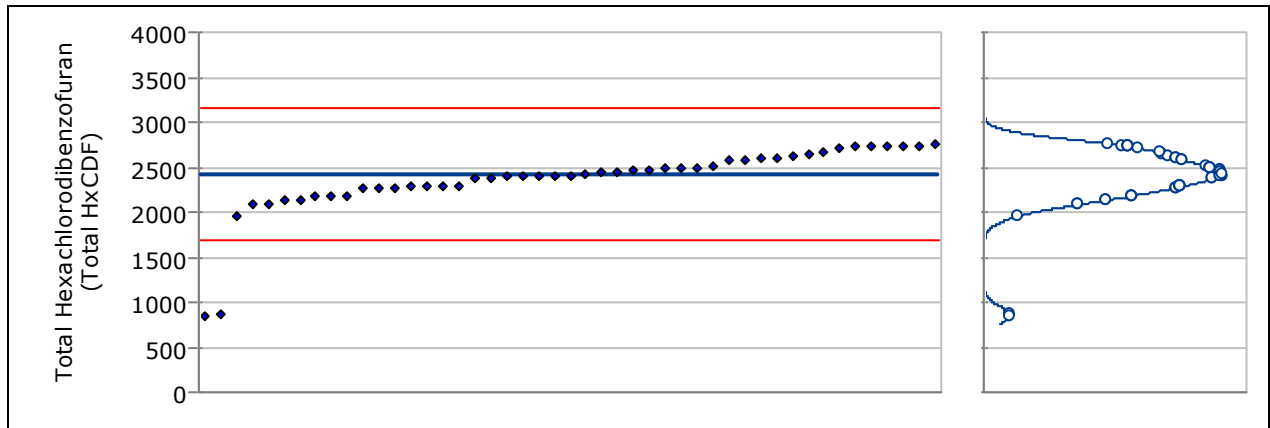
**4.1.26 Total Heptachlorodibenzofuran (Total HPCDF)**

No. of participating laboratories (in total / with quant. data points only)	18 / 18
No. of data points (in total / quantitative)	47 / 47
Assigned value	765 pg/g
Proficiency std. dev.	75.5 pg/g
Acceptance window	538 - 991 pg/g



4.1.27 Total Hexachlorodibenzofuran (Total HxCDF)

No. of participating laboratories (in total / with quant. data points only)	18 / 18
No. of data points (in total / quantitative)	47 / 47
Assigned value	2410 pg/g
Proficiency std. dev.	244 pg/g
Acceptance window	1680 - 3150 pg/g

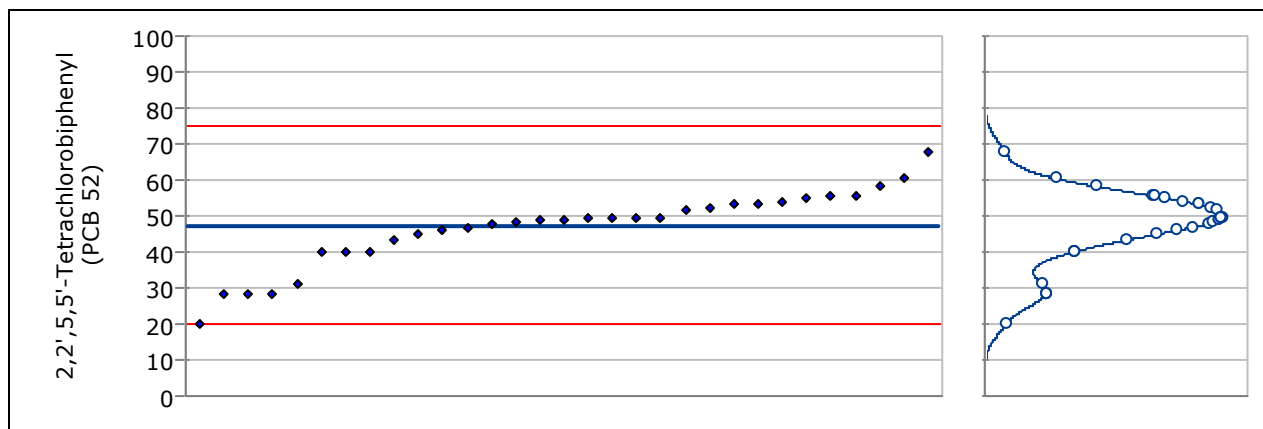


4.2 SPE068-50G PCB Congeners in Soil - PT / LRAC1565

This proficiency testing sample was produced in accordance with ISO/IEC 17043:2010.

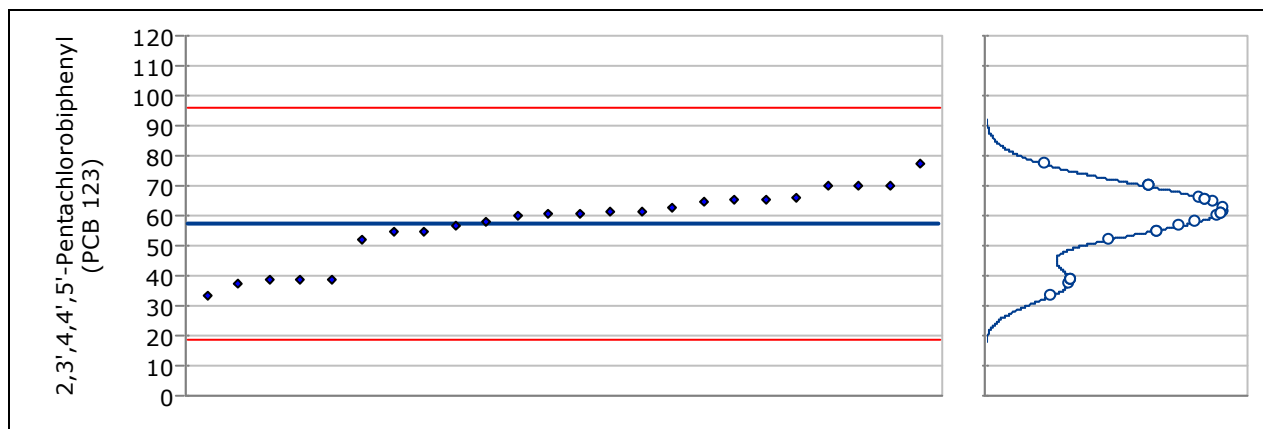
4.2.1 2,2',5,5'-Tetrachlorobiphenyl (PCB 52)

No. of participating laboratories (in total / with quant. data points only)	24 / 24
No. of data points (in total / quantitative)	31 / 31
Assigned value	47.5 ug/Kg
Proficiency std. dev.	9.10 ug/Kg
Acceptance window	20.2 - 74.8 ug/Kg



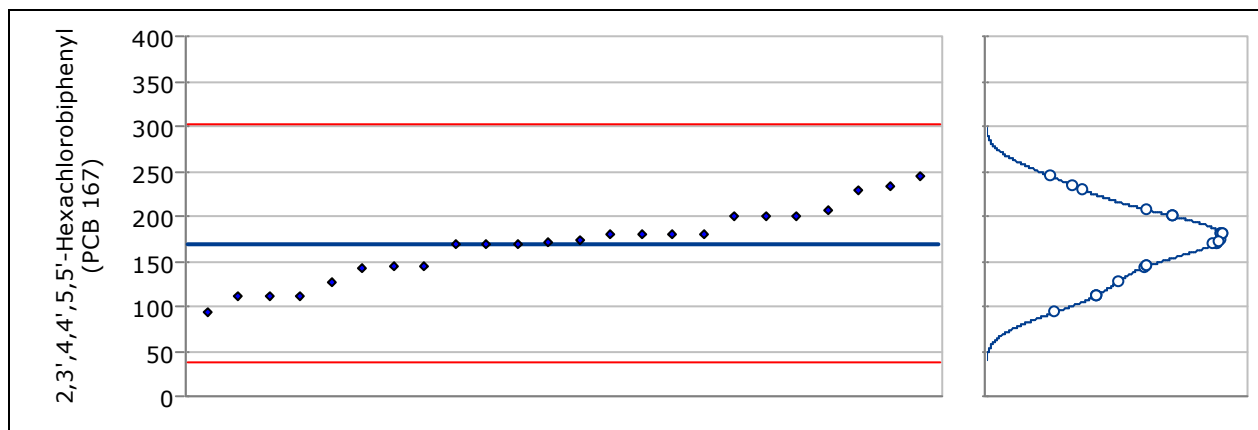
4.2.2 2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)

No. of participating laboratories (in total / with quant. data points only)	16 / 16
No. of data points (in total / quantitative)	24 / 24
Assigned value	57.7 ug/Kg
Proficiency std. dev.	12.9 ug/Kg
Acceptance window	19.0 - 96.3 ug/Kg

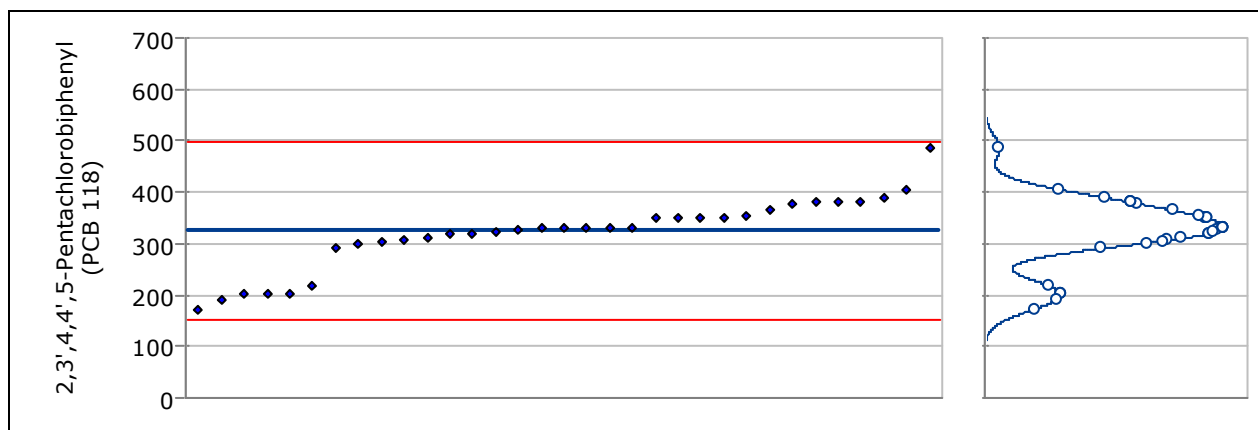


4.2.3 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)

No. of participating laboratories (in total / with quant. data points only)	16 / 16
No. of data points (in total / quantitative)	24 / 24
Assigned value	170 ug/Kg
Proficiency std. dev.	44.1 ug/Kg
Acceptance window	37.6 - 302 ug/Kg

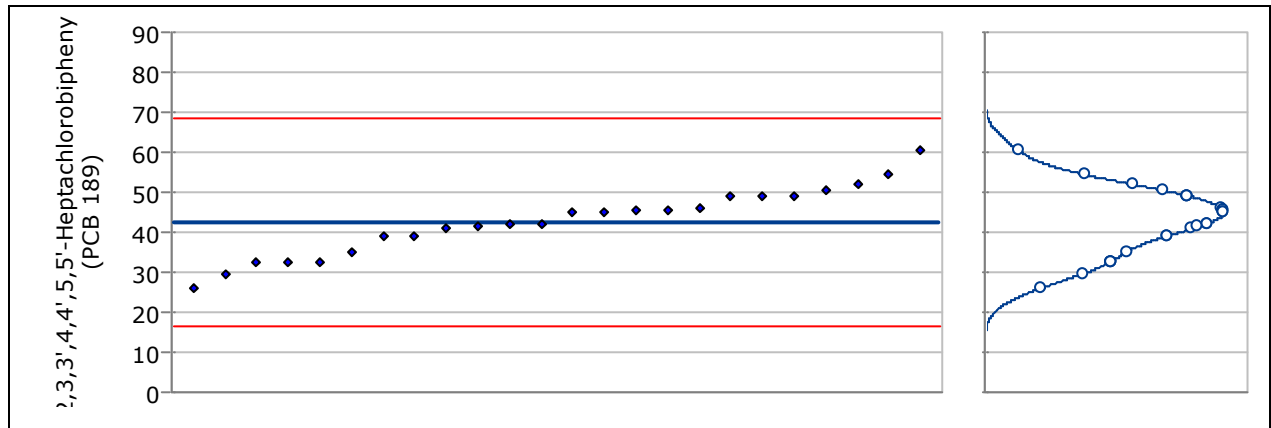
**4.2.4 2,3',4,4',5-Pentachlorobiphenyl (PCB 118)**

No. of participating laboratories (in total / with quant. data points only)	25 / 25
No. of data points (in total / quantitative)	33 / 33
Assigned value	325 ug/Kg
Proficiency std. dev.	57.3 ug/Kg
Acceptance window	153 - 497 ug/Kg

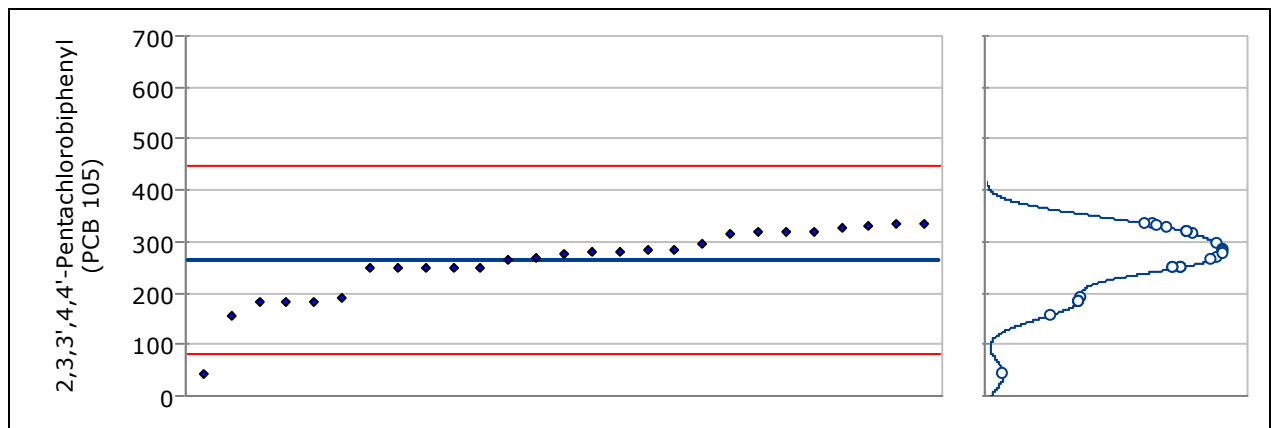


4.2.5 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)

No. of participating laboratories (in total / with quant. data points only)	16 / 16
No. of data points (in total / quantitative)	24 / 24
Assigned value	42.6 ug/Kg
Proficiency std. dev.	8.68 ug/Kg
Acceptance window	16.6 - 68.7 ug/Kg

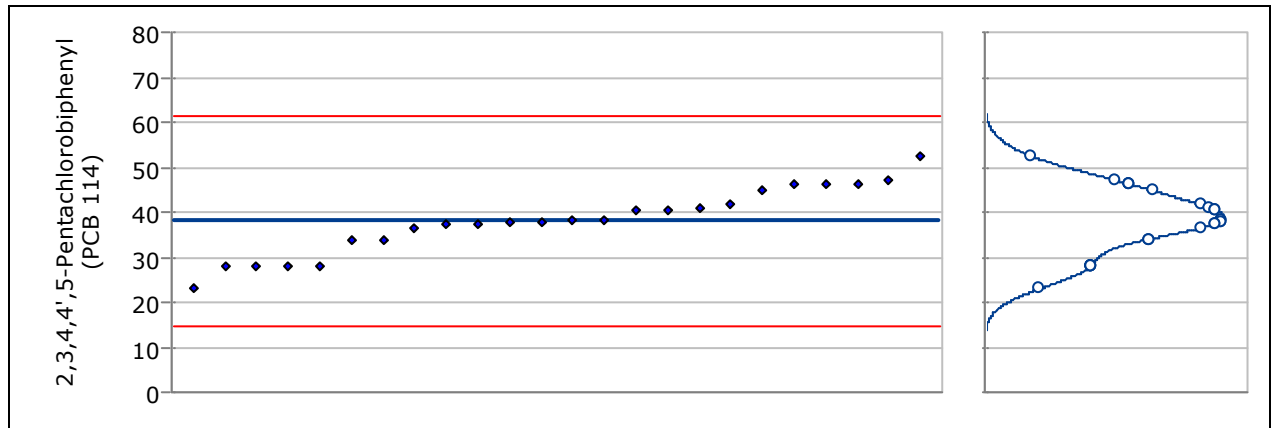
**4.2.6 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)**

No. of participating laboratories (in total / with quant. data points only)	20 / 19
No. of data points (in total / quantitative)	28 / 27
Assigned value	265 ug/Kg
Proficiency std. dev.	61.1 ug/Kg
Acceptance window	81.6 - 448 ug/Kg

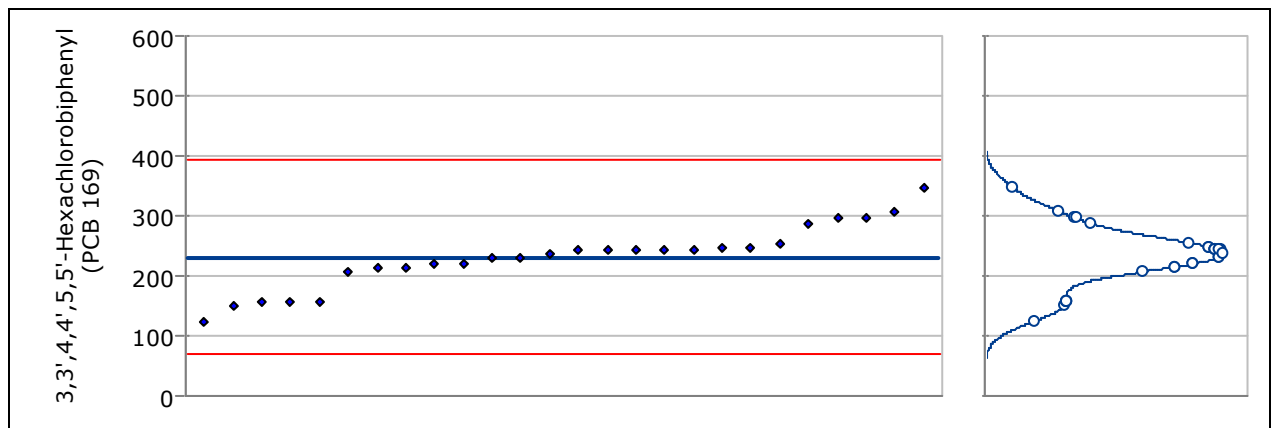


4.2.7 2,3,4,4',5-Pentachlorobiphenyl (PCB 114)

No. of participating laboratories (in total / with quant. data points only)	16 / 16
No. of data points (in total / quantitative)	24 / 24
Assigned value	38.1 ug/Kg
Proficiency std. dev.	7.79 ug/Kg
Acceptance window	14.7 - 61.4 ug/Kg

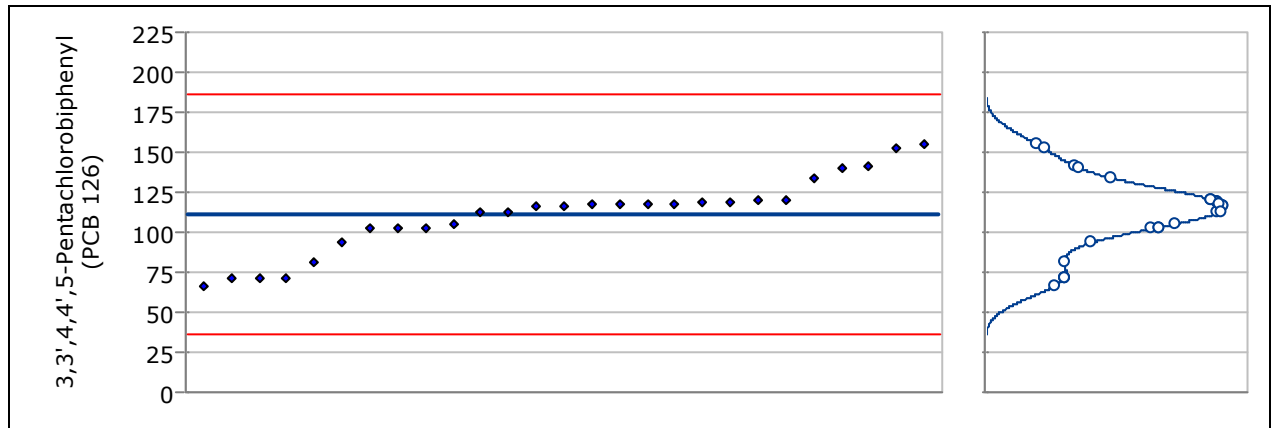
**4.2.8 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)**

No. of participating laboratories (in total / with quant. data points only)	18 / 18
No. of data points (in total / quantitative)	26 / 26
Assigned value	232 ug/Kg
Proficiency std. dev.	54.2 ug/Kg
Acceptance window	68.9 - 394 ug/Kg

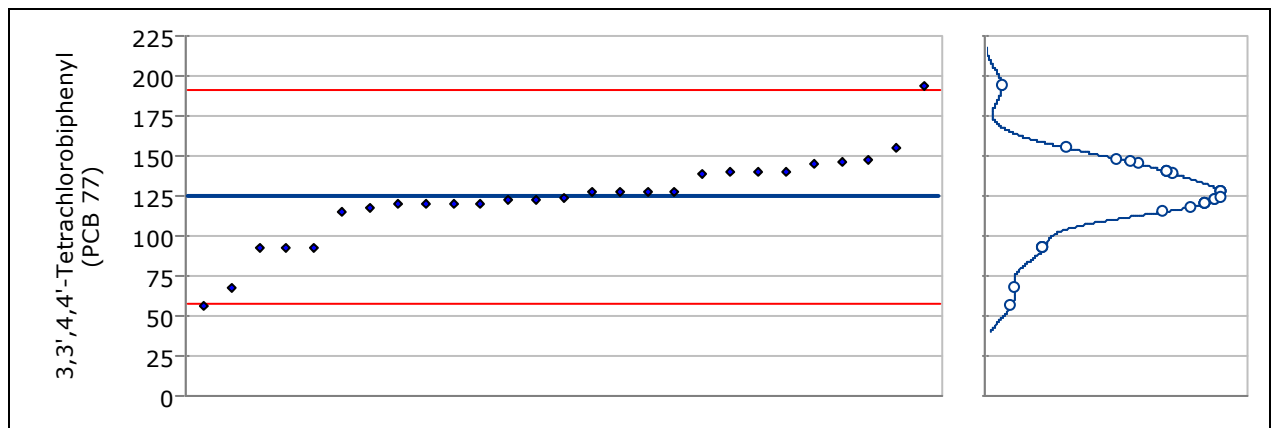


4.2.9 3,3',4,4',5-Pentachlorobiphenyl (PCB 126)

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	27 / 27
Assigned value	111 ug/Kg
Proficiency std. dev.	24.9 ug/Kg
Acceptance window	36.4 - 186 ug/Kg

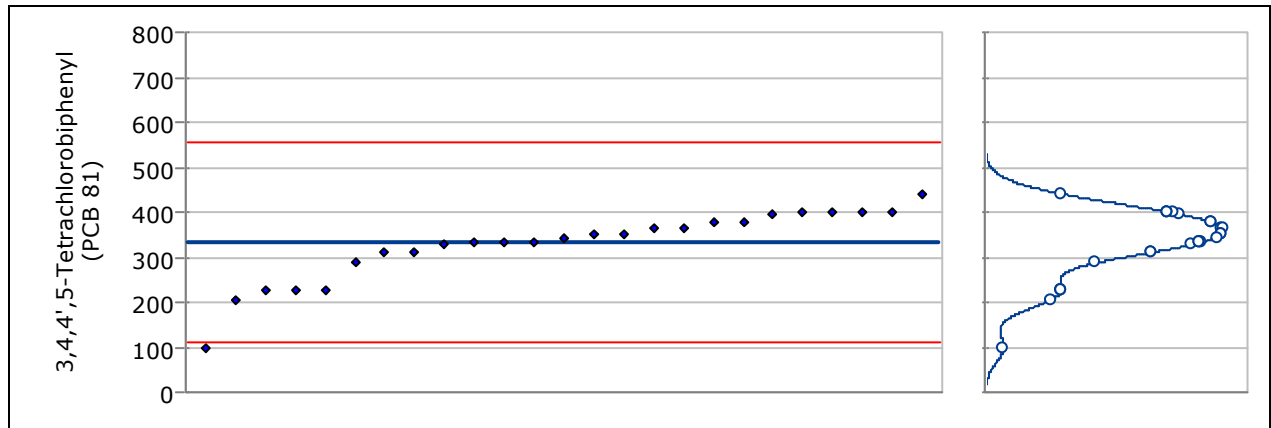
**4.2.10 3,3',4,4'-Tetrachlorobiphenyl (PCB 77)**

No. of participating laboratories (in total / with quant. data points only)	19 / 19
No. of data points (in total / quantitative)	27 / 27
Assigned value	125 ug/Kg
Proficiency std. dev.	22.3 ug/Kg
Acceptance window	57.8 - 191 ug/Kg

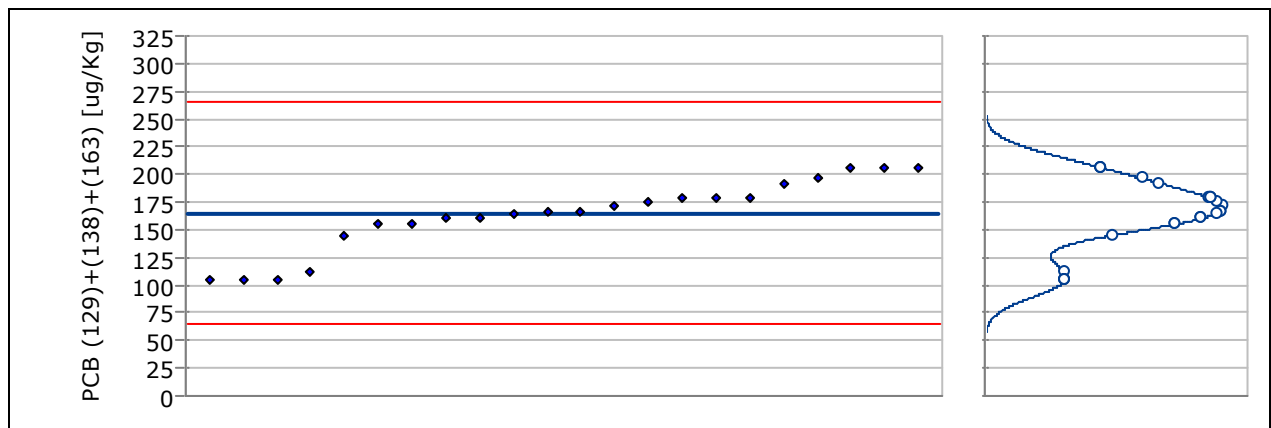


4.2.11 3,4,4',5-Tetrachlorobiphenyl (PCB 81)

No. of participating laboratories (in total / with quant. data points only)	17 / 17
No. of data points (in total / quantitative)	25 / 25
Assigned value	333 ug/Kg
Proficiency std. dev.	74.0 ug/Kg
Acceptance window	111 - 555 ug/Kg

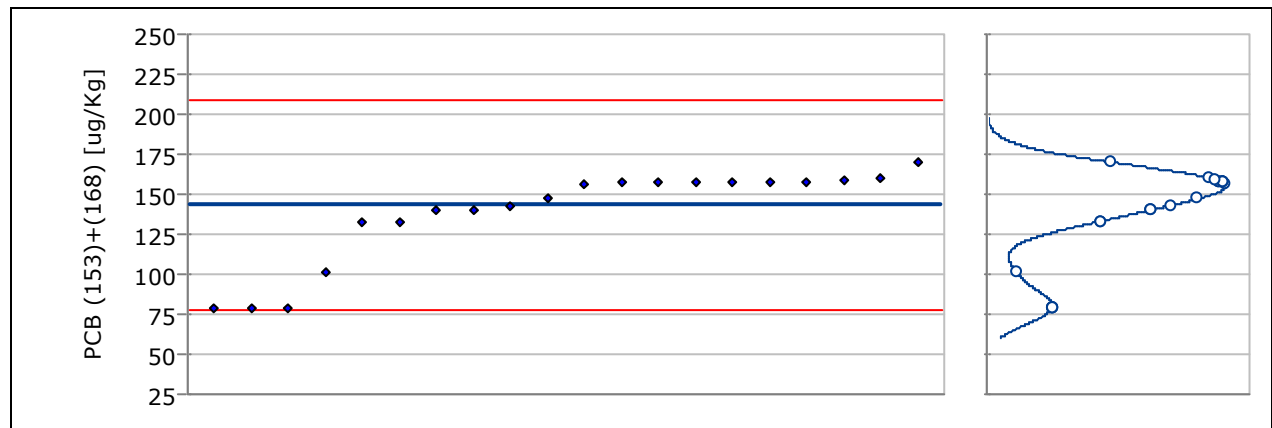
**4.2.12 PCB (129)+(138)+(163)**

No. of participating laboratories (in total / with quant. data points only)	14 / 14
No. of data points (in total / quantitative)	22 / 22
Assigned value	165 ug/Kg
Proficiency std. dev.	33.4 ug/Kg
Acceptance window	64.3 - 265 ug/Kg

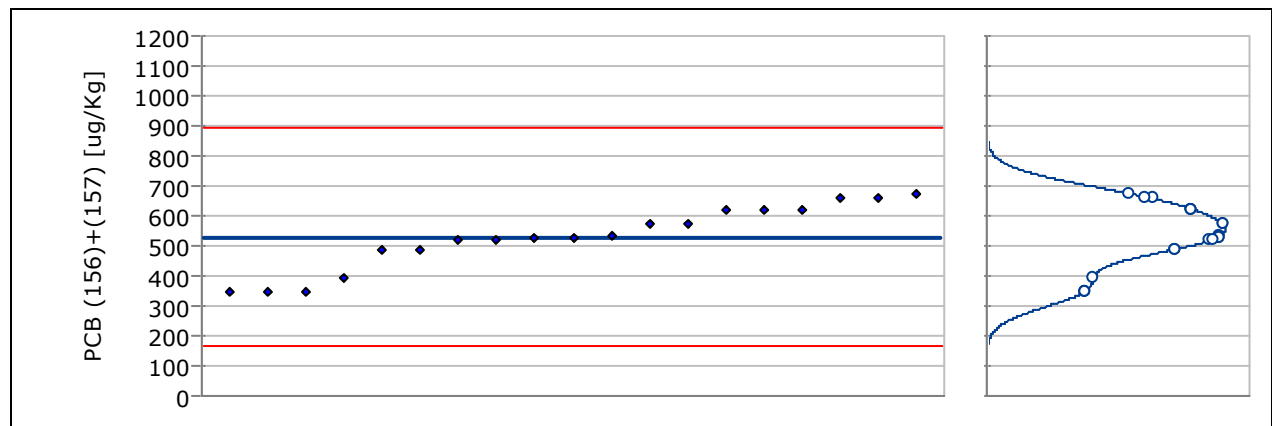


4.2.13 PCB (153)+(168)

No. of participating laboratories (in total / with quant. data points only)	13 / 13
No. of data points (in total / quantitative)	20 / 20
Assigned value	143 ug/Kg
Proficiency std. dev.	21.8 ug/Kg
Acceptance window	77.9 - 209 ug/Kg

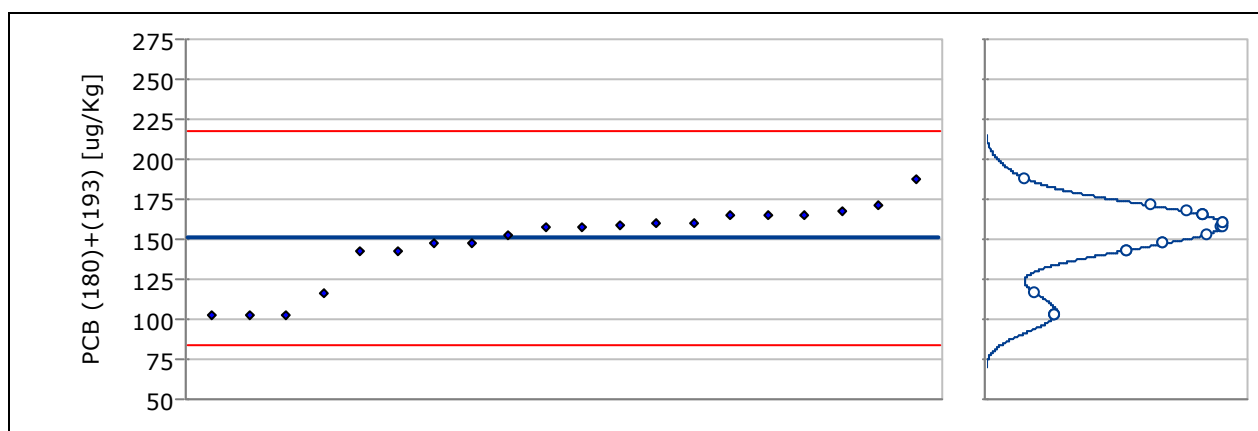
**4.2.14 PCB (156)+(157)**

No. of participating laboratories (in total / with quant. data points only)	12 / 12
No. of data points (in total / quantitative)	19 / 19
Assigned value	529 ug/Kg
Proficiency std. dev.	121 ug/Kg
Acceptance window	165 - 893 ug/Kg

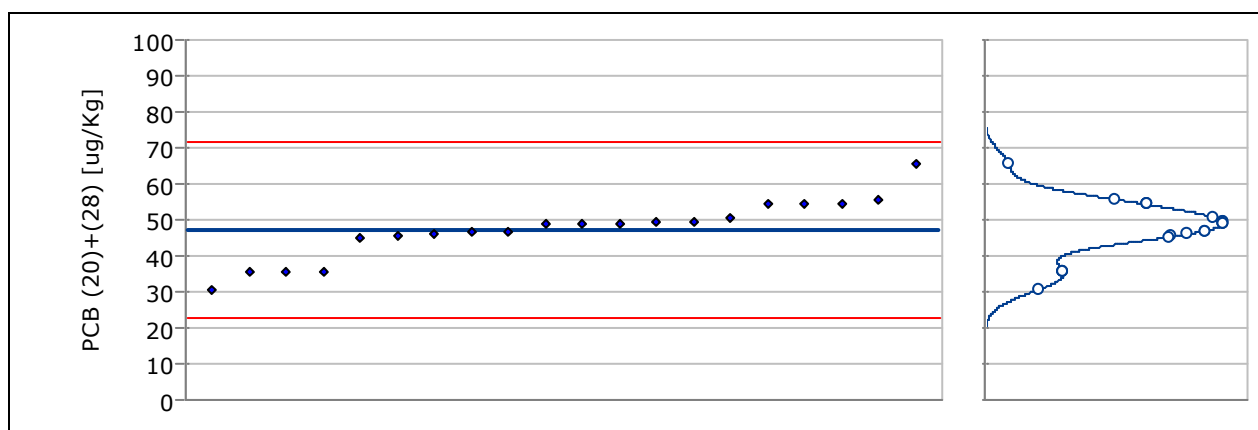


4.2.15 PCB (180)+(193)

No. of participating laboratories (in total / with quant. data points only)	13 / 13
No. of data points (in total / quantitative)	20 / 20
Assigned value	151 ug/Kg
Proficiency std. dev.	22.2 ug/Kg
Acceptance window	84.0 - 217 ug/Kg

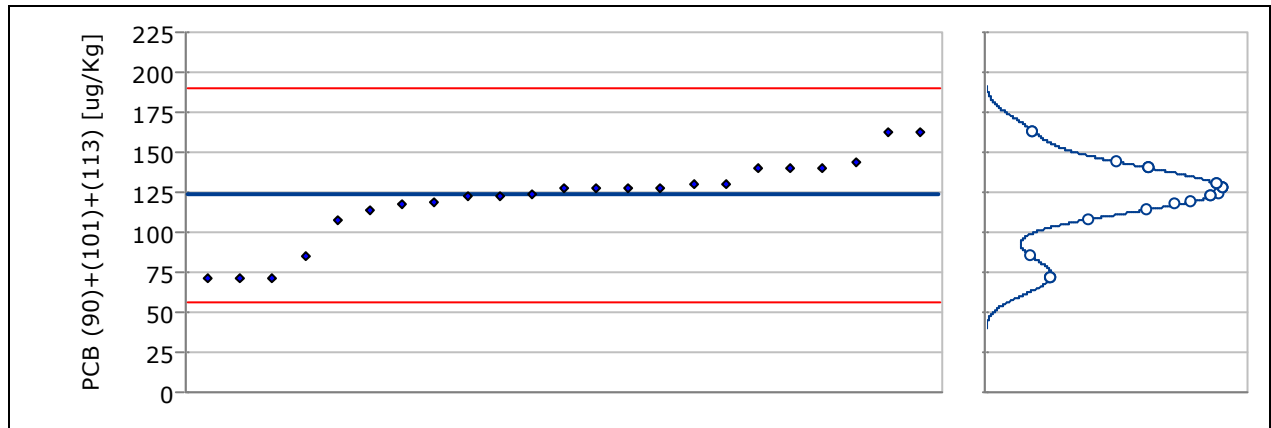
**4.2.16 PCB (20)+(28)**

No. of participating laboratories (in total / with quant. data points only)	13 / 13
No. of data points (in total / quantitative)	20 / 20
Assigned value	47.3 ug/Kg
Proficiency std. dev.	8.19 ug/Kg
Acceptance window	22.7 - 71.9 ug/Kg

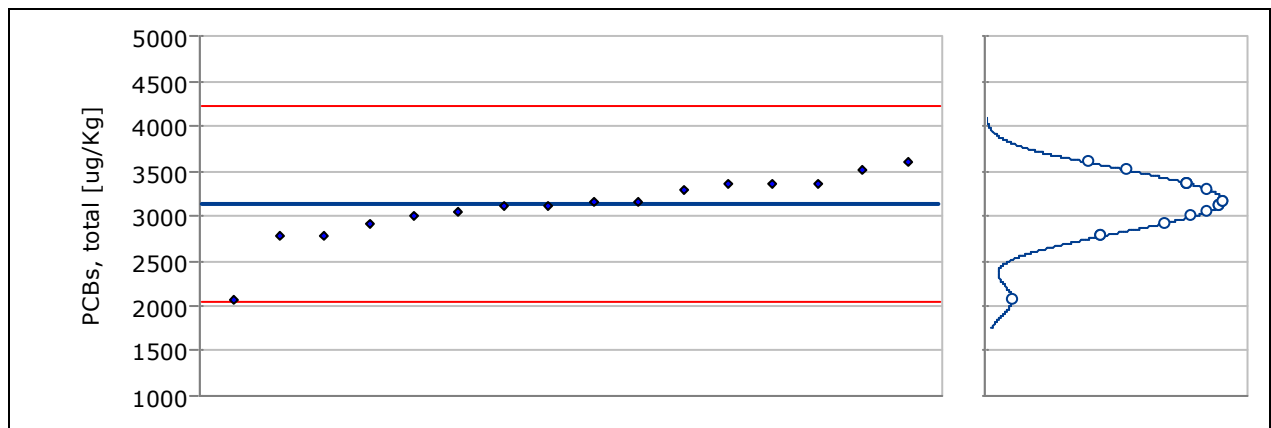


4.2.17 PCB (90)+(101)+(113)

No. of participating laboratories (in total / with quant. data points only)	15 / 15
No. of data points (in total / quantitative)	23 / 23
Assigned value	123 ug/Kg
Proficiency std. dev.	22.2 ug/Kg
Acceptance window	56.5 - 190 ug/Kg

**4.2.18 PCBs, total**

No. of participating laboratories (in total / with quant. data points only)	11 / 11
No. of data points (in total / quantitative)	16 / 16
Assigned value	3130 ug/Kg
Proficiency std. dev.	362 ug/Kg
Acceptance window	2040 - 4220 ug/Kg

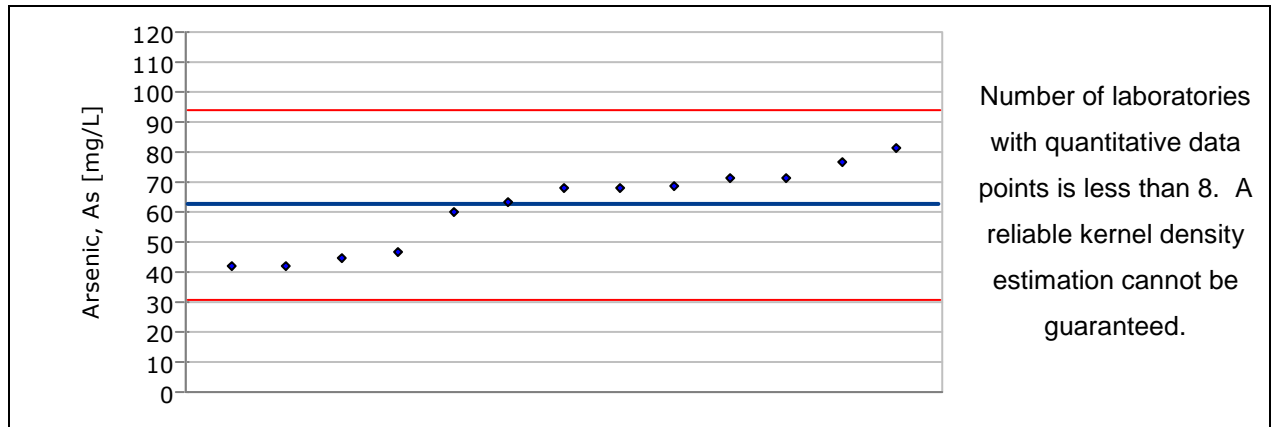


4.3 SPE006-225G STLC Metals CA - WET in Soil - PT / LRAC5370

This proficiency testing sample was produced in accordance with ISO/IEC 17043:2010.

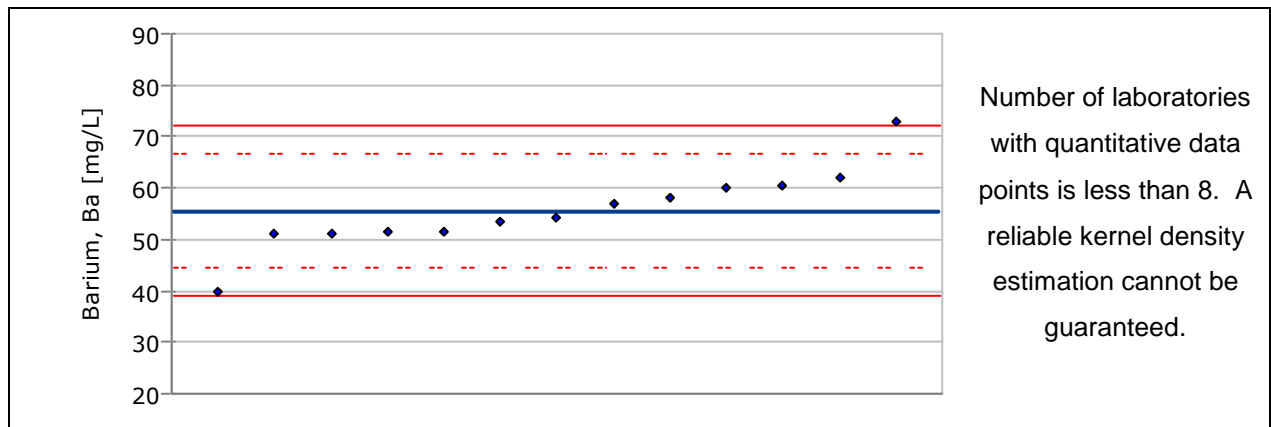
4.3.1 Arsenic, As

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	13 / 13
Assigned value	62.6 mg/L
Proficiency std. dev.	10.6 mg/L
Acceptance window	30.8 - 94.3 mg/L



4.3.2 Barium, Ba

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	13 / 13
Assigned value	55.6 mg/L
Proficiency std. dev.	5.56 mg/L
Acceptance window	38.9 - 72.2 mg/L

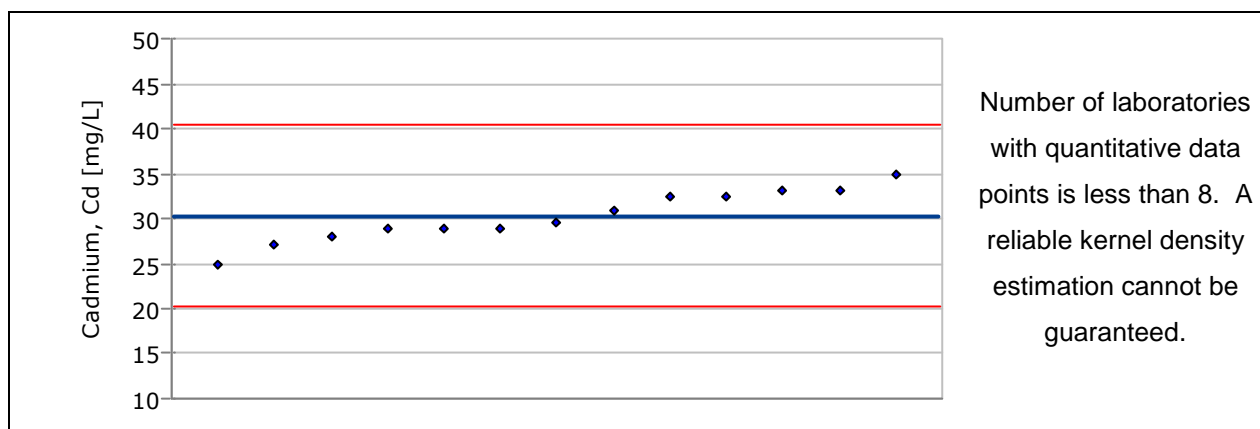


4.3.3 Beryllium, Be

No. of participating laboratories (in total / with quant. data points only)	5 / 2
No. of data points (in total / quantitative)	11 / 4
Assigned value	0 mg/L
Proficiency std. dev.	0 mg/L
Acceptance window	0 - 5.00 mg/L

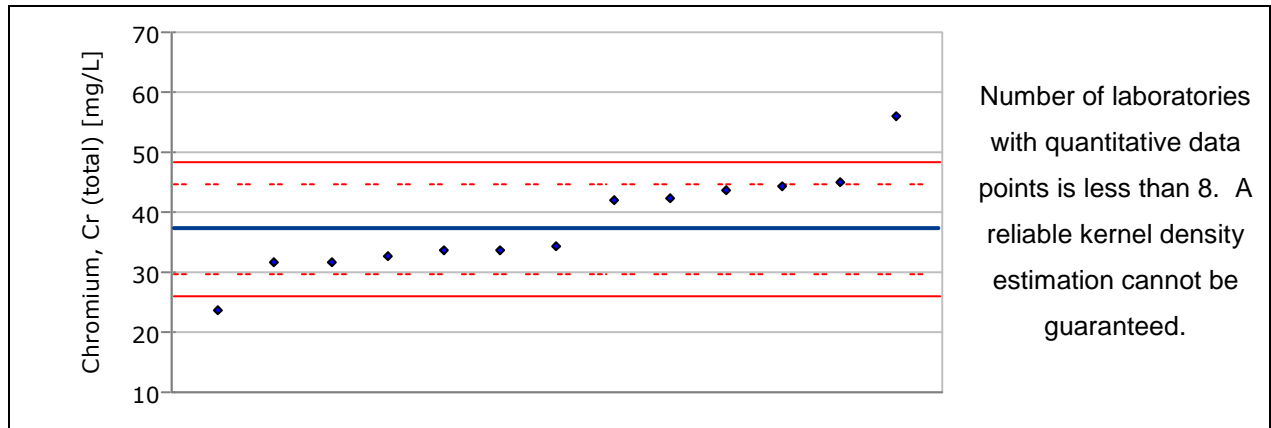
4.3.4 Cadmium, Cd

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	13 / 13
Assigned value	30.3 mg/L
Proficiency std. dev.	3.37 mg/L
Acceptance window	20.2 - 40.4 mg/L



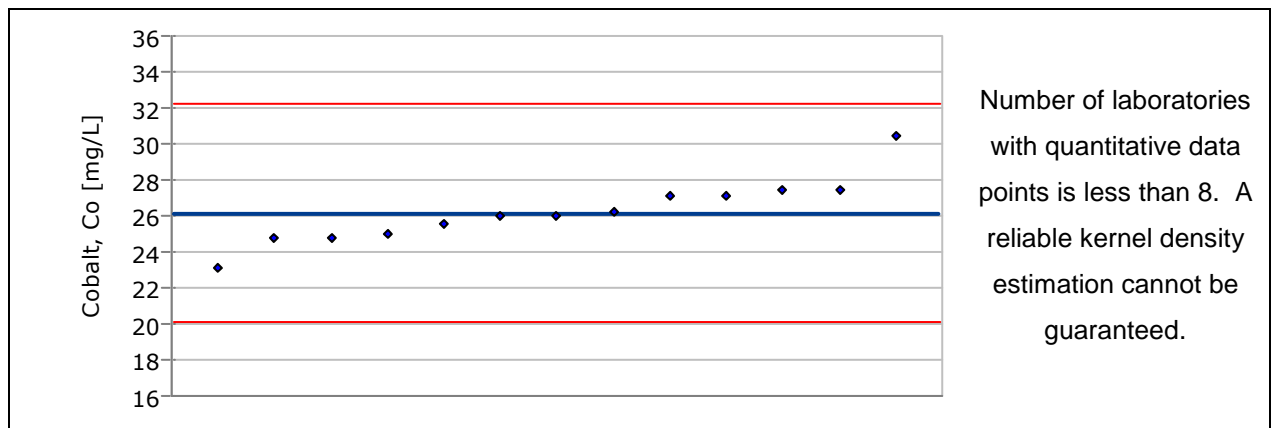
4.3.5 Chromium, Cr (total)

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	13 / 13
Assigned value	37.3 mg/L
Proficiency std. dev.	3.73 mg/L
Acceptance window	26.1 - 48.4 mg/L



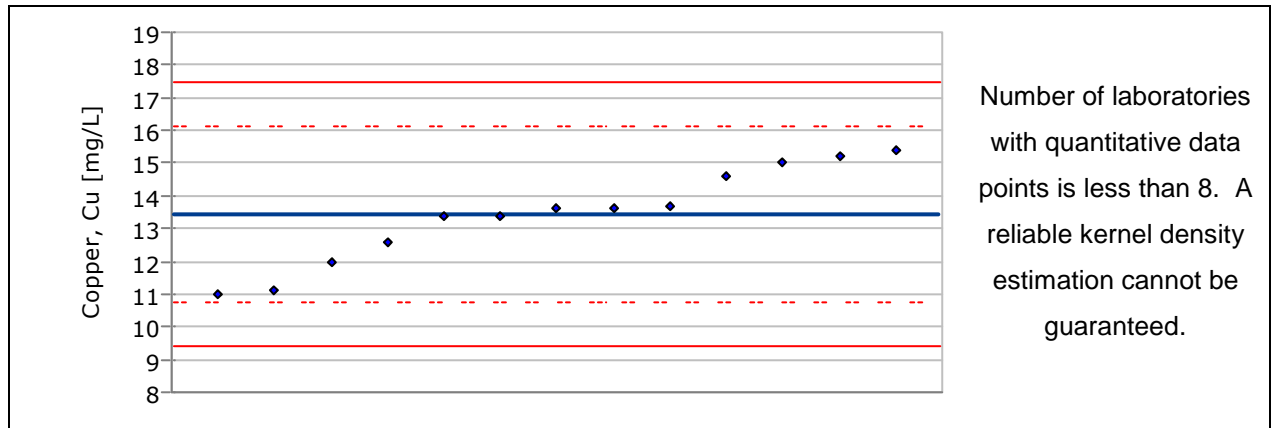
4.3.6 Cobalt, Co

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	13 / 13
Assigned value	26.1 mg/L
Proficiency std. dev.	2.01 mg/L
Acceptance window	20.1 - 32.2 mg/L



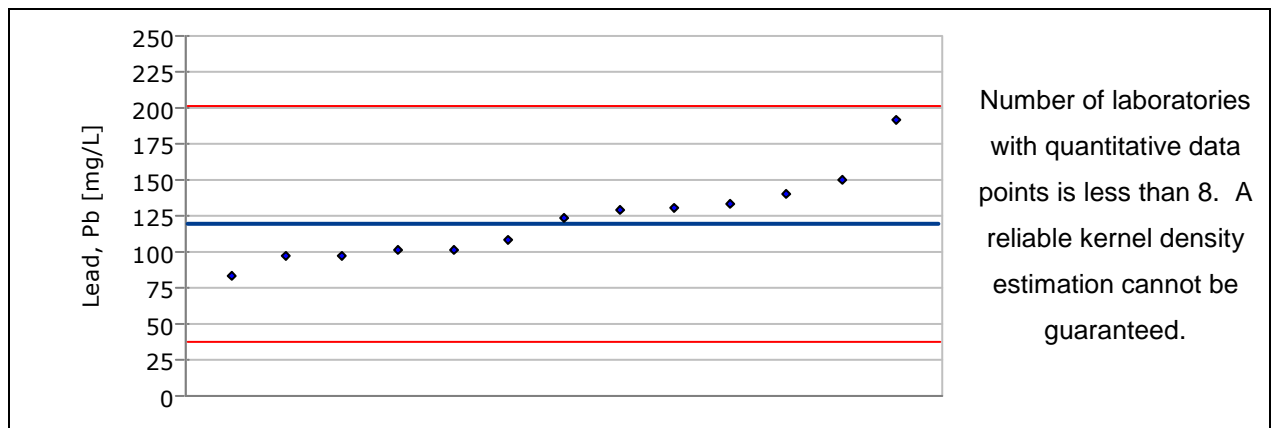
4.3.7 Copper, Cu

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	13 / 13
Assigned value	13.4 mg/L
Proficiency std. dev.	1.34 mg/L
Acceptance window	9.40 - 17.5 mg/L



4.3.8 Lead, Pb

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	13 / 13
Assigned value	120 mg/L
Proficiency std. dev.	27.1 mg/L
Acceptance window	38.1 - 201 mg/L

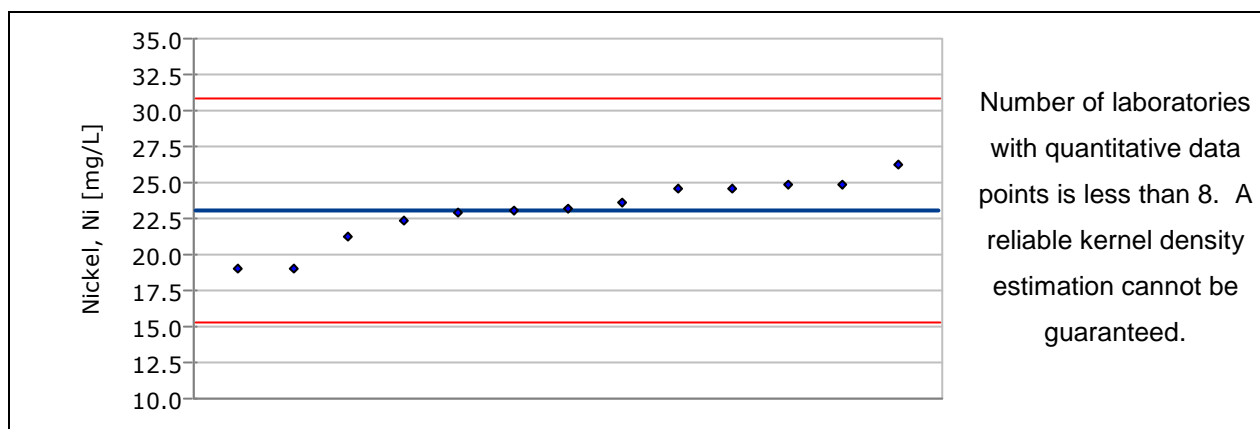


4.3.9 Molybdenum, Mo

No. of participating laboratories (in total / with quant. data points only)	5 / 2
No. of data points (in total / quantitative)	11 / 4
Assigned value	0 mg/L
Proficiency std. dev.	0 mg/L
Acceptance window	0 - 5.00 mg/L

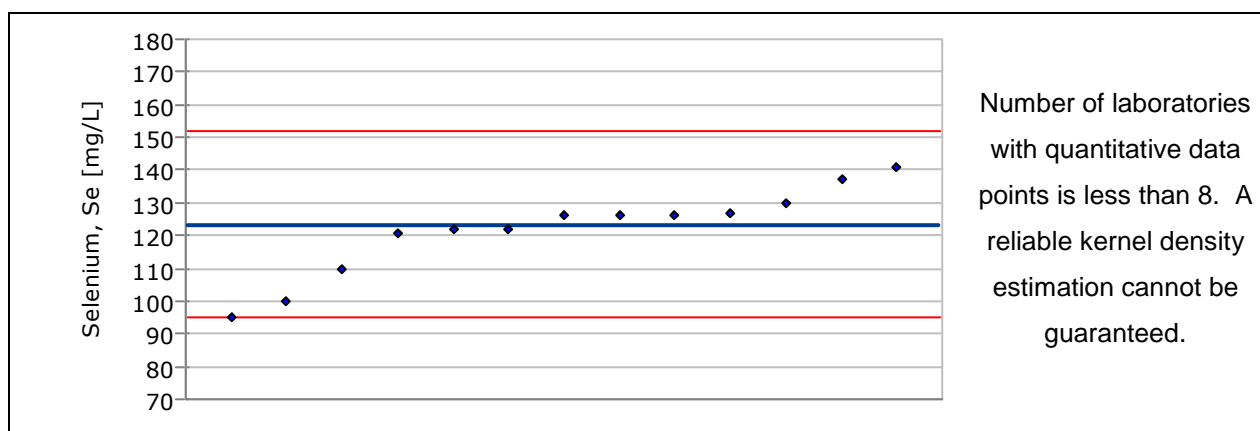
4.3.10 Nickel, Ni

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	13 / 13
Assigned value	23.1 mg/L
Proficiency std. dev.	2.59 mg/L
Acceptance window	15.3 - 30.8 mg/L



4.3.11 Selenium, Se

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	13 / 13
Assigned value	123 mg/L
Proficiency std. dev.	9.44 mg/L
Acceptance window	95.0 - 152 mg/L

**4.3.12 Silver, Ag**

No. of participating laboratories (in total / with quant. data points only)	5 / 3
No. of data points (in total / quantitative)	11 / 5
Assigned value	0 mg/L
Proficiency std. dev.	0 mg/L
Acceptance window	0 - 5.00 mg/L

4.3.13 Thallium, Tl

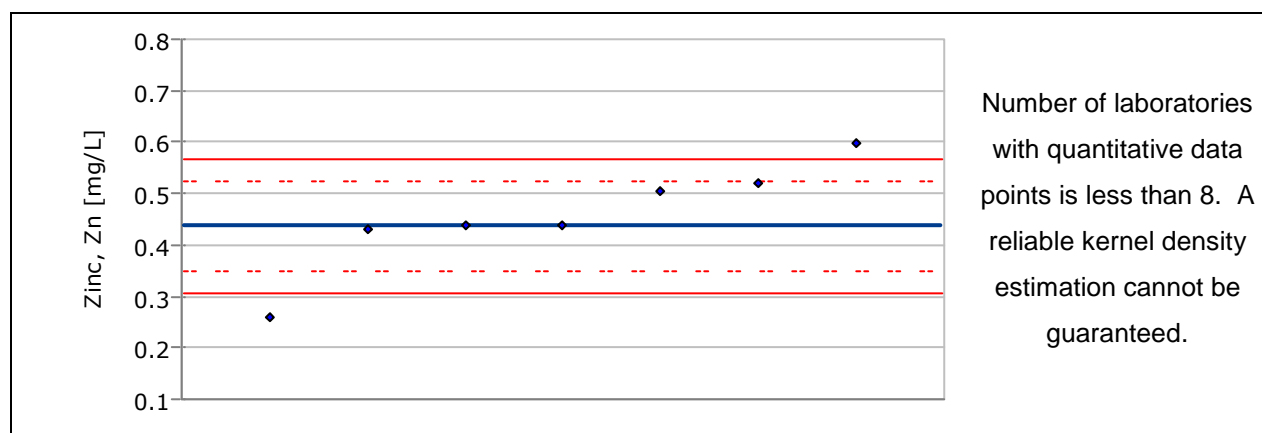
No. of participating laboratories (in total / with quant. data points only)	5 / 2
No. of data points (in total / quantitative)	11 / 2
Assigned value	0 mg/L
Proficiency std. dev.	0 mg/L
Acceptance window	0 - 5.00 mg/L

4.3.14 Vanadium, V

No. of participating laboratories (in total / with quant. data points only)	6 / 4
No. of data points (in total / quantitative)	12 / 8
Assigned value	0 mg/L
Proficiency std. dev.	0 mg/L
Acceptance window	0 - 5.00 mg/L

4.3.15 Zinc, Zn

No. of participating laboratories (in total / with quant. data points only)	6 / 5
No. of data points (in total / quantitative)	12 / 7
Assigned value	0.437 mg/L
Proficiency std. dev.	0.0437 mg/L
Acceptance window	0.306 - 0.568 mg/L



5 Statistical Analysis

5.1 Definitions and Interpretation

Reported Value

The participant's result.

Assigned Value

Value attributed to a particular quantity and accepted, sometimes by convention, as having an uncertainty appropriate for a given purpose. See ISO/IEC 17043 for additional information. In general, the assigned value is the value used to assess proficiency and may or may not be the made to value (gravimetric value).

Acceptance Window

The range of values that constitute acceptable performance for a laboratory participating in this PT study.

z-score

A z-score shows how a single data point compares to normal data. A z-score says not only whether a point was above or below average, but how unusual the measurement is. Generally, a method result with a z-score less than |2| is considered to be in control and 'Acceptable'; a z-score between |2| and |3| is considered 'Questionable', but still within control and 'Acceptable' and a z-score greater than |3| is considered 'Not Acceptable' and the method is out of control. For WS studies, a z-score greater than |2| is not acceptable.

Calculated as $z = (\text{Reported Value} - \text{Assigned Value}) / \text{Proficiency Std. Dev.}$

A z-score cannot be provided

- (1) for presence/absence data,
- (2) for identification data and other categorical data,
- (3) where the analyte is not present in the sample,
- (4) for "less than" and "greater than" values,
- (5) NOEC analytes (in the framework of WETT analysis).

In cases (1) to (3) the participant's result is only evaluated by "acceptable" if it matches with the assigned value. Otherwise the result is indicated as "not acceptable". In case the analyte is not present in the sample and a PTRL is available, the participant's result is indicated as "acceptable" as long the result is less than the PTRL.

In case (4) the following evaluation rules will be applied:

- “less than” values:
 - When the analyte is not present in the sample the result is always “acceptable”.
 - When the analyte is truly present in the sample, the result is only “acceptable” if the “less than” value is greater than the lower limit of the acceptance window.
- “greater than” values:
 - When the analyte is not present in the sample the result is always “not acceptable”.
 - When the analyte is truly present in the sample, the result is only “acceptable” if the “greater than” value is less than the upper limit of the acceptance window.

In case (5) the result is indicated as “acceptable” if it lies within the acceptance window, otherwise the result is indicated as “not acceptable”.

Proficiency Std. Dev.

Standard deviation calculated based on Evaluation Criteria.

PTRL

Proficiency Testing Reporting Limit

Study Mean

Statistical study mean calculated using a robust statistical model. Robust statistical techniques are used to minimize the influence extreme results can have on estimates of the mean and standard deviation. NOTE - These techniques assign less weight to extreme results, rather than eliminate them from a data set.

Choice of statistical technique: In case of quantitative data points from at least 8 laboratories, Algorithm A (ISO 13528, Section C.3.1), and in case of quantitative data points of 4 to 7 laboratories, the Hampel estimator (ISO 13528, Section C.5.3) is applied. A study mean cannot be calculated in case there are quantitative data points from less than 4 laboratories available.

Study Std. Dev.

Standard deviation calculated from study data using robust statistics.

In case of quantitative data points from at least 8 laboratories, Algorithm A (ISO 13528, Section C.3.1), and in case of quantitative data points of 4 to 7 laboratories, the Q method (ISO 13528, Section C.5.2) is applied. A study standard deviation cannot be calculated in case there are quantitative data points from less than 4 laboratories available.

Gravimetric Value

The 'prepared to' value, determined by gravimetric means. The uncertainty associated with this value is the standard uncertainty and based on Sigma-Aldrich RTC's gravimetric tolerances.

Analytical Value

The measured value, determined after preparation. The uncertainty associated to this value is the standard uncertainty and based on the measurement process.

5.2 Evaluation Criteria

1 - Regression Equation

Acceptance windows based on TNI adopted equation of proficiency value ± 3 proficiency standard deviations and check limits of proficiency value ± 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c & d as proficiency value = $a * \text{gravimetric} + b$ and proficiency standard deviation = $c * \text{gravimetric} + d$.

2 - Study Robust Mean and c, d regression

Acceptance windows based on TNI adopted equation of proficiency value ± 3 proficiency standard deviations and check limits of proficiency value ± 2 proficiency standard deviations. Proficiency value and proficiency standard deviation calculated from robust study mean and variables c & d as proficiency value = robust mean and proficiency standard deviation = $c * \text{proficiency value} + d$.

3 - Fixed Limits

Acceptance windows based on span of gravimetric percentage from gravimetric as $\text{gravimetric} \pm \text{gravimetric} * \text{percentage}$.

4 - Adjustable Fixed Limits

Acceptance windows based on a span of gravimetric percentage from gravimetric as $\text{gravimetric} \pm \text{gravimetric} * \text{lowPercentage}$ where $\text{gravimetric} < \text{break}$ and $\text{gravimetric} \pm \text{gravimetric} * \text{highPercentage}$ where $\text{gravimetric} \geq \text{break}$.

5 - Study Statistics

Acceptance windows based on a number of standard deviations span from the study mean as $\text{study mean} \pm (\text{deviations} * \text{standard deviation})$.

6 - Log Transform Statistics

Acceptance windows based on lognormal distributed data. Acceptance windows = $\text{mean}(\text{lognormal}) \pm \text{span} * \text{standard deviation}(\text{lognormal})$.

7 - Regression Equation 2SD

Acceptance windows based on EPA equation of proficiency value ± 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c & d as proficiency value = $a * \text{gravimetric} + b$ and proficiency standard deviation = $c * \text{gravimetric} + d$. Generally reserved for drinking water studies.

8 - Study Median and Dilution Levels

Acceptance windows based on study median ± 1 dilution. If the median falls between two test dilutions, then the assigned value is set at the higher value, and the lower acceptance limit is the second test dilution below the median, and the upper acceptance limit is the second test dilution above the median. Generally reserved for NOEC analytes (in the framework of WETT analysis).

9 - Fixed Limits based on Analytical Value

Acceptance windows based on span of analytical value from measurements.

6 Notes on the Interpretation of the Results

z score Overview

The z-scores are presented as colored triangles. For each item, the z-scores of all analytes of the current and the previous (up to three) scheduled studies of this study type. The z-scores depend on the lot, analytical method used, and analyst (if given). A red cross is shown if no z-score is available.

For the assessment of participants by means of z-scores according to ISO/IEC 17043:2010 [2], the triangles were colored as follows:

$ z \leq 2$	green
$2 < z < 3$	yellow (WS studies, WETT samples: red)
$ z \geq 3$	red.

For $|z| \geq 3$, the corresponding triangles are displayed as -3 or 3. For $|z| > 2$, the value of the z score is displayed next to the triangle (yellow or red). A z-score = 0 is shown as a light blue vertical bar.

Interpretation of the z-scores' overview:

A z-score < 0 , i.e. the triangle points to the left, means that the measurement result is lower than the assigned value.

A z-score > 0 , i.e. the triangle points to the right, means that the measurement result is higher than the assigned value.

A z-score = 0, i.e. a light blue vertical bar is shown, means that the measurement result coincides with the assigned value.

Figures per Combination of Item, Lot and Analyte

The *diagram on the left* shows the participant results by means of blue diamonds.

The horizontal blue line indicates the assigned value.

Both the acceptance and the check limits for the participant results are calculated based on z-scores.

The acceptance limits are displayed as solid lines and correspond to z-scores of ± 3 . For WS studies and non-NOEC analytes (in the framework of WETT analysis), the acceptance limits correspond to a z-score ± 2 . For NOEC analytes (in the framework of WETT analysis), the acceptance limits correspond to ± 1 dilution.

The check limits are displayed as dashed lines and correspond to z-scores of ± 2 . They are only calculated if a rule is given by the evaluation criterion.

In case there are at least 8 laboratories with quantitative data points are available: The *diagram on the right* is a kernel density estimation of the distribution of the participant results. The measurement values are indicated as small circles. The kernel width is determined by the ISO 13528 formula from section 10.3.2 i) a).

7 Proficiency Test Item Preparation, Homogeneity and Stability Assessment

Sigma-Aldrich RTC uses proprietary and published methods for the manufacture, homogeneity and stability testing of proficiency test items. Sigma-Aldrich RTC's proficiency test materials meet the requirements of ISO 17034. For more information contact Sigma-Aldrich RTC. Additionally, Sigma-Aldrich RTC complies with the TNI Volume 3 'General Requirements for Environmental Proficiency Test Providers', EL-V3-2009, 2009 for all TNI Fields of Proficiency Testing analytes.

8 Metrological Traceability

All preparations are made using balances calibrated annually traceable to NIST standards. Where appropriate analytical measurements are traceable through an unbroken chain to NIST standards, or a Certified Reference Material manufactured under ISO 17034 in conjunction with ISO/IEC 17025.

9 Additional Information

Go to merck-pt.com for additional information on summary statistics for specific methods, advice on the interpretation of the statistical analysis and additional comments/recommendations. Sigma-Aldrich RTC recommends that you contact your accreditation body for specific instruction.

10 References

- [1] ISO 13528: Statistical methods for use in proficiency testing by interlaboratory comparison, August 2015
- [2] ISO/IEC 17025:2017: General requirements for the competence of testing and calibration laboratories
- [3] ISO/IEC 17043:2010: Conformity assessment - General requirements for proficiency testing, May 2010
- [4] S. Uhlig und P. Henschel (1997): Limits of tolerance and z-scores in ring tests. Fresenius' J. Anal. Chem., Vol. 358, pp. 761-766.
- [5] ISO 17034:2016: General requirements for the competence of reference material producers.

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Lit. No. MS_BR1761EN
2018 - 10431
06/2018

PROFICIENCY TESTING

Evaluation Report

Scheduled Study

LPTP20-S3

Study Type

RCRA_UST

Open Date

2020-07-22

Close Date

2020-09-04

Report Generated

2020-09-22

Laboratory

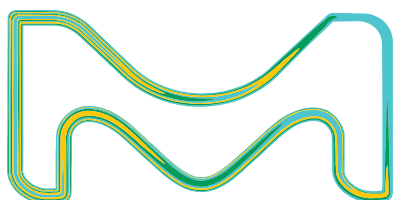
Pace Analytical Services, LLC. - Minneapolis MN
Jerry Thao
1700 Elm Street SE
Minneapolis MN 55414-2485 US

Account Number

49456465

US EPA Lab Code

MN00064



Provider of the proficiency test

Sigma-Aldrich RTC, Inc.
2931 Soldier Springs Road
Laramie, WY 82070 USA
ptservice@milliporesigma.com

Statistical analysis and reporting powered by

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Sigma-Aldrich RTC, Inc. is accredited by ANAB to provide PT programs for the scope of accreditation under ANAB Certificate # AP-1469.

All batch numbers of proficiency testing samples, including microbiological materials, are manufactured and tested in accordance with ISO/IEC 17043 requirements. For further information on proficiency testing samples, please check the PT product code information on each product detail page located on our website.



Accreditors

Evaluations of this study will be sent to the accreditor(s) listed below. If any of the information listed below is not correct, please contact Sigma-Aldrich RTC immediately.

Accrediting Agency

A2LA

Agency lab code: MN00064

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Accrediting Agency

North Dakota DOH

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West Virginia DEP

Agency lab code: 382

Lab Certification
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Charleston WV 25304 US

Accrediting Agency

Nevada DEP

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Washington State Dept. of Ecology

Agency lab code: C486

Rebecca Wood
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Manchester WA 98353 US

Accrediting Agency

Minnesota Pollution Control Agency

Agency lab code: MN00064

Sarah Yost
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St. Paul MN 55155 US

Summary Results for LPTP20-S3
SPE016-10G Dioxin and Furans in Soil - PT
LRAC4647

This proficiency testing sample was produced in accordance with ISO/IEC 17043:2010.

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 1613B 10120602				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: SMT Analysis Date: 2020-08-04	570 pg/g	547 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	219 - 875 pg/g	0.2 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: SMT Analysis Date: 2020-08-04	214 pg/g	198 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	79.2 - 317 pg/g	0.4 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: SMT Analysis Date: 2020-08-04	684 pg/g	749 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	300 - 1200 pg/g	-0.4 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: SMT Analysis Date: 2020-08-04	749 pg/g	749 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	300 - 1200 pg/g	0.0 Acceptable
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: SMT Analysis Date: 2020-08-04	784 pg/g	745 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	298 - 1190 pg/g	0.3 Acceptable
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: SMT Analysis Date: 2020-08-04	687 pg/g	674 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	270 - 1080 pg/g	0.1 Acceptable
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: SMT Analysis Date: 2020-08-04	202 pg/g	195 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	78.0 - 312 pg/g	0.2 Acceptable
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: SMT Analysis Date: 2020-08-04	1620 pg/g	1630 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	654 - 2610 pg/g	0.0 Acceptable

* Evaluation parameters used for the statistical analysis: explanation at the end of report; a yellow highlighted results is acceptable but to be checked.

** Unable to calculate a study mean due to <4 data points being received, therefore an effective evaluation could not be performed.

¹ TNI Compliant, covered by Sigma-Aldrich RTC's ANAB Proficiency Testing Provider accreditation, Cert. AP-1469

² ISO/IEC 17043 Accredited, covered by Sigma-Aldrich RTC's ANAB Proficiency Testing Provider accreditation, Cert AP-1469

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Hxcdd, total ² 9468 Analyst: SMT Analysis Date: 2020-08-04	2510 pg/g	2480 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	992 - 3970 pg/g	0.1 Acceptable
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: SMT Analysis Date: 2020-08-04	174 pg/g	162 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	64.6 - 258 pg/g	0.4 Acceptable
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: SMT Analysis Date: 2020-08-04	704 pg/g	702 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	281 - 1120 pg/g	0.0 Acceptable
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: SMT Analysis Date: 2020-08-04	835 pg/g	889 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	356 - 1420 pg/g	-0.3 Acceptable
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: SMT Analysis Date: 2020-08-04	687 pg/g	692 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	277 - 1110 pg/g	0.0 Acceptable
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: SMT Analysis Date: 2020-08-04	2400 pg/g	2410 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	965 - 3860 pg/g	0.0 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: SMT Analysis Date: 2020-08-04	753 pg/g	709 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	284 - 1130 pg/g	0.3 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: SMT Analysis Date: 2020-08-04	1880 pg/g	1720 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	688 - 2750 pg/g	0.5 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: SMT Analysis Date: 2020-08-04	373 pg/g	389 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	156 - 622 pg/g	-0.2 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: SMT Analysis Date: 2020-08-04	419 pg/g	413 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	165 - 661 pg/g	0.1 Acceptable

* Evaluation parameters used for the statistical analysis: explanation at the end of report; a yellow highlighted results is acceptable but to be checked.

** Unable to calculate a study mean due to <4 data points being received, therefore an effective evaluation could not be performed.

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² ISO/IEC 17043 Accredited, covered by Sigma-Aldrich RTC's ANAB Proficiency Testing Provider accreditation, Cert AP-1469

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,4,7,8-Pecdf ² 9549 Analyst: SMT Analysis Date: 2020-08-04	800 pg/g	841 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	336 - 1350 pg/g	-0.2 Acceptable
Pecdf, total ² 9552 Analyst: SMT Analysis Date: 2020-08-04	1220 pg/g	1300 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	519 - 2070 pg/g	-0.3 Acceptable
Pecdd, total ² 9555 Analyst: SMT Analysis Date: 2020-08-04	373 pg/g	389 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	156 - 622 pg/g	-0.2 Acceptable
TCDD, total ² 9609 Analyst: SMT Analysis Date: 2020-08-04	373 pg/g	372 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	149 - 595 pg/g	0.0 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: SMT Analysis Date: 2020-08-04	80.5 pg/g	77.8 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	31.1 - 124 pg/g	0.2 Acceptable
TCDF, total ² 9615 Analyst: SMT Analysis Date: 2020-08-04	80.5 pg/g	79.7 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	31.9 - 128 pg/g	0.0 Acceptable
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: SMT Analysis Date: 2020-08-04	373 pg/g	368 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	147 - 589 pg/g	0.1 Acceptable
PCDF, total ² 9657 Analyst: SMT Analysis Date: 2020-08-04	5240 pg/g	5200 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	2080 - 8320 pg/g	0.0 Acceptable
PCDD, total ² 9660 Analyst: SMT Analysis Date: 2020-08-04	5880 pg/g	5740 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	2300 - 9180 pg/g	0.1 Acceptable
Group Analysis Summary	Acceptable: 27/27		Score: 100% - Acceptable	

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 8280B (1998) 10187005				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: SMT Analysis Date: 2020-08-04	582 pg/g	547 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	219 - 875 pg/g	0.3 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: SMT Analysis Date: 2020-08-04	207 pg/g	198 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	79.2 - 317 pg/g	0.2 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: SMT Analysis Date: 2020-08-04	717 pg/g	749 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	300 - 1200 pg/g	-0.2 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: SMT Analysis Date: 2020-08-04	806 pg/g	749 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	300 - 1200 pg/g	0.4 Acceptable
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: SMT Analysis Date: 2020-08-04	789 pg/g	745 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	298 - 1190 pg/g	0.3 Acceptable
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: SMT Analysis Date: 2020-08-04	654 pg/g	674 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	270 - 1080 pg/g	-0.1 Acceptable
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: SMT Analysis Date: 2020-08-04	215 pg/g	195 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	78.0 - 312 pg/g	0.5 Acceptable
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: SMT Analysis Date: 2020-08-04	1600 pg/g	1630 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	654 - 2610 pg/g	-0.1 Acceptable
Hxcdd, total ² 9468 Analyst: SMT Analysis Date: 2020-08-04	2470 pg/g	2480 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	992 - 3970 pg/g	0.0 Acceptable
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: SMT Analysis Date: 2020-08-04	171 pg/g	162 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	64.6 - 258 pg/g	0.3 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: SMT Analysis Date: 2020-08-04	688 pg/g	702 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	281 - 1120 pg/g	-0.1 Acceptable
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: SMT Analysis Date: 2020-08-04	813 pg/g	889 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	356 - 1420 pg/g	-0.4 Acceptable
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: SMT Analysis Date: 2020-08-04	672 pg/g	692 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	277 - 1110 pg/g	-0.1 Acceptable
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: SMT Analysis Date: 2020-08-04	2340 pg/g	2410 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	965 - 3860 pg/g	-0.1 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: SMT Analysis Date: 2020-08-04	766 pg/g	709 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	284 - 1130 pg/g	0.4 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: SMT Analysis Date: 2020-08-04	2070 pg/g	1720 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	688 - 2750 pg/g	1.0 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: SMT Analysis Date: 2020-08-04	370 pg/g	389 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	156 - 622 pg/g	-0.2 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: SMT Analysis Date: 2020-08-04	412 pg/g	413 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	165 - 661 pg/g	0.0 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: SMT Analysis Date: 2020-08-04	797 pg/g	841 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	336 - 1350 pg/g	-0.3 Acceptable
Pecdf, total ² 9552 Analyst: SMT Analysis Date: 2020-08-04	1210 pg/g	1300 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	519 - 2070 pg/g	-0.3 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Pecdd, total ² 9555 Analyst: SMT Analysis Date: 2020-08-04	370 pg/g	389 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	156 - 622 pg/g	-0.2 Acceptable
TCDD, total ² 9609 Analyst: SMT Analysis Date: 2020-08-04	369 pg/g	372 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	149 - 595 pg/g	0.0 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: SMT Analysis Date: 2020-08-04	79.0 pg/g	77.8 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	31.1 - 124 pg/g	0.1 Acceptable
TCDF, total ² 9615 Analyst: SMT Analysis Date: 2020-08-04	79.0 pg/g	79.7 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	31.9 - 128 pg/g	0.0 Acceptable
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: SMT Analysis Date: 2020-08-04	369 pg/g	368 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	147 - 589 pg/g	0.0 Acceptable
PCDF, total ² 9657 Analyst: SMT Analysis Date: 2020-08-04	5180 pg/g	5200 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	2080 - 8320 pg/g	0.0 Acceptable
PCDD, total ² 9660 Analyst: SMT Analysis Date: 2020-08-04	6080 pg/g	5740 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	2300 - 9180 pg/g	0.3 Acceptable
Group Analysis Summary		Acceptable: 27/27		
Score: 100% - Acceptable				
EPA 8290 (1994) 10187209				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: SMT Analysis Date: 2020-08-04	570 pg/g	547 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	219 - 875 pg/g	0.2 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: SMT Analysis Date: 2020-08-04	214 pg/g	198 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	79.2 - 317 pg/g	0.4 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: SMT Analysis Date: 2020-08-04	684 pg/g	749 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	300 - 1200 pg/g	-0.4 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: SMT Analysis Date: 2020-08-04	749 pg/g	749 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	300 - 1200 pg/g	0.0 Acceptable
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: SMT Analysis Date: 2020-08-04	784 pg/g	745 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	298 - 1190 pg/g	0.3 Acceptable
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: SMT Analysis Date: 2020-08-04	687 pg/g	674 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	270 - 1080 pg/g	0.1 Acceptable
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: SMT Analysis Date: 2020-08-04	202 pg/g	195 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	78.0 - 312 pg/g	0.2 Acceptable
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: SMT Analysis Date: 2020-08-04	1620 pg/g	1630 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	654 - 2610 pg/g	0.0 Acceptable
Hxcdd, total ² 9468 Analyst: SMT Analysis Date: 2020-08-04	2510 pg/g	2480 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	992 - 3970 pg/g	0.1 Acceptable
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: SMT Analysis Date: 2020-08-04	174 pg/g	162 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	64.6 - 258 pg/g	0.4 Acceptable
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: SMT Analysis Date: 2020-08-04	704 pg/g	702 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	281 - 1120 pg/g	0.0 Acceptable
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: SMT Analysis Date: 2020-08-04	835 pg/g	889 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	356 - 1420 pg/g	-0.3 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: SMT Analysis Date: 2020-08-04	687 pg/g	692 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	277 - 1110 pg/g	0.0 Acceptable
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: SMT Analysis Date: 2020-08-04	2400 pg/g	2410 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	965 - 3860 pg/g	0.0 Acceptable
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: SMT Analysis Date: 2020-08-04	753 pg/g	709 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	284 - 1130 pg/g	0.3 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: SMT Analysis Date: 2020-08-04	1880 pg/g	1720 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	688 - 2750 pg/g	0.5 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: SMT Analysis Date: 2020-08-04	373 pg/g	389 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	156 - 622 pg/g	-0.2 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: SMT Analysis Date: 2020-08-04	419 pg/g	413 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	165 - 661 pg/g	0.1 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: SMT Analysis Date: 2020-08-04	800 pg/g	841 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	336 - 1350 pg/g	-0.2 Acceptable
Pecdf, total ² 9552 Analyst: SMT Analysis Date: 2020-08-04	1220 pg/g	1300 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	519 - 2070 pg/g	-0.3 Acceptable
Pecdd, total ² 9555 Analyst: SMT Analysis Date: 2020-08-04	373 pg/g	389 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	156 - 622 pg/g	-0.2 Acceptable
TCDD, total ² 9609 Analyst: SMT Analysis Date: 2020-08-04	373 pg/g	372 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	149 - 595 pg/g	0.0 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,7,8-TCDF ² 9612 Analyst: SMT Analysis Date: 2020-08-04	80.5 pg/g	77.8 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	31.1 - 124 pg/g	0.2 Acceptable
TCDF, total ² 9615 Analyst: SMT Analysis Date: 2020-08-04	80.5 pg/g	79.7 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	31.9 - 128 pg/g	0.0 Acceptable
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: SMT Analysis Date: 2020-08-04	373 pg/g	368 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	147 - 589 pg/g	0.1 Acceptable
PCDF, total ² 9657 Analyst: SMT Analysis Date: 2020-08-04	5240 pg/g	5200 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	2080 - 8320 pg/g	0.0 Acceptable
PCDD, total ² 9660 Analyst: SMT Analysis Date: 2020-08-04	5880 pg/g	5740 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	2300 - 9180 pg/g	0.1 Acceptable
Group Analysis Summary		Acceptable: 27/27		
Score: 100% - Acceptable				
EPA 8290A (2007) 10187403				
Dioxin and Furans - Soils				
1,2,3,4,6,7,8-Hpcdf ² 9420 Analyst: SMT Analysis Date: 2020-08-04	570 pg/g	547 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	219 - 875 pg/g	0.2 Acceptable
1,2,3,4,7,8,9-Hpcdf ² 9423 Analyst: SMT Analysis Date: 2020-08-04	214 pg/g	198 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	79.2 - 317 pg/g	0.4 Acceptable
1,2,3,4,6,7,8-Hpcdd ² 9426 Analyst: SMT Analysis Date: 2020-08-04	684 pg/g	749 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	300 - 1200 pg/g	-0.4 Acceptable
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) ² 9438 Analyst: SMT Analysis Date: 2020-08-04	749 pg/g	749 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	300 - 1200 pg/g	0.0 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Total Heptachlorodibenzofuran (Total HPCDF) ² 9444 Analyst: SMT Analysis Date: 2020-08-04	784 pg/g	745 pg/g	298 - 1190 pg/g	0.3 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
1,2,3,4,7,8-Hxcdd ² 9453 Analyst: SMT Analysis Date: 2020-08-04	687 pg/g	674 pg/g	270 - 1080 pg/g	0.1 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
1,2,3,6,7,8-Hxcdd ² 9456 Analyst: SMT Analysis Date: 2020-08-04	202 pg/g	195 pg/g	78.0 - 312 pg/g	0.2 Acceptable
Evaluation Criteria – 2* Parameters*: c:0.2, d:0				
1,2,3,7,8,9-Hxcdd ² 9459 Analyst: SMT Analysis Date: 2020-08-04	1620 pg/g	1630 pg/g	654 - 2610 pg/g	0.0 Acceptable
Evaluation Criteria – 2* Parameters*: c:0.2, d:0				
Hxcdd, total ² 9468 Analyst: SMT Analysis Date: 2020-08-04	2510 pg/g	2480 pg/g	992 - 3970 pg/g	0.1 Acceptable
Evaluation Criteria – 2* Parameters*: c:0.2, d:0				
1,2,3,4,7,8-Hxcdf ² 9471 Analyst: SMT Analysis Date: 2020-08-04	174 pg/g	162 pg/g	64.6 - 258 pg/g	0.4 Acceptable
Evaluation Criteria – 2* Parameters*: c:0.2, d:0				
1,2,3,6,7,8-Hxcdf ² 9474 Analyst: SMT Analysis Date: 2020-08-04	704 pg/g	702 pg/g	281 - 1120 pg/g	0.0 Acceptable
Evaluation Criteria – 2* Parameters*: c:0.2, d:0				
1,2,3,7,8,9-Hxcdf ² 9477 Analyst: SMT Analysis Date: 2020-08-04	835 pg/g	889 pg/g	356 - 1420 pg/g	-0.3 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
2,3,4,6,7,8-Hxcdf ² 9480 Analyst: SMT Analysis Date: 2020-08-04	687 pg/g	692 pg/g	277 - 1110 pg/g	0.0 Acceptable
Evaluation Criteria – 2* Parameters*: c:0.2, d:0				
Total Hexachlorodibenzofuran (Total HxCDF) ² 9483 Analyst: SMT Analysis Date: 2020-08-04	2400 pg/g	2410 pg/g	965 - 3860 pg/g	0.0 Acceptable
Evaluation Criteria – 2* Parameters*: c:0.2, d:0				

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
1,2,3,4,6,7,8,9-OCDF ² 9516 Analyst: SMT Analysis Date: 2020-08-04	753 pg/g	709 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	284 - 1130 pg/g	0.3 Acceptable
1,2,3,4,6,7,8,9-OCDD ² 9519 Analyst: SMT Analysis Date: 2020-08-04	1880 pg/g	1720 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	688 - 2750 pg/g	0.5 Acceptable
1,2,3,7,8-Pecdd ² 9540 Analyst: SMT Analysis Date: 2020-08-04	373 pg/g	389 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	156 - 622 pg/g	-0.2 Acceptable
1,2,3,7,8-Pecdf ² 9543 Analyst: SMT Analysis Date: 2020-08-04	419 pg/g	413 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	165 - 661 pg/g	0.1 Acceptable
2,3,4,7,8-Pecdf ² 9549 Analyst: SMT Analysis Date: 2020-08-04	800 pg/g	841 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	336 - 1350 pg/g	-0.2 Acceptable
Pecdf, total ² 9552 Analyst: SMT Analysis Date: 2020-08-04	1220 pg/g	1300 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	519 - 2070 pg/g	-0.3 Acceptable
Pecdd, total ² 9555 Analyst: SMT Analysis Date: 2020-08-04	373 pg/g	389 pg/g <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	156 - 622 pg/g	-0.2 Acceptable
TCDD, total ² 9609 Analyst: SMT Analysis Date: 2020-08-04	373 pg/g	372 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	149 - 595 pg/g	0.0 Acceptable
2,3,7,8-TCDF ² 9612 Analyst: SMT Analysis Date: 2020-08-04	80.5 pg/g	77.8 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	31.1 - 124 pg/g	0.2 Acceptable
TCDF, total ² 9615 Analyst: SMT Analysis Date: 2020-08-04	80.5 pg/g	79.7 pg/g <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	31.9 - 128 pg/g	0.0 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) ² 9618 Analyst: SMT Analysis Date: 2020-08-04	373 pg/g	368 pg/g	147 - 589 pg/g	0.1 Acceptable
PCDF, total ² 9657 Analyst: SMT Analysis Date: 2020-08-04	5240 pg/g	5200 pg/g	2080 - 8320 pg/g	0.0 Acceptable
PCDD, total ² 9660 Analyst: SMT Analysis Date: 2020-08-04	5880 pg/g	5740 pg/g	2300 - 9180 pg/g	0.1 Acceptable
Group Analysis Summary	Acceptable: 27/27		Score: 100% - Acceptable	

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**Summary Results for LPTP20-S3
SPE068-50G PCB Congeners in Soil - PT
LRAC7359**

This proficiency testing sample was produced in accordance with ISO/IEC 17043:2010.

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
EPA 1668A 10129405				
PCBs in Soil				
PCBs, total ² 8870 Analyst: CVS Analysis Date: 2020-08-12	3150 ug/Kg	4040 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	1620 - 6470 ug/Kg	-1.1 Acceptable
PCB (20)+(28) ² 8936 Analyst: CVS Analysis Date: 2020-08-12	181 ug/Kg	253 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	101 - 405 ug/Kg	-1.4 Acceptable
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) ² 8955 Analyst: CVS Analysis Date: 2020-08-12	313 ug/Kg	345 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	0 - 818 ug/Kg	-0.2 Acceptable
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) ² 8965 Analyst: CVS Analysis Date: 2020-08-12	55.2 ug/Kg	59.3 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	23.7 - 94.9 ug/Kg	-0.3 Acceptable
3,4,4',5-Tetrachlorobiphenyl (PCB 81) ² 8970 Analyst: CVS Analysis Date: 2020-08-12	16.6 ug/Kg	19.9 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	7.96 - 31.8 ug/Kg	-0.8 Acceptable
PCB (90)+(101)+(113) ² 8982 Analyst: CVS Analysis Date: 2020-08-12	159 ug/Kg	209 ug/Kg <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.2, d:0</i>	83.6 - 334 ug/Kg	-1.2 Acceptable
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) ² 8985 Analyst: CVS Analysis Date: 2020-08-12	14.3 ug/Kg	15.9 ug/Kg <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.2, d:0</i>	6.36 - 25.4 ug/Kg	-0.5 Acceptable
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) ² 8995 Analyst: CVS Analysis Date: 2020-08-12	192 ug/Kg	210 ug/Kg <i>Evaluation Criteria – 5*</i> <i>Parameters*: deviations:3</i>	35.3 - 385 ug/Kg	-0.3 Acceptable

* Evaluation parameters used for the statistical analysis: explanation at the end of report; a yellow highlighted results is acceptable but to be checked.

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) ² 9000 Analyst: CVS Analysis Date: 2020-08-12	253 ug/Kg	317 ug/Kg	127 - 507 ug/Kg	-1.0 Acceptable
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) ² 9005 Analyst: CVS Analysis Date: 2020-08-12	294 ug/Kg	373 ug/Kg	149 - 597 ug/Kg	-1.1 Acceptable
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) ² 9015 Analyst: CVS Analysis Date: 2020-08-12	257 ug/Kg	276 ug/Kg	110 - 442 ug/Kg	-0.3 Acceptable
PCB (129)+(138)+(163) ² 9026 Analyst: CVS Analysis Date: 2020-08-12	201 ug/Kg	269 ug/Kg	108 - 430 ug/Kg	-1.3 Acceptable
PCB (153)+(168) ² 9041 Analyst: CVS Analysis Date: 2020-08-12	303 ug/Kg	332 ug/Kg	133 - 531 ug/Kg	-0.4 Acceptable
PCB (156)+(157) ² 9046 Analyst: CVS Analysis Date: 2020-08-12	211 ug/Kg	253 ug/Kg	101 - 405 ug/Kg	-0.8 Acceptable
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) ² 9055 Analyst: CVS Analysis Date: 2020-08-12	180 ug/Kg	166 ug/Kg	66.4 - 266 ug/Kg	0.4 Acceptable
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) ² 9060 Analyst: CVS Analysis Date: 2020-08-12	42.8 ug/Kg	44.4 ug/Kg	17.8 - 71.0 ug/Kg	-0.2 Acceptable
PCB (180)+(193) ² 9070 Analyst: CVS Analysis Date: 2020-08-12	180 ug/Kg	290 ug/Kg	116 - 464 ug/Kg	-1.9 Acceptable

* Evaluation parameters used for the statistical analysis: explanation at the end of report; a yellow highlighted results is acceptable but to be checked.

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) ² 9085 Analyst: CVS Analysis Date: 2020-08-12	287 ug/Kg	349 ug/Kg	140 - 558 ug/Kg	-0.9 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
Group Analysis Summary	Acceptable: 18/18		Score: 100% - Acceptable	
EPA 1668C (2010) 10262109				
PCBs in Soil				
PCBs, total ² 8870 Analyst: CVS Analysis Date: 2020-08-12	3150 ug/Kg	4040 ug/Kg	1620 - 6470 ug/Kg	-1.1 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
PCB (20)+(28) ² 8936 Analyst: CVS Analysis Date: 2020-08-12	181 ug/Kg	253 ug/Kg	101 - 405 ug/Kg	-1.4 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) ² 8955 Analyst: CVS Analysis Date: 2020-08-12	313 ug/Kg	345 ug/Kg	0 - 818 ug/Kg	-0.2 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) ² 8965 Analyst: CVS Analysis Date: 2020-08-12	55.2 ug/Kg	59.3 ug/Kg	23.7 - 94.9 ug/Kg	-0.3 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
3,4,4',5-Tetrachlorobiphenyl (PCB 81) ² 8970 Analyst: CVS Analysis Date: 2020-08-12	16.6 ug/Kg	19.9 ug/Kg	7.96 - 31.8 ug/Kg	-0.8 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
PCB (90)+(101)+(113) ² 8982 Analyst: CVS Analysis Date: 2020-08-12	159 ug/Kg	209 ug/Kg	83.6 - 334 ug/Kg	-1.2 Acceptable
Evaluation Criteria – 2* Parameters*: c:0.2, d:0				
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) ² 8985 Analyst: CVS Analysis Date: 2020-08-12	14.3 ug/Kg	15.9 ug/Kg	6.36 - 25.4 ug/Kg	-0.5 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) ² 8995 Analyst: CVS Analysis Date: 2020-08-12	192 ug/Kg	210 ug/Kg	35.3 - 385 ug/Kg	-0.3 Acceptable
Evaluation Criteria – 5* Parameters*: deviations:3				

* Evaluation parameters used for the statistical analysis: explanation at the end of report; a yellow highlighted results is acceptable but to be checked.

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) ² 9000 Analyst: CVS Analysis Date: 2020-08-12	253 ug/Kg	317 ug/Kg	127 - 507 ug/Kg	-1.0 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) ² 9005 Analyst: CVS Analysis Date: 2020-08-12	294 ug/Kg	373 ug/Kg	149 - 597 ug/Kg	-1.1 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) ² 9015 Analyst: CVS Analysis Date: 2020-08-12	257 ug/Kg	276 ug/Kg	110 - 442 ug/Kg	-0.3 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
PCB (129)+(138)+(163) ² 9026 Analyst: CVS Analysis Date: 2020-08-12	201 ug/Kg	269 ug/Kg	108 - 430 ug/Kg	-1.3 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
PCB (153)+(168) ² 9041 Analyst: CVS Analysis Date: 2020-08-12	303 ug/Kg	332 ug/Kg	133 - 531 ug/Kg	-0.4 Acceptable
Evaluation Criteria – 2* Parameters*: c:0.2, d:0				
PCB (156)+(157) ² 9046 Analyst: CVS Analysis Date: 2020-08-12	211 ug/Kg	253 ug/Kg	101 - 405 ug/Kg	-0.8 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) ² 9055 Analyst: CVS Analysis Date: 2020-08-12	180 ug/Kg	166 ug/Kg	66.4 - 266 ug/Kg	0.4 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) ² 9060 Analyst: CVS Analysis Date: 2020-08-12	42.8 ug/Kg	44.4 ug/Kg	17.8 - 71.0 ug/Kg	-0.2 Acceptable
Evaluation Criteria – 2* Parameters*: c:0.2, d:0				
PCB (180)+(193) ² 9070 Analyst: CVS Analysis Date: 2020-08-12	180 ug/Kg	290 ug/Kg	116 - 464 ug/Kg	-1.9 Acceptable
Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0				

* Evaluation parameters used for the statistical analysis: explanation at the end of report; a yellow highlighted results is acceptable but to be checked.

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) ² 9085	287 ug/Kg	349 ug/Kg	140 - 558 ug/Kg	-0.9 Acceptable
Analyst: CVS Analysis Date: 2020-08-12	Evaluation Criteria – 1* Parameters*: a:1, b:0, c:0.2, d:0			
Group Analysis Summary	Acceptable: 18/18		Score: 100% - Acceptable	

* Evaluation parameters used for the statistical analysis: explanation at the end of report; a yellow highlighted results is acceptable but to be checked.

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**Summary Results for LPTP20-S3
SPE006-225G STLC Metals CA - WET in Soil - PT
LRAC7412**

This proficiency testing sample was produced in accordance with ISO/IEC 17043:2010.

Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
CA Title 22 WET 90017235				
STLC - CA WET				
Antimony, Sb ² 1005 Analyst: DM Analysis Date: 2020-08-18	10.9 mg/L	9.88 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	4.41 - 15.3 mg/L	0.6 Acceptable
Arsenic, As ² 1010 Analyst: DM Analysis Date: 2020-08-18	22.1 mg/L	19.0 mg/L <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.15, d:0.34</i>	9.43 - 28.6 mg/L	1.0 Acceptable
Barium, Ba ² 1015 Analyst: DM Analysis Date: 2020-08-18	7.10 mg/L	5.86 mg/L <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.15, d:0.34</i>	2.20 - 9.52 mg/L	1.0 Acceptable
Beryllium, Be ² 1020 Analyst: DM Analysis Date: 2020-08-18	<0.050 mg/L	0.0100 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	0 - 1.03 mg/L	Acceptable
Cadmium, Cd ² 1030 Analyst: BD1 Analysis Date: 2020-08-18	12.8 mg/L	11.6 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	5.36 - 17.8 mg/L	0.6 Acceptable
Chromium, Cr (total) ² 1040 Analyst: DM Analysis Date: 2020-08-18	13.2 mg/L	12.5 mg/L <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.15, d:0.34</i>	5.83 - 19.1 mg/L	0.3 Acceptable
Cobalt, Co ² 1050 Analyst: DM Analysis Date: 2020-08-18	0.168 mg/L	0.178 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	0 - 1.28 mg/L	0.0 Acceptable
Copper, Cu ² 1055 Analyst: DM Analysis Date: 2020-08-18	17.7 mg/L	16.2 mg/L <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.15, d:0.34</i>	7.90 - 24.5 mg/L	0.5 Acceptable
Lead, Pb ² 1075 Analyst: DM Analysis Date: 2020-08-18	21.4 mg/L	19.0 mg/L <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.15, d:0.34</i>	9.42 - 28.5 mg/L	0.8 Acceptable

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Analyte	Reported Value	Assigned Value	Acceptance Window	z-score*
Molybdenum, Mo ² 1100 Analyst: DM Analysis Date: 2020-08-18	<0.15 mg/L	0.150 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	0 - 1.24 mg/L	Acceptable
Nickel, Ni ² 1105 Analyst: DM Analysis Date: 2020-08-18	14.5 mg/L	12.3 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	5.74 - 18.9 mg/L	1.0 Acceptable
Selenium, Se ² 1140 Analyst: DM Analysis Date: 2020-08-18	9.86 mg/L	9.20 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	4.04 - 14.4 mg/L	0.4 Acceptable
Silver, Ag ² 1150 Analyst: DM Analysis Date: 2020-08-18	0.144 mg/L	0.259 mg/L <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.15, d:0.34</i>	0 - 1.40 mg/L	-0.3 Acceptable
Thallium, Tl ² 1165 Analyst: DM Analysis Date: 2020-08-18	2.48 mg/L	2.79 mg/L <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.15, d:0.34</i>	0.516 - 5.07 mg/L	-0.4 Acceptable
Vanadium, V ² 1185 Analyst: DM Analysis Date: 2020-08-18	26.8 mg/L	23.5 mg/L <i>Evaluation Criteria – 1*</i> <i>Parameters*: a:1, b:0, c:0.15, d:0.34</i>	11.9 - 35.1 mg/L	0.9 Acceptable
Zinc, Zn ² 1190 Analyst: DM Analysis Date: 2020-08-18	18.6 mg/L	16.9 mg/L <i>Evaluation Criteria – 2*</i> <i>Parameters*: c:0.15, d:0.34</i>	8.26 - 25.5 mg/L	0.6 Acceptable
Group Analysis Summary	Acceptable: 16/16		Score: 100% - Acceptable	

* Evaluation parameters used for the statistical analysis: explanation at the end of report; a yellow highlighted results is acceptable but to be checked.

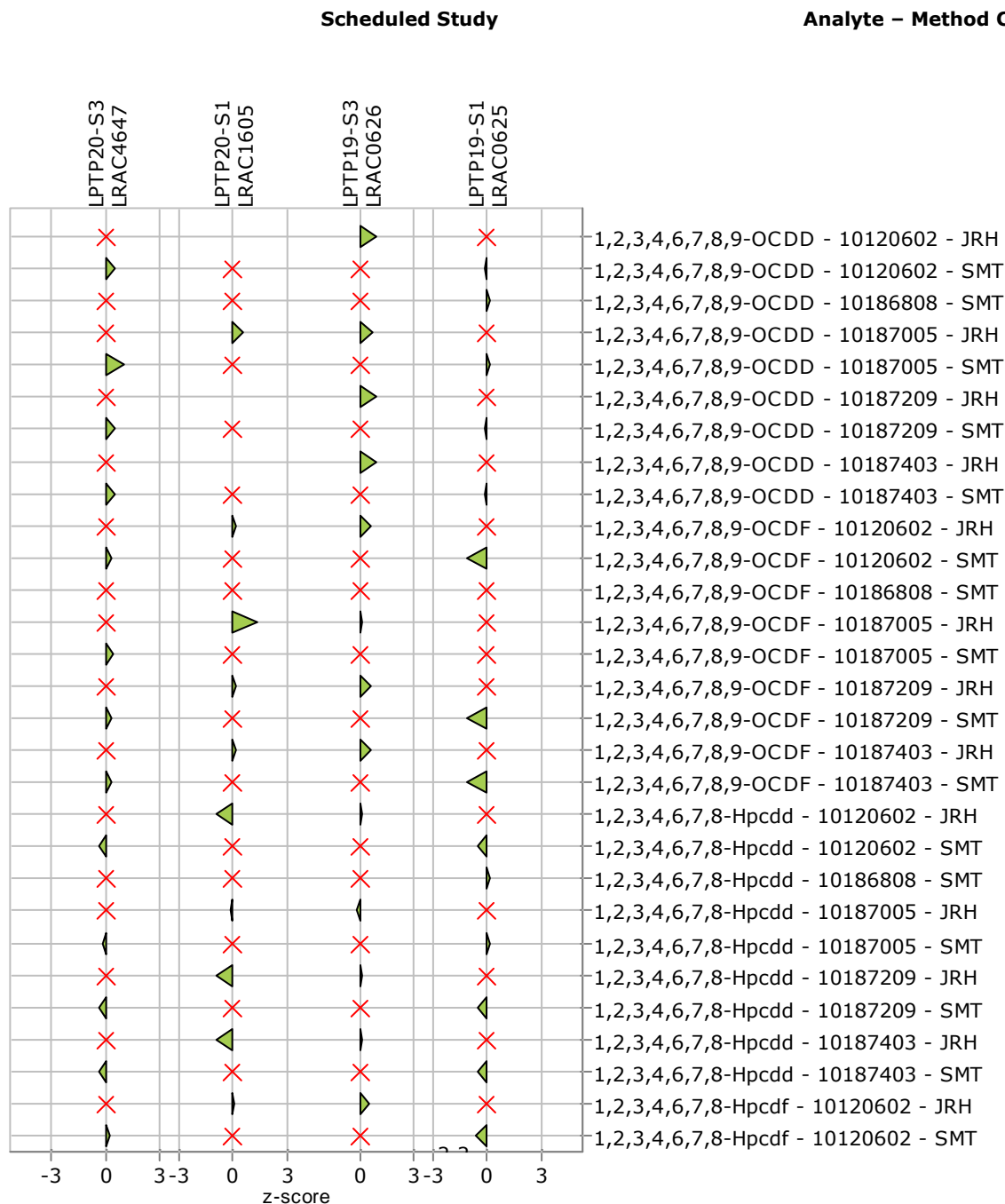
** Unable to calculate a study mean due to <4 data points being received, therefore an effective evaluation could not be performed.

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Graphical z-score Overview for LPTP20-S3 SPE016-10G Dioxin and Furans in Soil - PT

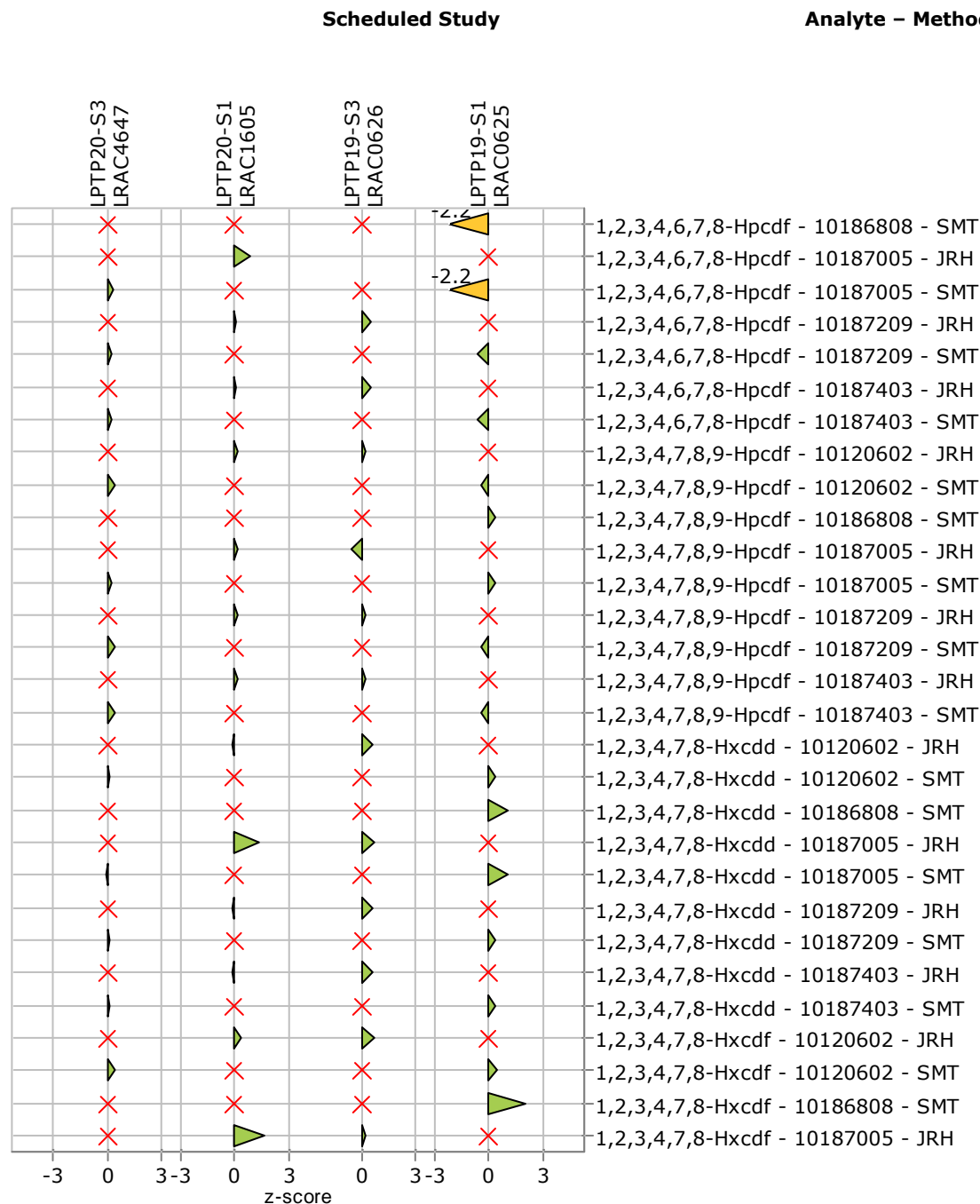
z-score Overview* for LPTP20-S3 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

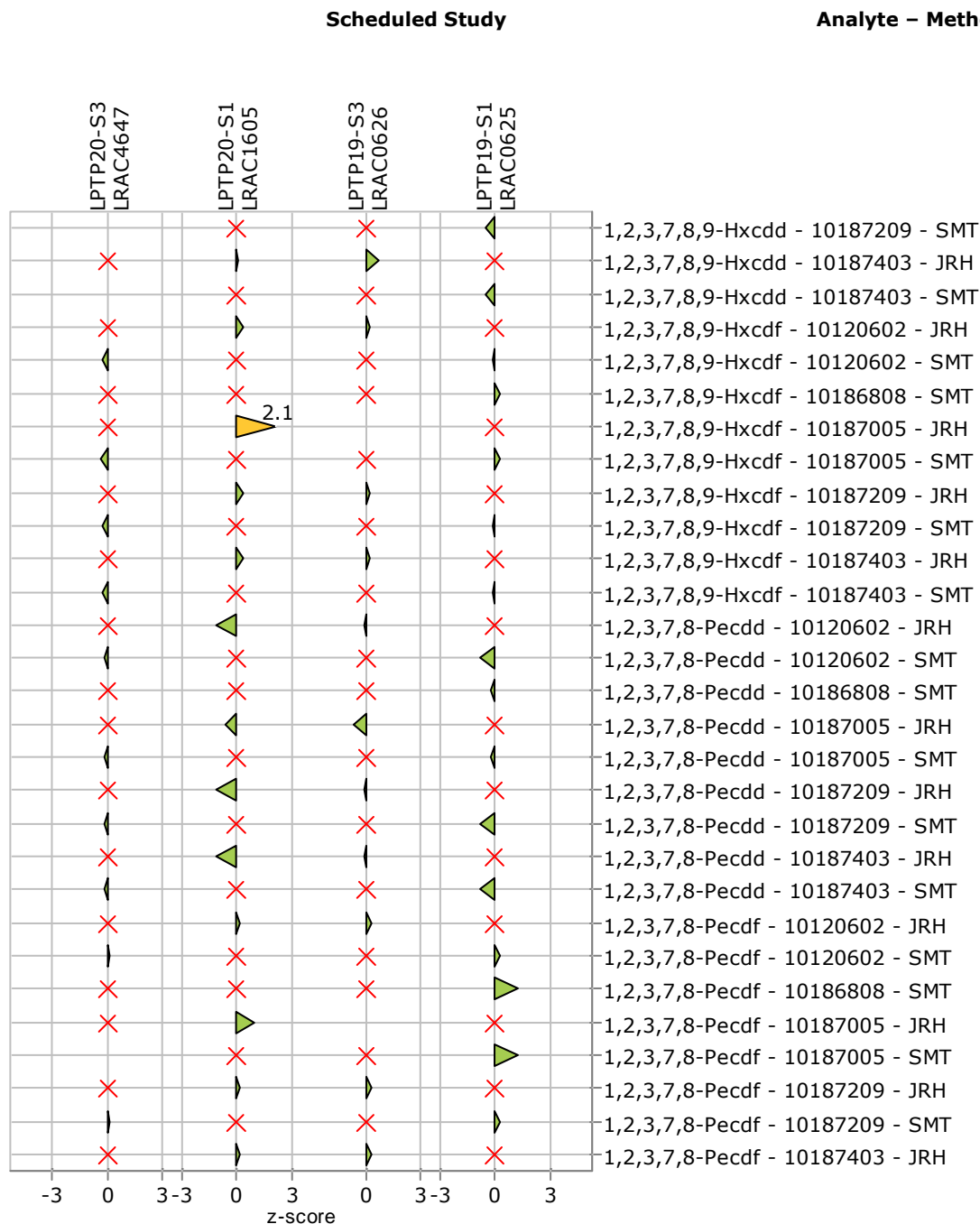
z-score Overview* for LPTP20-S3 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

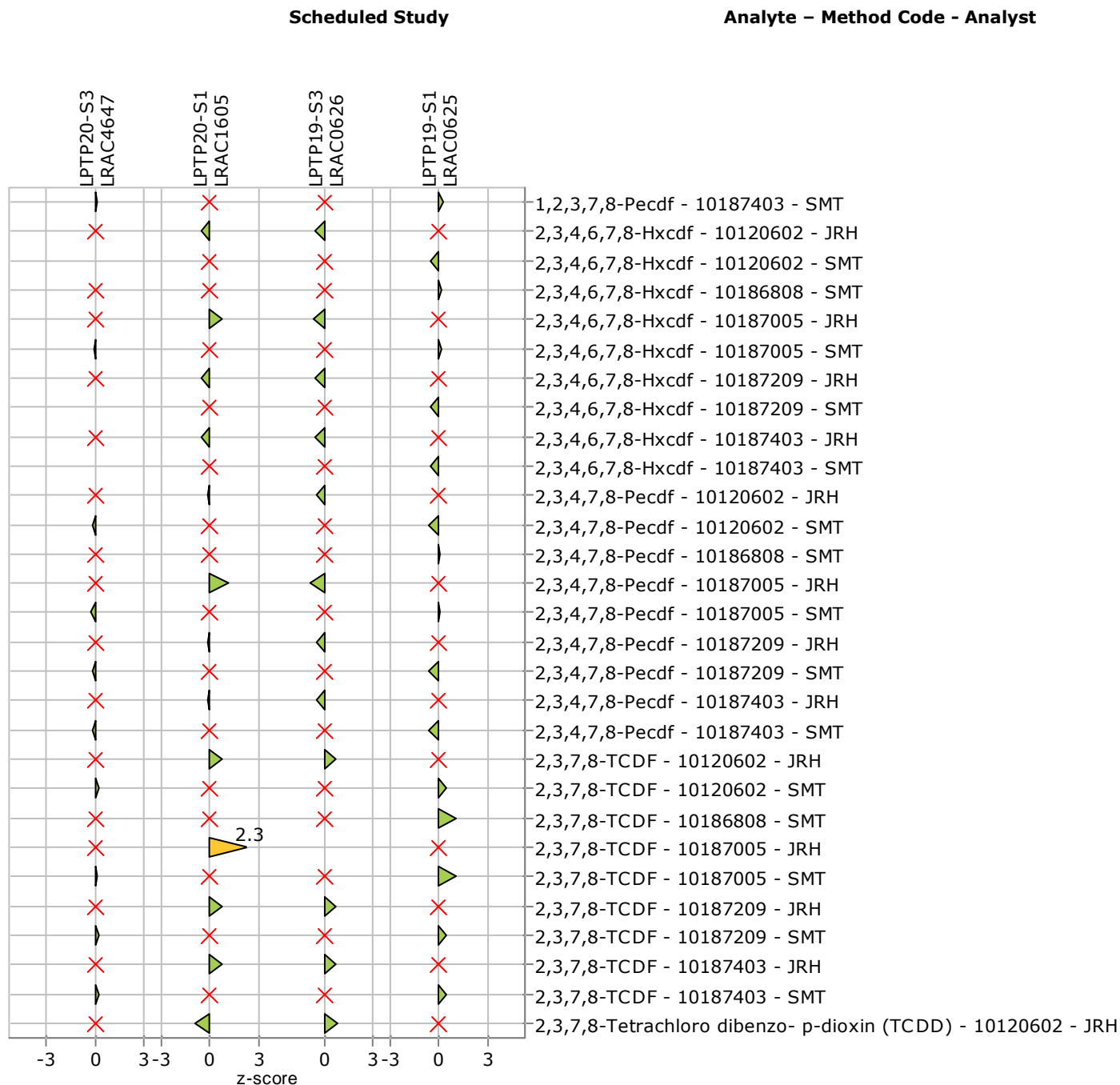
z-score Overview* for LPTP20-S3 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

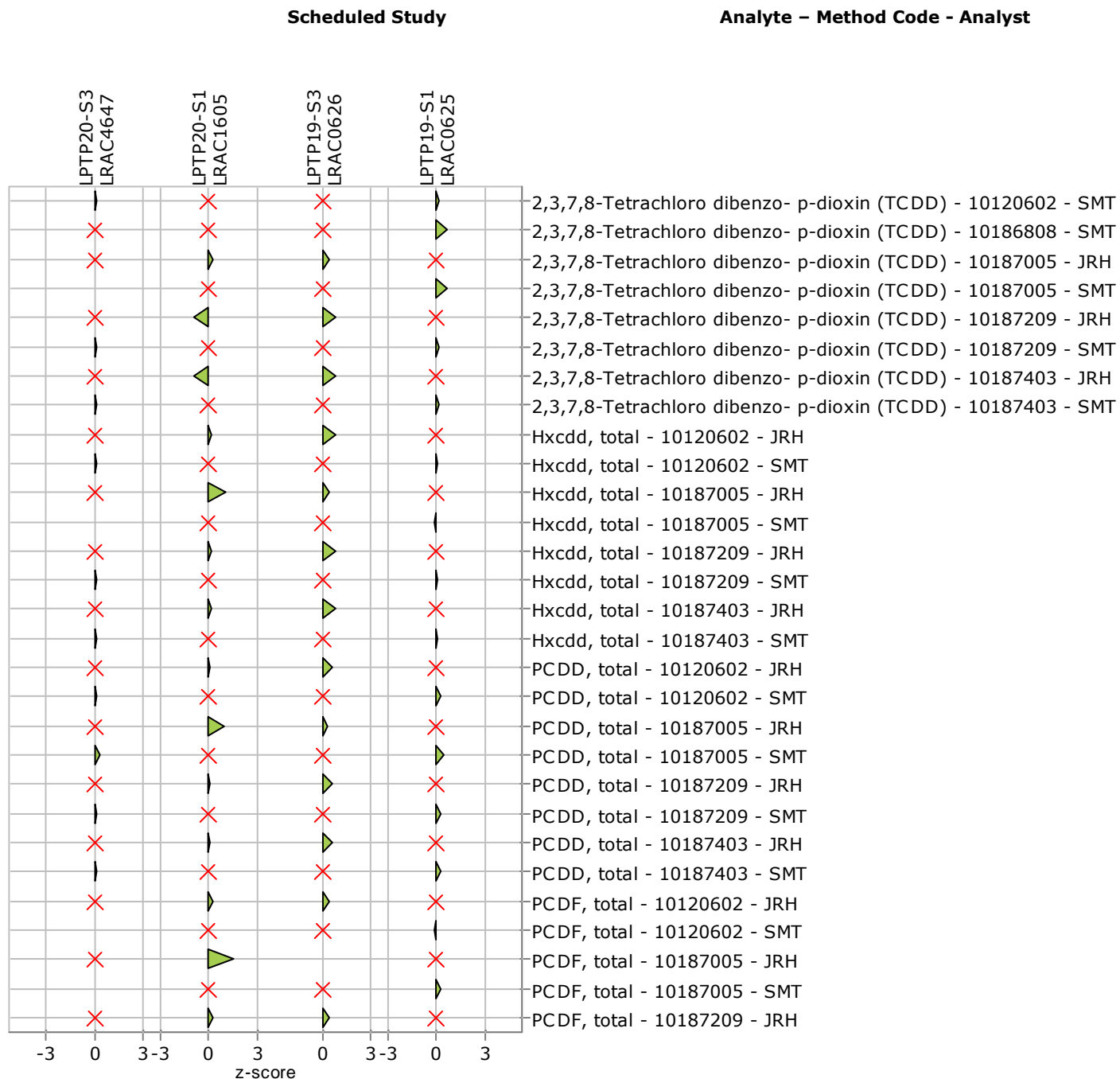
z-score Overview* for LPTP20-S3 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

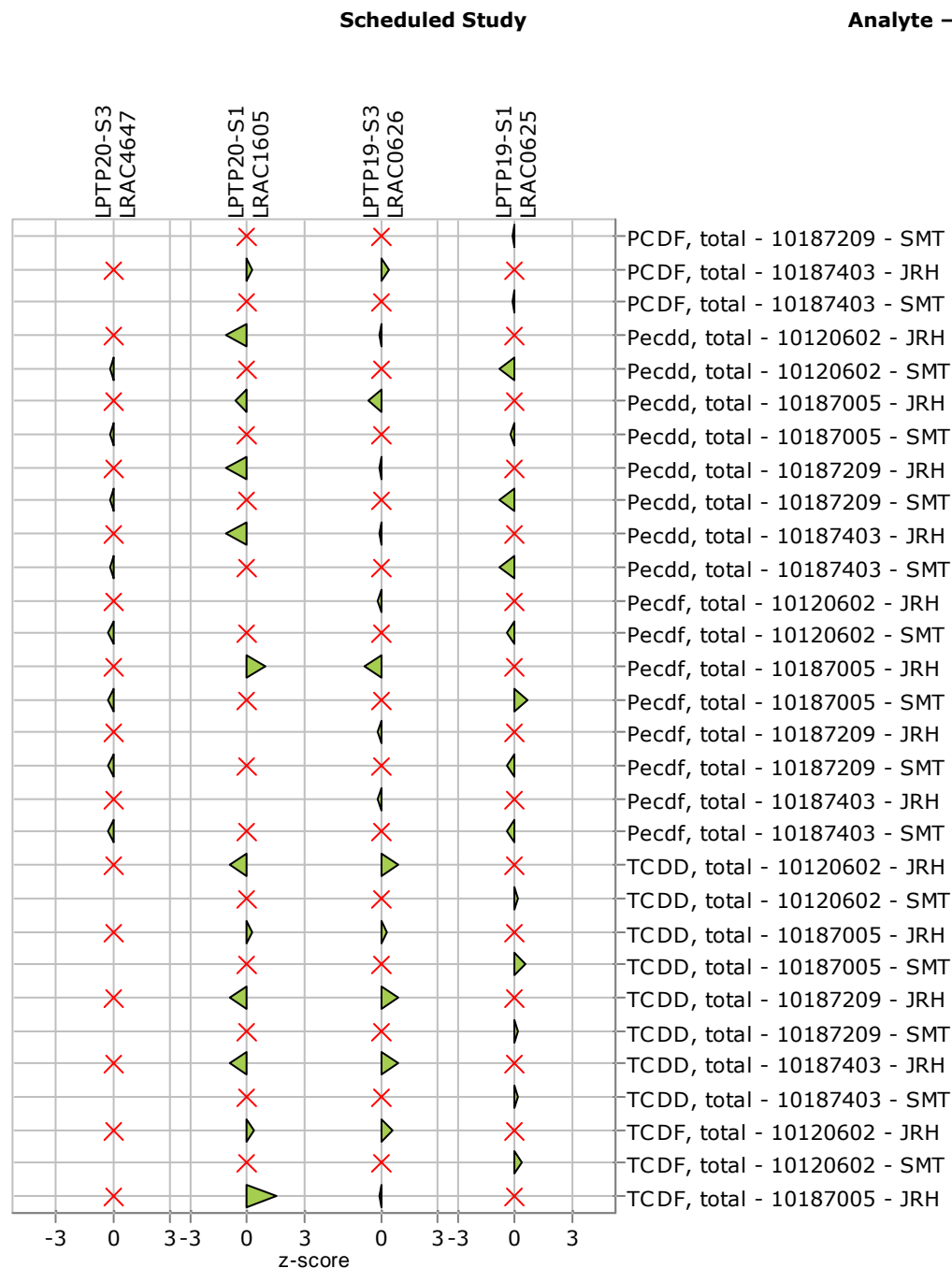
z-score Overview* for LPTP20-S3 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

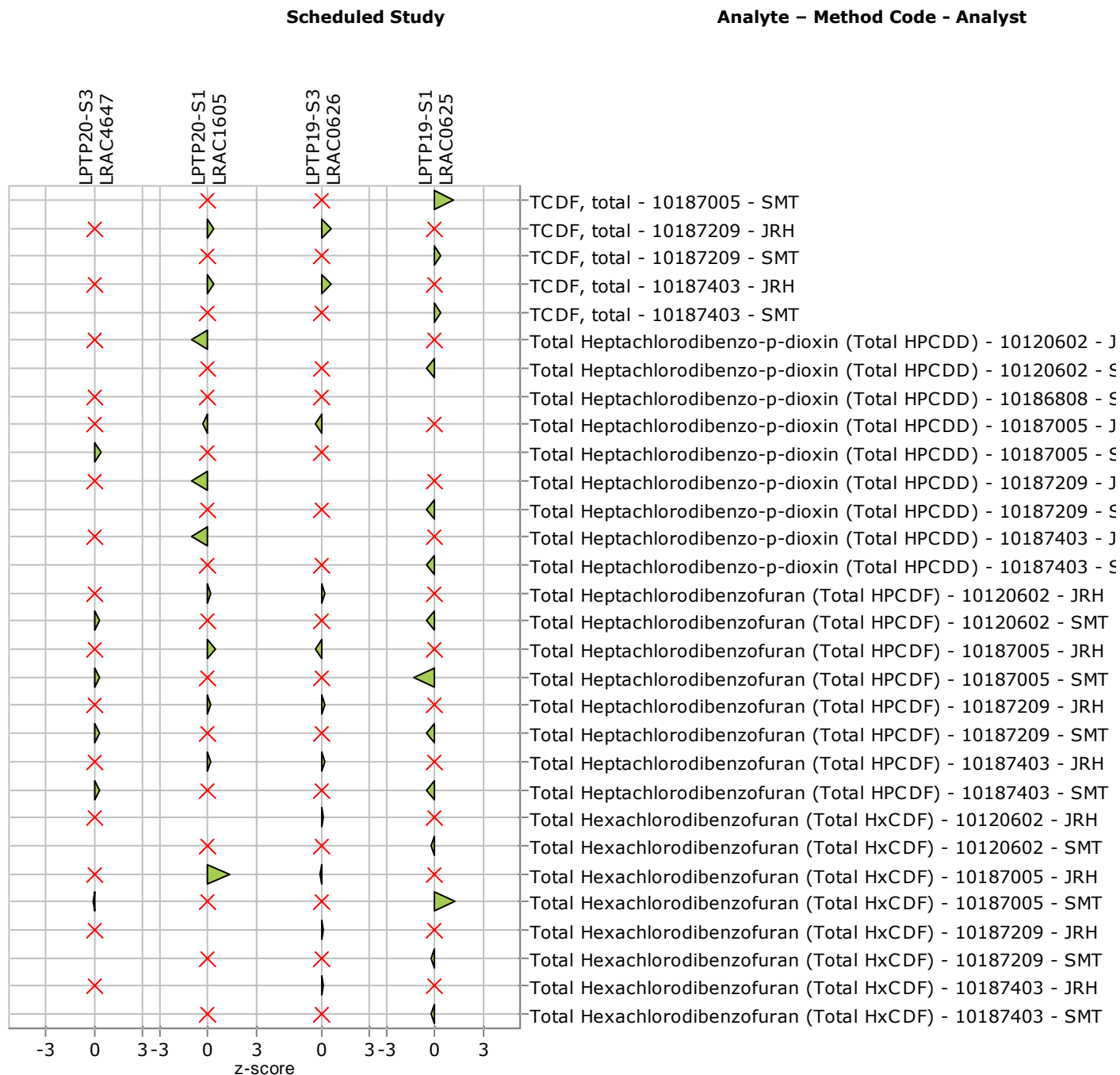
z-score Overview* for LPTP20-S3 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S3 SPE016-10G Dioxin and Furans in Soil - PT [Continuation]

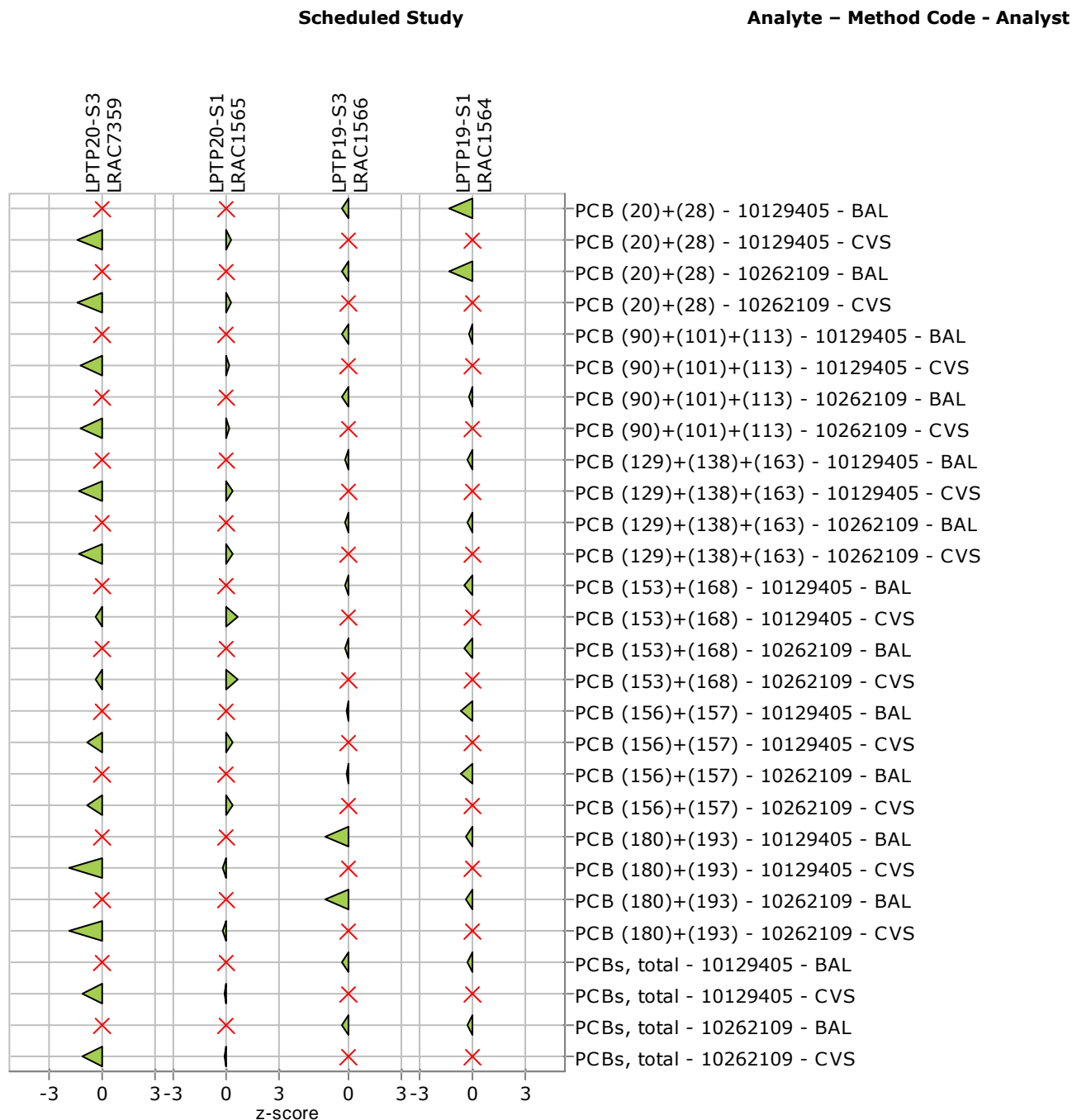
z-score Overview* for LPTP20-S3 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S3 SPE068-50G PCB Congeners in Soil - PT [Continuation]

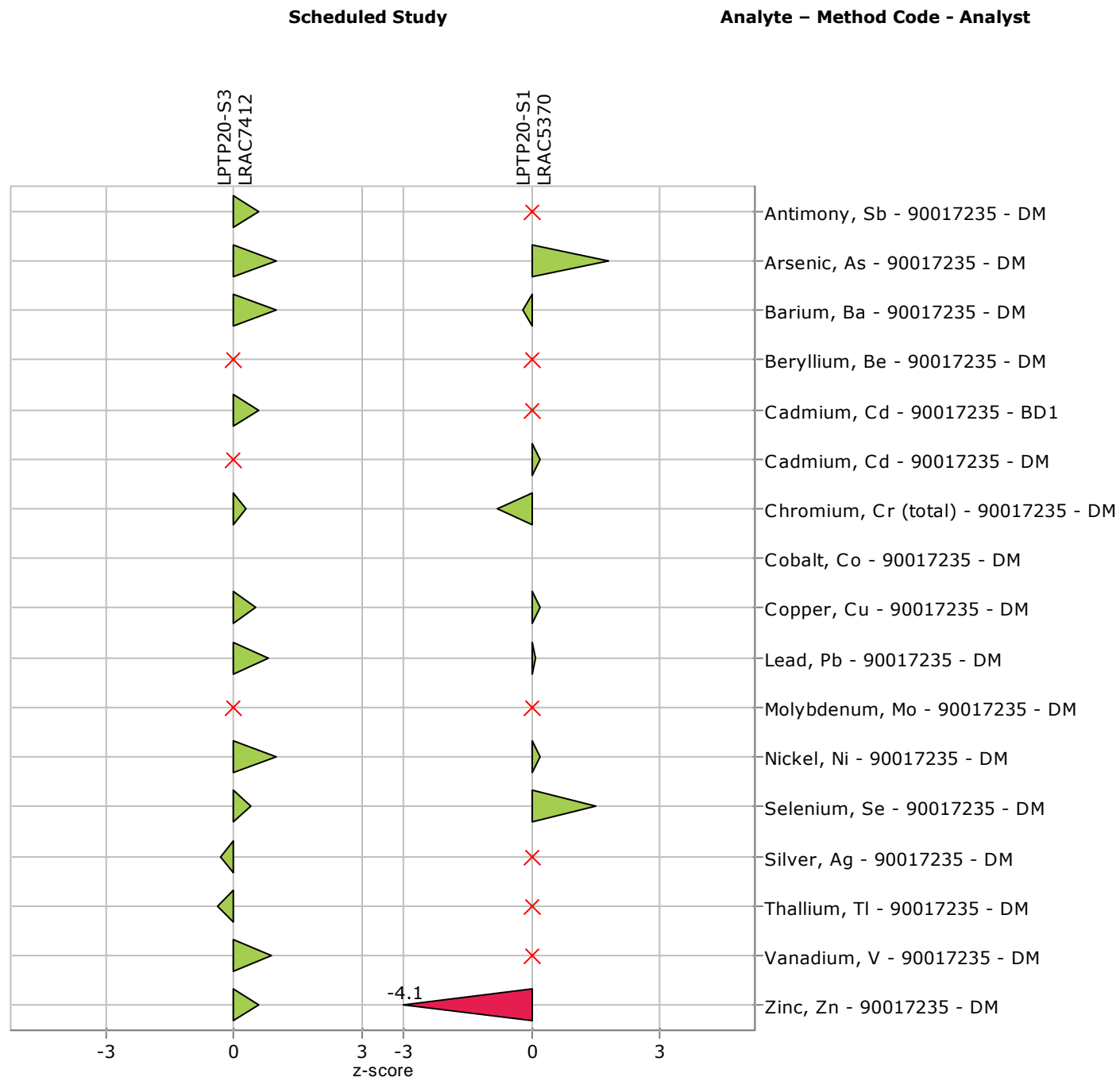
z-score Overview* for LPTP20-S3 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

Graphical z-score Overview for LPTP20-S3 SPE006-225G STLC Metals CA - WET in Soil - PT

z-score Overview* for LPTP20-S3 and the Previous three Scheduled Studies of this Study Type



* Evaluation parameters used for the statistical analysis; explanation at the end of report

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1 Aim of the Proficiency Test

This interlaboratory study is a proficiency test for the assessment of laboratory performance. It was conducted in the framework of external quality assurance and the report provides an external appraisal of the participant laboratories' competence in the particular testing field.

2 Sample Information

SPE016-10G Dioxin and Furans in Soil - PT LRAC4647

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
1,2,3,4,6,7,8-Hpcdf 9420	pg/g	547 ± 16.0	---	565	19.6
1,2,3,4,7,8,9-Hpcdf 9423	pg/g	198 ± 6.00	---	211	11.4
1,2,3,4,6,7,8-Hpcdd 9426	pg/g	749 ± 23.0	---	713	57.9
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) 9438	pg/g	749 ± 23.0	---	774	58.9
Total Heptachlorodibenzofuran (Total HPCDF) 9444	pg/g	745 ± 22.0	---	788	33.0
1,2,3,4,7,8-Hxcdd 9453	pg/g	674 ± 20.0	---	640	75.9
1,2,3,6,7,8-Hxcdd 9456	pg/g	220 ± 7.00	---	195	11.7
1,2,3,7,8,9-Hxcdd 9459	pg/g	588 ± 18.0	---	1630	250
Hxcdd, total 9468	pg/g	1480 ± 44.0	---	2480	310
1,2,3,4,7,8-Hxcdf 9471	pg/g	178 ± 5.00	---	162	11.4
1,2,3,6,7,8-Hxcdf 9474	pg/g	855 ± 26.0	---	702	55.1
1,2,3,7,8,9-Hxcdf 9477	pg/g	889 ± 27.0	---	839	64.3
2,3,4,6,7,8-Hxcdf 9480	pg/g	765 ± 23.0	---	692	38.5
Total Hexachlorodibenzofuran (Total HxCDF) 9483	pg/g	2690 ± 81.0	---	2410	181
1,2,3,4,6,7,8,9-OCDF 9516	pg/g	459 ± 14.0	---	709	58.8
1,2,3,4,6,7,8,9-OCDD 9519	pg/g	817 ± 25.0	---	1720	262
1,2,3,7,8-Pecdd 9540	pg/g	389 ± 12.0	---	385	16.4
1,2,3,7,8-Pecdf 9543	pg/g	353 ± 11.0	---	413	15.3
2,3,4,7,8-Pecdf 9549	pg/g	772 ± 23.0	---	841	42.1

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
Pecdf, total 9552	pg/g	1120 ± 34.0	---	1300	101
Pecdd, total 9555	pg/g	389 ± 12.0	---	385	14.3
TCDD, total 9609	pg/g	494 ± 14.8	---	372	6.94
2,3,7,8-TCDF 9612	pg/g	103 ± 3.00	---	77.8	2.68
TCDF, total 9615	pg/g	103 ± 3.00	---	79.7	3.05
2,3,7,8-Tetrachloro dibenzo- p- dioxin (TCDD) 9618	pg/g	494 ± 15.0	---	368	12.8
PCDF, total 9657	pg/g	4660 ± 140	---	5200	187
PCDD, total 9660	pg/g	3930 ± 118	---	5740	308

SPE068-50G PCB Congeners in Soil - PT LRAC7359

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
PCBs, total 8870	ug/Kg	4040 ± 121	---	---	---
PCB (20)+(28) 8936	ug/Kg	253 ± 7.59	---	248	71.9
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) 8955	ug/Kg	430 ± 12.9	---	345	157
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) 8965	ug/Kg	59.3 ± 1.78	---	58.2	7.52
3,4,4',5-Tetrachlorobiphenyl (PCB 81) 8970	ug/Kg	19.9 ± 0.600	---	18.6	2.12
PCB (90)+(101)+(113) 8982	ug/Kg	260 ± 7.80	---	209	52.3
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) 8985	ug/Kg	15.9 ± 0.480	---	16.2	3.11
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) 8995	ug/Kg	227 ± 6.81	---	210	58.2
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) 9000	ug/Kg	317 ± 9.51	---	275	59.5

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) 9005	ug/Kg	373 ± 11.2	---	316	86.4
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) 9015	ug/Kg	276 ± 8.28	---	270	69.5
PCB (129)+(138)+(163) 9026	ug/Kg	269 ± 8.07	---	220	69.5
PCB (153)+(168) 9041	ug/Kg	434 ± 13.0	---	332	108
PCB (156)+(157) 9046	ug/Kg	253 ± 7.59	---	220	54.2
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) 9055	ug/Kg	166 ± 4.98	---	191	45.3
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) 9060	ug/Kg	50.9 ± 1.53	---	44.4	3.71
PCB (180)+(193) 9070	ug/Kg	290 ± 8.70	---	230	81.5
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) 9085	ug/Kg	349 ± 10.5	---	324	67.7

SPE006-225G STLC Metals CA - WET in Soil - PT LRAC7412

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
Antimony, Sb 1005	mg/L	9.88 ± 0.0958	15.0	9.86	0.649
Arsenic, As 1010	mg/L	21.8 ± 0.211	5.00	19.0	1.25
Barium, Ba 1015	mg/L	11.0 ± 0.118	100	5.86	0.140
Beryllium, Be 1020	mg/L	0.0100	0.750	---	---
Cadmium, Cd 1030	mg/L	11.6 ± 0.194	1.00	11.4	0.479
Chromium, Cr (total) 1040	mg/L	14.8 ± 0.143	5.00	12.5	1.30
Cobalt, Co 1050	mg/L	0.178 ± 0.00172	80.0	---	---
Copper, Cu 1055	mg/L	18.3 ± 0.175	25.0	16.2	1.75
Lead, Pb 1075	mg/L	17.3 ± 0.180	5.00	19.0	1.69

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

Analyte	Unit	Gravimetric Value	PTRL	Study Mean*	Study Std. Dev.*
Molybdenum, Mo 1100	mg/L	0.150	350	---	---
Nickel, Ni 1105	mg/L	12.3	20.0	13.7	1.94
Selenium, Se 1140	mg/L	9.20	1.00	9.22	0.830
Silver, Ag 1150	mg/L	2.00	5.00	0.259	0.149
Thallium, Tl 1165	mg/L	3.85	7.00	2.79	0.411
Vanadium, V 1185	mg/L	23.5	24.0	24.4	2.11
Zinc, Zn 1190	mg/L	25.0	250	16.9	1.71

* If there are not enough data available to provide Study mean and Study Std. Dev, this is indicated by "---".

3 Data Availability

SPE016-10G Dioxin and Furans in Soil - PT LRAC4647

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
1,2,3,4,6,7,8-Hpcdf 9420	6	6	12	12
1,2,3,4,7,8,9-Hpcdf 9423	6	6	12	12
1,2,3,4,6,7,8-Hpcdd 9426	6	6	12	12
Total Heptachlorodibenzo-p-dioxin (Total HPCDD) 9438	6	6	12	12
Total Heptachlorodibenzofuran (Total HPCDF) 9444	6	6	12	12
1,2,3,4,7,8-Hxcdd 9453	6	6	12	12
1,2,3,6,7,8-Hxcdd 9456	6	6	12	12
1,2,3,7,8,9-Hxcdd 9459	6	6	12	12
Hxcdd, total 9468	6	6	12	12
1,2,3,4,7,8-Hxcdf 9471	6	6	12	12
1,2,3,6,7,8-Hxcdf 9474	6	6	12	12
1,2,3,7,8,9-Hxcdf 9477	6	6	12	12
2,3,4,6,7,8-Hxcdf 9480	6	6	12	12
Total Hexachlorodibenzofuran (Total HxCDF) 9483	6	6	12	12
1,2,3,4,6,7,8,9-OCDF 9516	6	6	12	12
1,2,3,4,6,7,8,9-OCDD 9519	6	6	12	12
1,2,3,7,8-Pecdd 9540	6	6	12	12
1,2,3,7,8-Pecdf 9543	6	6	12	12

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
2,3,4,7,8-Pecdf 9549	6	6	12	12
Pecdf, total 9552	6	6	12	12
Pecdd, total 9555	6	6	12	12
TCDD, total 9609	6	6	12	12
2,3,7,8-TCDF 9612	6	6	12	12
TCDF, total 9615	6	6	12	12
2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD) 9618	6	6	12	12
PCDF, total 9657	5	5	10	10
PCDD, total 9660	5	5	10	10

SPE068-50G PCB Congeners in Soil - PT LRAC7359

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
PCBs, total 8870	3	3	6	6
PCB (20)+(28) 8936	5	5	12	12
2,2',5,5'-Tetrachlorobiphenyl (PCB 52) 8955	10	10	17	17
3,3',4,4'-Tetrachlorobiphenyl (PCB 77) 8965	7	7	14	14
3,4,4',5-Tetrachlorobiphenyl (PCB 81) 8970	7	7	14	14
PCB (90)+(101)+(113) 8982	5	5	12	12
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) 8985	7	7	14	14
2,3',4,4',5-Pentachlorobiphenyl (PCB 118) 8995	10	10	17	17

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) 9000	7	7	14	14
2,3,4,4',5-Pentachlorobiphenyl (PCB 114) 9005	7	7	14	14
3,3',4,4',5-Pentachlorobiphenyl (PCB 126) 9015	7	7	14	14
PCB (129)+(138)+(163) 9026	5	5	12	12
PCB (153)+(168) 9041	5	5	12	12
PCB (156)+(157) 9046	5	5	12	12
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) 9055	7	7	14	14
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) 9060	7	7	14	14
PCB (180)+(193) 9070	5	5	12	12
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) 9085	7	7	14	14

SPE006-225G STLC Metals CA - WET in Soil - PT LRAC7412

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
Antimony, Sb 1005	5	5	8	8
Arsenic, As 1010	6	6	12	12
Barium, Ba 1015	6	6	12	12
Beryllium, Be 1020	5	3	8	4
Cadmium, Cd 1030	6	6	12	12

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

Analyte	Number of participating laboratories		Number of data points	
	in total	with quantitative data points only*	in total	quantitative only*
Chromium, Cr (total) 1040	6	6	12	12
Cobalt, Co 1050	7	4	13	8
Copper, Cu 1055	5	5	8	8
Lead, Pb 1075	7	7	13	13
Molybdenum, Mo 1100	5	2	8	3
Nickel, Ni 1105	5	5	8	8
Selenium, Se 1140	6	6	10	10
Silver, Ag 1150	6	5	12	9
Thallium, Tl 1165	5	5	8	8
Vanadium, V 1185	6	6	12	12
Zinc, Zn 1190	6	6	12	12

* Only quantitative values are taken into account in the calculation of study mean and study std.dev. (i.e. without missing results, without less-than results, without larger-than results).

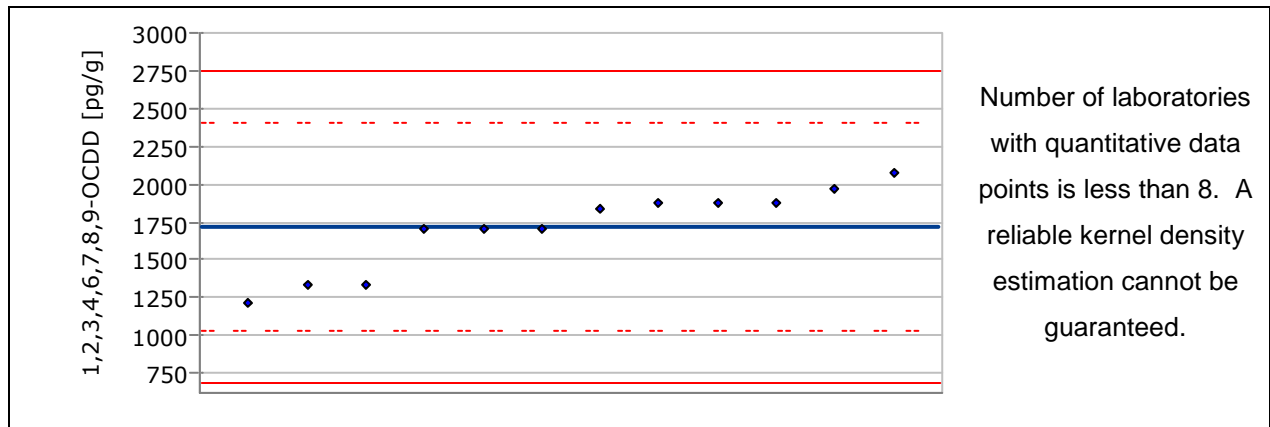
4 Results

4.1 SPE016-10G Dioxin and Furans in Soil - PT / LRAC4647

This proficiency testing sample was produced in accordance with ISO/IEC 17043:2010.

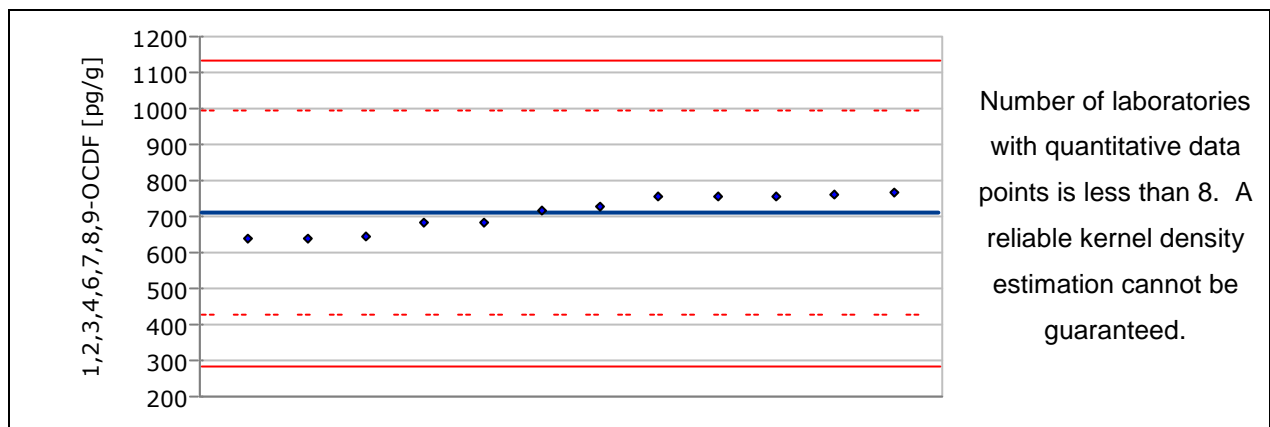
4.1.1 1,2,3,4,6,7,8,9-OCDD

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	1720 pg/g
Proficiency std. dev.	344 pg/g
Acceptance window	688 - 2750 pg/g



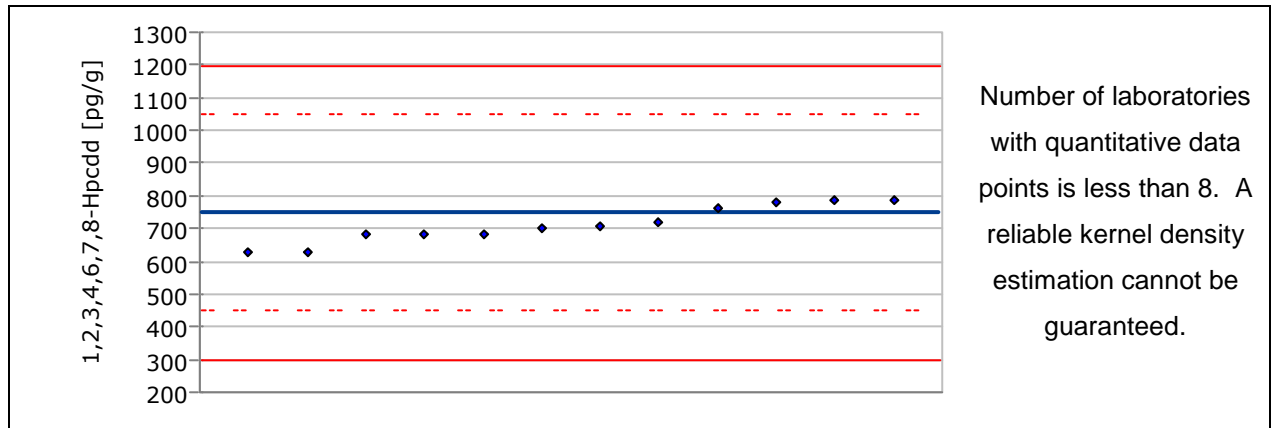
4.1.2 1,2,3,4,6,7,8,9-OCDF

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	709 pg/g
Proficiency std. dev.	142 pg/g
Acceptance window	284 - 1130 pg/g

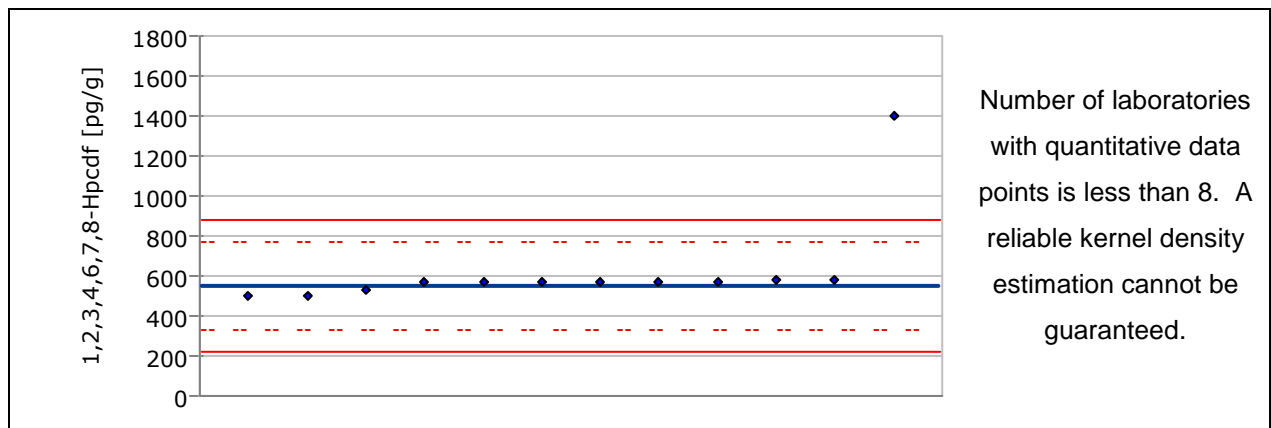


4.1.3 1,2,3,4,6,7,8-Hpcdd

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	749 pg/g
Proficiency std. dev.	150 pg/g
Acceptance window	300 - 1200 pg/g

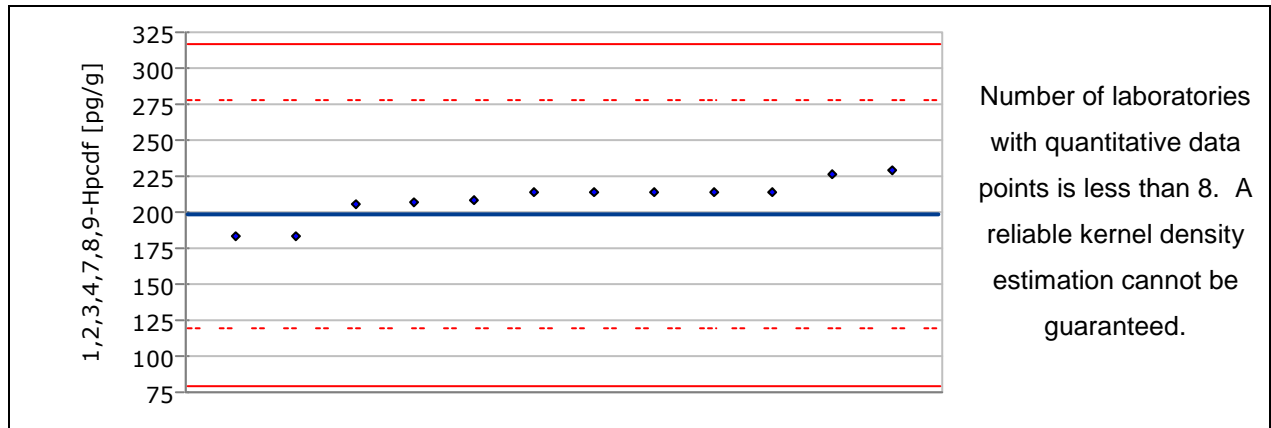
**4.1.4 1,2,3,4,6,7,8-Hpcdf**

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	547 pg/g
Proficiency std. dev.	109 pg/g
Acceptance window	219 - 875 pg/g

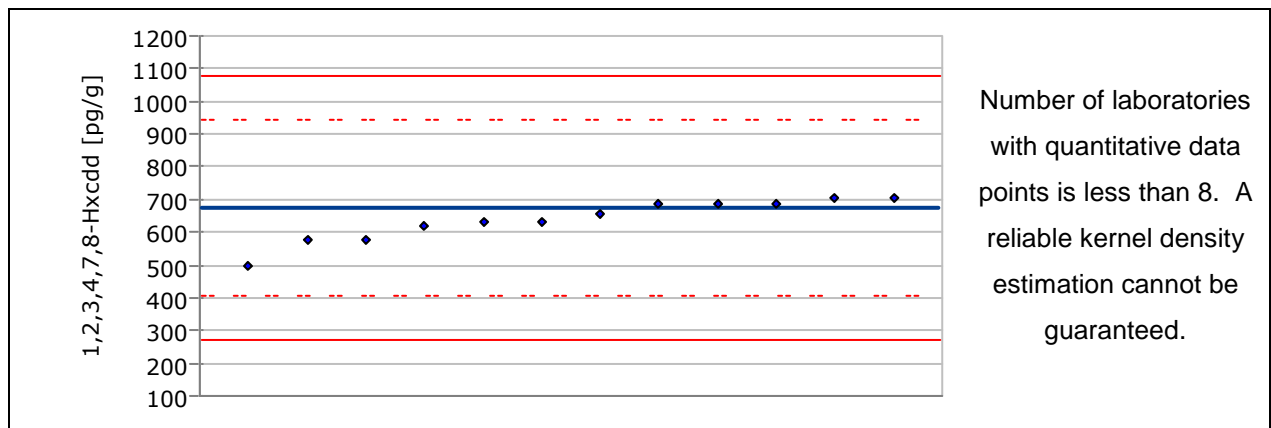


4.1.5 1,2,3,4,7,8,9-Hpcdf

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	198 pg/g
Proficiency std. dev.	39.6 pg/g
Acceptance window	79.2 - 317 pg/g

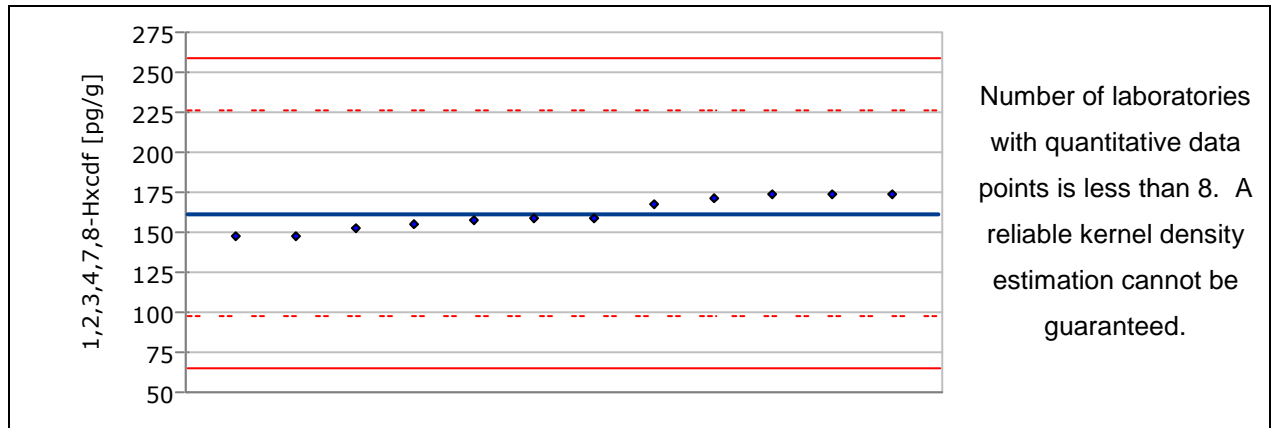
**4.1.6 1,2,3,4,7,8-Hxcdd**

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	674 pg/g
Proficiency std. dev.	135 pg/g
Acceptance window	270 - 1080 pg/g

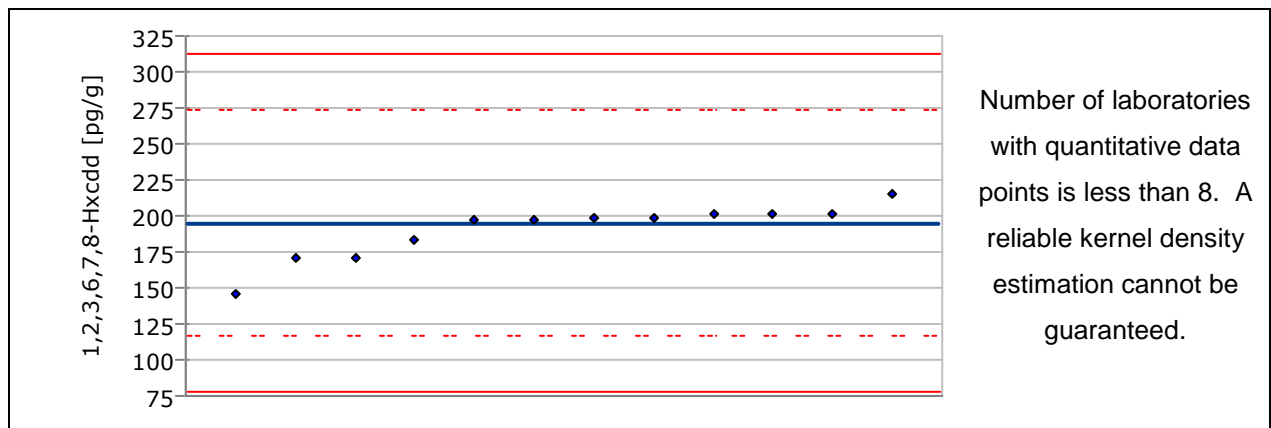


4.1.7 1,2,3,4,7,8-Hxcdf

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	162 pg/g
Proficiency std. dev.	32.3 pg/g
Acceptance window	64.6 - 258 pg/g

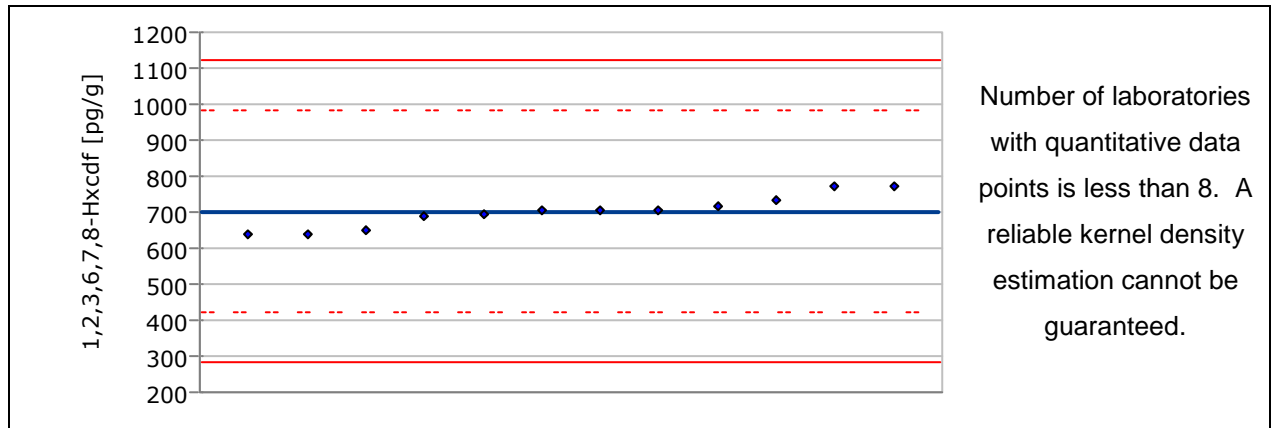
**4.1.8 1,2,3,6,7,8-Hxcdd**

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	195 pg/g
Proficiency std. dev.	39.0 pg/g
Acceptance window	78.0 - 312 pg/g

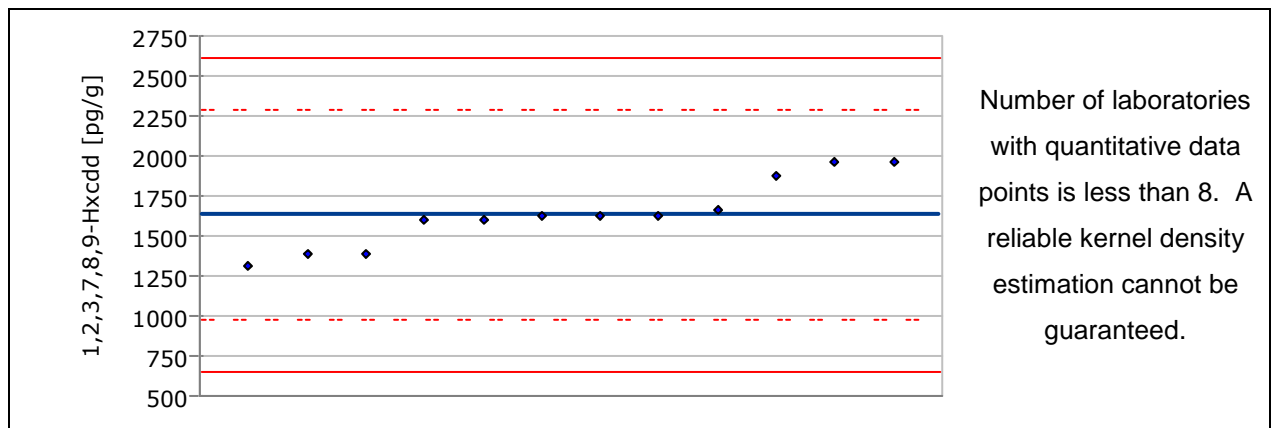


4.1.9 1,2,3,6,7,8-Hxcdf

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	702 pg/g
Proficiency std. dev.	140 pg/g
Acceptance window	281 - 1120 pg/g

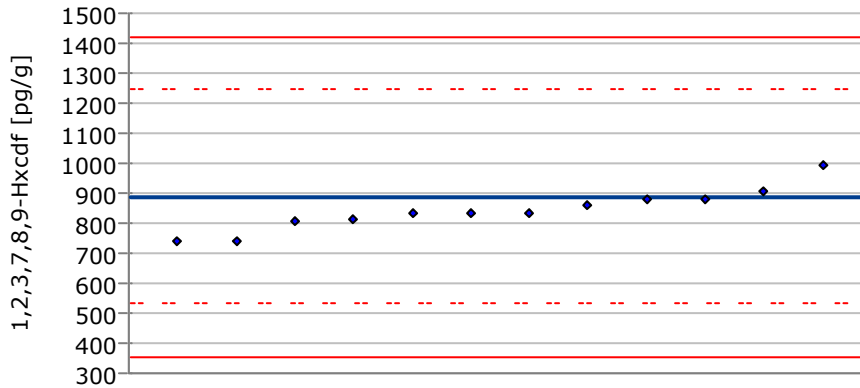
**4.1.10 1,2,3,7,8,9-Hxcdd**

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	1630 pg/g
Proficiency std. dev.	327 pg/g
Acceptance window	654 - 2610 pg/g



4.1.11 1,2,3,7,8,9-Hxcdf

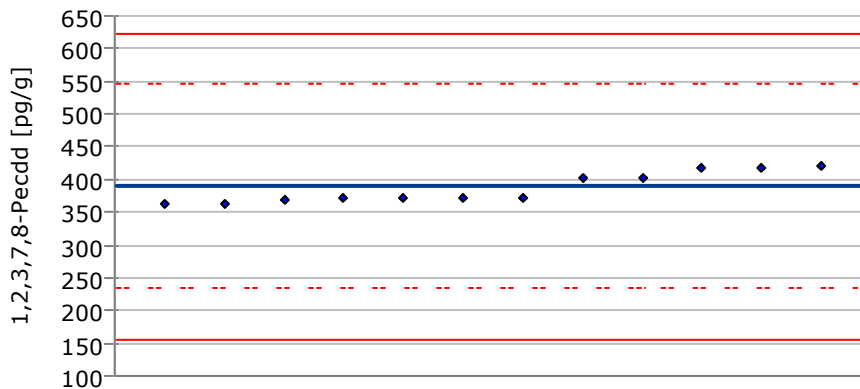
No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	889 pg/g
Proficiency std. dev.	178 pg/g
Acceptance window	356 - 1420 pg/g



Number of laboratories with quantitative data points is less than 8. A reliable kernel density estimation cannot be guaranteed.

4.1.12 1,2,3,7,8-Pecdd

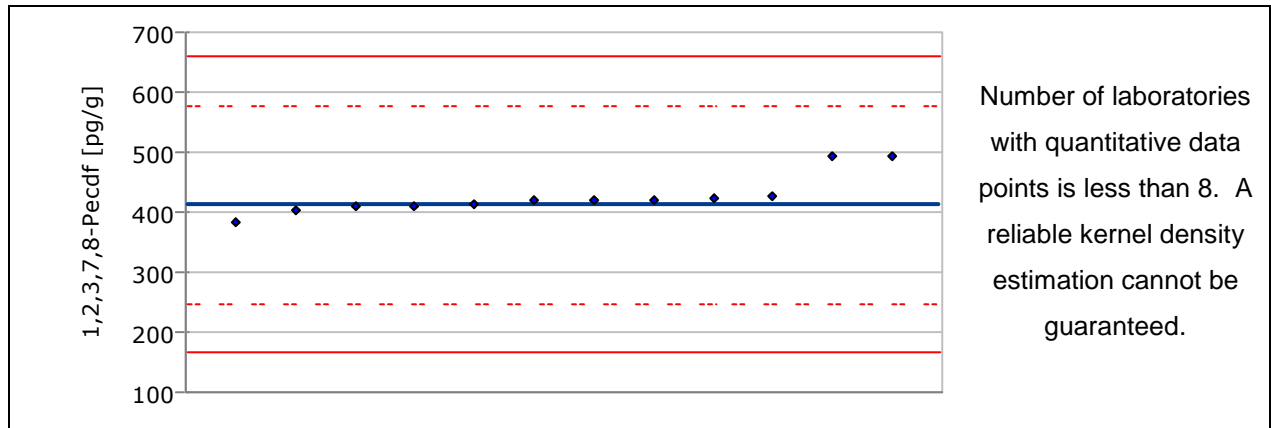
No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	389 pg/g
Proficiency std. dev.	77.8 pg/g
Acceptance window	156 - 622 pg/g



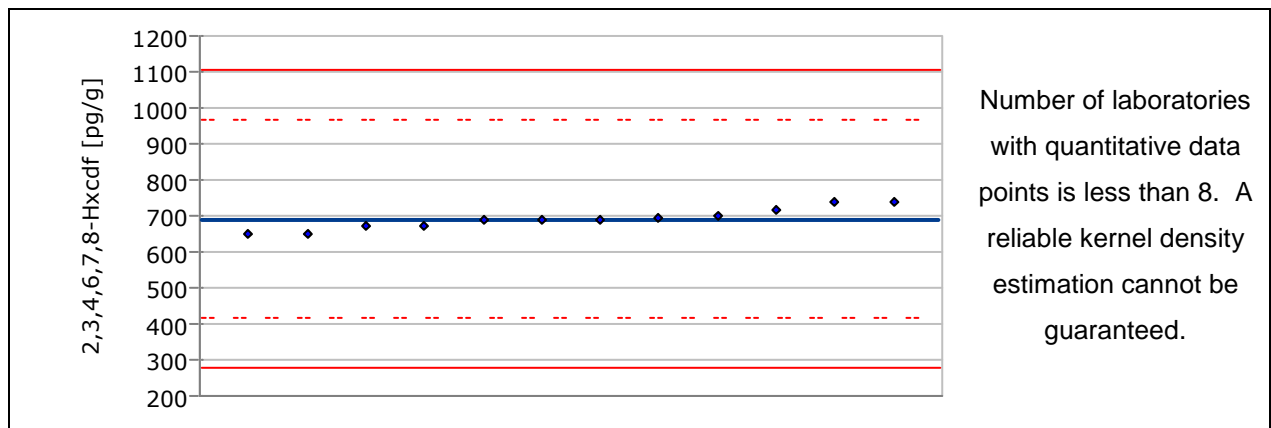
Number of laboratories with quantitative data points is less than 8. A reliable kernel density estimation cannot be guaranteed.

4.1.13 1,2,3,7,8-Pecdf

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	413 pg/g
Proficiency std. dev.	82.6 pg/g
Acceptance window	165 - 661 pg/g

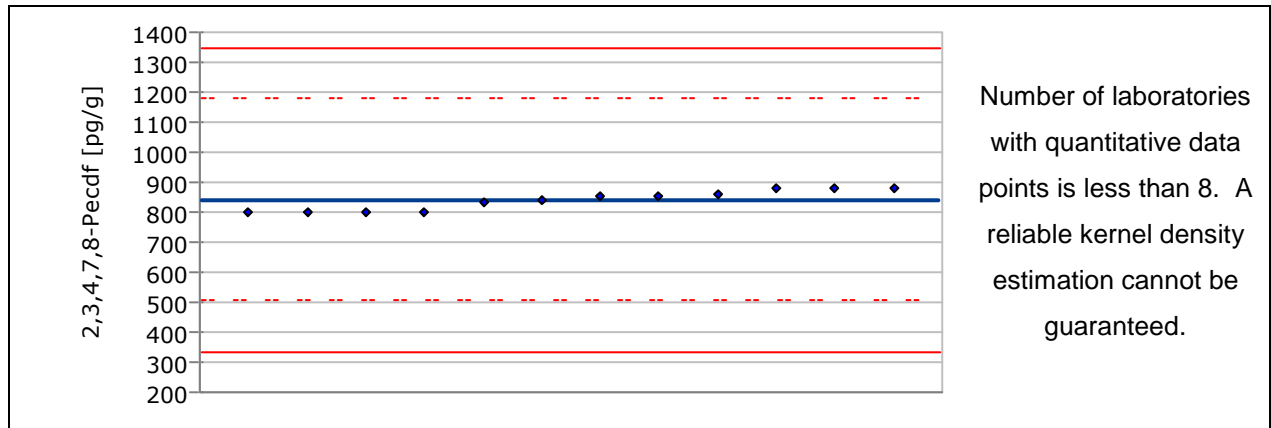
**4.1.14 2,3,4,6,7,8-Hxcdf**

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	692 pg/g
Proficiency std. dev.	138 pg/g
Acceptance window	277 - 1110 pg/g

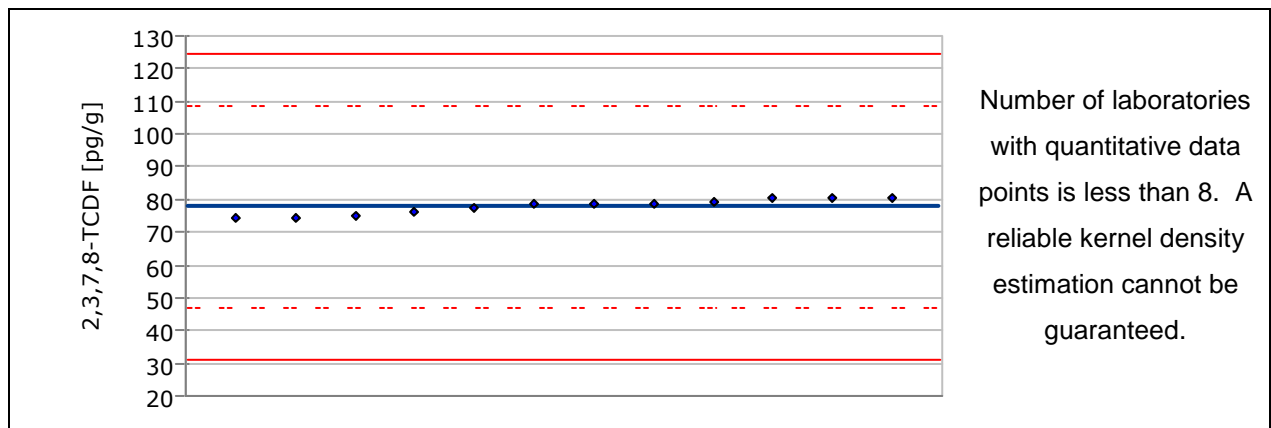


4.1.15 2,3,4,7,8-Pecdf

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	841 pg/g
Proficiency std. dev.	168 pg/g
Acceptance window	336 - 1350 pg/g

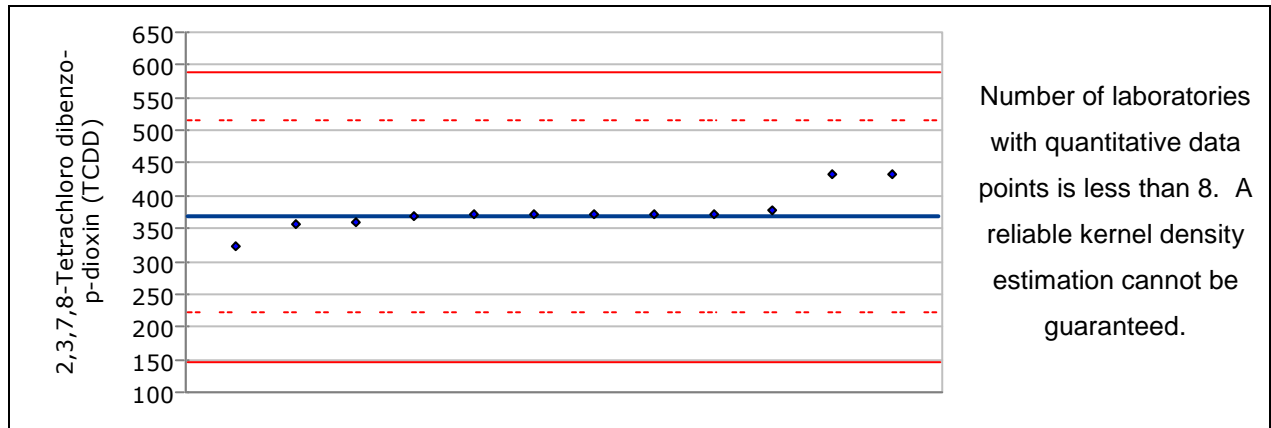
**4.1.16 2,3,7,8-TCDF**

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	77.8 pg/g
Proficiency std. dev.	15.6 pg/g
Acceptance window	31.1 - 124 pg/g

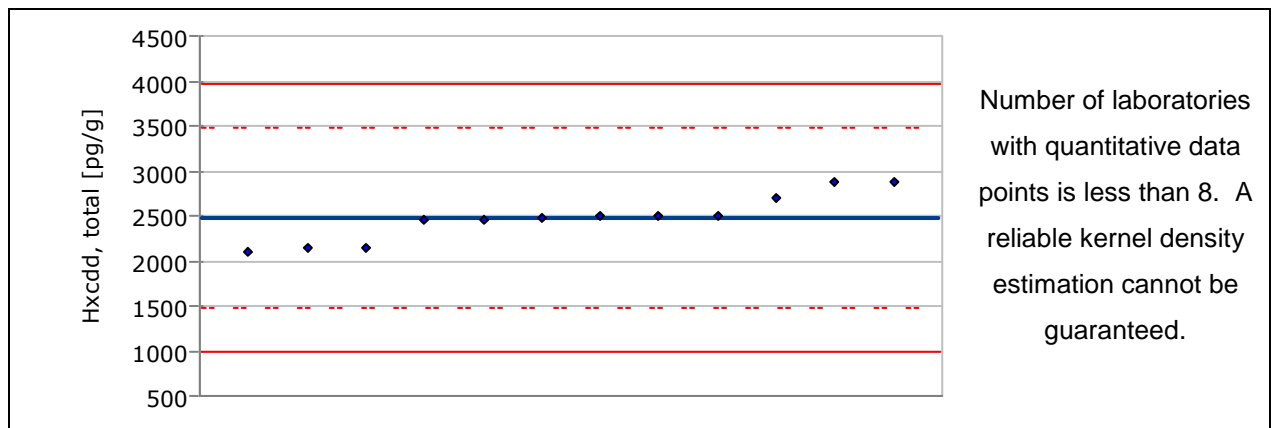


4.1.17 2,3,7,8-Tetrachloro dibenzo- p-dioxin (TCDD)

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	368 pg/g
Proficiency std. dev.	73.7 pg/g
Acceptance window	147 - 589 pg/g

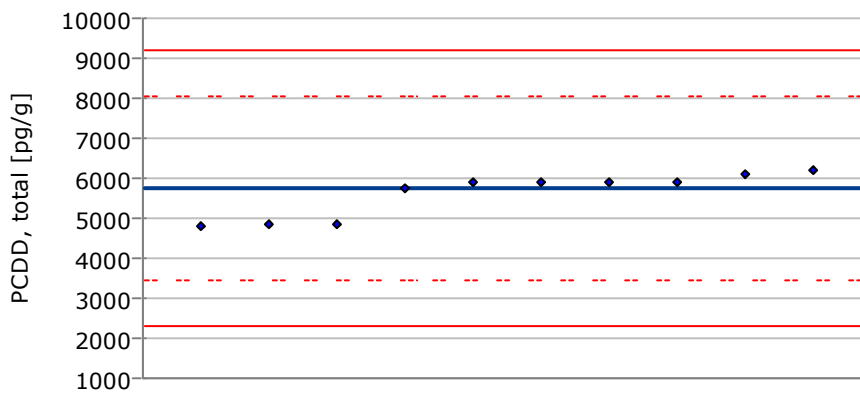
**4.1.18 Hxccc, total**

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	2480 pg/g
Proficiency std. dev.	496 pg/g
Acceptance window	992 - 3970 pg/g



4.1.19 PCDD, total

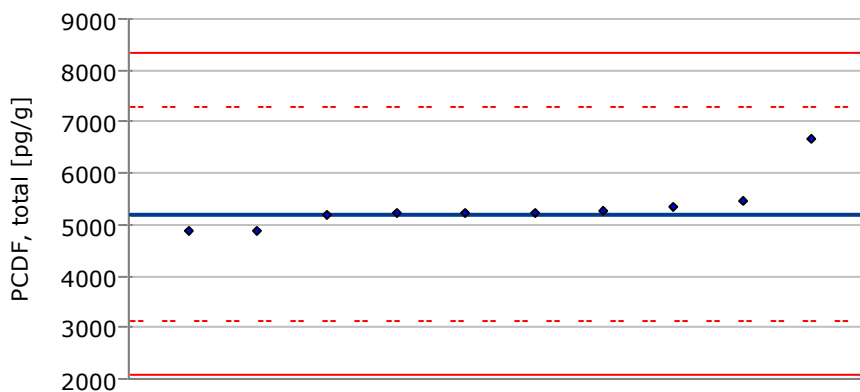
No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	10 / 10
Assigned value	5740 pg/g
Proficiency std. dev.	1150 pg/g
Acceptance window	2300 - 9180 pg/g



Number of laboratories with quantitative data points is less than 8. A reliable kernel density estimation cannot be guaranteed.

4.1.20 PCDF, total

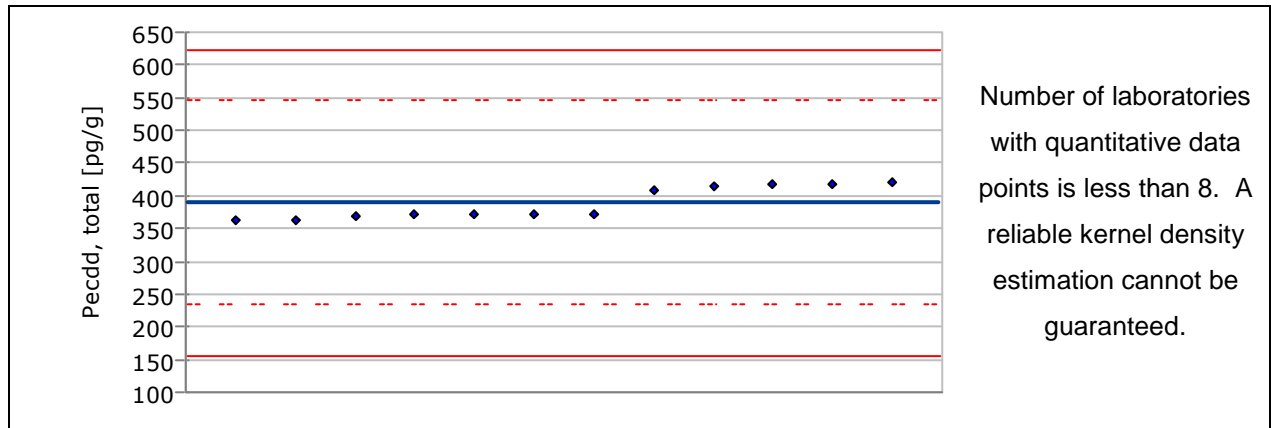
No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	10 / 10
Assigned value	5200 pg/g
Proficiency std. dev.	1040 pg/g
Acceptance window	2080 - 8320 pg/g



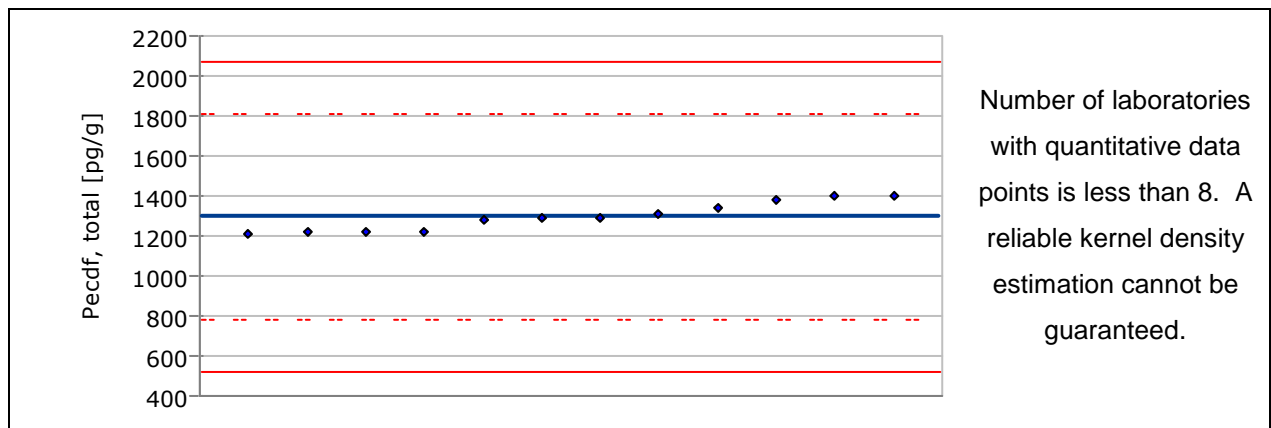
Number of laboratories with quantitative data points is less than 8. A reliable kernel density estimation cannot be guaranteed.

4.1.21 Pecdd, total

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	389 pg/g
Proficiency std. dev.	77.8 pg/g
Acceptance window	156 - 622 pg/g

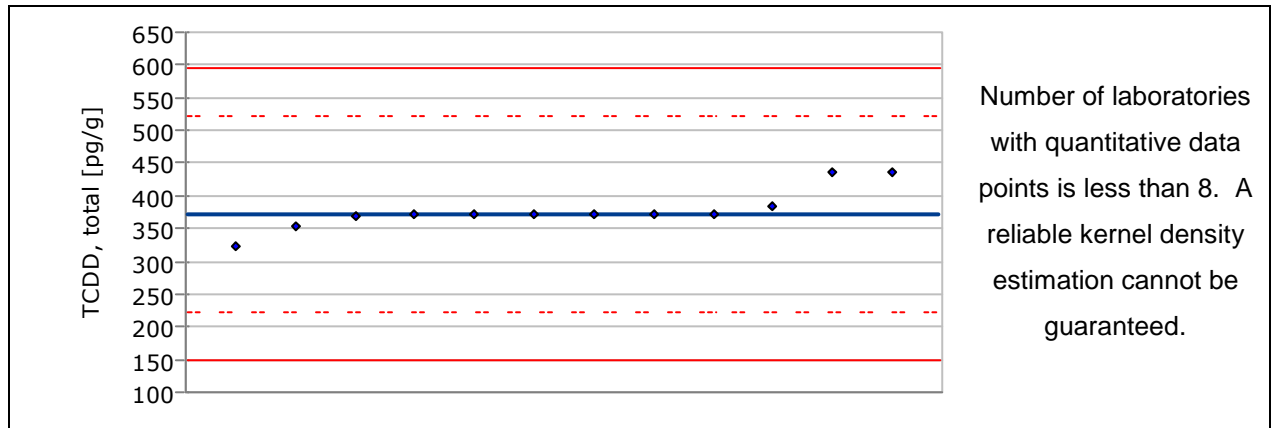
**4.1.22 Pecdf, total**

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	1300 pg/g
Proficiency std. dev.	259 pg/g
Acceptance window	519 - 2070 pg/g

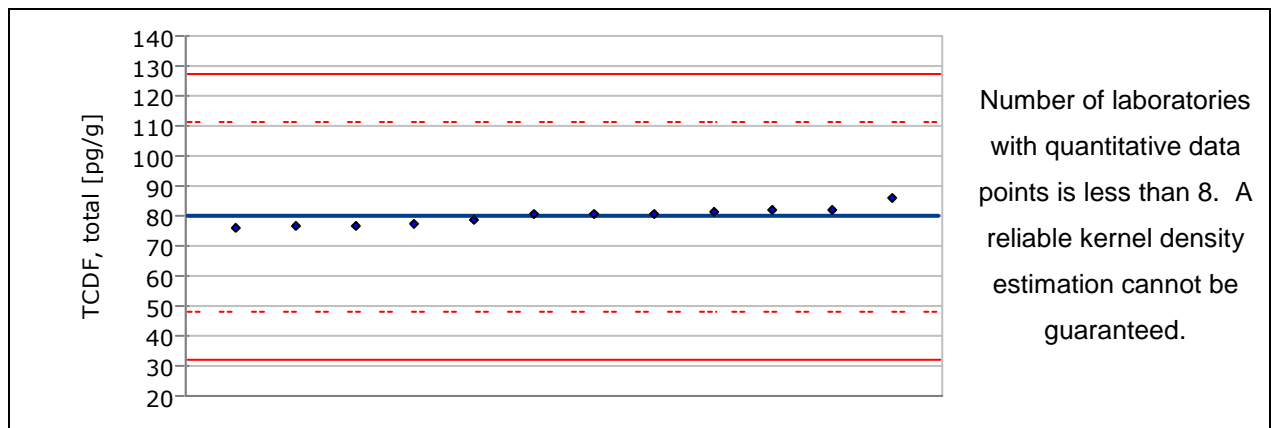


4.1.23 TCDD, total

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	372 pg/g
Proficiency std. dev.	74.3 pg/g
Acceptance window	149 - 595 pg/g

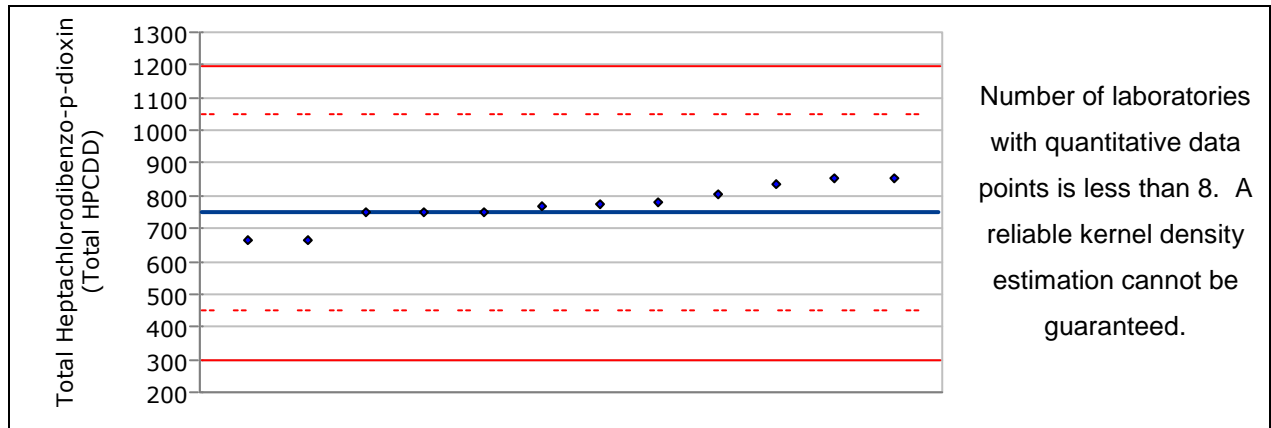
**4.1.24 TCDF, total**

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	79.7 pg/g
Proficiency std. dev.	15.9 pg/g
Acceptance window	31.9 - 128 pg/g

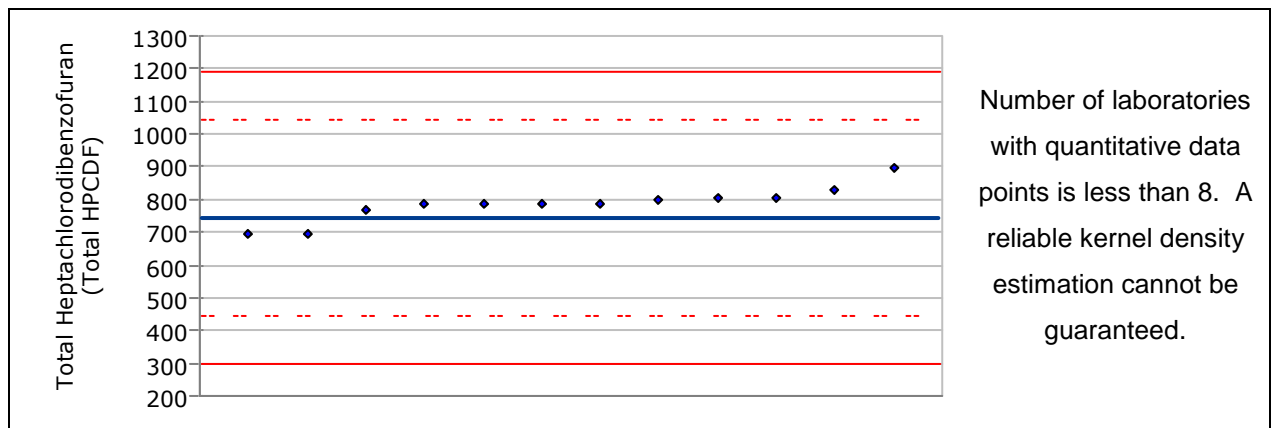


4.1.25 Total Heptachlorodibenzo-p-dioxin (Total HPCDD)

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	749 pg/g
Proficiency std. dev.	150 pg/g
Acceptance window	300 - 1200 pg/g

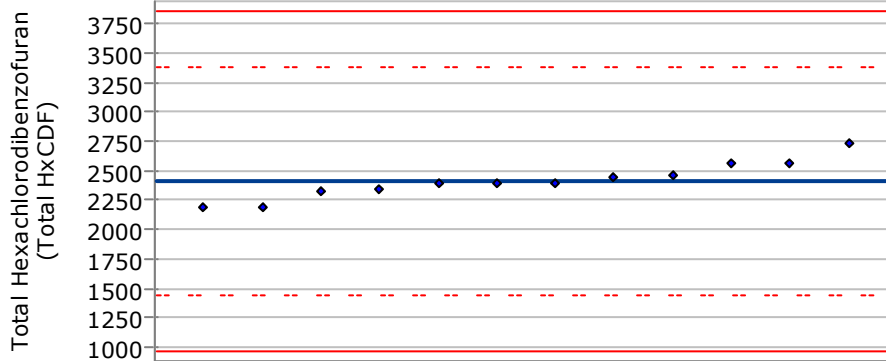
**4.1.26 Total Heptachlorodibenzofuran (Total HPCDF)**

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	745 pg/g
Proficiency std. dev.	149 pg/g
Acceptance window	298 - 1190 pg/g



4.1.27 Total Hexachlorodibenzofuran (Total HxCDF)

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	2410 pg/g
Proficiency std. dev.	482 pg/g
Acceptance window	965 - 3860 pg/g



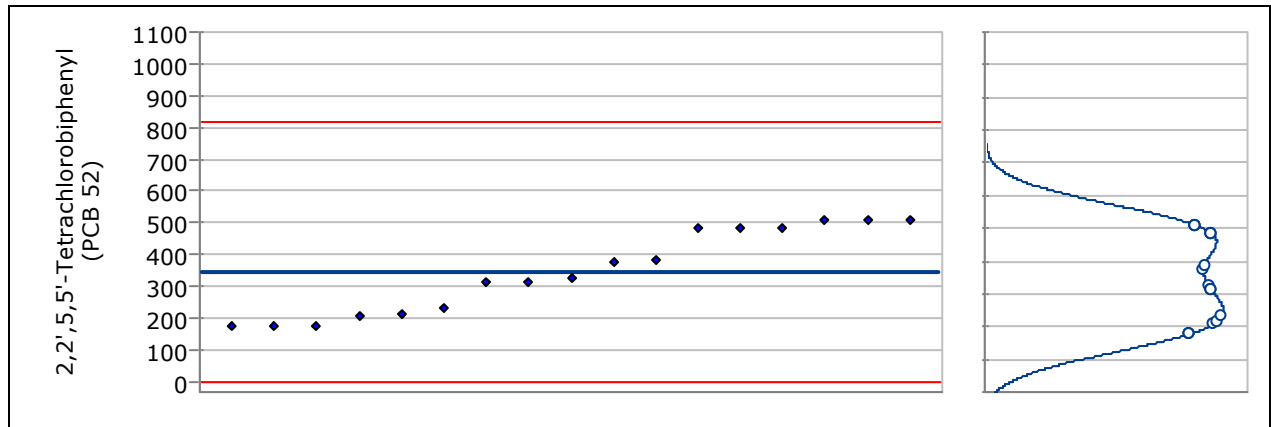
Number of laboratories with quantitative data points is less than 8. A reliable kernel density estimation cannot be guaranteed.

4.2 SPE068-50G PCB Congeners in Soil - PT / LRAC7359

This proficiency testing sample was produced in accordance with ISO/IEC 17043:2010.

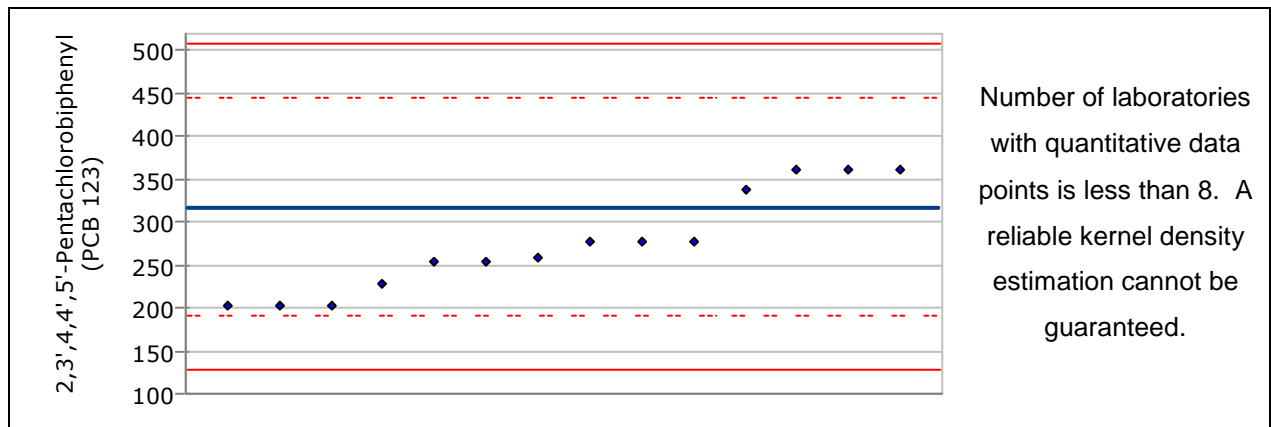
4.2.1 2,2',5,5'-Tetrachlorobiphenyl (PCB 52)

No. of participating laboratories (in total / with quant. data points only)	10 / 10
No. of data points (in total / quantitative)	17 / 17
Assigned value	345 ug/Kg
Proficiency std. dev.	157 ug/Kg
Acceptance window	0 - 818 ug/Kg



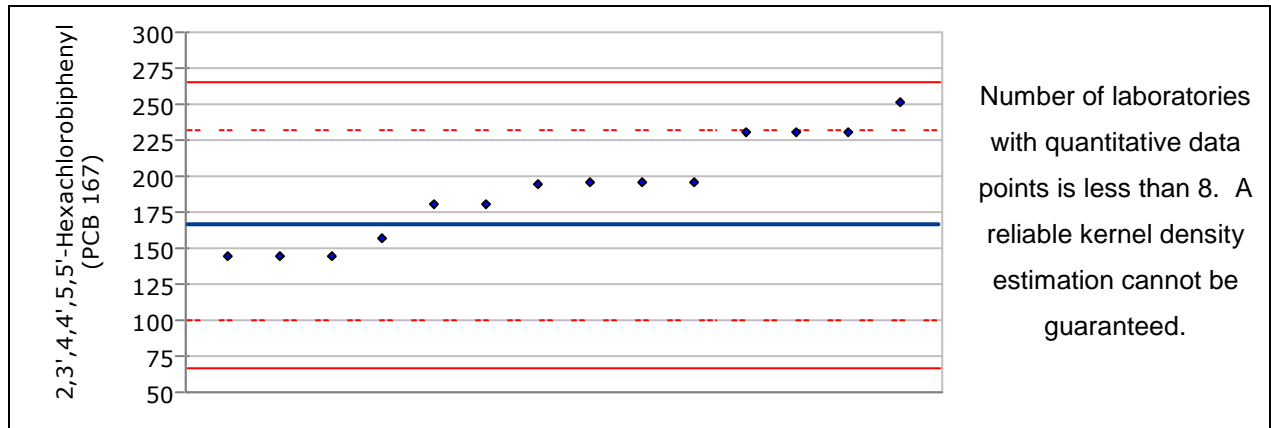
4.2.2 2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	14 / 14
Assigned value	317 ug/Kg
Proficiency std. dev.	63.4 ug/Kg
Acceptance window	127 - 507 ug/Kg

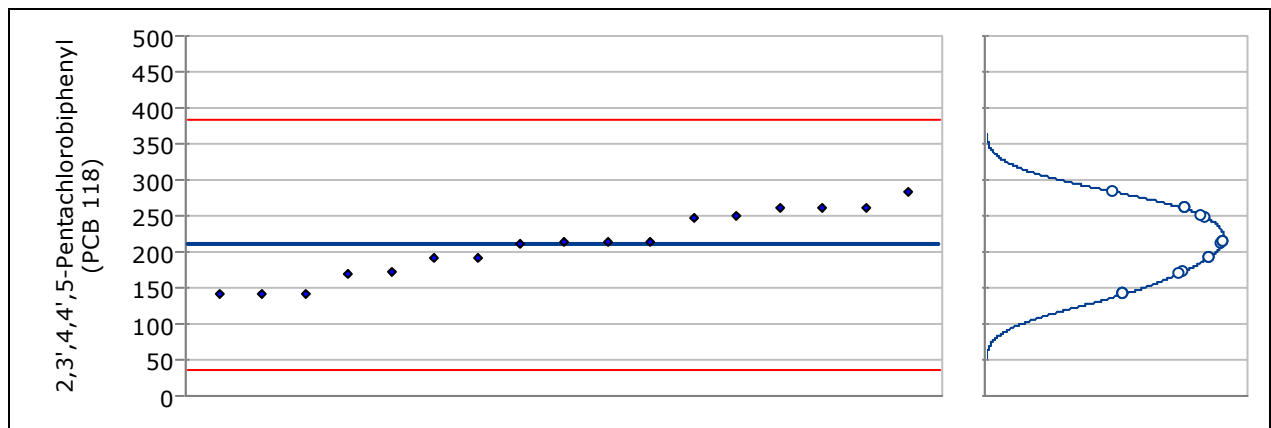


4.2.3 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	14 / 14
Assigned value	166 ug/Kg
Proficiency std. dev.	33.2 ug/Kg
Acceptance window	66.4 - 266 ug/Kg

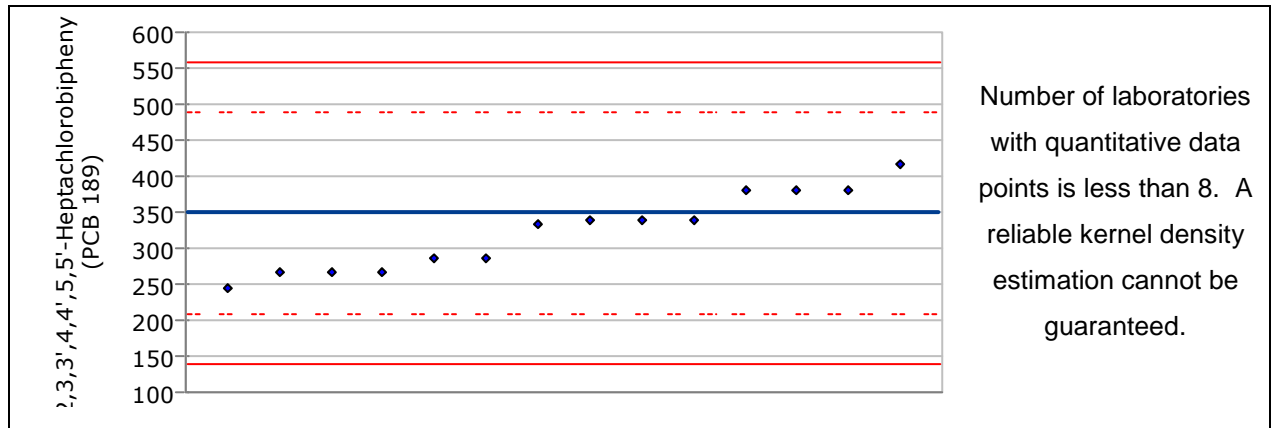
**4.2.4 2,3',4,4',5-Pentachlorobiphenyl (PCB 118)**

No. of participating laboratories (in total / with quant. data points only)	10 / 10
No. of data points (in total / quantitative)	17 / 17
Assigned value	210 ug/Kg
Proficiency std. dev.	58.2 ug/Kg
Acceptance window	35.3 - 385 ug/Kg

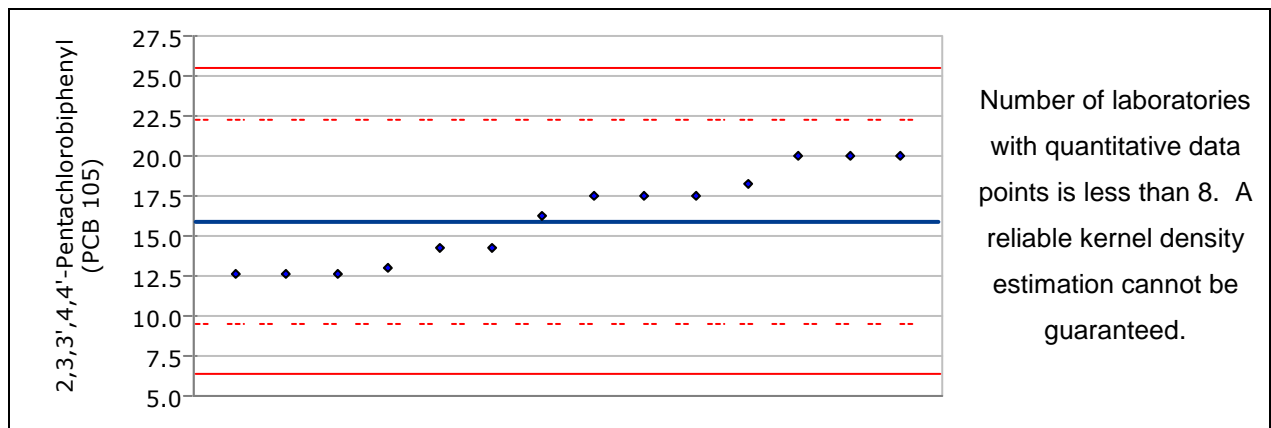


4.2.5 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	14 / 14
Assigned value	349 ug/Kg
Proficiency std. dev.	69.8 ug/Kg
Acceptance window	140 - 558 ug/Kg

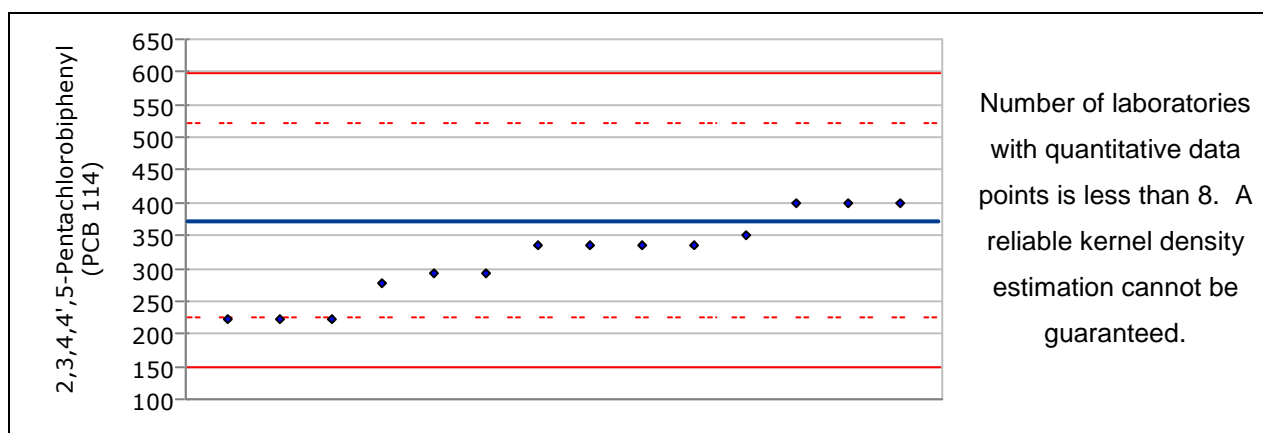
**4.2.6 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)**

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	14 / 14
Assigned value	15.9 ug/Kg
Proficiency std. dev.	3.18 ug/Kg
Acceptance window	6.36 - 25.4 ug/Kg

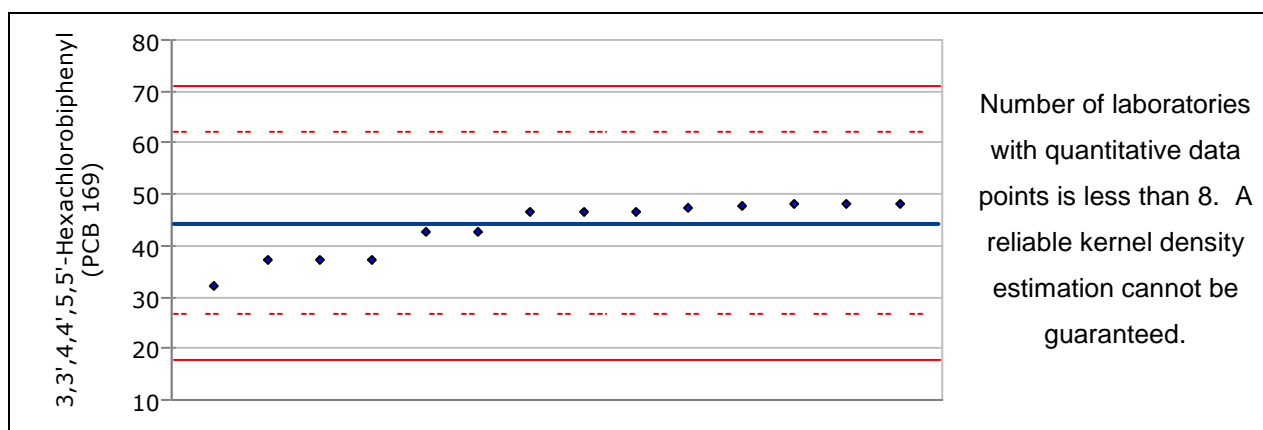


4.2.7 2,3,4,4',5-Pentachlorobiphenyl (PCB 114)

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	14 / 14
Assigned value	373 ug/Kg
Proficiency std. dev.	74.6 ug/Kg
Acceptance window	149 - 597 ug/Kg

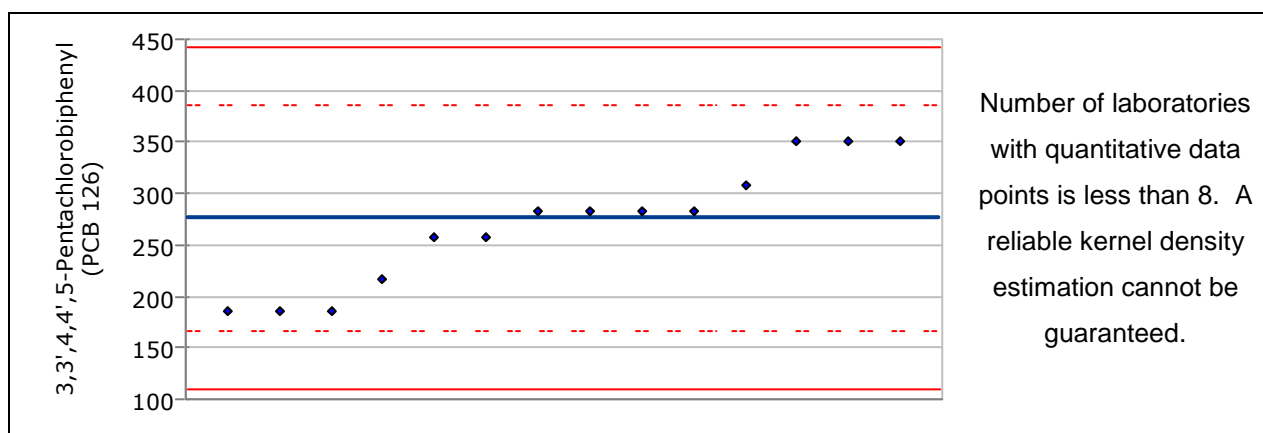
**4.2.8 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)**

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	14 / 14
Assigned value	44.4 ug/Kg
Proficiency std. dev.	8.88 ug/Kg
Acceptance window	17.8 - 71.0 ug/Kg

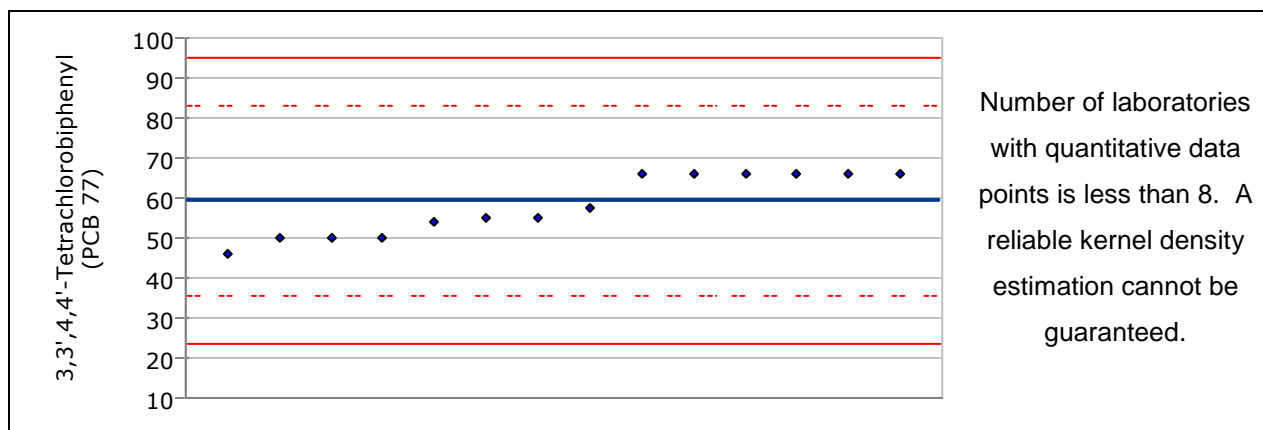


4.2.9 3,3',4,4',5-Pentachlorobiphenyl (PCB 126)

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	14 / 14
Assigned value	276 ug/Kg
Proficiency std. dev.	55.2 ug/Kg
Acceptance window	110 - 442 ug/Kg

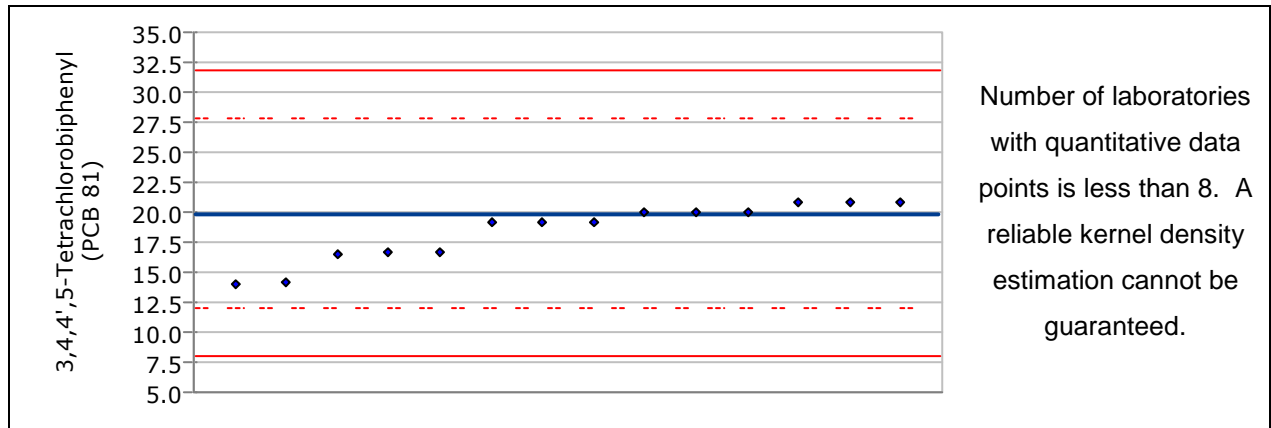
**4.2.10 3,3',4,4'-Tetrachlorobiphenyl (PCB 77)**

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	14 / 14
Assigned value	59.3 ug/Kg
Proficiency std. dev.	11.9 ug/Kg
Acceptance window	23.7 - 94.9 ug/Kg

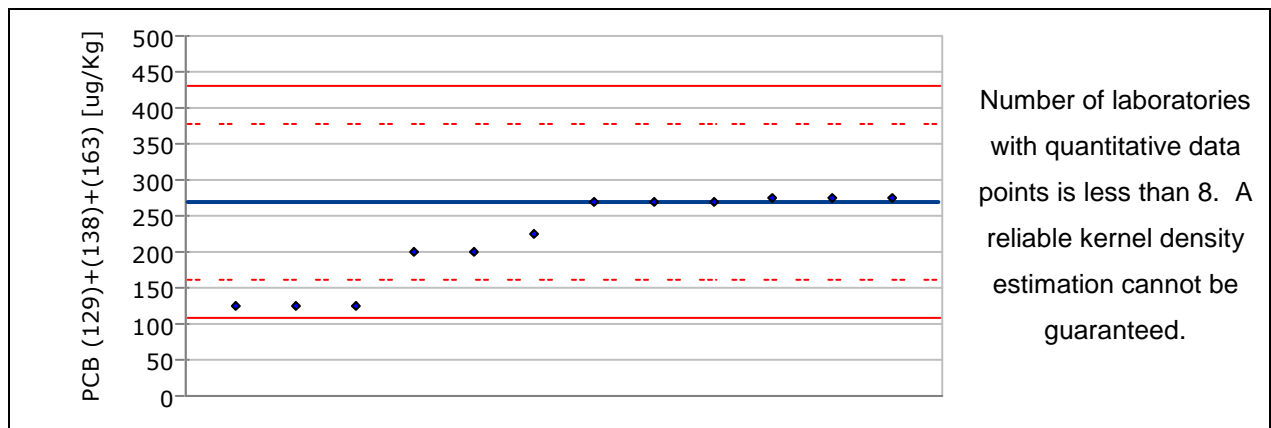


4.2.11 3,4,4',5-Tetrachlorobiphenyl (PCB 81)

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	14 / 14
Assigned value	19.9 ug/Kg
Proficiency std. dev.	3.98 ug/Kg
Acceptance window	7.96 - 31.8 ug/Kg

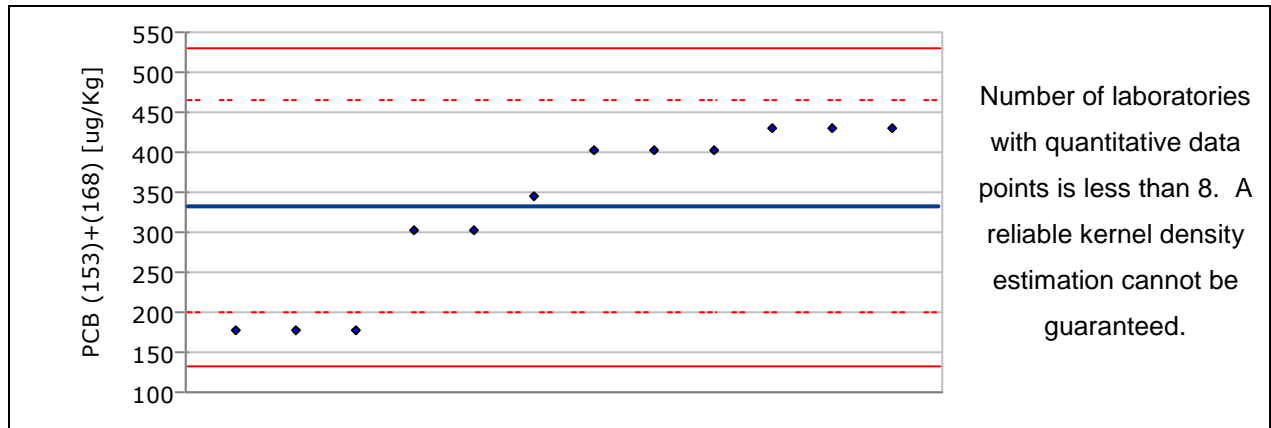
**4.2.12 PCB (129)+(138)+(163)**

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	12 / 12
Assigned value	269 ug/Kg
Proficiency std. dev.	53.8 ug/Kg
Acceptance window	108 - 430 ug/Kg

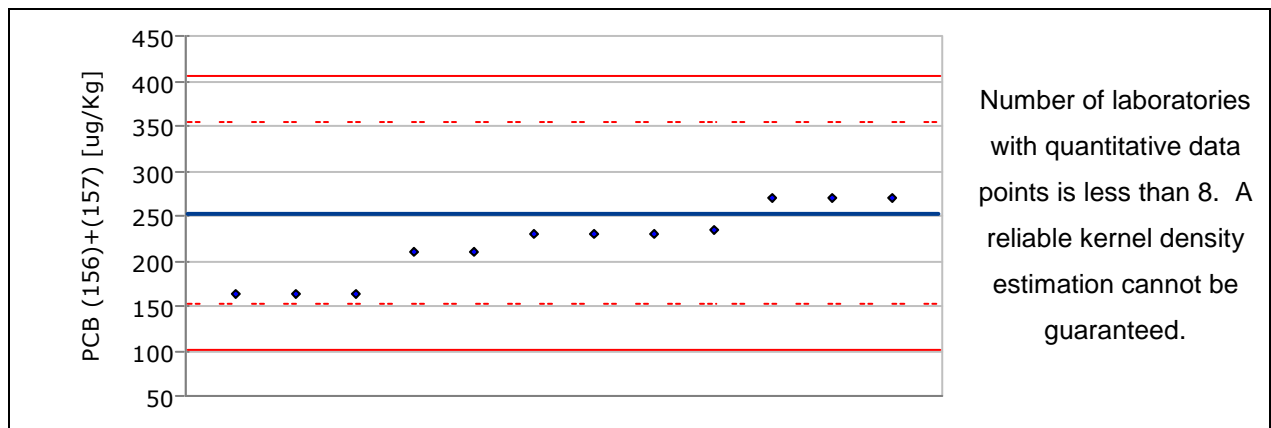


4.2.13 PCB (153)+(168)

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	12 / 12
Assigned value	332 ug/Kg
Proficiency std. dev.	66.4 ug/Kg
Acceptance window	133 - 531 ug/Kg

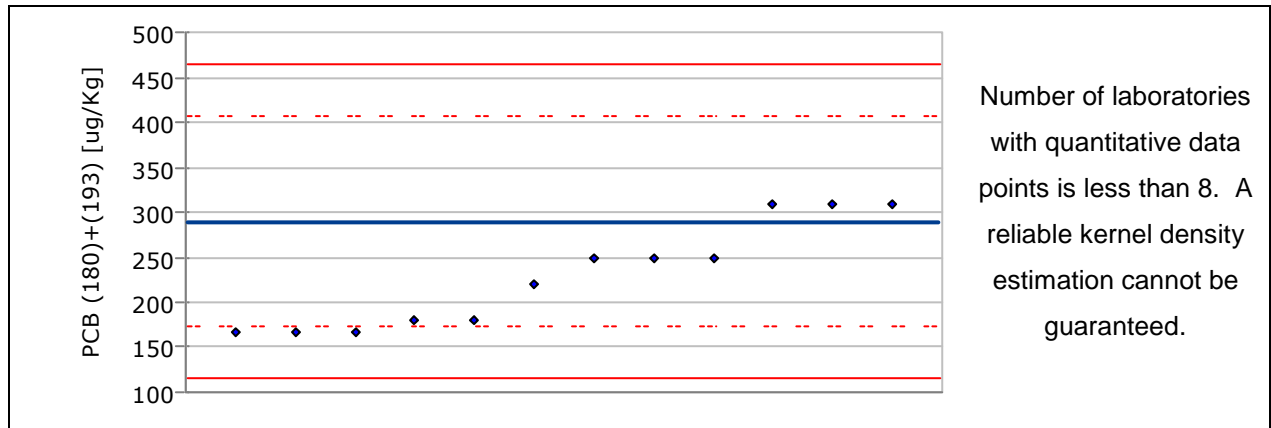
**4.2.14 PCB (156)+(157)**

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	12 / 12
Assigned value	253 ug/Kg
Proficiency std. dev.	50.6 ug/Kg
Acceptance window	101 - 405 ug/Kg

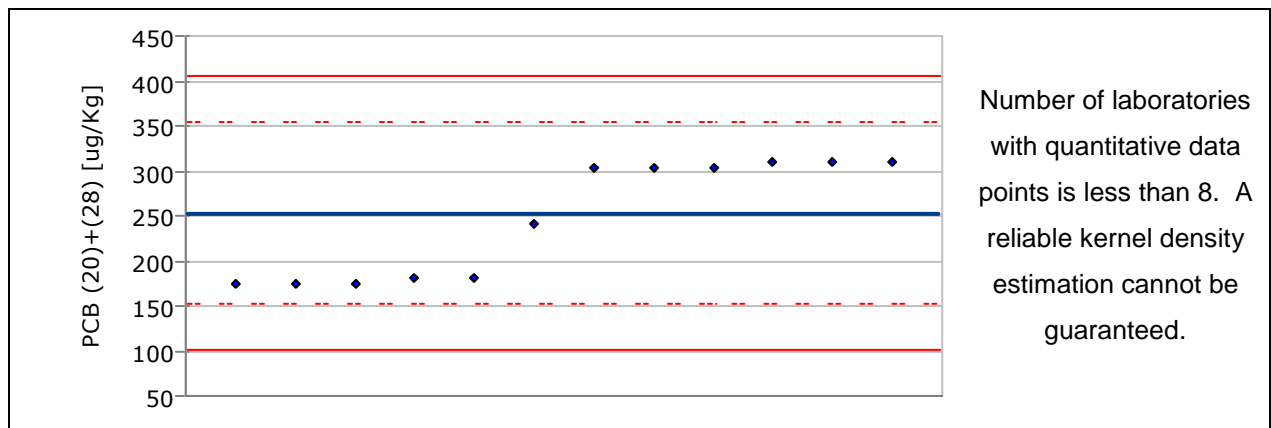


4.2.15 PCB (180)+(193)

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	12 / 12
Assigned value	290 ug/Kg
Proficiency std. dev.	58.0 ug/Kg
Acceptance window	116 - 464 ug/Kg

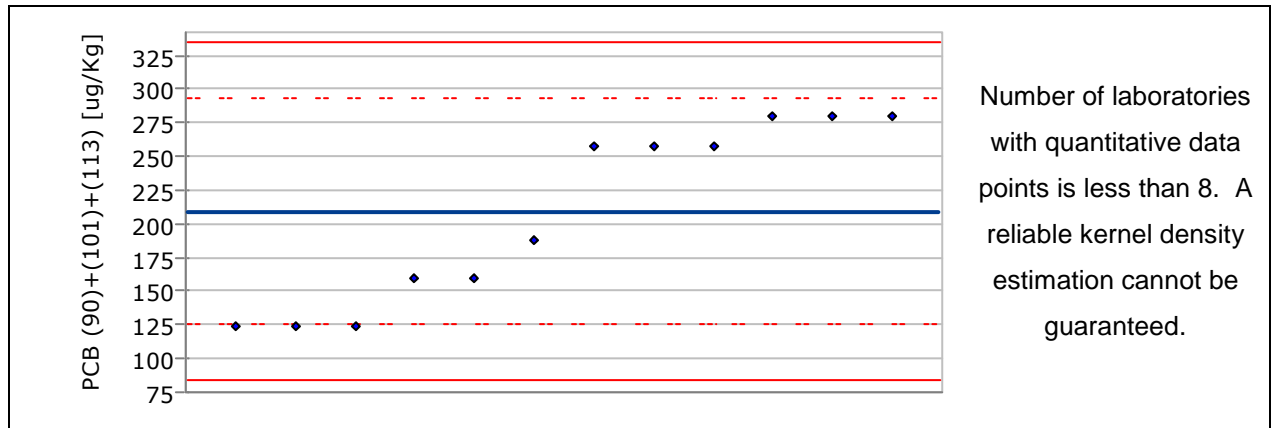
**4.2.16 PCB (20)+(28)**

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	12 / 12
Assigned value	253 ug/Kg
Proficiency std. dev.	50.6 ug/Kg
Acceptance window	101 - 405 ug/Kg

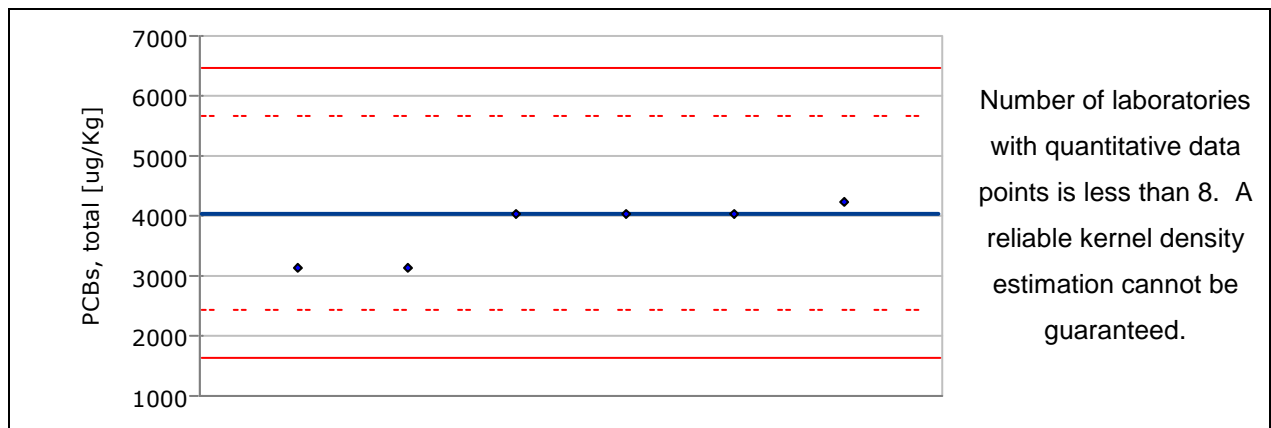


4.2.17 PCB (90)+(101)+(113)

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	12 / 12
Assigned value	209 ug/Kg
Proficiency std. dev.	41.8 ug/Kg
Acceptance window	83.6 - 334 ug/Kg

**4.2.18 PCBs, total**

No. of participating laboratories (in total / with quant. data points only)	3 / 3
No. of data points (in total / quantitative)	6 / 6
Assigned value	4040 ug/Kg
Proficiency std. dev.	809 ug/Kg
Acceptance window	1620 - 6470 ug/Kg

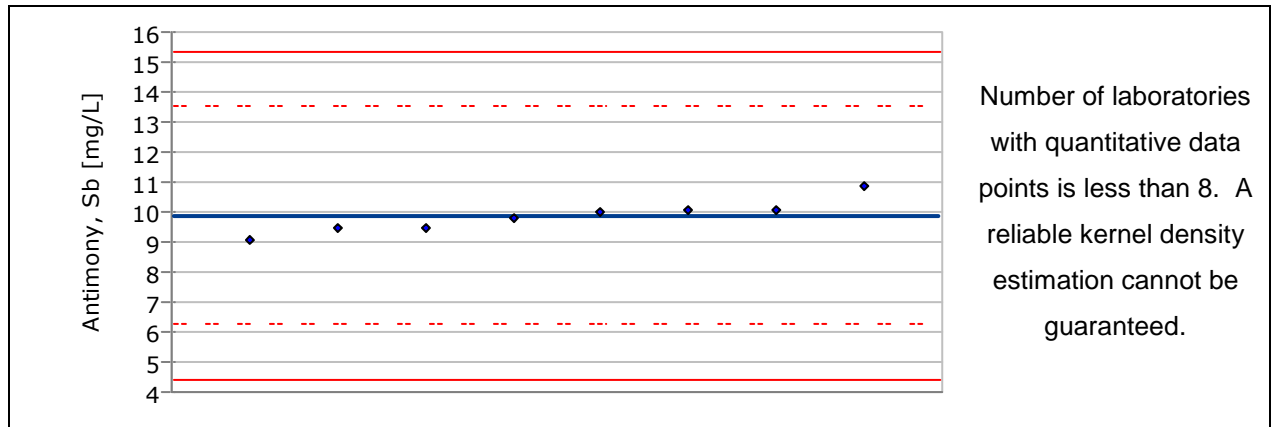


4.3 SPE006-225G STLC Metals CA - WET in Soil - PT / LRAC7412

This proficiency testing sample was produced in accordance with ISO/IEC 17043:2010.

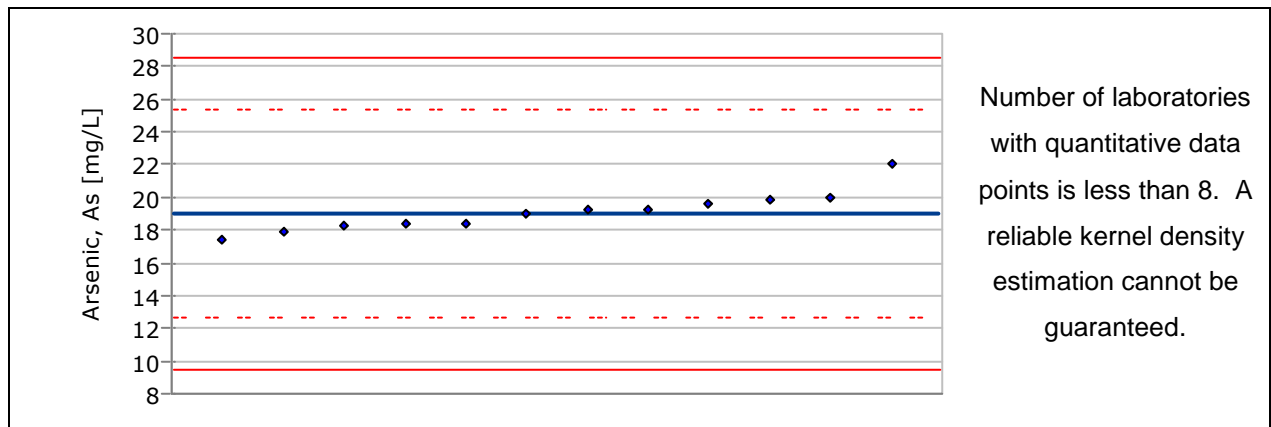
4.3.1 Antimony, Sb

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	8 / 8
Assigned value	9.88 mg/L
Proficiency std. dev.	1.82 mg/L
Acceptance window	4.41 - 15.3 mg/L



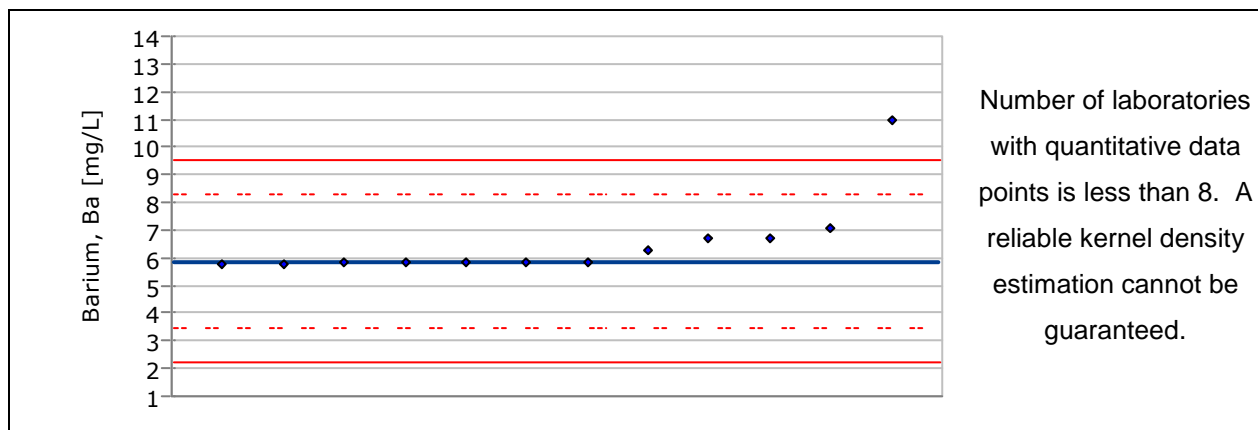
4.3.2 Arsenic, As

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	19.0 mg/L
Proficiency std. dev.	3.19 mg/L
Acceptance window	9.43 - 28.6 mg/L



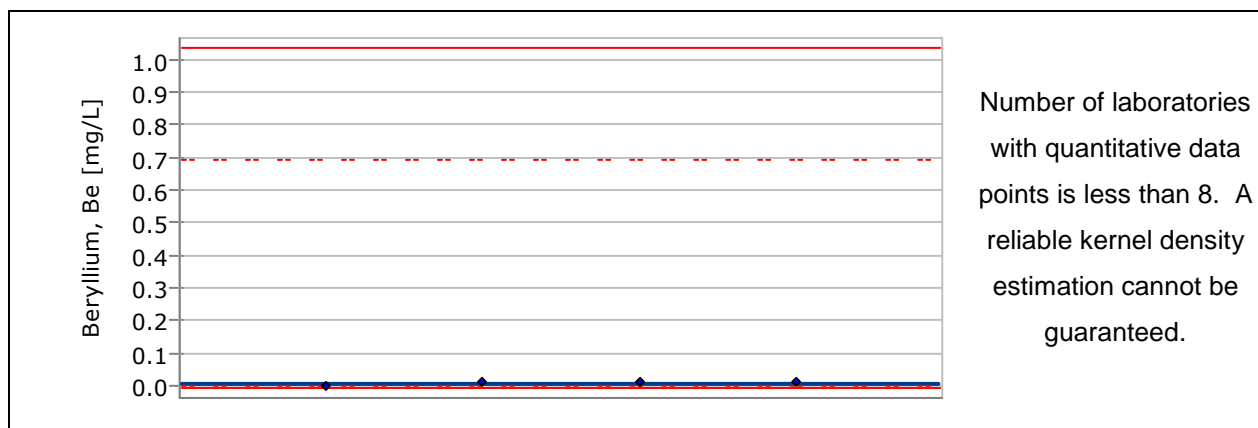
4.3.3 Barium, Ba

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	5.86 mg/L
Proficiency std. dev.	1.22 mg/L
Acceptance window	2.20 - 9.52 mg/L



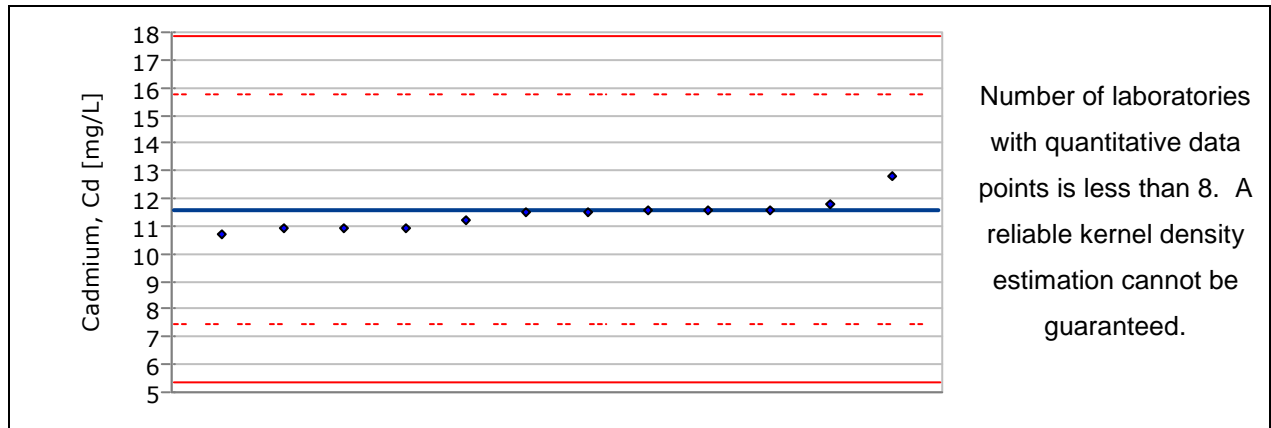
4.3.4 Beryllium, Be

No. of participating laboratories (in total / with quant. data points only)	5 / 3
No. of data points (in total / quantitative)	8 / 4
Assigned value	0.0100 mg/L
Proficiency std. dev.	0.342 mg/L
Acceptance window	0 - 1.03 mg/L



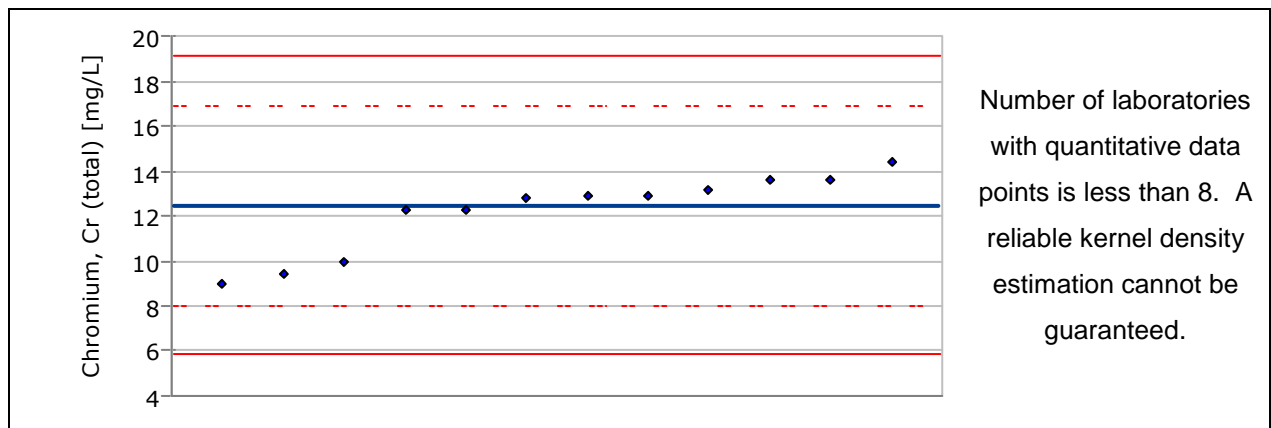
4.3.5 Cadmium, Cd

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	11.6 mg/L
Proficiency std. dev.	2.08 mg/L
Acceptance window	5.36 - 17.8 mg/L



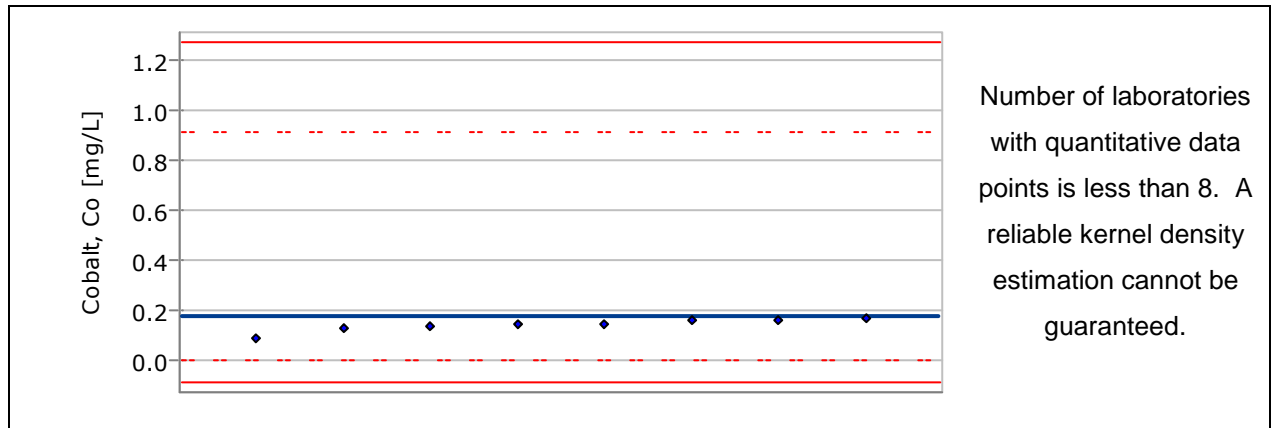
4.3.6 Chromium, Cr (total)

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	12.5 mg/L
Proficiency std. dev.	2.21 mg/L
Acceptance window	5.83 - 19.1 mg/L



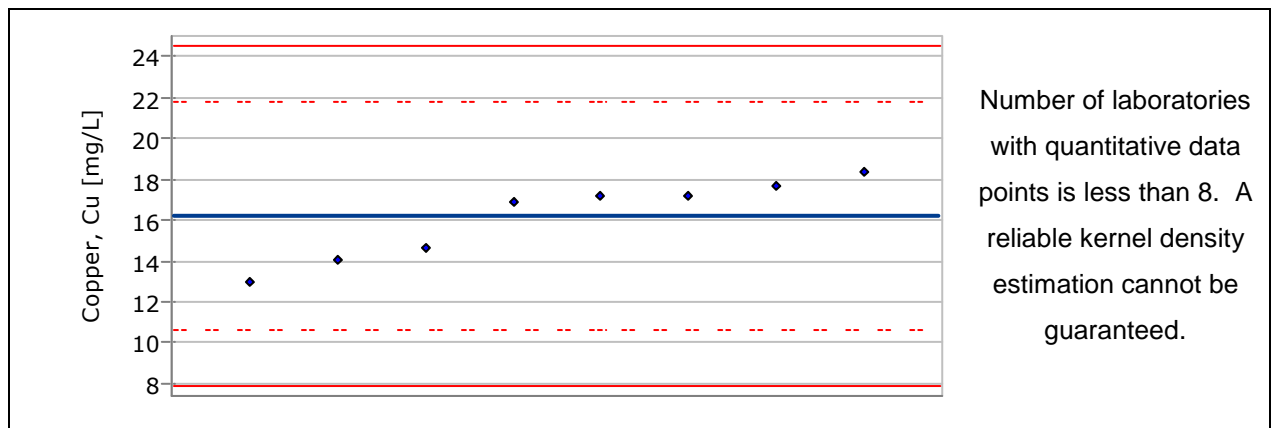
4.3.7 Cobalt, Co

No. of participating laboratories (in total / with quant. data points only)	7 / 4
No. of data points (in total / quantitative)	13 / 8
Assigned value	0.178 mg/L
Proficiency std. dev.	0.367 mg/L
Acceptance window	0 - 1.28 mg/L



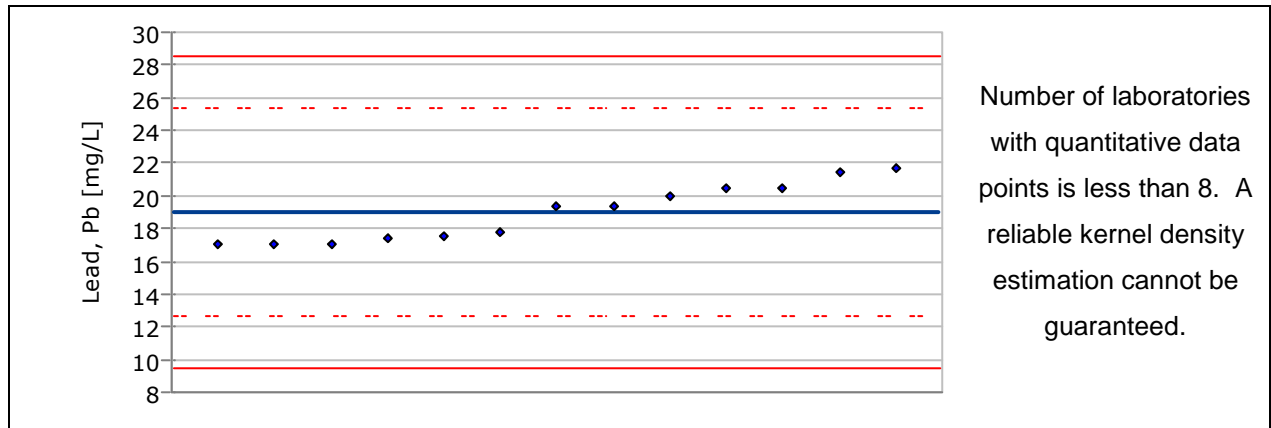
4.3.8 Copper, Cu

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	8 / 8
Assigned value	16.2 mg/L
Proficiency std. dev.	2.77 mg/L
Acceptance window	7.90 - 24.5 mg/L

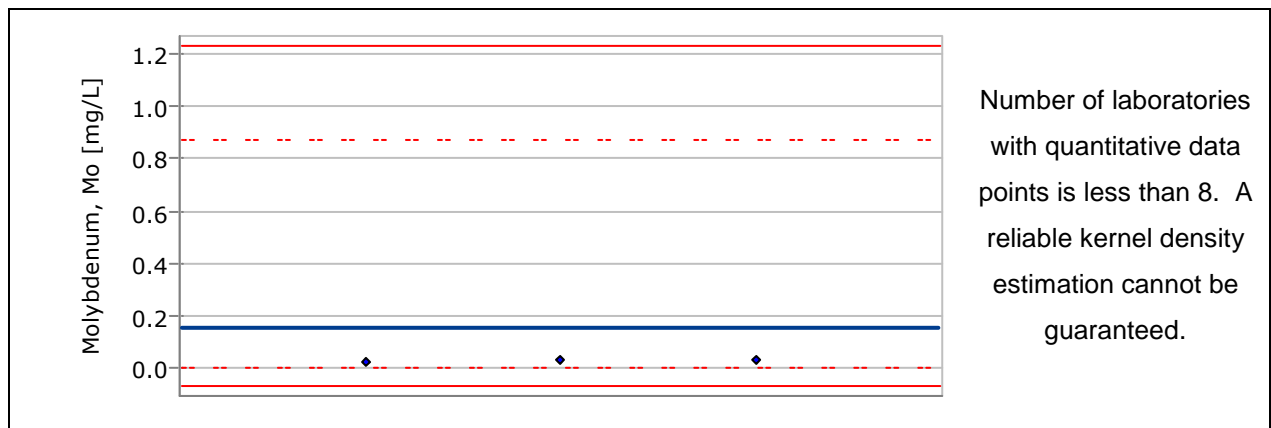


4.3.9 Lead, Pb

No. of participating laboratories (in total / with quant. data points only)	7 / 7
No. of data points (in total / quantitative)	13 / 13
Assigned value	19.0 mg/L
Proficiency std. dev.	3.19 mg/L
Acceptance window	9.42 - 28.5 mg/L

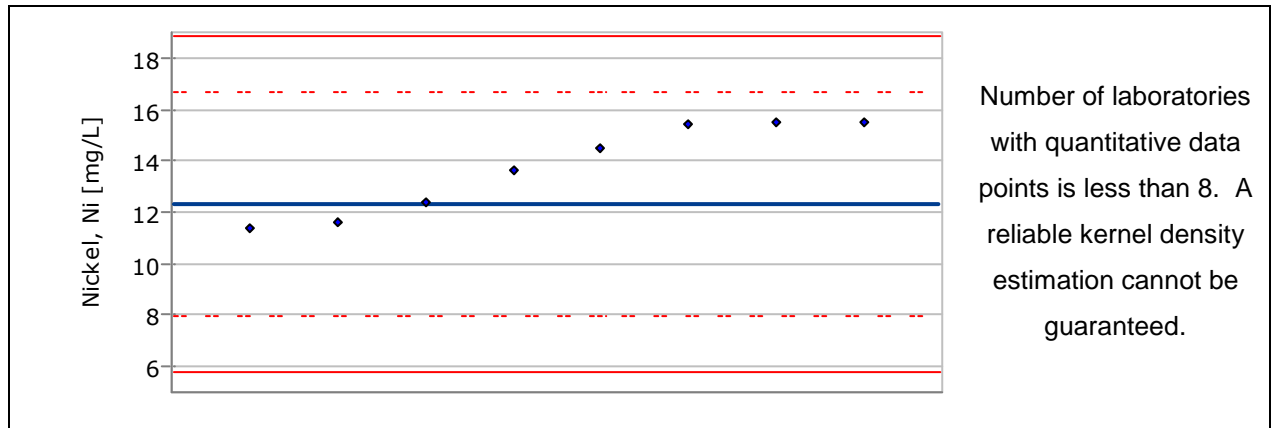
**4.3.10 Molybdenum, Mo**

No. of participating laboratories (in total / with quant. data points only)	5 / 2
No. of data points (in total / quantitative)	8 / 3
Assigned value	0.150 mg/L
Proficiency std. dev.	0.363 mg/L
Acceptance window	0 - 1.24 mg/L

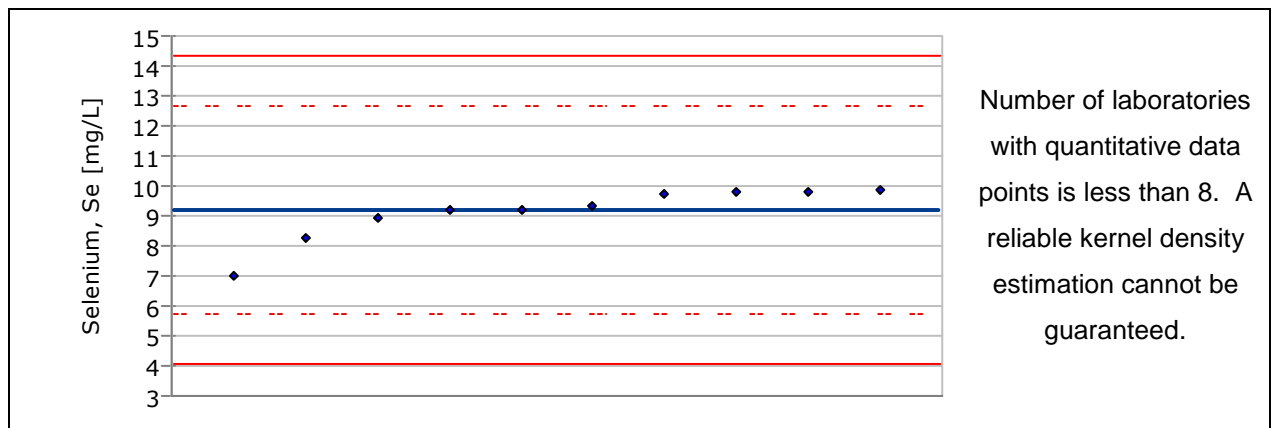


4.3.11 Nickel, Ni

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	8 / 8
Assigned value	12.3 mg/L
Proficiency std. dev.	2.18 mg/L
Acceptance window	5.74 - 18.9 mg/L

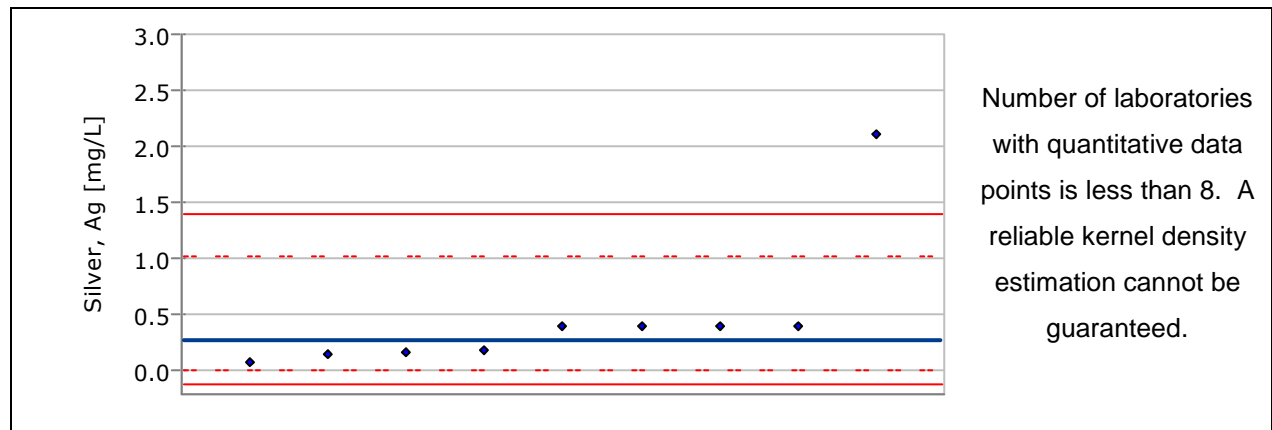
**4.3.12 Selenium, Se**

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	10 / 10
Assigned value	9.20 mg/L
Proficiency std. dev.	1.72 mg/L
Acceptance window	4.04 - 14.4 mg/L

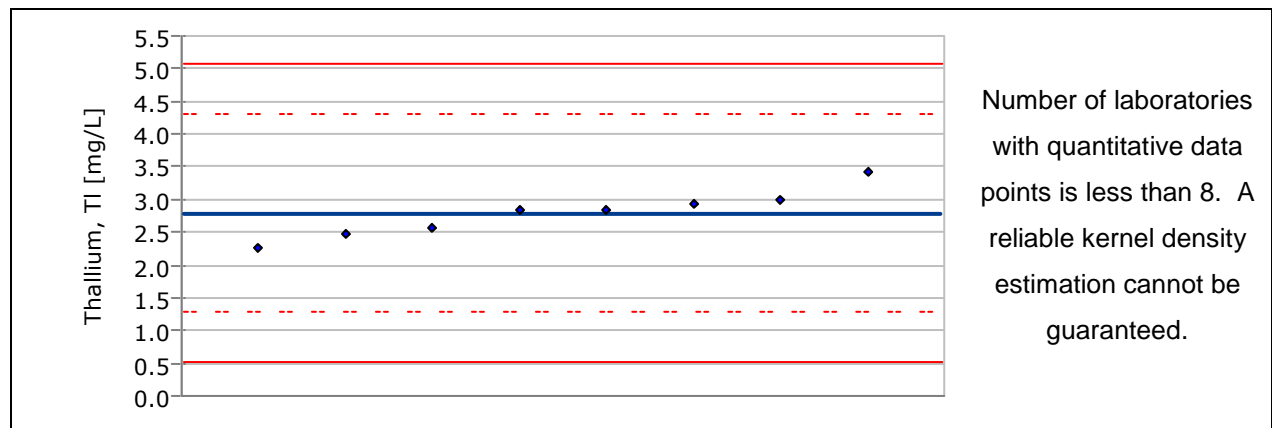


4.3.13 Silver, Ag

No. of participating laboratories (in total / with quant. data points only)	6 / 5
No. of data points (in total / quantitative)	12 / 9
Assigned value	0.259 mg/L
Proficiency std. dev.	0.379 mg/L
Acceptance window	0 - 1.40 mg/L

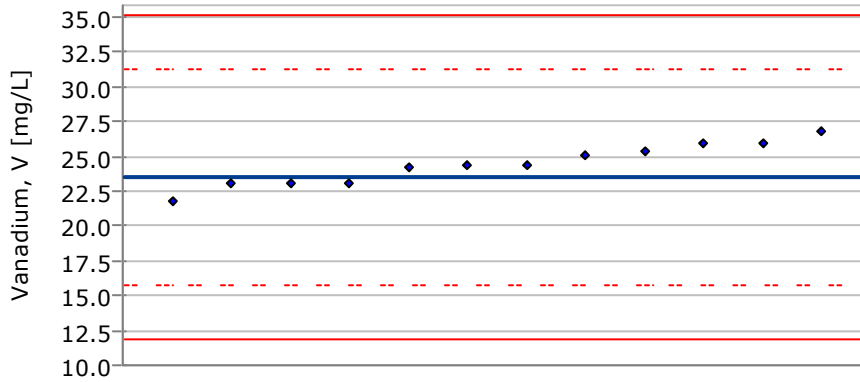
**4.3.14 Thallium, Tl**

No. of participating laboratories (in total / with quant. data points only)	5 / 5
No. of data points (in total / quantitative)	8 / 8
Assigned value	2.79 mg/L
Proficiency std. dev.	0.759 mg/L
Acceptance window	0.516 - 5.07 mg/L



4.3.15 Vanadium, V

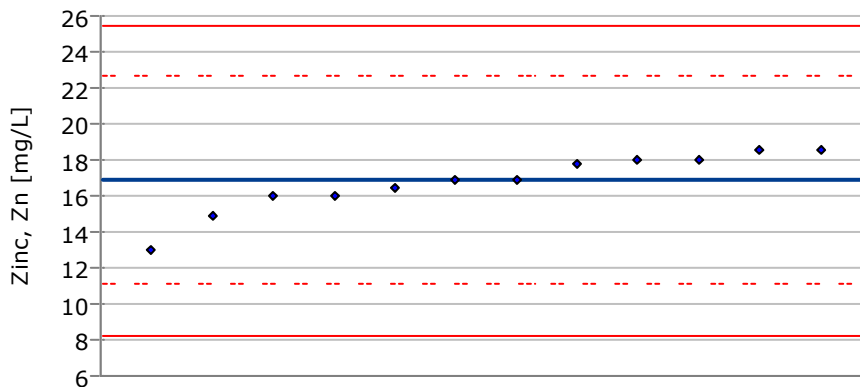
No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	23.5 mg/L
Proficiency std. dev.	3.87 mg/L
Acceptance window	11.9 - 35.1 mg/L



Number of laboratories with quantitative data points is less than 8. A reliable kernel density estimation cannot be guaranteed.

4.3.16 Zinc, Zn

No. of participating laboratories (in total / with quant. data points only)	6 / 6
No. of data points (in total / quantitative)	12 / 12
Assigned value	16.9 mg/L
Proficiency std. dev.	2.87 mg/L
Acceptance window	8.26 - 25.5 mg/L



Number of laboratories with quantitative data points is less than 8. A reliable kernel density estimation cannot be guaranteed.

5 Statistical Analysis

5.1 Definitions and Interpretation

Reported Value

The participant's result.

Assigned Value

Value attributed to a particular quantity and accepted, sometimes by convention, as having an uncertainty appropriate for a given purpose. See ISO/IEC 17043 for additional information. In general, the assigned value is the value used to assess proficiency and may or may not be the made to value (gravimetric value).

Acceptance Window

The range of values that constitute acceptable performance for a laboratory participating in this PT study.

z-score

A z-score shows how a single data point compares to normal data. A z-score says not only whether a point was above or below average, but how unusual the measurement is. Generally, a method result with a z-score less than |2| is considered to be in control and 'Acceptable'; a z-score between |2| and |3| is considered 'Questionable', but still within control and 'Acceptable' and a z-score greater than |3| is considered 'Not Acceptable' and the method is out of control. For WS studies, a z-score greater than |2| is not acceptable.

Calculated as $z = (\text{Reported Value} - \text{Assigned Value}) / \text{Proficiency Std. Dev.}$

A z-score cannot be provided

- (1) for presence/absence data,
- (2) for identification data and other categorical data,
- (3) where the analyte is not present in the sample,
- (4) for "less than" and "greater than" values,
- (5) NOEC analytes (in the framework of WETT analysis).

In cases (1) to (3) the participant's result is only evaluated by "acceptable" if it matches with the assigned value. Otherwise the result is indicated as "not acceptable". In case the analyte is not present in the sample and a PTRL is available, the participant's result is indicated as "acceptable" as long the result is less than the PTRL.

In case (4) the following evaluation rules will be applied:

- “less than” values:
 - When the analyte is not present in the sample the result is always “acceptable”.
 - When the analyte is truly present in the sample, the result is only “acceptable” if the “less than” value is greater than the lower limit of the acceptance window.
- “greater than” values:
 - When the analyte is not present in the sample the result is always “not acceptable”.
 - When the analyte is truly present in the sample, the result is only “acceptable” if the “greater than” value is less than the upper limit of the acceptance window.

In case (5) the result is indicated as “acceptable” if it lies within the acceptance window, otherwise the result is indicated as “not acceptable”.

Proficiency Std. Dev.

Standard deviation calculated based on Evaluation Criteria.

PTRL

Proficiency Testing Reporting Limit

Study Mean

Statistical study mean calculated using a robust statistical model. Robust statistical techniques are used to minimize the influence extreme results can have on estimates of the mean and standard deviation. NOTE - These techniques assign less weight to extreme results, rather than eliminate them from a data set.

Choice of statistical technique: In case of quantitative data points from at least 8 laboratories, Algorithm A (ISO 13528, Section C.3.1), and in case of quantitative data points of 4 to 7 laboratories, the Hampel estimator (ISO 13528, Section C.5.3) is applied. A study mean cannot be calculated in case there are quantitative data points from less than 4 laboratories available.

Study Std. Dev.

Standard deviation calculated from study data using robust statistics.

In case of quantitative data points from at least 8 laboratories, Algorithm A (ISO 13528, Section C.3.1), and in case of quantitative data points of 4 to 7 laboratories, the Q method (ISO 13528, Section C.5.2) is applied. A study standard deviation cannot be calculated in case there are quantitative data points from less than 4 laboratories available.

Gravimetric Value

The 'prepared to' value, determined by gravimetric means. The uncertainty associated with this value is the standard uncertainty and based on Sigma-Aldrich RTC's gravimetric tolerances.

Analytical Value

The measured value, determined after preparation. The uncertainty associated to this value is the standard uncertainty and based on the measurement process.

5.2 Evaluation Criteria

1 - Regression Equation

Acceptance windows based on TNI adopted equation of proficiency value ± 3 proficiency standard deviations and check limits of proficiency value ± 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c & d as proficiency value = $a * \text{gravimetric} + b$ and proficiency standard deviation = $c * \text{gravimetric} + d$.

2 - Study Robust Mean and c, d regression

Acceptance windows based on TNI adopted equation of proficiency value ± 3 proficiency standard deviations and check limits of proficiency value ± 2 proficiency standard deviations. Proficiency value and proficiency standard deviation calculated from robust study mean and variables c & d as proficiency value = robust mean and proficiency standard deviation = $c * \text{proficiency value} + d$.

3 - Fixed Limits

Acceptance windows based on span of gravimetric percentage from gravimetric as $\text{gravimetric} \pm \text{gravimetric} * \text{percentage}$.

4 - Adjustable Fixed Limits

Acceptance windows based on a span of gravimetric percentage from gravimetric as $\text{gravimetric} \pm \text{gravimetric} * \text{lowPercentage}$ where $\text{gravimetric} < \text{break}$ and $\text{gravimetric} \pm \text{gravimetric} * \text{highPercentage}$ where $\text{gravimetric} \geq \text{break}$.

5 - Study Statistics

Acceptance windows based on a number of standard deviations span from the study mean as $\text{study mean} \pm (\text{deviations} * \text{standard deviation})$.

6 - Log Transform Statistics

Acceptance windows based on lognormal distributed data. Acceptance windows = $\text{mean}(\text{lognormal}) \pm \text{span} * \text{standard deviation}(\text{lognormal})$.

7 - Regression Equation 2SD

Acceptance windows based on EPA equation of proficiency value ± 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c & d as proficiency value = $a * \text{gravimetric} + b$ and proficiency standard deviation = $c * \text{gravimetric} + d$. Generally reserved for drinking water studies.

8 - Study Median and Dilution Levels

Acceptance windows based on study median ± 1 dilution. If the median falls between two test dilutions, then the assigned value is set at the higher value, and the lower acceptance limit is the second test dilution below the median, and the upper acceptance limit is the second test dilution above the median. Generally reserved for NOEC analytes (in the framework of WETT analysis).

9 - Fixed Limits based on Analytical Value

Acceptance windows based on span of analytical value from measurements.

6 Notes on the Interpretation of the Results

z score Overview

The z-scores are presented as colored triangles. For each item, the z-scores of all analytes of the current and the previous (up to three) scheduled studies of this study type. The z-scores depend on the lot, analytical method used, and analyst (if given). A red cross is shown if no z-score is available.

For the assessment of participants by means of z-scores according to ISO/IEC 17043:2010 [2], the triangles were colored as follows:

$ z \leq 2$	green
$2 < z < 3$	yellow (WS studies, WETT samples: red)
$ z \geq 3$	red.

For $|z| \geq 3$, the corresponding triangles are displayed as -3 or 3. For $|z| > 2$, the value of the z score is displayed next to the triangle (yellow or red). A z-score = 0 is shown as a light blue vertical bar.

Interpretation of the z-scores' overview:

A z-score < 0 , i.e. the triangle points to the left, means that the measurement result is lower than the assigned value.

A z-score > 0 , i.e. the triangle points to the right, means that the measurement result is higher than the assigned value.

A z-score = 0, i.e. a light blue vertical bar is shown, means that the measurement result coincides with the assigned value.

Figures per Combination of Item, Lot and Analyte

The *diagram on the left* shows the participant results by means of blue diamonds.

The horizontal blue line indicates the assigned value.

Both the acceptance and the check limits for the participant results are calculated based on z-scores.

The acceptance limits are displayed as solid lines and correspond to z-scores of ± 3 . For WS studies and non-NOEC analytes (in the framework of WETT analysis), the acceptance limits correspond to a z-score ± 2 . For NOEC analytes (in the framework of WETT analysis), the acceptance limits correspond to ± 1 dilution.

The check limits are displayed as dashed lines and correspond to z-scores of ± 2 . They are only calculated if a rule is given by the evaluation criterion.

In case there are at least 8 laboratories with quantitative data points are available: The *diagram on the right* is a kernel density estimation of the distribution of the participant results. The measurement values are indicated as small circles. The kernel width is determined by the ISO 13528 formula from section 10.3.2 i) a).

7 Proficiency Test Item Preparation, Homogeneity and Stability Assessment

Sigma-Aldrich RTC uses proprietary and published methods for the manufacture, homogeneity and stability testing of proficiency test items. Sigma-Aldrich RTC's proficiency test materials meet the requirements of ISO 17034. For more information contact Sigma-Aldrich RTC. Additionally, Sigma-Aldrich RTC complies with the TNI Volume 3 'General Requirements for Environmental Proficiency Test Providers', EL-V3-2016, for all TNI Fields of Proficiency Testing analytes.

8 Metrological Traceability

All preparations are made using balances calibrated annually traceable to NIST standards. Where appropriate analytical measurements are traceable through an unbroken chain to NIST standards, or a Certified Reference Material manufactured under ISO 17034 in conjunction with ISO/IEC 17025.

9 Additional Information

Go to supelco-pt.com for additional information on summary statistics for specific methods, advice on the interpretation of the statistical analysis and additional comments/recommendations. Sigma-Aldrich RTC recommends that you contact your accreditation body for specific instruction.

10 References

- [1] ISO 13528: Statistical methods for use in proficiency testing by interlaboratory comparison, August 2015
- [2] ISO/IEC 17025:2017: General requirements for the competence of testing and calibration laboratories
- [3] ISO/IEC 17043:2010: Conformity assessment - General requirements for proficiency testing, May 2010
- [4] S. Uhlig und P. Henschel (1997): Limits of tolerance and z-scores in ring tests. Fresenius' J. Anal. Chem., Vol. 358, pp. 761-766.
- [5] ISO 17034:2016: General requirements for the competence of reference material producers.

This section of the report is for informational purposes only. If you are unsure about specific accreditation requirements, please contact your state coordinator.

Unacceptable Analytes

No unacceptable analytes

¹ TNI Compliant, covered by Sigma-Aldrich RTC's ANAB Proficiency Testing Provider accreditation, Cert. AP-1469

² ISO/IEC 17043 Accredited, covered by Sigma-Aldrich RTC's ANAB Proficiency Testing Provider accreditation, Cert AP-1469

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